BEHAVIORAL AND MORPHOLOGICAL STUDIES OF THE GOODEID GENUS *ILYODON*, AND COMPARATIVE BEHAVIOR OF FISHES OF THE FAMILY GOODEIDAE

by

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To My Husband, Pete, And To My
Family Who Encouraged My Studies
Of Fishes

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INTRODUCTION

The Goodeidae comprise a small family of viviparous cyprinodontoid fishes, restricted largely to the highlands of the Mesa Central, México although the genus Ilyodon occurs in the lowland habitats on the Pacific slope in Jalisco and Colima (Miller and Fitzsimons, 1971). The 35 to 40 extant species exhibit great diversity in morphology, feeding adaptations, karyotypes and habitats.

The family has several characters related to viviparity. All males have a modified anal fin with six to eight crowded, shortened anterior anal-fin rays, separated as a group from the rest of the fin. Trophotaeniae, rectal processes that develop in the young during gestation, are found in all but one species. Characteristics of the ovary and trophotaeniae were used by Hubbs and Turner (1939) in their revision of the Goodeidae.

The present study comprises two major divisions. The first division concerns the courting and aggressive behaviors of 27 species of the family Goodeidae. The behaviors are described, field and laboratory data are compared and the data examined for taxonomic information. Evidence for auditory, chemical, tactile and/or visual communication among goodeids is discussed briefly.

The second division comprises a morphological study of the genus Ilyodon that includes specimens from all known localities. Four new subspecies are described. Sexual dimorphism and ecophenotypic variation are examined. Similarities and differences among populations are outlined and problem areas are discussed in the light of preliminary electrophoretic, karyotypic and hybridization data.

A brief account of care and maintenance of laboratory stocks is given in Appendix A. General ecological and behavioral information on 10 goodeid localities is summarized in Appendix B.

Appendix C lists the data used in the morphological study, and Appendix D gives descriptive statistics for 69 populations.

MATERIALS AND METHODS

This morphological and behavioral study of the Goodeidae is based on live and preserved material. The preserved specimens are deposited in The University of Michigan Museum of Zoology (UMMZ). Live stocks were collected in México and shipped to Ann Arbor in 1976 by R. R. Miller, F. H. Miller and D. I. Kingston and in 1978 by D. I. Kingston and P. J. Kingston. Methods used in counting and measuring are given in Miller (1948) and Hubbs and Lagler (1958) with several modifications for goodeids given in Fitzsimons (1970, 1972). The characters chosen for the morphological study are listed in Table 1.

Initially 25 males (where available) and six females from each of 21 populations of Ilyodon were measured for 42 characters. These 21 populations represent all drainages from which Ilyodon is reported. An analysis of variance revealed that three characters are invariant among all the populations and they were eliminated from the study. Meristic and morphometric data were analyzed by multivariate techniques. The males were analyzed separately from the females. Principal Components Analysis was chosen to analyze the geographic variation among populations. This method ordinates the data in a few dimensions that summarize the trends in variance in the original data set and it does not require that specimens be grouped initially in order to do the analysis. Different species are usually represented as distinct, non-overlapping clusters of specimens. The pattern formed by the scores for specimens on the first two principal component axes reflects the two major directions of maximum variation for the 39 characters (Morrison, 1967). The program used is MIDAS of The University of Michigan Statistical Research Laboratory.

Use of raw data resulted in specimens being ranked by

Table 1. Morphometric and meristic characters used in the study of the genus Ilyodon. Asterisks denote the three characters that are not significant by an analysis of variance.

Morphometric

1. Standard length
2. Predorsal length
3. Prepelvic length
4. Anal origin to caudal base
5. Body, greatest depth
6. Body, greatest width
7. Head, length
8. Head, depth
9. Head, width
10. Caudal peduncle, length
11. Caudal peduncle, least depth
12. Interorbital, least bony width
13. Preorbital, least width
14. Postorbital, length
15. Snout, length
16. Orbit, length
17. Mouth, width
18. Mandible, length
19. Dorsal fin, basal length
20. Dorsal fin, depressed length
21. Anal fin, basal length
22. Anal fin, depressed length
23. Middle caudal rays, length
24. Pectoral fin, length longest ray
25. Pelvic fin, length longer fin
26. Upper jaw, length
27. Opercle, length

Meristic

1. Dorsal fin rays
2. Anal fin rays
3. Pectoral fin rays, both fins
4. Pelvic fin rays, both fins *
5. Caudal fin rays
6. Lateral scale series
7. Dorsal to anal scales
8. Body circumference scales
9. Predorsal scales
10. Caudal peduncle circumference scales
11. Gill rakers
12. Vertebrae
13. Mandibular pores *
14. Preopercular pores
15. Lacrimal pores *

increasing size along the first principal component. It is necessary to remove this size effect as it may cause collections of the same species to form distinct clusters when analyzed by Principal Components Analysis if the specimens in the collections differ in length. The collections would be incorrectly assigned to different taxa. Specimen size may be influenced by the locality, time of year of the collection and collecting technique. Log transformed data also failed to remove the size effect. The data were converted to proportional measurements by dividing each measurement by the standard length of the fish from which it was derived. This transformation removed the size effect.

While proportional measurements effectively remove size as a factor from the first principal component, they do not control for allometry. Populations may not show the same pattern of allometric growth, which makes comparisons among them more difficult. Using adult specimens in the study reduces the influence of allometry. But one reason for using Principal Components Analysis is that the effects of allometry are visualized in the spread of specimens along the major axes.

Mahalanobis distances (Afifi and Azen, 1972) were calculated between the means of the 21 populations using the scores of the first eight principal components as variables. Pairwise comparisons along the first and second principal components and along the first and third principal components were made for all pairs of populations with a d^2 value of 19 or less, as well as for some pairs with larger d^2 values. Distance values greater than or equal to 19 gave non-overlapping clusters in pairwise comparisons. Distance values ranged from 2 to 140. These comparisons indicated that specimens from additional localities were needed to interpret some of the results. The study was enlarged to include five additional males (where available) from each of 48 collections. The specimens were chosen so as to represent the range of adult sizes present in each collection. These specimens were also examined for all characters. These 69 collections represent all localities in which Ilyodon have been caught.

The 10 characters having the greatest between-population variances and the least within-population variances (highest F statistic) were determined by an analysis of variance. The enlarged sample of 69 populations was examined by Principal Components Analysis for these 10 characters. Pairwise comparisons were repeated using these 10 characters for cases having shown marginal overlap of populations.

Preparations of Chromosome Slides

Chromosome microslides were prepared by an air-dried technique (Black and Howell, 1978; Black, pers. comm.). Juvenile fish are fed live food for several days, then injected intraperitoneally with .01% colchicine until the abdominal cavity becomes swollen. They are sacrificed 6 to 8 hours later, the gill arches removed and placed in 0.4% KCl for 45 to 60 minutes. The gill tissue is then placed in a fresh solution of fixative (3:1 ethanol:glacial acetic acid) for 15 minutes, then placed in fresh fixative for an additional 15 minutes. The tissue is dabbed on clean slides dampened with a few drops of fixative. After the slides are dry, they are stained for 10 minutes in 6% Giemsa solution and mounted. Slides for 80 specimens representing four populations in the Coahuayana drainage were prepared. Preliminary counts indicate no sexual differences in karyotypes.

Electrophoretic Study

Electrophoretic techniques followed those of Selander et al. (1971) with modifications by B. J. Turner (pers. comm.). Thirty loci for each of 16 fish representing four populations were examined by means of starch gels. Specimens for karyotyping and for electrophoresis were obtained in the field.

Maintenance of Live Fishes

Live fishes used in this study are the descendents or original members of stocks collected in México and shipped to Ann

Arbor. They are maintained in the aquarium facility of the Museum of Zoology. A 12-hour photoperiod is maintained by use of timers and fluorescent fixtures. But as aquaria receive light from windows and skylights, the photoperiod is longer in the summer. Temperature varies between 20°C at night and 30°C during the day to simulate field conditions (Fitzsimons, 1970). Fish are fed once a day with Purina trout chow, supplemented by newly hatched brine shrimp and Daphnia. A detailed account of care and propagation of stocks is given in Appendix A.

Behavioral Observations

Pairs of goodeids were observed in the laboratory and the courtship behaviors noted for each species. Pairs were handled in several ways. Some were isolated by a partition except during periods of observation. Others were allowed full access to each other. Observations were also made on stock aquaria containing as many as 100 fish of one species. The behaviors, their frequencies and sequences were recorded by keeping a continuous written record of the pair's activities. If no courting behavior was observed in 10 minutes, observations ceased for that day. Actively courting pairs were usually observed at least 30 minutes, or until they ceased courting.

Field observations for 19 species were made by snorkeling and by watching from the bank. Goodeids often occurred in water less than 1 m deep and I could follow them by swimming or walking slowly. At Lago Camécuaro, snorkeling was accomplished by floating over the deeper sections of the lake on an air mattress. The fish are upset by movements in the water and observations from the bank were better for obtaining behavioral data. The fishes acclimated quickly to a stationary observer. By lying along the bank with my head in the water, I could see the fishes clearly without startling them.

Observations were recorded on special underwater writing paper. After a day or more of recording, the laboratory-observed behaviors were compared to the field-observed behaviors. An additional day was spent examining discrepancies in these two data sets. Sequence data were also obtained for field populations.

Live Stocks

Karyology, hybridization experiments and ethology were based largely on the following live stocks, all from México.

Allodontichthys sp.

Jalisco: Río de la Pola ca. 5 km E of Guachinango and 40 km W of Ameca.
Drainage: trib. Río Atenguillo, Río Ameca basin.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:22:1976 M76-37

Allodontichthys tamazulae

Jalisco: Río Terrero, at crossing ca. 1 km W of 21 de Noviembre on Hwy 110, ca. 16 km N of Pihuamo.
Drainage: trib. Río Coahuayana.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:18:1976 M76-30

Allodontichthys zonistius

Colima: Río de Comala at S entrance to Comala, first bridge, 10 km N of Colima.
Drainage: trib. Río Armería.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:18:1976 M76-31

Alloophorus robustus

Michoacán: Lago Zirahuén, SE end.
Drainage: interior.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:6:1976 M76-18

Guanajuato: Río Turbio, 10 km E of Pénjamo at Hwy 110 crossing.
Drainage: trib. Río Lerma.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:9:1976 M76-22

Michoacán: Pond on W side of road just N of Jaripo.
Drainage: Río Lerma basin.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:8:1976 M76-21

Michoacán: Lago de Camécuaro, SE of Zamora.
Drainage: trib. Río Duero, Río Lerma basin.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:15:1976 M76-26

Allotoca sp.

Jalisco: Marshy roadside on S side of road, Laguna Magdalena, about 150 m SSW of R.R. crossing.
Drainage: interior.
Collectors: R. R. Miller and J. M. Fitzsimons
II:22:1970 M70-12

Allotoca dugesi

Michoacán: Lago Zirahuén, SE end.
Drainage: interior.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:6:1976 M76-18

Michoacán: Río Grande de Morelia just above Undameo and lateral canal.
Drainage: interior (to Lago Cuitzeo).
Collectors: R. R. Miller and F. H. Miller
III:4:1976 M76-43

Ameca splendens

Jalisco: Río de Teuchitlán below Teuchitlán.
Drainage: trib. Río Ameca.
Collectors: R. R. Miller and H. L. Huddle
V:5:1966 M66-17

Ataeniobius toweri

San Luis Potosí: La Media Luna at western outlet ditch next to road, 12.2 km SSW of Río Verde.
Drainage: Río Verde, Río Pánuco basin.
Collectors: R. R. Miller and M. B. Lackey
II:13:1968 M68-18

Chapalichthys encaustus

Michoacán: Río Tanhuato on NE edge of town 50-65 m below highway bridge.
Drainage: trib. Río Lerma.
Collectors: R. R. Miller and J. M. Fitzsimons
II:26:1970 M70-16

Chapalichthys pardalis

Michoacán: El Agua de Zapote de Tocumbo, Tocumbo.
Drainage: trib. to stream passing Los Reyes to Río Balsas.
Collectors: R. R. Miller and T. M. Cavender
II:17:1971 M71-9

Characodon lateralis

Durango: Berros, 4 km from El Salto, ca. 40 km SE of Durango.
Drainage: Río Mezquital basin.
Collector: A. L. Metcalf
IX:1:1968 M68-41

Girardinichthys multiradiatus

México: Río Lerma, just below Presa Alzate, 24 km N and 5.6 km E of Toluca off Hwy 55.
Drainage: Pacific.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:13:1976 M76-24

Girardinichthys viviparus

México: Lago Zumpango, at NE corner.
Drainage: interior.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:25:1976 M76-40

Goodea atripinnis

Michoacán: Normally dry expansion of Lago Cuitzeo, just at N edge of Cuitzeo, on E side of Hwy 43.
Drainage: interior.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:3:1976 M76-13

Michoacán: Canal closest to Tzintzimeo, 8.9 km E of Alvaro Obregón.
Drainage: interior (Río Grande de Morelia).
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:4:1976 M76-15

Guanajuato: Río Turbio, 10 km E of Pénjamo, at Hwy 110 crossing.
Drainage: trib. Río Lerma.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:9:1976 M76-22

Jalisco: Presa de la Vega in Río Ameca, 32 km W of junction of Hwy 15 and Hwy 70.
Drainage: Pacific.
Collectors: R. R. Miller and H. L. Huddle
V:5:1966 M66-16

Goodea gracilis

Querétaro: Río San Juan del Río, just below old bridge.
Drainage: trib. Río Pánuco.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:14:1976 M76-25

Goodea luitpoldi

Michoacán: Spring-fed pond at Rancho El Molino, 5.3 km E and 4.8 km N of Pátzcuaro-Quiroga-Morelia junction.
Drainage: trib. Lago Pátzcuaro.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:5:1976 M76-17

Michoacán: Same locality as preceding.
Drainage: trib. Lago Pátzcuaro.
Collectors: R. R. Miller and J. M. Fitzsimons
III:7:1970 M70-25

Ilyodon furcidens amecae

Jalisco: Río de la Pola, ca. 5 km E of Guachinango and 40 km W of Ameca.
Drainage: trib. Río Atenguillo, Río Ameca basin.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:22:1976 M76-37

Ilyodon furcidens furcidens

Colima: Río de Comala at S entrance to Comala, first bridge, 10 km N of Colima.
Drainage: trib. Río Armería.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:18:1976 M76-31

Jalisco: Outlet of Presa Santa Rosa, 3.7 km E of Hwy 80 from turnoff, 5 km S of Unión de Tula.
Drainage: trib. Río San Pedro, Río Armería basin.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:21:1976 M76-35

Jalisco: Río Terrero, at crossing 1 km W of 21 de Noviembre on Hwy 110, ca. 16 km N of Pihuamo.
Drainage: trib. Río Coahuayana.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:18:1976 M76-30

Ilyodon furcidens tuxpan

Jalisco: Río Tamazula just below Hwy 110 bridge, 4.8 km S of Cd. Guzman turnoff.
Drainage: Río Coahuayana basin.
Collectors: R. R. Miller and H. L. Huddle
IV:3:1968 M68-30

<u>Ilyodon xantusi latos</u>

Jalisco: Río Terrero, ca. 1 km W of 21 de Noviembre on Hwy 110, ca. 16 km N of Pihuamo.

Drainage: trib. Río Coahuayana.

Collectors: D. I. Kingston and P. J. Kingston

IV:24:1978 K78-9

<u>Ilyodon xantusi xantusi</u>

Colima: Río de Comala at S entrance to Comala, first bridge, 10 km N of Colima.

Drainage: trib. Río Armería.

Collectors: R. R. Miller, F. H. Miller and D. I . Kingston

II:18:1976 M76-31

<u>Ilyodon whitei</u>

Puebla: Río Nexapa at Puente Tepexcala, ca. 32 km WSW of Matamoras, near Morelos line.

Drainage: trib. Río Balsas.

Collectors: R. R. Miller and H. L. Huddle

V:2:1966 M66-12

<u>Neoophorus catarinae</u>

Michoacán: Río Santa Catarina, above dam, 4 km WSW of Uruapan.

Drainage: trib. Río Cupatitzio, Río Balsas basin.

Collectors: R. R. Miller, F. H. Miller and D. I. Kingston

II:6:1976 M76-19

<u>Neoophorus diazi</u>

Michoacán: Spring-fed pond at Rancho El Molino, 5.3 km E and 4.8 km N of Pátzcuaro-Quiroga-Morelia junction.

Drainage: trib. Lago Pátzcuaro.

Collectors: R. R. Miller, F. H. Miller and D. I. Kingston

II:5:1976 M76-17

Neoophorus meeki

Michoacán: Lago Zirahuén, SE end.
Drainage: interior.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:6:1976 M76-18

Skiffia bilineata

Michoacán: Canal closest to Tzintzimeo, 8.9 km E of Alvaro Obregón.
Drainage: interior (Río Grande de Morelia).
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:4:1976 M76-15

Michoacán: Río Grande de Morelia just above Undameo and lateral canal.
Drainage: interior (to Lago Cuitzeo).
Collectors: R. R. Miller and F. H. Miller
III:4:1976 M76-43

Skiffia francesae

Jalisco: Río Teuchitlán above Hwy at Teuchitlán.
Drainage: trib. Río Ameca.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:23:1976 M76-39

Skiffia lermae

Michoacán: Spring-fed pond at Rancho El Molino, 5.3 km E and 4.8 km N of Pátzcuaro-Quiroga-Morelia junction.
Drainage: trib. Lago Pátzcuaro.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:5:1976 M76-17

Skiffia multipunctata

Michoacán: Lago de Camécuaro.
Drainage: trib. Río Duero, Río Lerma basin.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:15:1976 M76-26

Xenoophorus captivus

San Luis Potosí: Río Villeto, 10.1 km S of Hwy 57 crossing of Río Santa Maria below highway bridge.
Drainage: trib. Río Santa Maria, Río Pánuco basin.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:1:1976 M76-10

Xenotaenia resolanae

Jalisco: 2.1 km W of Hwy 80 on road to Purificación, first bridge that has a water gauging station.
Drainage: trib. Río Purificación.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:20:1976 M76-33

Jalisco: Tributary to Río Purificación at Hwy 80 crossing just S of turnoff to Purificación.
Drainage: trib. Río Purificación.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:20:1976 M76-34

Xenotoca eiseni

Nayarit: Manatial El Sacristán, 1.3 km NW of plaza of Tepic.
Drainage: trib. Río de Tepic, Río Grande de Santiago basin.
Collectors: R. R. Miller and J. T. Greenbank
III:28:1955 M55-72

Jalisco: Río Tamazula at Hwy 110 bridge, 4.8 km S of Cd. Guzman turnoff.
Drainage: trib. Río Naranjo, Río Coahuayana basin.
Collectors: R. R. Miller and H. L. Huddle
V:3:1966 M66-13

Xenotoca melanosoma

Jalisco: Río Teuchitlán, at Teuchitlán.
Drainage: trib. Río Ameca.
Collectors: J. M. Humphries and M. L. Smith
VI:5:1976 H76-15

Xenotoca variata

San Luis Potosí: Río Santa María about 1.6 km S of Villa de Reyes.
Drainage: trib. Río Pánuco.
Collectors: R. R. Miller and H. L. Huddle
III:26:1968 M68-21

Michoacán: Lago de Cuitzeo on S side at Hwy 43, just E of the viaduct.
Drainage: interior.
Collectors: R. R. Miller and J. M. Fitzsimons
III:8:1970 M70-27

Zoogoneticus quitzeoensis

Guanajuato: Ojo de Agua de Santiaguito, 1.6 km NE and 2.4 km N of San Francisco del Rincón, which is about 24 km WSW of Léon.
Drainage: trib. Río Turbio, Río Lerma basin.
Collectors: R. R. Miller and J. M. Fitzsimons
II:19:1970 M70-9

New genus and species

Jalisco: Río Terrero, above dam, ca. 1 km W of 21 de Noviembre on Hwy 110, ca. 16 km N of Pihuamo.
Drainage: trib. Río Coahuayana.
Collectors: D. I. Kingston and P. J. Kingston
IV:24:1978 K78-9

Incertae Sedis

Jalisco: Río Potrero Grande (Arroyo Grande), 9.6 km W of Ameca on road to Guachinango.
Drainage: trib. Río Ameca.
Collectors: R. R. Miller, F. H. Miller and D. I. Kingston
II:23:1976 M76-38

Preserved Material

The morphological study was based on the following collections of Ilyodon.

Ilyodon sp.—UMMZ 178411: Río Aguililla at Aguililla, Michoacán, R. R. Miller and M. Miller III:15:1957, 25 males, six females, 40.6-83.2 mm SL; UMMZ 178419: Río Aguacate, tributary to Río Tumbiscatio, ca. 8 km by road W of Arteaga, Michoacán, R. R. Miller and M. Miller III:17:1957, 25 males, six females, 28.8-62.5 mm SL; UMMZ 178421: Río Arteaga at Arteaga, Michoacán, R. R. Miller and M. Miller III:17:1957, 25 males, six females, 32.4-46.5 mm SL.

Ilyodon furcidens amecae.—UMMZ 178344: Río Potrero Grande, 8 km W of Ameca on road to Atenguillo, Jalisco, R. R. Miller and M. Miller III:4:1957, five males, 53.4-65.4 mm SL; UMMZ 178347: Río de la Pola, tributary to Río Atenguillo, 4.8 km W of Guachinango, Jalisco, R. R. Miller and M. Miller III:5:1957, 179, 11-67 mm SL; UMMZ 178352: Río Atenguillo, ca. 0.4 km below town of Atenguillo, Jalisco, R. R. Miller and M. Miller III:5:1957, five males, 46.0-65.5 mm SL; UMMZ 178358: Río Mascota at road crossing just above Mascota, Jalisco, R. R. Miller and M. Miller III:6:1957, 25 males, 15 females, 37.3-76.0 mm SL; UMMZ 189586: Río de la Pola, tributary to Río Atenguillo, ca. 4 km E of Guachinango and 40 km W of Ameca, Jalisco, R. R. Miller and J. M. Fitzsimons II:21:1970, 24 males, 14 females, 42.3-67.6 mm SL; UMMZ 192183: tributary Río Ameca just W of Ameca on road to Mascota, Jalisco, C. D. Barbour and R. J. Douglass IV:21:1969, three males, 33.3-61.4 mm SL; UMMZ 192198: tributary to Río Ameca about 0.4 km W Talpa turnoff on road to Mascota, Jalisco, C. D. Barbour and R. J. Douglass IV:22:1969, three males, 35.3-47.2 mm SL; UMMZ 192200: Río Mascota, 4.0 km E Mascota at road crossing, Jalisco, C. D. Barbour and R. J. Douglass IV:22:1969, five males, 50.6-63.7 mm SL; UMMZ 192202: tributary to Río Atenguillo to Río Ameca, about 1.6 km S Volcanes, Jalisco, C. D. Barbour and R. J. Douglass IV:23:1969, one male, 54.6 mm SL; UMMZ 203259: Río de la Pola, tributary to Río Atenguillo, ca. 4 km E of Guachinango and 40 km W of Ameca, Jalisco, R. R. Miller and J. M. Fitzsimons II:21:1970, one male, 58.7 mm SL; UMMZ 203260:

Río de la Pola, tributary to Río Atenguillo, ca. 4 km E of Guachinango and 40 km W of Ameca, Jalisco, R. R. Miller and J. M. Fitzsimons II:21:1970, one female, 62.7 mm SL.

Ilyodon furcidens furcidens.—UMMZ 145304: Río Colima, 300 m from R.R. station, Colima, C. L. Turner IV:2:1939, five males, 54.2-65.6 mm SL; UMMZ 145313: Río Salado, 10 km S of Colima City, Colima, C. L. Turner IV:2:1939, two males, 35.2 mm SL and 40.9 mm SL; UMMZ 160761: Río Colima at the SW edge of the city of Colima, Colima, J. Oliver and A. Bakewell VII:4:1935, five males, 37.4-64.0 mm SL; UMMZ 160776: tributary of Río Colima, W of Colima on Hacienda Los Limones, 2 km SW of Villa Alvarez, Colima, J. Oliver and A. Bakewell VIII:3:1935, three males, 74.0-82.0 mm SL; UMMZ 172147: Río Salado, 7.2 km by highway E of Colima, Colima, R. R. Miller and J. T. Greenbank III:7:1955, one male, 49.1 mm SL; UMMZ 172208: tributary of Río San Pedro at highway bridge, 14.5 km NE of Autlán, Jalisco, R. R. Miller and J. T. Greenbank III:23:1955, five males, 57.3-68.6 mm SL; UMMZ 172217: tributary to Río San Pedro, 5.6 km E of Tecolotlán, 85 km NE of Autlán on road to Guadalajara, Jalisco, R. R. Miller and J. T. Greenbank III:24:1955, five males, 38.0-57.2 mm SL; UMMZ 178364: Río de Ayutla, tributary Río San Pedro, 4 km ESE of Ayutla, Jalisco, R. R. Miller and M. Miller III:7:1957, 15 males, 15 females, 40.3-70.3 mm SL; UMMZ 189595: Río de Comala, just above and below second bridge S of Comala, ca. 8 km N of Colima, Colima, R. R. Miller and J. M. Fitzsimons II:24:1970, 25 males, 15 females, 32.2-78.5 mm SL; UMMZ 189601: Río Terrero, about 1.6 km W of 21 de Noviembre, Jalisco, R. R. Miller and J. M. Fitzsimons II:24-25:1970, 25 males, 15 females, 32.5-63.6 mm SL; UMMZ 192193: small stream crossing road 4.7 km SW Colotitlán on Hwy 80, Jalisco, C. D. Barbour and R. J. Douglass IV:22:1969, 25 males, 15 females, 37.8-65.8 mm SL; UMMZ 192195: stream crossing 9.8 km W junction of Mascota road with Hwy 80, Jalisco, C. D. Barbour and R. J. Douglass IV:22:1969, 15 males, 15 females, 39.1-83.7 mm SL; UMMZ 192205: tributary to Río San Pedro, 17.7 km E El Grullo on road to Tonaya or 1.3 km N San Juan de Amula, Jalisco, C. D. Barbour and R. J. Douglass IV:23:1969, five males, 45.3-53.2 mm SL; UMMZ 192206: tributary to Río San Pedro, 17.7 km E El Grullo on road to Tonaya or 1.3 km N San Juan de Amula, Jalisco, C. D. Barbour and R. J. Douglass IV:23:1969, five males, 46.4-75.7 mm SL; UMMZ 192222: Río Salado, 5.1 km E Colima turnoff on Hwy 110, Colima, C. D. Barbour and R. J. Douglass IV:25:1969, four males, 53.7-62.5 mm SL; UMMZ 192228: stream crossing 17.1 km E Río Salado on Hwy 110, Colima, C. D. Barbour and R. J. Douglass IV:25:1969, one male, 73.5 mm SL; UMMZ 198845: outlet of Presa Santa Rosa, 3.7 km E of Hwy 80 from turnoff, 5 km S of Unión de Tula, Jalisco, R. R. Miller, F. H. Miller and D. I. Kingston II:21:1976, 25 males, 15 females, 36.4-85.0 mm SL.

Ilyodon furcidens tuxpan.—UMMZ 138691: Río Tuxpan at Tuxpan, Jalisco, D. S. Erdman X:15:1941, one male, 49.2 mm SL; UMMZ 145307: Río Tamazula, at Tuxpan, Jalisco, C. L. Turner IV:3:1939, 12 males, 10 females, 27.2-58.0 mm SL; UMMZ 172160: Río San Rafael at San Rafael bridge (Hwy 110), Jalisco, R. R. Miller and J. T. Greenbank III:8:1955, 24 males, 14 females, 36.4-71.6 mm SL; UMMZ 172166: tributary of Río Tamazula, 0.8 km by highway E of La Garita, Jalisco, R. R. Miller and J. T. Greenbank III:8:1955, five males, 42.5-72.1 mm SL; UMMZ 189075: Río Tamazula, just below Hwy 110 bridge, Jalisco, R. R. Miller and H. L. Huddle IV:3:1968, 316, 21-78 mm SL; UMMZ 189080: Río de Tecalitlán at Tecalitlán on Hwy 110 SSE of Tuxpan, Jalisco, R. R. Miller and H. L. Huddle IV:3:1968, five males, 43.1-51.0 mm SL; UMMZ 189591: Río Tuxpan about 1 km above Atenquique in small tributary from E and main river, Jalisco, R. R. Miller and J. M. Fitzsimons II:23:1970, 25 males, six females, 31.4-57.5 mm SL; UMMZ 189592: Río Tuxpan about 1 km above Atenquique in small tributary from E and main river, Jalisco, R. R. Miller and J. M. Fitzsimons II:23:1970, five males, 50.4-73.9 mm SL; UMMZ 192247: Río Tuxpan, 5.8 km S junction Hwy. to Cd. Guzman and Hwy 110, Jalisco, C. D. Barbour and R. J. Douglass IV:27:1969, five males, 53.8-71.5 mm SL; UMMZ 192251: Río Tuxpan 7.1 km N Tamazula, Jalisco, C. D. Barbour and R. J. Douglass IV:27:1969, five males, 37.1-60.4 mm SL; UMMZ 192256: tributary to Río Tuxpan, 4.5 km W Soyatlán de Afuera, Jalisco, C. D. Barbour and R. J. Douglass

IV:28:1969, five males, 44.5-67.5 mm SL; UMMZ 202434: Hwy 110 bridge at San Rafael above and below bridge, Jalisco, D. I. Kingston and P. J. Kingston IV:27:1978, 45, 25-39 mm SL; UMMZ 202612: Río Tamazula, ca. 1 km NE of La Garita, from bridge Hwy 110 to 300 m upstream, Jalisco, B. Chernoff, B. L. Brett and S. Poss V:2:1978, five males, 38.6-57.1 mm SL; UMMZ 202613: Río Tamazula at N end of Tamazula ca. 200 m above factory and 13.0 km below bridge, Jalisco, B. Chernoff, B. L. Brett and S. Poss V:2:1978, five males, 37.1-62.0 mm SL; UMMZ 202617: Río Tamazula ca. 2 km W of Hwy 110 bridge at river crossing and small stream that feeds into river, Jalisco, B. Chernoff, B. L. Brett and S. Poss V:3:1978, five males, 43.2-67.4 mm SL; UMMZ 202620: river below town of Fereria, 20-30 km above Vista Hermosa, Jalisco, B. Chernoff, B. L. Brett and S. Poss V:3:1978, two males, 67.4 mm SL and 72.8 mm SL; UMMZ 203257: Río San Rafael at San Rafael bridge (Hwy 110), Jalisco, R. R. Miller and J. T. Greenbank III:8:1955, one male, 63.4 mm SL; UMMZ 203258: Río San Rafael at San Rafael bridge (Hwy 110), Jalisco, R. R. Miller and J. T. Greenbank III:8:1955, one female, 64.9 mm SL.

Ilyodon furcidens variabilis.—UMMZ 173795: 0.8-2.4 km W of San Gabriel, Jalisco, J. Peters V:27:1949, two males, 40.4 mm SL and 49.9 mm SL; UMMZ 192234: tributary of Río San Pedro at Apulco, Jalisco, C. D. Barbour and R. J. Douglass IV:26:1969, 10 males, 45.2-59.2 mm SL; UMMZ 192235: tributary of Río San Pedro at Apulco, Jalisco, C. D. Barbour and R. J. Douglass IV:26:1969, 10 males, 52.2-79.7 mm SL; UMMZ 192236: tributary of Río San Pedro at Apulco, Jalisco, C. D. Barbour and R. J. Douglass IV:26:1969, 24 males, 14 females, 44.8-77.9 mm SL; UMMZ 203261: tributary of Río San Pedro at Apulco, Jalisco, C. D. Barbour and R. J. Douglass IV:26:1969, one male, 56.4 mm SL; UMMZ 203262: tributary of Río San Pedro at Apulco, Jalisco, C. D. Barbour and R. J. Douglass IV:26:1969, one female, 57.0 mm SL.

Ilyodon xantusi latos.—UMMZ 172154: tributary of Río Naranjo, 8 km by highway N of Pihuamo, Jalisco, R. R. Miller and J. T. Greenbank III:8:1955, five males, 43.5-69.5 mm SL; UMMZ 189600: Río Terrero, about 1.6 km W of 21 de Noviembre, Jalisco, R. R. Miller and J. M. Fitzsimons II:24-25:1970, 286, 17-66 mm SL; UMMZ 191680: Río Terrero, about 1.6

km W of 21 de Noviembre, tributary to Río Coahuayana, Jalisco, R. R. Miller and T. M. Cavender II:15:1971, 148, 13-62 mm SL; UMMZ 198840: Río Terrero, at road crossing 0.8 km W of 21 de Noviembre, on Hwy 110, 15.8 km N of Pihuamo, Jalisco, R. R. Miller, F. H. Miller and D. I. Kingston II:18:1976, 24 males, 14 females, 38.9-63.0 mm SL; UMMZ 201952: tributary Río Naranjo, 8.0 km by highway N of Pihuamo (on Colima-Jiquilpan highway), Jalisco, R. R. Miller and J. T. Greenbank III:8:1955, five males, 38.5-44.3 mm SL; UMMZ 202431: Río Terrero, above where canal drains river, Jalisco, D. I. Kingston and P. J. Kingston IV:24:1978, 56, 19-68 mm SL; UMMZ 203255: Río Terrero, at road crossing 0.8 km W of 21 de Noviembre, on Hwy 110, 15.8 km N of Pihuamo, Jalisco, R. R. Miller, F. H. Miller and D. I. Kingston II:18:1976, one male, 62.1 mm SL; UMMZ 203256: Río Terrero, at road crossing 0.8 km W of 21 de Noviembre, on Hwy 110, 15.8 km N of Pihuamo, Jalisco, R. R. Miller, F. H. Miller and D. I. Kingston II:18:1976, one female, 56.0 mm SL.

Ilyodon xantusi xantusi.—UMMZ 145306: Río Salado, 10 km S of Colima City, Colima, C. L. Turner IV:2:1939, five males, 28.3-48.8 mm SL; UMMZ 145309: Colima River, 300 m from Colima R.R. station, Colima, C. L. Turner IV:2:1939, five males, 39.2-66.7 mm SL; UMMZ 160762: Río Colima at the SW edge of the city of Colima, Colima, J. Oliver and A. Bakewell VII:4:1935, five males, 31.7-54.0 mm SL; UMMZ 160777: tributary of Río Colima, W of Colima on Hacienda Los Limones, 2 km SW of Villa Alvarez, Colima, J. Oliver and A. Bakewell VIII:3:1935, five males, 68.0-82.9 mm SL; UMMZ 166443: tributary of Río Salado, 5 km SE of Colima, Colima, I. J. Cantrall II:10:1953, one male, 35.7 mm SL; UMMZ 166445: tributary of Río Salado, 5 km SE of Colima, Colima, I. J. Cantrall II:10:1953, five males, 47.9-72.1 mm SL; UMMZ 166451: Arroyo Pueblo Nuevo, 30.1 km N of Santiago, (Colima) Jalisco, I. J. Cantrall and E. T. Hooper V:2:1953, 15 males, 15 females, 36.9-66.8 mm SL; UMMZ 169841: Río Coalcomán, NE edge of town of Coalcomán, Michoacán, C. R. Gilbert and W. E. Duellman VI:30:1955, 25 males, 15 females, 31.5-60.0 mm SL; UMMZ 169842: Río Chiquito, N of town of Coalcomán, Michoacán, C. R. Gilbert and W. E. Duellman VII:1:1955, two males, 39.7 mm SL and 41.0 mm SL; UMMZ 172132: Arroyo Pueblo Nuevo ca. 11 km NE Manzanillo, (Colima) Jalisco, R. R. Miller and J. T. Greenbank III:3:1955, 25 males, 15 females, 27.8-64.0 mm SL; UMMZ 189594: Río de Comala, just above and below second bridge S of Comala, ca. 8 km N of Colima, Colima, R. R. Miller and J. M. Fitzsimons II:24:1970, 25 males, 15 females, 31.9-78.6 mm SL; UMMZ 192223: Río Salado, 5.1 km E Colima turnoff on Hwy 110, Colima, C. D. Barbour and R. J. Douglass IV:25:1969, five males, 52.0-101.8 mm SL; UMMZ 192229: stream crossing 17.1 km E Río Salado on Hwy 110, Colima, C. D. Barbour and R. J. Douglass IV:25:1969, five males, 35.2-95.1 mm SL.

Ilyodon whitei.—UMMZ 65229: in Río Yautepec, an upper tributary of the Río Balsas, Morelos, S. E. Meek III:27:1903, two males, 39.3 mm SL and 60.8 mm SL; UMMZ 108627: Río Cuautla, Cuautla, Morelos, C. L. Turner and Dildine III:13:1932, one male, 38.5 mm SL; UMMZ 169846: Río Cupatitzio at Puente el Marquez, 46.0 km NE Apatzingan and 10.5 km S of Lombardio, on road from Apatzingan to Uruapan, Michoacán, C. R. Gilbert and W. E. Duellman VII:2:1955, five males, 47.2-73.3 mm SL; UMMZ 181313: Río Nexapa, ca. 32 km WSW of Izucar Matamoras on highway to Cuernavaca, Puebla-Morelos line, R. R. Miller and R. J. Schultz III:5:1963, 25 males, six females, 33.3-49.8 mm SL; UMMZ 189674: Río Yautepec, Yautepec, Morelos, S. E. Meek and F. E. Lutz III:27:1903, five males, 39.9-67.0 mm SL; UMMZ 189675: Río Cuautla, Cuautla, Morelos, S. E. Meek and F. E. Lutz III:25:1903, five males, 37.2-46.5 mm SL; UMMZ 192423: Presa Cupatitzio, 16.4 km S Uruapan, Hwy 37, Michoacán, C. D. Barbour and R. J. Douglass V:27:1969, 35 males, 15 females, 39.9-87.6 mm SL; UMMZ 192431: Río Cupatitzio at Hwy 37 crossing, 9.5 km N of Nueva Italia, Michoacán, C. D. Barbour and R. J. Douglass V:28:1969, 10 males, six females, 30.7-66.1 mm SL; UMMZ 192436: tributary crossing 3.5 km S Tocumbo, Michoacán, C. D. Barbour and R. J. Douglass V:29:1969, one male, 34.0 mm SL.

Ilyodon furcidens x Ilyodon xantusi hybrids.—UMMZ 145308: Río Colima, 300 m from R.R. station, Colima, C. L. Turner IV:2:1939, three males, three females, 30.1-51.5 mm SL; UMMZ 160760: Río

Colima at the SW edge of the city of Colima, Colima, J. Oliver and A. Bakewell VII:4:1935, two males, three females, one juvenile, 28.5-80.9 mm SL; UMMZ 160775: tributary of Río Colima, W of Colima on Hacienda Los Limones, 2 km SW of Villa Alvarez, Colima, J. Oliver and A. Bakewell VIII:3:1935, four males, seven females, 32.8-78.5 mm SL; UMMZ 166444: tributary of Río Salado, 5 km SE of Colima, Colima, I. J. Cantrall II:10:1953, one female, 28.6 mm SL; UMMZ 173589: Río Salado, 10 km S of Colima City on the road to Coalcomán, tributary to Río Coahuayana, Colima, C. L. Turner IV:2:1939, three males, three females, 32.0-45.3 mm SL.

COMPARATIVE STUDY OF THE BEHAVIOR OF THE GOODEIDAE

The value of comparative behavioral studies in taxonomy has been demonstrated for many groups of organisms (Lorenz, 1972; Tinbergen, 1959; Alexander, 1962; Blair, 1962). Recent behavioral studies of the Goodeidae attempted to use the courting behaviors as taxonomic characters in this family (Fitzsimons, 1970, 1972, 1974, 1976). Fitzsimons described differences in the frequencies and sequences of courting behaviors for four goodeid species based on laboratory observations. The present study was initiated to identify the courtship behaviors for all available goodeid species and to evaluate their use as taxonomic characters.

Thirty-five populations representing 27 described species are included in the study. Three species not represented are Allodontichthys zonistius, Hubbsina turneri and Neoophorus meeki. They did not survive shipment from México. A fourth species, Alloophorus regalis, was believed extinct until April, 1978 when three specimens possibly representing it were caught by the author. A fifth, Chapalichthys peraticus, could not be caught at the type locality. Of 33 described species, 27 or 85% were observed. Further, at least three populations included in the study represent undescribed species. Where available, five to ten adult pairs were observed from each population. Courting pairs were observed singularly and in stock aquaria for a total of more than 145 hours. Individual species were observed from 2 to over 19 hours, depending on the difficulty of obtaining sexually active pairs and the number of adult pairs available for observation. A month was spent in the field observing 19 species, eight of which were actively courting.

The 145^+ hours of laboratory study and a month of field observations revealed that most goodeids share the same courtship behaviors. These behaviors are placed into six categories:

introductory behaviors, headflick behaviors, quiver behaviors, zig zag dance, headwag behaviors and displacement behaviors.

Introductory Behaviors

Introductory behaviors are performed at the onset of a courting sequence. Generally it is the male that initiates courtship by approaching the female. If the female is unresponsive, the courtship may terminate at this stage.

Orient (OR).—Either sex may watch a stationary or moving conspecific and may pivot in place so as to continue watching a moving conspecific.

Follow (F).—Either sex may follow a moving conspecific. Generally the male follows the female.

Parallel Swim (PS).—The male swims alongside and parallel to the female, matching his speed to hers. He may swim in an exaggerated fashion, stiff-bodied with fins erect, and/or with jerky darts on either side of the female. Parallel Swim is easily observed in the field, but small aquaria limit the expression of this behavior in the laboratory.

Frontal Wheeling (FW).—The male swims from behind the female, passes alongside her and cuts in front of, and broadside to her (Fig. 1). He may swim in jerky darts (DT) and may approach the female from either side. Frontal Wheeling usually causes a moving female to slow down or stop, and the male then begins headflick or quiver behaviors. This behavior appears to be the same as the Front Wheeling display described by Fitzsimons (1970, 1972) for the three species of *Xenotoca*. Drewry (1967) describes a similar pattern in *Fundulus*.

Lead (LD).—The male swims slowly in front of the female, often in an exaggerated manner. The female follows.

Headflicking Behaviors

Headflicking, performed by males, generally follows introductory behaviors and precedes quiver behaviors. All headflick

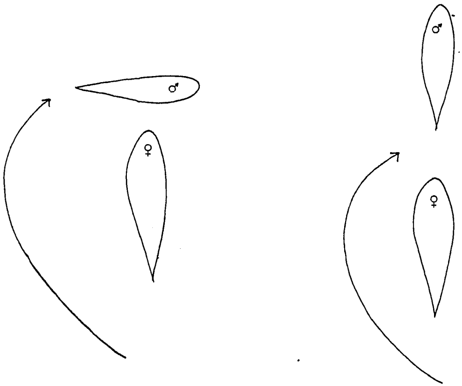


Fig. 1. Front Wheeling behavior (FW) of the Goodeidae.

behaviors are characterized by the same pattern of body and fin movements but differ in the orientation of the male to the female.

In headflick behavior, the male's dorsal, anal and caudal fins are usually slightly relaxed and partly folded, less frequently erect. The male "jerks" or shakes his body in erratic undulations. In some species, headflicks are evident primarily in the head region. In others, the entire body shakes. Headflicks may be expressed in varying intensities by the same individual on different days or on the same day after courtship has proceeded for a time. They may be barely perceptible twitches of the body or large amplitude vigorous shakes involving sigmoiding of the body. The dorsal and anal fins "jerk" with the body. The frequency of the displays and the number of shakes per display vary. The male may be head-up, head-down or horizontal when headflicking. Usually the male is in the same plane as the female, but occasionally he may be above or below her. The female is usually stationary or moving slowly. Headflick behaviors may last several seconds and may be done on either side of the female. They are commonly done from four positions; side, frontal, lead and oblique. Frequently at the beginning of courtship, the male assumes one of the four positions, pauses, but does not headflick. These cases appear to be "intention movements" (Hinde, 1970). Fitzsimons (1972,1976) described headflicking in the genus Xenotoca. This behavior appears to be homologous to the headflicking behavior observed by Foster (1967) in courting male killifishes, a sister group of the Goodeidae.

Side Headflick (SF).—The male is generally alongside and parallel to the female and oriented head to head or rarely head to tail. Less commonly, the male may be slightly behind or trailing the female (Fig. 2).

Frontal Headflick (FF).—The male is directly in front of and broadside to the female. Less commonly, the male may be slightly off center and to one side (Fig. 3).

Lead Headflick (LF).—The male is directly in front of the female, facing toward or away from her (Fig. 4).

Oblique Headflick (OF).—The male is at an oblique angle to the

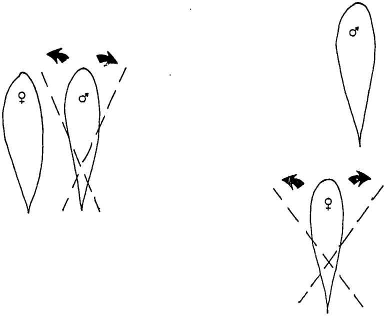


Fig. 2. Side Headflick behavior (SF) of the Goodeidae. Side Quiver behaviors (SQ) are also presented in these positions.

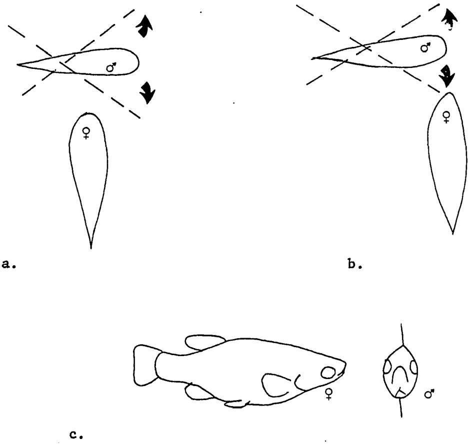


Fig. 3. Frontal Headflick behavior (FF) of the Goodeidae. a) and b) are dorsal views, c) is a lateral view. Frontal Quivers (FQ) are also presented in these positions.

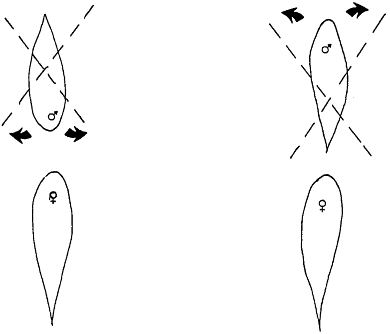


Fig. 4. Lead Headflick behavior (LF) of the Goodeidae. Lead Quivers (LQ) are also presented in these positions.

female, facing toward or away from her (Fig. 5). This position is rarer than the other three.

Quiver Behaviors

Quiver behaviors, performed by males, generally follow headflick behaviors. They share a common pattern of body and fin movements and generally precede a copulation attempt.

In quiver behavior, the male's dorsal, anal, caudal and pelvic fins are generally held fully erect. The entire body quivers in small amplitude, rapid, regularly-spaced undulations. The dorsal and anal fins quiver with the body. Commonly the male's body is sigmoid or C-shaped. Some species may show both sigmoid and C-shape patterns. The male is oriented head to head, rarely head to tail, with the female. He may be head-up, head-down or horizontal. The male is usually in the same plane as the female, although in quiver behaviors lasting several seconds he may move above or below the plane of the female. The female is generally stationary or moving slowly. Males may quiver continuously as they follow a rapidly moving female, or as they dart alongside her or cut her off. Quiver behaviors are done from the same four positions as headflicks, resulting in <u>Side Quivers</u> (SQ), <u>Frontal Quivers</u> (FQ), <u>Lead Quivers</u> (LQ) and <u>Oblique Quivers</u> (OQ). The oblique position is less frequently observed than the others. Quiver behaviors can be done on either side of the female. Nelson (1975) and Fitzsimons (1970, 1972) described the Lead Quiver behavior as Frontal head-down display, not realizing that the male may be head-up, head-down or horizontal to the female. Frontal Quiver was called "tilting" by these authors.

Zig Zag Dance

Zig Zag dance, performed by males, is often combined with headflick and quiver behaviors. The male swims back and forth in front of and broadside to the female. The turns may be performed in place, so that little forward progress is made, or they may be

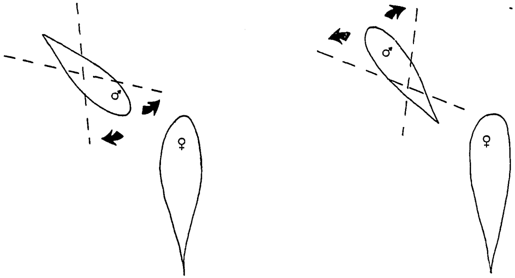


Fig. 5. Oblique Headflick behavior (OF) of the Goodeidae. Oblique Quivers (OQ) are also presented in these positions.

done at acute angles so as to keep ahead of a moving female (Fig. 6). The male may pause, then resume turning. He may turn in towards the female or away from her at the end of each loop, or in both fashions in one continuous series of turns. The behavior consists of one to 10 or more turns. Some species, such as *Skiffia lermae* and *Skiffia multipunctata*, tend to have longer zig zag sequences than others. Small aquaria limit the expression of this behavior in the laboratory. The male may headflick or quiver as he is turning. Some species may zig zag with or without headflicks and quivers.

Fitzsimons (1970, 1972) described this behavior as three separate behaviors: zig zag dance, loop dance and dance intention display. I have observed one male do all three patterns in one courting sequence. The presence or absence of these behaviors are not species specific as Fitzsimons thought. All three patterns appear functionally the same and elicit the same headwagging response in females. The three categories erected by Fitzsimons may just represent different intensities of the same behavior, with the number of turns and the direction in which the male turns being variable.

Copulation Attempt

Copulation attempts generally follow quiver behaviors. They were rarely observed in the field.

In a copulation attempt (CA), the male sidles up to the female, alongside and parallel to her and in a head to head orientation. The anal fin and commonly the dorsal fin are inclined toward her. The male quivers (Fig. 7). The female's response determines if the attempt results in a successful copulation. She may swim away from the male, remain impassive as the male quivers or stop and quiver synchronously with the male. In the last case, the male cups his anal fin over her genital opening, and in some species, the dorsal fin is folded over the female's back. Synchronous quivering usually lasts several seconds and the quivering and prolonged clasping may carry the pair slightly forward. The bodies

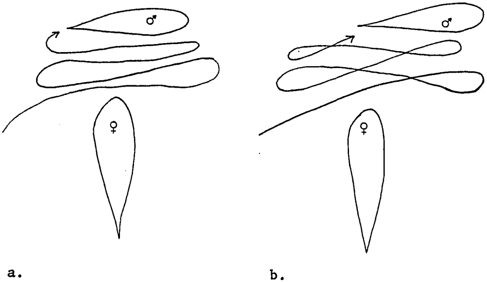


Fig. 6. Zig Zag Dance (ZZ) of the Goodeidae. The number of turns and the direction the male turns are variable. a) the male turns away from the female at the end of each loop b) the male turns toward the female at the end of each loop. The male may switch the direction of turning within one dance sequence.

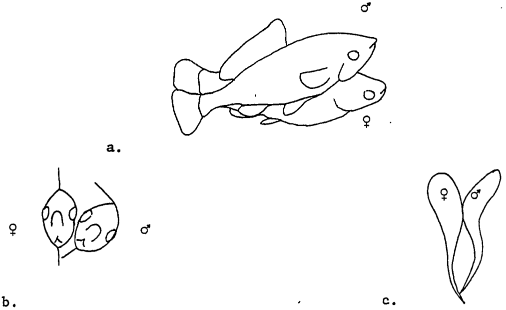


Fig. 7. Copulation attempt (CA) in the Goodeidae. a) lateral view b) frontal view c) dorsal view

of both fish are sigmoid during synchronous quivering. Clasping and quivering also occur in some killifishes during spawning (Richardson, 1939; Koster, 1948; Raney et al., 1953). The male may approach and copulate on either side of the female. The folding of the male's anal fin over the female genital opening makes it difficult to determine how sperm are actually transferred, but several hypotheses are given in the literature based on the anatomical structure of the male's anal fin, the musculature surrounding the male's urogenital tract and live observations of copulating fishes (Mohsen, 1961a, 1961b, 1965; Nelson, 1975). My observations indicate that the folding of the anal fin, and particularly the modified, small anterior lobe of the anal fin, directs the sperm to the genital opening of the female.

Headwag Behavior

Headwag behavior, performed by females, appears to signal sexual receptivity. In general, only adult females headwag (HW). The female can be head-up, head-down or horizontal. Her dorsal, anal, pelvic and caudal fins are folded. Headwags are large amplitude, relatively slow undulations, primarily of the head region. They are similar to the headflicks seen in males, but the movements in the female are generally slower, smoother and of larger amplitude. The female may be stationary or swimming as she headwags. Headwags consist of one to 10 or more consecutive undulations. They may last for several seconds and are done only in the presence of a male. Pregnant females occasionally headwag.

Displacement Behaviors

Behaviors listed in this section are commonly seen just prior to, and during courtship displays but appear to be "irrelevant" to the context of courtship. They are performed by both sexes and are frequently seen when one member of a pair is unresponsive. During active courting, these behaviors are uncommon. Feeding (FD).—Either the male (FM) or female (FD) may respond to courtship behaviors of the partner by feeding. Although objects are taken into the mouth, they are spit out and not consumed. "Mouthing" also occurs, where the mouth moves as though the fish were feeding although no food is present.

Sigmoid (S).—The body (either sex) may slowly undulate once. All fins are spread. Sigmoid behavior is seen most often in the male, especially when initiating courtship. In a "Yawn", the body undulates and the mouth is slowly opened and closed. Sigmoid behavior is rarely seen in the field.

Scraping (SP).—The side of the body is scraped against the side or bottom of the aquarium.

Biting (BT).—Males frequently bite females when the females do not headwag. Less commonly, a large unresponsive female bites the male.

Circling.—Circling behavior alongside the female (SC) or directly in front of her (FC) is occasionally seen, especially in stock aquaria. The circling behavior seems to result from confinement to a small aquarium, the presence of other fish in the path of the courting pair, or an adjustment by the male to a change in direction by the female.

Chase.—The male chases other males from the female (CH). Occasionally the female may chase a male (CF).

Aggressive Behavior

Aggressive behavior is "behavior directed toward another individual which could lead to physical injury to the latter and often results in settling status, precedence or access to some object or space between the two" (Hinde, 1970). In goodeids, aggressive behavior between a conspecific male and female generally precedes or follows courtship. It often occurs when one fish is unresponsive to the courtship behaviors of its mate. Conspecific males frequently aggress each other but conspecific females rarely do. In the field, aggressive behaviors were observed only between males.

The nature of aggressive interactions.—There are two categories of aggressive interactions that depend on the relative body sizes of the pair. In the first, a larger fish displaces a smaller fish by a short chase. The smaller fish flees without displaying. In the second, two fish of the same size (within 5 mm) align their bodies parallel and horizontal, generally head to tail, and "Tailbeat". In tailbeating, the dorsal, anal, caudal and pelvic fins are held fully erect. The body is snapped in slow "S" undulations forcing water at the opponent. Often the bodies or caudal fins of the fish slap against each other. A frontal position is also commonly assumed. One fish swims directly in front of and broadside to the other fish. The fish may also align in a "V" formation, head to head with their heads apart and tails together (Fig. 8). During a vigorous tailbeating bout, these positions are often shifted.

As goodeids have an acoustico-lateralis system on the head that comprises pores or neuromasts, and tailbeats are often directed at the head of the opponent, the waves generated in this display are presumably used by the fish to assess the opponent's strength. If tailbeating does not result in one fish fleeing, the fish then circle and bite each other. In two species, Allotoca dugesi and Alloophorus robustus, the fish may lock jaws and tug.

Color changes during aggressive interactions.—The colors of many male goodeids intensify during aggressive interactions, and the rim of the eye forms a vertical black bar which includes the pupil (Fig. 9). This black bar develops in both males and females, and has been seen in the following species: Allodontichthys tamazulae Turner, Allotoca dugesi (Bean), Ameca splendens Miller and Fitzsimons, Chapalichthys encaustus (Jordan and Snyder), Goodea gracilis Hubbs and Turner, Goodea luitpoldi (Therese von Bayern and Steindachner), Ilyodon furcidens (Jordan and Gilbert), Ilyodon xantusi (Hubbs and Turner), Skiffia francesae Kingston, Xenotaenia resolanae Turner, Xenotoca eiseni (Rutter), Xenotoca melanosoma Fitzsimons and one undescribed genus and species (Uyeno and Miller, 1972). The bar is more prominent in some species than in others. The defeated fish in these species may develop a completely black iris (Fig. 9c), fold its fins and flee or hide. But in prolonged

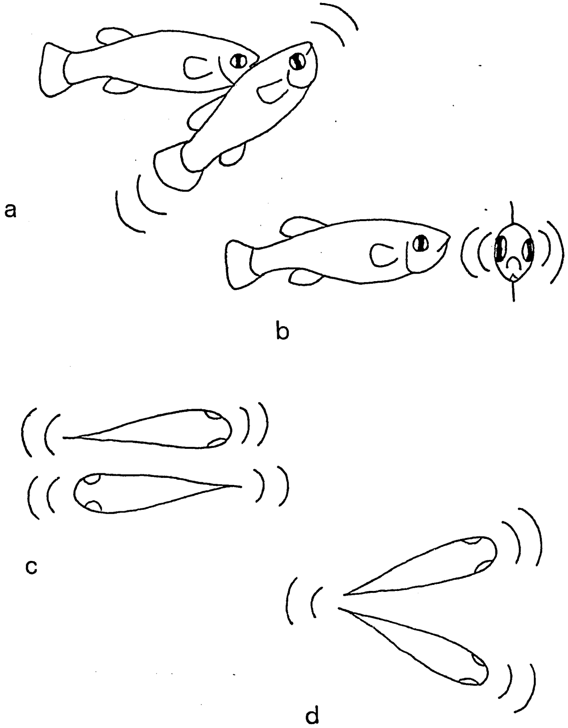


Fig. 8. Aggressive behavior in the Goodeidae. a) and b) are lateral views, c) and d) are dorsal views.

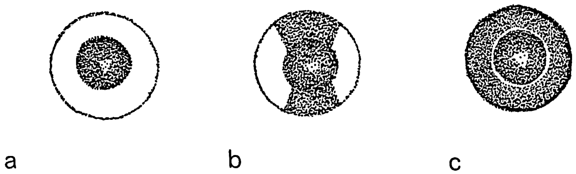


Fig. 9. Eye-color changes in the Goodeidae. a) normal eye color b) and c) aggressive patterns

battles in which neither fish appears dominant, both fish may develop blackened eyes. Blackened eyes were also noted in *Skiffia bilineata* (Bean), *Skiffia lermae* Meek and *Alloophorus robustus* (Bean). Similar eye color changes also occur in aggressive pomacentrids (Rasa, 1969), cichlids (Heiligenberg et al., 1972; Leong, 1969), sunfish (Miller, 1963), darters (Moerchen, 1974) and possibly a killifish (Carranza and Winn, 1954). These aggressive eye-color changes presumably have a signal function, although this hypothesis has not been critically tested. The subordinate fish flees the aggressive interaction shortly after its eyes blacken. In long displays, where both fish develop blackened eyes, the aggressive interaction is usually ended by both fish swimming away. The development of blackened eyes in goodeids appears to be associated with a decrease in the willingness to fight (Kingston, in press).

Distinguishing aggressive behavior from courtship behavior.— Aggressive behavior differs from headflick and quiver behaviors because the bodies of aggressive fish undulate in large amplitude, smooth waves. Also the orientation of the fish is generally head to tail in aggressive interactions and head to head in courting behaviors. Finally eye-color changes are seen only in aggressive fishes.

Earlier accounts of goodeid behavior (Fitzsimons 1970, 1972) failed to distinguish between aggressive and courtship behaviors. Tailbeating behavior in *Characodon lateralis* was thought to be a courtship behavior. But in the field, I never observed tailbeating behavior between males and females, and tailbeating behavior was never seen to precede courtship. Barlow (1961) reported a similar movement in a lateral agonistic display between two males and between a male and a female of *Cyprinodon macularius*. Koster (1948) also observed killifish aligning in parallel with fins erect.

In the laboratory, both males and females show aggressive behavior, but cases involving females generally followed the introduction of a male to an aquarium in which the female had been isolated for some time. Occasionally a female responded to a male's aggressive display by headwagging. In these cases, the male often ceased displaying aggressively and began courting the female. Fitzsimons undoubtably witnessed this sequence, which led him to misinterpret agonistic displays as courtship displays. In the field, only conspecific males were observed displaying aggressively.

Summary.—Goodeid courtship behaviors include Orient, Follow, Parallel Swim, Frontal Wheeling, Lead, Headflicks, Quivers, Zig Zag Dance, Copulation Attempt and Headwag. Females perform only the headwag behavior. Males perform all other behaviors. Headflick and quiver behaviors are presented from four positions; side, frontal, lead and oblique. In headflick behavior, the fins are relaxed and partly folded and the body "jerks" in erratic undulations. In quiver behavior, the fins are held erect and the body quivers in small amplitude, rapid, regularly-spaced undulations. During the zig zag dance, the male may also headflick or quiver. Displacement behaviors, such as Feeding, Sigmoid, Scraping, Biting, Circling and Chase are rare in actively courting pairs.

In the field, aggressive behaviors occur between conspecific males of the same size. Aggressive behaviors include tailbeating, circling, biting and jaw tugging. In tailbeating, the body is snapped in large "S" undulations and the fins are held erect. Fighting fish develop vertical black bars through the eyes or completely blackened eyes.

Similarities and Differences in Courtship Behavior

In this section, the courtship behaviors of different goodeid species are compared and contrasted.

Similarities in courtship behaviors.—Few courting behaviors have been described for any goodeid species. Incomplete accounts have been given for *Xenotoca eiseni*, *Xenotoca melanosoma*, *Xenotoca variata*, *Characodon lateralis* and *Goodea atripinnis* (Fitzsimons, 1970, 1972; Nelson, 1975). In the present study, the behaviors observed for 27 species of goodeids are summarized in Table 2. All species show Orient and Follow behavior, and these behaviors are omitted from the table.

Contrary to the previously published accounts (Fitzsimons,

Table 2. Courtship behaviors of the Goodeidae. Blanks indicate behavior not observed. All species show Watch, Orient and Follow behavior. See text for explanation.

SPECIES	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	PS	HW
Allodontichthys sp.	x	x	x	x	x	x	x	x	x	x		x	x	x
Allodontichthys tamazulae	x	x	x	x	x		x		x	x	x	x	x	x
Alloophorus robustus	x	x	x	x	x	x	x	x		x	x	x	x	x
Allotoca sp.	x		x	x	x		x			x	x	x		x
Allotoca dugesi	x		x	x	x	x	x	x		x		x	x	
Ameca splendens	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ataeniobius toweri	x		?	x	x	x	x	x		x	x	x	x	x
Chapalichthys encaustus	x	x	x	x	x	x	x	x	x	x	x	x	x	
Chapalichthys pardalis	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Characodon lateralis	x	x	x	x	x	x	x	x		x	x	x	x	x
Girardinichthys multiradiatus									x					x
Girardinichthys viviparus					x						x	x		x
Goodea atripinnis	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Goodea gracilis	x	x	x	x	x	x	x	x	x	x	x	x		x
Goodea luitpoldi	x	x	x	x	x	x	x	x		x	x	x	x	x
Ilyodon furcidens furcidens	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ilyodon furcidens amecae	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ilyodon furcidens tuxpan	x	x	x	x	x	x	x	x	x	x	x	x		x
Ilyodon xantusi xantusi	x	x	x	x	x	x	x	x	x	x	x	x		x
Ilyodon xantusi latos	x			x	x						x	x	x	x
Ilyodon whitei	x	x	x	x	x	x	x	x	x	x	x	x		x
Neoophorus catarinae	x	x	x	x	x	x	x	x		x	x	x		
Neoophorus diazi	x		x	x	x	x	x	x	x	x	x	x		x
Skiffia bilineata	x		x			x	x		x	x	x	x	x	
Skiffia francesae	x	x	x	x	x	x	x	x	x	x	x	x		
Skiffia lermae	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Skiffia multipunctata	x	x	x		x	x	x	x	x	x	x	x	x	x
Xenoophorus captivus	x	x	x	x	x	x	x	x	x	x	x	x	x	
Xenotaenia resolanae	x	x	x	x	x	x	x	x	x	x	x	x		?

Table 2. continued...

SPECIES	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	PS	HW
Xenotoca eiseni	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Xenotoca melanosoma	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Xenotoca variata	x	x	x	x	x	x	x	x		x	x	x		x
Zoogoneticus quitzeoensis	x			x	x	x	x				x	x		x
Undescribed sp. Ameca drainage	x	x	x	x	x	x	x	x	x	x	x			
Undescribed genus and sp.			x											

1970, 1972; Nelson, 1975), in this study, most goodeids were observed to share the same courtship behaviors. For example, the three species of Xenotoca share headflicking and headwag behaviors which were thought to be species specific behaviors by Fitzsimons (1970, 1972). Also, species and subspecies representing six genera have been observed to share the same 14 courtship behaviors. They are: Ameca splendens, Chapalichthys pardalis, Goodea atripinnis, Ilyodon furcidens furcidens, Ilyodon furcidens amecae, Skiffia lermae, Xenotoca eiseni and Xenotoca variata (Table 2). In fact, few behaviors appear species specific in goodeids. Additional observations may reveal that most of the remaining species perform all 14 behaviors and that many of the blanks in Table 2 result from insufficient information. In particular, where a species has been shown to do several headflick behaviors, it is likely that it can do all the headflick behaviors. The same is true of the quiver behaviors. Failure to observe certain behaviors for some species is largely a result of the small number of adult pairs available for study, seasonal fluctuations in the availability of courting pairs, and lack of control over the "readiness" of both members of a pair to court.

In several species one male was seen to perform all of the headflick and quiver behaviors, although rarely during one observation period. Evidently each male is capable of performing all the behaviors demonstrated for its species, but rarely performs them all at one time because of differences in his and the female's readiness to mate. Varying the conditions of observation, although not controlling the "motivational state" of a pair, gave a more complete behavioral repertoire than would have been otherwise observed. Some fish were isolated or separated by a partition until observed. Other pairs were introduced to an aquarium simultaneously. Stock aquaria were also observed. Using "virgin" females, those isolated from males since the birth of their last brood, improved the chances of selecting a responsive female. But the absolute time pairs of a species were observed is not correlated with the completeness of behavioral observations for that species (Fig. 10). In general,

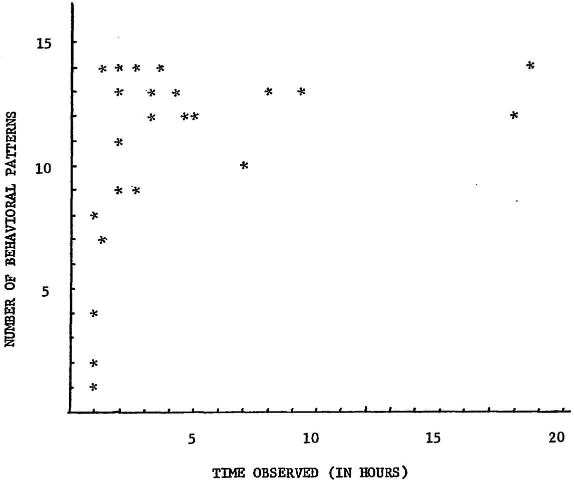


Fig. 10. Relationship of the number of courting behaviors to the number of hours of observation. r = .2575

3 hours spent observing courting pairs, under a variety of conditions, was sufficient to determine many of the behaviors performed by a species.

Differences in courtship behavior.—It is possible that some behaviors are less frequent in some species than others, but this possibility is difficult to test. Differences in courtship behaviors among goodeids are of two types, deletions or additions of behavioral patterns. These differences suggest evolutionary changes in several goodeid lineages.

Some blanks in Table 2 appear real. Headflicking behaviors have never been observed in the genus *Girardinichthys*, although all other goodeid genera perform them. Copulation attempts in *Girardinichthys viviparus* were frequently observed, suggesting that headflick behavior must be rare or absent in this species. *Girardinichthys viviparus* shows the simplest courtship, consisting of following, sidling and attempting copulation. In *Girardinichthys multiradiatus*, the only other member of this genus, males did not court females in the laboratory, although females headwagged at approaching males. It is not known if the simplified courtship of *Girardinichthys* represents the primitive state or a derived state of secondary loss of courtship behaviors. If the relative ages of goodeid genera were known, a reasonable guess could be made about the primitiveness of the simple courtship of *Girardinichthys*. As yet, the fossil record is meager (Alvarez and Longoria, 1972; Smith et al., 1975), and gives little information on the evolutionary history of this family.

An additional behavioral pattern, Lunge and Retreat (LR), is seen only in the two species of the genus *Allotoca* (Fig. 11). The male darts, generally in a "jerky" fashion, towards the female, with dorsal and anal fins variably erected or folded. He then backs up slowly, tail down, or rarely turns a tight circle in place. The Lunge and Retreat behavior may be done in front of and facing the female, in front of and broadside to the female, alongside and parallel to the female, alongside and facing the female at a 90° angle, or slightly behind the female. The Lunge and Retreat

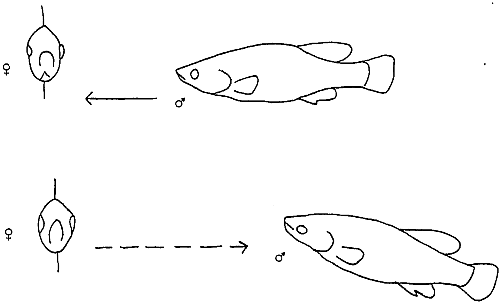


Fig. 11. Side Lunge and Retreat behavior (LR) of Allotoca. This display may be presented in many positions. See text for explanation.

behavior is an addition to the behaviors shown by other goodeids, as both Allotoca species show many, possibly all, of the other behaviors. Allotoca males also dart in semicircles around the female, behind her, and in front of and broadside to her. In these "jerky" darts, the dorsal and anal fins are generally folded, and the male swims with large amplitude "S" undulations of the body. The quivers of Allotoca are also broken up by erratic twitches of the body, a peculiarity it shares with an undescribed species from the Ameca drainage.

Modifications of courtship behaviors.—Other modifications of courtship were seen in Skiffia bilineata and Skiffia francesae. In these two species, females were not observed to headwag. In S. bilineata, the female quivers energetically presumably to indicate sexual receptivity. Only quivering females are vigorously courted by males and only they copulate. Skiffia francesae females also appear to quiver when actively courted by males, but the quivers are imperceptible except as slight tremors of the erected dorsal fin. Quivering is a behavior usually seen only in copulating females, but in these two species it has replaced headwagging as a signal of receptivity. Skiffia francesae males also share the behavior Nuzzling with S. multipunctata males. In Nuzzling, actively courting males poke or nose the female around her genital opening. The male is slightly behind and below the female, his body inclined upwards at a 45° angle bringing his snout to the female's genital opening. This behavior is seen only in actively courting males. Barlow (1961) observed this behavior in Cyprinodon macularius. Although such behavior suggests that females produce a pheromone, experiments with S. francesae males discussed later do not support this hypothesis. In Skiffia lermae, the headflick behaviors are somewhat de-emphasized. Rather than being erratic undulations of the body, the body is held stiffly and swung in an arc at erratically spaced intervals. The head swings through the greatest part of the arc, the tail region acting as a pivot.

Too few adult pairs of Zoogoneticus quitzeoensis were available to determine if this species exhibits all the behaviors seen in other goodeids. One peculiar modification is that a male may roll until his side is parallel to the bottom or even until he is virtually upside down. Rolling occurs during headflick and quiver behaviors. No other species observed exhibited this behavior.

A modified behavior is also seen in four species that are not presently considered closely related. The two species of Allotoca, Characodon lateralis, and an undescribed species from the Ameca drainage all share a modified headflick behavior in the males. The headflick is a small amplitude, rapid shudder of the head region and is more uniform than the erratic, larger amplitude movements seen in other goodeids. Additional data on these four species may elucidate presently unrecognized interrelationships.

Summary.—Courtship behaviors are similar and probably homologous for all goodeids. The behavioral patterns involve the same fin and body movements. The expression of headflicks and quivers varies slightly as a result of differences in morphology. Field observations indicate that the behaviors observed in the laboratory are relatively free of distortion.

In general, modified behaviors were observed in single species or were confined to species of one genus. While these behavioral differences support the present taxonomic placement of these species, they provide little new taxonomic information. One exception may be the modified headflick behavior of the two species of Allotoca, Characodon lateralis and an undescribed species from the Ameca drainage. These species are not presently recognized as closely related.

Sequence Data and its Limitations

As the courtship behaviors yield little taxonomic information for the Goodeidae, the frequencies of these behaviors and their sequences were examined (Tables 3-15).

Selection of sexually responsive fishes.—Selecting sexually receptive fishes is difficult. A variety of arrangements designed to induce sexual responsiveness failed. The arrangements were:

Table 3. Frequency and sequence of behavioral patterns in courtship of a pair of *Ilyodon furcidens furcidens*. First day, observed 22 minutes in the laboratory. See text for explanation.

FOLLOWS ⟶

PRECEDES ↓

	MALE BEHAVIOR																			FEMALE BEHAVIOR	
	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	CH	BT	DT	FD	HW
SF																					
OF			1									1									
FF			2			1	8						3								12
LF																					
SQ						2	2														
OQ							2						1								7
FQ		1				4	1						1								22
LQ																					
ZZ			1									1	5							2	8
FW																					
CA																					
S						1															1
F			13		1	2	2		3											2	2
PS																					
CH																					
BT													1								1
DT			1																		
FD									1				4								
HW		1	8		3	1	12		9				9					2	1	5	10

Table 4. Frequency and sequence of behavioral patterns in courtship of a pair of *Ilyodon furcidens furcidens*. Same pair as in Table 3, recorded three days later for 22 minutes. See text for explanation.

FOLLOWS ⟶

PRECEDES ↓	MALE BEHAVIOR																			FEMALE BEHAVIOR	
	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	CH	BT	DT	FD	HW
SF																					
OF			2																		
FF			1		2		7		1				2								5
LF																					
SQ	1		1		10		4		1		5		6					4			
OQ					2															1	1
FQ					8	3	5		1			2	3								12
LQ																					
ZZ			4		1		13		6			4	6							2	11
FW																					
CA					5																
S			1			1	1		1				2								
F			5				2		21									3		1	3
PS																					
CH																					
BT		1			1				3				5								
DT																					
FD							1		3				3					1			
HW			2		1		2		13				9					2		2	3

Table 5. Frequency and sequence of behavioral patterns in courtship of a pair of <u>Ilyodon furcidens furcidens</u>. Same pair and same day as in Table 4, recording resumed after a ten minute lapse. Observed 22 minutes. See text for explanation.

FOLLOWS →

	MALE BEHAVIOR																		FEMALE BEHAVIOR	
PRECEDES ↓	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	CH	BT	DT	FD	HW
SF																					
OF			1						1												
FF			1				2		3				1					1			6
LF																					
SQ							2		1		4		2							1	3
OQ																					1
FQ					6	1	1		1				2							1	19
LQ																					
ZZ			3				14		5			2	20					1		2	28
FW																					
CA					4																1
S			2				1														
F		1	2				4		30				1					3		2	2
PS																					
FC																					
SC																					
CH																					
BT									1			1	3					4			
DT																					
FD			1						6				4								
HW		1	4		3		7		27		1		12							5	4

Table 6. Frequency and sequence of behavioral patterns in courtship of a pair of *Ilyodon furcidens tuxpan*. Observed 143 minutes over a period of seven days. See text for explanation.

FOLLOWS ⟶

PRECEDES ↓	MALE BEHAVIOR																					FEMALE BEHAVIOR		
	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	CH	BT	DT	FM	SP	FD	CF	HW
SF													1											
OF																								
FF			7		1				1				1					3		2		5	2	1
LF																								
SQ			1										1											1
OQ																								
FQ																								
LQ																								
ZZ																								
FW																						1		
CA																								
S			5									1	1						2			2		
F	1		4									2						5	2	5	3	4	1	
PS																								
FC																								
SC																								
CH																								
BT												2	2					2	1	4	1	6	1	
DT													1									1	2	
FM			2									4	4					6		2		3	3	
SP													4											
FD			2										9					1	1	12			1	
CF			3									2								3		3		1
HW			2																			1		2

Table 7. Frequency and sequence of behavioral patterns in courtship of a pair of *Ilyodon furcidens tuxpan*. Same pair as in Table 6. Observed 60 minutes. See text for explanation.

PRECEDES ↓

FOLLOWS ⟶

	MALE BEHAVIOR																				FEMALE BEHAVIOR		
	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	CH	BT	DT	FM	SP	FD	CF	HW
SF															1									2
OF																								
FF	1		2		1		4		1			1						1						12
LF																								
SQ									1															1
OQ																								
FQ			1				2				1				1									11
LQ																								
ZZ							1											1						8
FW																								
CA																								1
S															1			1						
F			3						1									1	1			1		1
PS																								
FC			4										1		6			2		1				6
SC																								
CH																								
BT			4				1						2		2			7		2		2		1
DT																								3
FM													2		1			4				3	1	
SP													2										1	
FD	1		1						1								1	1		6				
CF																					1			
HW	1		8		1		7		6						8			4	2	1	1	5		9

Table 8. Frequency and sequence of behavioral patterns in courtship of <u>Ameca splendens</u> at El Rincón, Teuchitlán, Jalisco. Seventy-three interactions.

PRECEDES ↓

FOLLOWS ⟶

	MALE BEHAVIOR																FEMALE BEHAVIOR	
	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	FD	HW
SF	4		2						1	1			1	2				14
OF	1		1								1		1					
FF	1	1			1				2				4				1	12
LF																		
SQ						1		2	1				7	2				6
OQ																		2
FQ																		3
LQ					1								3					1
ZZ	2		5										1				1	5
FW									2									2
CA					3													1
S																		
F	5		5		7		1			1				7			1	5
PS	1	1	2				1	1	2	1	1		2					6
FC																		
SC																		
FD	1								1				1					
HW	4		3		1				4	1			5	2			4	1

Table 9. Frequency and sequence of behavioral patterns in courtship of *Skiffia multipunctata* at Lago de Camēcuaro, Michoacán. One hundred and forty-four interactions.

MALE BEHAVIOR FEMALE BEHAVIOR

PRECEDES ↓ FOLLOWS ⟶

	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	HW
SF	2		1		1	1	2			2			6				
OF															1		
FF							2			1							
LF																	
SQ	1		1		2	1	4		4	4	6		11				
OQ	2				1		7	1	5				5				
FQ	3				20	12	75	6	34	37			68	1	1	2	1
LQ						2	5	3	6	4			5				
ZZ	1	1			2	1	128	2	9	2			11				2
FW					1	4	68	9	30	7			10				
CA					1		1		1	1			1				
S																	
F	1		1		7	2	16	4	20	66			14	1	1		
PS										1							
FC						1			1							1	
SC										1			2				
HW							1		1				2				

Table 10. Frequency and sequence of behavioral patterns in courtship of Ilyodon furcidens furcidens at Río Terrero, Jalisco. Thirty-five interactions observed.

MALE BEHAVIOR FEMALE BEHAVIOR

PRECEDES ↓ FOLLOWS ⟶

	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	HW
SF			1	3					1					2		1	12
OF																	2
FF	1	1	3	1					4					6			26
LF	1		5	4			1	1	6	3				3	4	1	31
SQ					1									1			3
OQ																	
FQ								1									2
LQ				1	1		1							1			1
ZZ	1		16						2				2	1	1		24
FW			1	4					4				1	2			16
CA																	
S																	
F			2	2	1					2				18			5
PS	6	1	3	8	1			1	5	4			2	2			85
FC									1	1					2		5
SC				1										2			
HW	21		12	35	1			2	23	18			20	66	2	1	105

Table 11. Frequency and sequence of behavioral patterns in courtship of Ilyodon furcidens furcidens. Observed 83 minutes in the laboratory.

MALE BEHAVIOR FEMALE BEHAVIOR

PRECEDES ↓ FOLLOWS →

	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	HW
SF	15	4	5	5	1		2	2	3			1	10			5	10
OF			5						2				1			1	2
FF	4	2	3	1	2	1	5		11			1	4		1	1	5
LF	4		2				1		4				5				1
SQ	3		1	2	8		2				1		3			2	13
OQ					1	2	4						1				1
FQ					9	1	3		4				3				20
LQ					2		2										1
ZZ	3		11	2		1	7	1	17			1	5				21
FW			1	2			1	1	1				1		2		
CA	1				1												
S				2					1								
F	11	5	6	2	1	2	1	1	5	8			18			5	1
PS																	
FC	1												2		1		
SC	8								3	1			4				1
HW	15		8	1	9	2	12		17				6			3	7

Table 12. Frequency and sequence of behavioral patterns in courtship of _Skiffia lermae_ at El Molino, Michoacán.

MALE BEHAVIOR FEMALE BEHAVIOR

PRECEDES ↓ FOLLOWS ⟶

	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	CH	FD	HW
SF	3	1	2	3				2		2			11	2	1	3	7		2
OF			1	1															
FF	7			3			1						3		1		2		4
LF	1		3		1		2	2	2				6		2		6		1
SQ	1			1	2		1	1		1			5	2			2		
OQ	1					1	3	1					4						2
FQ				1		4	7	7	3				9				4		4
LQ	1	1			1	1	7	2					4						2
ZZ	3			2			3	1					7		1		4		4
FW	1		3	3			1	1					4				1		1
CA																			
S																			
F	12	1	6	7	7	2	7	6	3	10			2	8		1	10		7
PS	2		2	2	1		1			2			1	1					9
FC			3												1	3	2		
SC	3		1						2				1		2		1		1
CH	1			1	1		2	1	1				13	1	1				
FD																			
HW																			

Table 13. Frequency and sequence of behavioral patterns in courtship of Skiffia lermae. Observed 79 minutes in the laboratory.

MALE BEHAVIOR FEMALE BEHAVIOR

PRECEDES ↓ FOLLOWS →

	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	CH	FD	HW
SF	6	1	4	4	1				6	1		1	9			1	3		2
OF									2										
FF	4	1	3	6						1			2						1
LF	6		6	12			1					2	2						1
SQ							1		1		1		2						
OQ																			
FQ	1	1			1		1		1			1							
LQ																			
ZZ	1		7				2		11	3			5				6		
FW			2						5				1						
CA	1																		
S				2					1			1	1						1
F	8		2	3	2		1		3	1		1	6				2		
PS																			
FC			1																
SC									1										
CH			2		1				4	2			1			1			
FD																			
HW	1		1	3								1							

Table 14. Frequency and sequence of behavioral patterns in courtship of *Chapalichthys pardalis* at Tocumbo, Michoacán. Eighty-five interactions observed.

MALE BEHAVIOR FEMALE BEHAVIOR

PRECEDES ↓ FOLLOWS ⟶

	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	HW
SF	5		3	2	3	1	1			1	2		18	6		1	
OF																	
FF	2		5				3						14	2			
LF	1		1				2						6				
SQ					4	1	2	1			5		9	2			
OQ					2								2				
FQ													12	1			
LQ					1								2	2			
ZZ													1				
FW			1										5	1			
CA					1						4		5	1			
S																	
F	21		18	9	14	2	10	2	4	6	3		12	38	1	2	1
PS	18		2	2	1	1		2	1	2	3		17	1			1
FC								1					1				
SC							1						1				
HW																	

Table 15. Frequency and sequence of behavioral patterns in courtship of *Goodea atripinnis* at Lago de Camécuaro, Michoacán. Forty-five interactions observed.

FOLLOWS ⟶

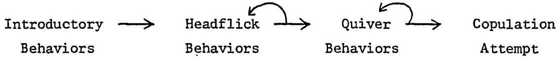
PRECEDES ↓	MALE BEHAVIOR																			FEMALE BEHAVIOR	
	SF	OF	FF	LF	SQ	OQ	FQ	LQ	ZZ	FW	CA	S	F	PS	FC	SC	CH	BT	DT	FD	HW
SF	2		1							1				1	1						9
OF																					1
FF										1			2						1		5
LF																					1
SQ						1				1	4		3								5
OQ													1								
FQ													2								
LQ															1						1
ZZ																					
FW			5	1			2						4								8
CA													2								
S																					
F	1				5		1			8	2			3					1		13
PS	2												1								15
FC			1							1											1
SC																					
CH																					
BT																					
DT	1				1			1		1					1						4
FD																					
HW	8	1	3	2	3			1		6			23	6	1				4		3

females and males were kept in isolation then brought together for observations, a female was placed with several males or a male with several females and pairs were isolated from stock aquaria simultaneously. No treatment was better in yielding sexually responsive fishes.

The male often initiates courtship, but if the female does not headwag, he generally ceases or engages largely in introductory behaviors or sporadic headflick displays. In rare cases, a male attempts copulation with the female immediately upon being released in her aquarium. A few of these attempts appeared successful. Females respond to male courtship by fleeing, hiding, aggressive behaviors, headwagging and copulating. Males often perform quiver behaviors if headwagging females are present. Females can also initiate courtship by headwagging at approaching males. The male responds either by courting or by acting indifferently. In the latter case, he swims randomly without showing aggressive or courting behaviors. To obtain a responsive pair at times takes several days to several weeks. As a result, in a few species, less than five courting pairs were observed in the course of three years. Mortality also terminated observations on some species. For many species, the sequence data represents a few pairs observed over several days to weeks.

Individual variation in courting behavior.—Comparisons of sequence data obtained on different days revealed that the behaviors, their frequencies and sequences varied for a given pair (Tables 3-7). On one day a male might show frequent headflick behaviors (Table 6). Later in the week, he might show more quiver behaviors (Table 7). Different pairs of fishes did not exhibit the same frequency of courtship behaviors per unit time (Tables 3-6). A pair of *Ilyodon furcidens* observed for 143 minutes showed fewer courtship behaviors than another pair observed for 22 minutes. There is no obvious control for such discrepancies in activity, making quantitative comparisons among species difficult for taxonomic purposes. However, consideration of only actively courting pairs revealed a general pattern to courtship for the Goodeidae.

General sequence of behavior.—The sequence matrices indicate that headflick behaviors tend to follow headflick behaviors and that quiver behaviors follow quiver or headflick behaviors. Headflick behaviors do not often follow quiver behaviors (Tables 3-15). A general pattern of behaviors emerges:



This diagram is simplified. For instance, as noted earlier, a pair may copulate with no prior behavior, and headflick behaviors occasionally follow quiver behaviors. But most sequences derived from actively courting pairs follow this pattern. The headflick behaviors appear together in blocks as do the quiver behaviors. In fact, females may be responding to headflicks or quivers per se and not to the position in which they are done. The two most common positions, alongside the female, and in front of her, coincide with the placement of neuromasts and pore canals in these fishes. These pressure receptors might enable the fishes to differentiate between headflicks and quivers by differences in the pressure waves generated by these behaviors. Goodeids have well developed pore canals along the top of the head, the preopercles, lacrimals, mandibles and around the eyes.

Populational variation in reproductive activity.—Field data indicate that the responses of populations are not always comparable (Tables 8, 10). Individuals in these populations differ in the number of behaviors they perform per unit time and the intensity with which these behaviors are performed. Sequence matrices derived from field data reflect these differences. Increasing the number of courting pairs observed does not necessarily increase the total number of sequences or the total number of courtship behaviors observed. Populations containing fewer courting fish may generate more sequence data than populations in which most individuals are courting. The greater the number of courting males, the greater the likelihood that the courtship of any one female is interrupted by male-male interactions and the shorter the behavioral sequence observed. Variation in the breeding seasons and in the sexual responsiveness of individual fish makes it possible to see largely headflicking behaviors in one population and quivering behaviors in another observed at the same time of year. In Neoophorus catarinae no members were courting. As variation in the intensity of courtship is great within and among populations, and local environmental and seasonal changes determine when goodeids reproduce, even field-derived sequence data obtained for several species at the same time of year cannot be used safely for quantitative comparisons (Tables 8, 9, 10, 12, 14, 15).

Differences between field and laboratory data.—Field observations are not strictly comparable to laboratory-derived sequence matrices as the conditions under which they are obtained are different. In the laboratory, a pair of fish is isolated and each fish interacts only with its partner in an artificially confined space largely devoid of cover. Extensive sequence data can be recorded for one pair. Observations of stock aquaria simulate natural conditions better, despite restrictions of space and crowding. Sequence data can be compiled for many pairs simultaneously. In the field and in stock aquaria, a male rarely completes more than a few courtship behaviors before he is separated from the female. Males often interrupt courtship to display aggressively at adjacent males. They frequently become separated from the female during these aggressive bouts. Males also become separated from females when the females flee, hide in vegetation or disappear in fish aggregates. Males even cease courting females, appearing to lose interest after several minutes of courting. Frequently they switch their attentions to another female that crosses their path. As a result, sequence matrices derived from field data are the sum of brief encounters among many fish. In the field, there are virtually no instances where only one pair of fish interacts. Because of these differences, it appears unwise to compare field and laboratory sequence data. Failure to control the sexual responsiveness of goodeids, even under controlled laboratory conditions, makes comparisons among species difficult. Conclusions based on sequence data must remain tentative.

Communication between males and females.—In general, males appear to respond to headwagging females, and females appear to respond to courting males. To test this hypothesis, the sequence data (Tables 4, 8, 9, 10, 12, 14, 15) were rewritten to indicate the female's responses to male behaviors. The responses of the female were scored as either headwag or "other behavior" (which included no response by the female). The frequencies were calculated for each male and female behavior. These frequencies were used to calculate the expected number of female behaviors that would follow each male behavior. Chi square values were calculated from the observed and expected values and the values for each table summed to give a test statistic (Tables 16-29). A chi square test of independence was performed for each data matrix (Hazlett and Bossert, 1965; Dixon and Massey, 1969).

In most cases, the hypothesis of independence could be rejected at the .005 level, indicating that female behavior is not independent of male behavior (Tables 17, 19, 23, 25, 29). In two cases, female behavior appears independent of male behavior (Tables 21, 27). Few females in these populations were observed to headwag. Most of the females of Chapalichthys pardalis (Table 27) were already pregnant and unresponsive to male courtship.

These results further illustrate the difficulty in comparing sequence matrices. Male courtship behaviors may be performed even in the virtual absence of receptive females. The sequence matrix derived from a population in which females are responsive could be quite different than one derived from a population of unresponsive females. Laboratory studies suggest that quiver behaviors would be less frequently seen in populations with unresponsive females.

The male behavior that elicited the most response from females (indicated by large chi square values) varies from species to species and even within a species (Tables 17, 19, 23, 25, 29). In one case, females of Ilyodon furcidens furcidens responded to frontal and side quivers (Table 17). In another case, they responded to follow and parallel swim behaviors (Table 23). Females of

Table 16. Observed and expected responses of female _Ilyodon furcidens_ _furcidens_ to male courtship. Female behavior is scored as either "headwag behavior" or "other behavior" (including "no response"). The expected values are given in parentheses next to the observed values. Data from Table 4.

MALE BEHAVIOR	FEMALE BEHAVIOR			
	Headwag	"Other"	Total	Frequency
OF	0(0)	2(2)	2	.012
FF	5(3)	8(10)	13	.081
SQ	0(6)	32(27)	32	.199
OQ	1(1)	2(2)	3	.019
FQ	12(4)	10(18)	22	.137
ZZ	11(7)	25(29)	36	.224
CA	0(1)	5(4)	5	.031
S	0(1)	6(5)	6	.037
F	3(6)	29(26)	32	.199
BT	0(2)	10(8)	10	.062
Total	32	129	161	
Frequency	.199	.801		

Table 17. Test of independence of male and female behavior in *Ilyodon furcidens furcidens*. Data from Table 16. Numbers in table are chi-square values.

$$\text{Chi-square} = \frac{(\text{observed} - \text{expected} - 0.5)^2}{\text{expected}}$$

MALE BEHAVIOR	FEMALE BEHAVIOR	
	Headwag	"Other"
OF	———	.13
FF	.75	.63
SQ	7.04	.75
OQ	.25	.13
FQ	14.06	4.01
ZZ	1.75	.70
CA	2.25	.06
S	2.25	.05
F	2.04	.24
BT	3.13	.28

Chi-square (for table) = 40.50

Theoretical value (.001 level, nine degrees of freedom) = 21.67

Table 18. Observed and expected responses of female *Ameca splendens* to male courtship. Female behavior is scored as either "headwag behavior" or "other behavior" (including "no response"). The expected values are given in parentheses next to the observed values. Data from Table 8.

MALE BEHAVIOR	FEMALE BEHAVIOR			
	Headwag	"Other"	Total	Frequency
SF	14(9)	11(16)	25	.164
OF	0(1)	4(2)	4	.026
FF	12(8)	10(14)	22	.148
SQ	6(7)	13(12)	19	.125
OQ	2(1)	0(1)	2	.013
FQ	3(1)	0(2)	3	.020
LQ	1(2)	4(3)	5	.033
ZZ	5(5)	9(9)	14	.092
FW	2(1)	2(2)	4	.026
CA	1(1)	3(2)	4	.026
F	5(12)	27(20)	32	.211
PS	6(7)	12(11)	18	.118
Total	57	95	152	
Frequency	.375	.625		

Table 19. Test of independence of male and female behavior in *Ameca splendens*. Data from Table 18. Numbers in table are chi-square values.

$$\text{Chi-square} = \frac{(\text{observed} - \text{expected} - 0.5)^2}{\text{expected}}$$

MALE BEHAVIOR	FEMALE BEHAVIOR	
	Headwag	"Other"
SF	2.25	1.89
OF	2.25	1.13
FF	1.53	1.45
SQ	.32	.02
OQ	.25	2.25
FQ	2.25	3.13
LQ	1.13	.08
ZZ	.05	.03
FW	.25	.13
CA	.25	.13
F	4.69	2.11
PS	.32	.02

Chi-square (for table) = 27.91

Theoretical value (.001 level, 11 degrees of freedom) = 24.73

Table 20. Observed and expected responses of female *Skiffia multipunctata* to male courtship. Female behavior is scored as either "headwag behavior" or "other behavior" (including "no response"). The expected values are given in parentheses next to the observed values. Data from Table 9.

MALE BEHAVIOR	FEMALE BEHAVIOR			
	Headwag	"Other"	Total	Frequency
SF	0(0)	15(15)	15	.019
OF	0(0)	1(1)	1	.001
FF	0(0)	3(3)	3	.004
SQ	0(0)	34(34)	34	.043
OQ	0(0)	21(21)	21	.026
FQ	1(1)	259(259)	260	.328
LQ	0(0)	25(24)	25	.031
ZZ	2(1)	157(159)	159	.201
FW	0(1)	129(129)	129	.163
CA	0(0)	5(5)	5	.006
F	1(1)	133(133)	134	.169
PS	0(0)	1(1)	1	.001
FC	0(0)	3(3)	3	.004
SC	0(0)	3(3)	3	.004
Total	4	789	793	
Frequency	.005	.995		

Table 21. Test of independence of male and female behavior in *Skiffia multipunctata*. Data from Table 20. Numbers in table are chi-square values.

$$\text{Chi-square} = \frac{(\text{observed} - \text{expected} - 0.5)^2}{\text{expected}}$$

MALE BEHAVIOR	FEMALE BEHAVIOR	
	Headwag	"Other"
SF	———	.02
OF	———	.25
FF	———	.08
SQ	———	.01
OQ	———	.01
FQ	.25	0
LQ	———	.01
ZZ	.25	.04
FW	2.25	0
CA	———	.05
F	.25	0
PS	———	.25
FC	———	.08
SC	———	.08

Chi-square (for table) = 3.88

Theoretical value (.005 level, 13 degrees of freedom) = 22.36

Table 22. Observed and expected responses of female *Ilyodon furcidens furcidens* to male courtship. Female behavior is scored as either "headwag behavior" or "other behavior" (including "no response"). The expected values are given in parentheses next to the observed values. Data from Table 10.

MALE BEHAVIOR	FEMALE BEHAVIOR			
	Headwag	"Other"	Total	Frequency
SF	12(11)	8(9)	20	.054
OF	2(1)	0(1)	2	.005
FF	26(24)	16(18)	42	.113
LF	31(34)	29(26)	60	.161
SQ	3(3)	2(2)	5	.013
FQ	2(2)	1(1)	3	.008
LQ	1(3)	4(2)	5	.013
ZZ	24(27)	23(20)	47	.126
FW	16(16)	12(12)	28	.075
F	5(17)	25(13)	30	.081
PS	85(67)	33(51)	118	.317
FC	5(5)	4(4)	9	.024
SC	0(2)	3(1)	3	.008
Total	212	160	372	
Frequency	.570	.430		

Table 23. Test of independence of male and female behavior in *Ilyodon furcidens furcidens*. Data from Table 22. Numbers in table are chi-square values.

$$\text{Chi-square} = \frac{(\text{observed} - \text{expected} - 0.5)^2}{\text{expected}}$$

MALE BEHAVIOR	FEMALE BEHAVIOR	
	Headwag	"Other"
SF	.02	.25
OF	.25	2.25
FF	.09	.35
LF	.36	.24
SQ	.08	.13
FQ	.13	.25
LQ	2.08	1.13
ZZ	.45	.31
FW	.01	.02
F	9.19	10.17
PS	4.57	6.71
FC	.05	.06
SC	3.13	2.25

Chi-square (for table) = 44.53

Theoretical value (.001 level, 12 degrees of freedom) = 26.22

Table 24. Observed and expected responses of female Skiffia lermae to male courtship. Female behavior is scored as either "headwag behavior" or "other behavior" (including "no response"). The expected values are given in parentheses next to the observed values. Data from Table 12.

MALE BEHAVIOR	FEMALE BEHAVIOR			
	Headwag	"Other"	Total	Frequency
SF	2(4)	37(35)	39	.107
OF	0(0)	2(2)	2	.005
FF	4(2)	17(19)	21	.057
LF	1(2)	25(23)	26	.071
SQ	0(2)	16(14)	16	.044
OQ	2(1)	10(11)	12	.033
FQ	4(4)	35(35)	39	.107
LQ	2(2)	17(17)	19	.052
ZZ	4(3)	21(22)	25	.068
FW	1(1)	14(13)	15	.041
F	7(9)	82(80)	89	.243
PS	9(2)	12(19)	21	.057
FC	0(1)	9(8)	9	.025
SC	1(1)	10(10)	11	.030
CH	0(2)	22(20)	22	.060
Total	37	329	366	
Frequency	.101	.899		

Table 25. Test of independence of male and female behavior in *Skiffia lermae*. Data from Table 24. Numbers in table are chi-square values.

$$\text{Chi-square} = \frac{(\text{observed} - \text{expected} - 0.5)^2}{\text{expected}}$$

MALE BEHAVIOR	FEMALE BEHAVIOR	
	Headwag	"Other"
SF	1.56	.06
OF	———	.13
FF	1.13	.33
LF	1.13	.10
SQ	3.13	.16
OQ	.25	.20
FQ	.06	.01
LQ	.13	.01
ZZ	.08	.10
FW	.25	.02
F	.69	.03
PS	21.13	2.96
FC	2.25	.03
SC	.25	.03
CH	3.13	.11

Chi-square (for table) = 39.45

Theoretical value (.001 level, 14 degrees of freedom) = 29.14

Table 26. Observed and expected responses of female *Chapalichthys pardalis* to male courtship. Female behavior is scored as either "headwag behavior" or "other behavior" (including "no response"). The expected values are given in parentheses next to the observed values. Data from Table 14.

MALE BEHAVIOR	FEMALE BEHAVIOR			
	Headwag	"Other"	Total	Frequency
SF	0(0)	43(43)	43	.126
FF	0(0)	26(26)	26	.076
LF	0(0)	10(9)	10	.029
SQ	0(0)	24(24)	24	.070
OQ	0(0)	4(4)	4	.012
FQ	0(0)	13(13)	13	.038
LQ	0(0)	5(5)	5	.015
ZZ	0(0)	1(1)	1	.003
FW	0(0)	7(7)	7	.020
CA	0(0)	11(11)	11	.032
F	1(1)	142(142)	143	.418
PS	1(0)	50(51)	51	.149
FC	0(0)	2(2)	2	.006
SC	0(0)	2(2)	2	.006
Total	2	340	342	
Frequency	.006	.994		

Table 27. Test of independence of male and female behavior in Chapalichthys pardalis. Data from Table 26. Numbers in table are chi-square values.

$$\text{Chi-square} = \frac{(\text{observed} - \text{expected} - 0.5)^2}{\text{expected}}$$

MALE BEHAVIOR	FEMALE BEHAVIOR	
	Headwag	"Other"
SF	———	.01
FF	———	.01
LF	———	.03
SQ	———	.01
OQ	———	.06
FQ	———	.02
LQ	———	.05
ZZ	———	.25
FW	———	.03
CA	———	.02
F	.25	0
PS	———	.04
FC	———	.13
SC	———	.13

Chi-square (for table) = 1.04

Theoretical value (.005 level, 13 degrees of freedom) = 22.36

Table 28. Observed and expected responses of female *Goodea atripinnis* to male courtship. Female behavior is scored as either "headwag behavior" or "other behavior" (including "no response"). The expected values are given in parentheses next to the observed values. Data from Table 15.

MALE BEHAVIOR	FEMALE BEHAVIOR			
	Headwag	"Other"	Total	Frequency
SF	9(7)	6(8)	15	.115
OF	1(1)	0(1)	1	.008
FF	5(4)	4(5)	9	.069
LF	1(1)	0(1)	1	.008
SQ	5(7)	9(7)	14	.107
OQ	0(1)	1(1)	1	.008
FQ	0(1)	2(1)	2	.015
LQ	1(1)	1(1)	2	.015
FW	8(10)	12(10)	20	.153
CA	0(1)	2(1)	2	.015
F	13(16)	21(18)	34	.259
PS	15(9)	3(9)	18	.137
FC	1(1)	2(2)	3	.023
DT	4(4)	5(5)	9	.069
Total	63	68	131	
Frequency	.481	.519		

Table 29. Test of independence of male and female behavior in *Goodea atripinnis*. Data from Table 28. Numbers in table are chi-square values.

$$\text{Chi-square} = \frac{(\text{observed} - \text{expected} - 0.5)^2}{\text{expected}}$$

MALE BEHAVIOR	FEMALE BEHAVIOR	
	Headwag	"Other"
SF	.32	.78
OF	.25	2.25
FF	.06	.45
LF	.25	2.25
SQ	.89	.32
OQ	2.25	.25
FQ	2.25	.25
LQ	.25	.25
FW	.63	.23
CA	2.25	.25
F	.77	.35
PS	3.36	4.69
FC	.25	.13
DT	.06	.05

Chi-square (for table) = 26.34

Theoretical value (.001 level, 13 degrees of freedom) = 27.69

Theoretical value (.005 level, 13 degrees of freedom) = 22.36

Skiffia lermae responded primarily to parallel swim behavior (Table 25). Females of Ameca splendens and Goodea atripinnis appeared to respond slightly to several male behaviors (Tables 19, 29). If female response to male behaviors is not consistent for a given species, as suggested by the data for Ilyodon furcidens furcidens, sequence data can offer little taxonomic information about this family.

Summary.—The sequences and frequencies of courting behavior appear unsuited for taxonomic inference in this family. The sequence matrices for individual pairs vary with each period of observation. Laboratory-derived data are based on artificially restricting behavioral interactions to one pair, a situation rarely encountered in the field. Field-derived sequence data are difficult to interpret because of populational differences in sexual responsiveness.

Chi square tests indicate that female behavior is dependent on male behavior in most populations, but in others, female behavior appears independent of male courtship. Females from one species may respond to different male behaviors. For these reasons, sequence data appear to provide little taxonomic information for the Goodeidae.

Function of Goodeid Courtship Behavior

As most goodeids share the same courting behaviors, they probably do not serve as mechanisms for species identification, species isolation or selection of conspecific mates. Yet in April, 1978, field observations on 18 species of goodeids revealed that males only courted conspecific females and only displayed aggressively at conspecific males, even at localities containing five or more goodeid species. As several goodeid species were courting at each of these localities, temporal separation of breeding seasons cannot totally explain these observations. At the Río Terrero, two sympatric species of the genus Ilyodon courted and aggressed only conspecifics although they mingled freely at this time of year. If courtship behaviors are not used in species identification, they may be important in the choice of an "appropriate" mate, one that is physiologically ready. This possibility is explored in this section.

Reproductive biology.—All goodeids are viviparous. Females do not store sperm and do not have superfetation (Fitzsimons, pers. comm.; Mendoza, 1962). Isolated pregnant females in the laboratory produce at most one brood. The laboratory gestation time varies from about 30 to 90 days and may be influenced by light, temperature and the nutritional state of the female. Records on individual females reveal that they may produce sequential broods at 2-month or greater intervals (Table 30). Observations in the laboratory and in the field demonstrate that not all females in a population are pregnant or in the same phase of pregnancy at the same time, implying that not all females produce mature eggs synchronously. Less is known about sperm production. Females confined with one male can produce broods within a week of each other. These studies indicate that one male is capable of inseminating several females within a week period, assuming that females raised in the same aquarium under the same conditions have about the same gestation period.

Female's contribution to offspring.—The female invests heavily in the production of a brood. Although relatively few eggs are produced, they are retained within the female's body and nourished there for periods exceeding a month. The female may actually lose weight during this time (Table 30). Mature eggs must have a limited fertilization time before becoming inviable. Turner (1933) found that after reaching their maximum size, the oocytes immediately degenerate unless they undergo maturation and fertilization. To produce a brood, a female must obtain a mate within this time period. Failure to fertilize the present batch of eggs will reduce the number of young she can produce and may mean she will produce no young this season. *Alloophorus robustus* and *Goodea luitpoldi* females, for example, are believed to produce only one brood a year in nature (Mendoza, 1962). Also, a female may not survive to produce another batch of eggs. The headwag behavior, indicating sexual receptivity in the female and performed only in the presence of a male, may increase the probability that the male will court, and thus increase the probability that the eggs will be fertilized. Headwagging is a visual advertisement and may also be transmitted through pressure

Table 30. Brood records of individual females. *Female lost weight. Females weighed after broods born.

	SPECIES			
	Xenotaenia resolanae	*Goodea atripinnis*	*Skiffia multipunctata*	*Skiffia multipunctata*
Date parents born	IV:9:76	V:6:76	VI:10:76	VI:10:76
Date first brood born	IX:6:76	IX:4:76	IX:11:76	IX:10:76
Number in brood	5	8	10	11
Weight of female	1.02 g	1.16 g	1.15 g	0.90 g
Date second brood born	XI:3:76	XI:15:76	XI:1:76	X:27:76
Number in brood	7	8	2	7
Weight of female	2.27 g	1.33 g	1.07 g*	1.12 g
Date third brood born	I:31:77	I:12:77	XII:17:76	XII:17:76
Number in brood	11	10	14	12
Weight of female	2.73 g	1.50 g	1.50 g	1.20 g
Date fourth brood born	III:16:77	III:10:77	II:8:77	II:6:77
Number in brood	22	8	5	11
Weight of female	2.56 g*	1.10 g*	1.35 g*	1.60 g
Date fifth brood born	V:5:77	♀ died IV:18	(Brood eaten ?)	
Number in brood	18			
Weight of female	3.00 g			
Date sixth brood born	VII:15:77			XI:21:77
Number in brood	9			16
Weight of female	4.08 g			2.90 g
Date seventh brood born	X:20:77			(Returned to stock)
Number in brood	14			
Weight of female	3.34 g*			

waves that are received through the well developed head pore and canal systems. In the field and laboratory, males generally respond quickly to headwagging, usually by swimming toward the female and displaying. Many males are attracted to headwagging females, and a female could choose among many potential mates. In Skiffia lermae females did appear to choose their mates. Females were seen fleeing packs of two to ten males. If all but one male ended the chase, the female stopped and headwagged to the one remaining male. Was she selecting the most vigorous male? As copulation is rarely observed in field or laboratory, this hypothesis is difficult to test. But it is unlikely that males could succeed in inseminating females without the cooperation of the females. Unlike poeciliids, the anal fin of goodeids is not a gonopodium (Miller and Fitzsimons, 1971) and is not inserted into the female's genital opening. Cases of fleeing females that were interpreted as rejection behavior (Fitzsimons, 1970) need to be re-examined more critically.

Male's contribution to offspring.—Males compete aggressively for females. They contribute less energy than females to the production of gametes. They do not nourish or protect the young. Trivers (1972) predicted that "where one sex invests considerably more than the other, members of the latter will compete among themselves to mate with members of the former." Goodeids support this prediction. In the field, females were never seen fighting, but conspecific males of the same size tailbeat, circle and bite. During the prolonged aggressive displays of the males, the female often escapes. But as it is impossible to copulate successfully in the presence of interfering rival males, the male must try to chase away his competitors. Larger males have an advantage. They simply displace smaller males and do not lose the female. Displacement occurs when the larger male orients or swims toward the smaller male. The smaller male stops pursuing the female, folds his fins and flees. Aggressive males are also the most brightly colored, suggesting that the male's colors may serve as a warning to keep other males away. Noble (1938) concluded the same for some poeciliids. It is not known if goodeid females prefer brightly colored males. In the laboratory, the most aggressive and therefore the most colorful males monopolize the females, but pale males also court females and copulate. A male placed only with females often remains pale even when courting. It is not known if pale males achieve copulation in the field. In pupfish (Kodric-Brown, 1977) and the cyprinodont *Nothobranchius guentheri* (Haas, 1976), females prefer brightly colored males.

Mate selection.—Often males spontaneously cease following a female, even after a long sequence of displays. Perhaps the female is abandoned because she does not respond appropriately. None of the 19 species observed defended territories so the abandonment of the female is not a result of the male exceeding his territorial boundaries. Frequently a male switched to courting a second female that crossed his path while courting the first female. Perhaps he follows the nearest female because she appears the largest. As larger females have larger broods, the male maximizes his fitness by copulating with the largest available female. Large size also implies faster growth or greater age, suggesting that the genotype is particularly fit. Males may follow the nearest female for another reason. Receptive females slow down or stop when courted by males. The male may interpret a female crossing his path as having slowed down, since he has suddenly approached her closely without altering his speed. Receptive poeciliid females also halt swimming (Clark and Aronson, 1951; Wickler, 1957).

Females also choose from among available males. They do not copulate with every male that courts them. Females sometimes reject males smaller than themselves. In the field, most responses are to males their own size. Some female pupfish tend to mate with males their own size, and Kodric-Brown (1977) has suggested that disparate sizes of partners may interfere with successful mating.

Facilitation.—Some goodeid species show peaks of courting activity at certain times of the day that may be related to environmental factors, especially photoperiod and temperature. The presence of some courting males in a population may act as a stimulus to initiate courtship in other males. If selection acts on the individual, as Williams (1966) argues, it would be advantageous for males to be physiologically ready to copulate as soon as a headwagging female is sighted, especially if not all females are receptive at the same time. These males would inseminate more females. Field observations indicated that not all females are in phase reproductively. It seems unlikely from Turner's (1933) study that male behavior can facilitate maturation of the eggs. However, females with mature eggs may copulate more quickly in the presence of many courting males than if accompanied by only one. Also, multiple inseminations may result in more of the eggs being fertilized. It is not known if a female's brood can be sired by more than one male.

Courting of pregnant females.—Several observations appear difficult to explain. In the laboratory and field, pregnant females are occasionally courted by adult males. Males do not appear to interpret the swollen abdomen of a female as "pregnant female". They may court pregnant females even though females do not store sperm. This waste of time and energy by the male should be eliminated by natural selection. Yet in the field, pregnant females of *Chapalichthys pardalis* were courted. Virtually all the females in this population were pregnant. Males may prefer headwagging females, but if not available, they appear to court any female.

Headwagging females in the absence of courting males.—Sometimes females may have mature eggs but be unable to find a responsive male. At one locality, females of *Goodea atripinnis* headwagged but few if any courting males were present. These females were not attacked by the males, so headwagging appeared to be an indicator of sexual readiness. Possibly females initiate the breeding season by headwagging. Once a male encounters some responsive females, he may begin displaying. If the number of headwagging females encountered in a given period of time falls below a certain threshold, the male may continue to display for a time, especially if a receptive female is occasionally found by this means. In field and laboratory, in a few cases females did not headwag prior to the male's courtship but headwagged after it. Eventually the absence of headwagging females would end male courtship. Alternately, females may mature eggs before males begin sperm production. Mendoza (1962) demonstrated that this explanation is unlikely. In the field, courtship was directed only at conspecific females. But in the laboratory, inexperienced juvenile males court even large adult males. Apparently recognition of sex and the association of headwag behavior with females are learned.

Headwagging in pregnant females.—At times, pregnant females headwag. Headwagging must serve a different function in these cases. In the laboratory, pregnant females of Alloophorus robustus headwagged after a male began courting another headwagging female in the same aquarium. Perhaps the pregnant female was interfering with the other female's chance of producing a brood. Females may compete for males. But field observations do not support this hypothesis. Equal numbers of males and females occur in most populations and there is no sequestering of males. Where goodeids occur, they are so numerous that it would be impossible for a female to sequester a male for very long, certainly not the time it takes to have a brood and mature another batch of eggs. A second hypothesis seems more likely. The female may be using receptive behavior to ward off aggression by the male. Males often charge, bite or kill other fish in the aquarium when courting a female. If no other fish is available, the female is sometimes alternately courted and chased, especially if she does not headwag. If headwagging is used in this fashion, it may be used by females that are not obviously pregnant, but for these females, there is no way to know if headwagging is used to indicate receptivity or to avert aggression. Small, subordinate males might also avert aggression by headwagging, but this behavior was not seen. Field observations indicate that subordinate males largely avoid larger males or are displaced by them with little harm to the subordinates. In the laboratory, large males do harrass and kill smaller ones, especially in small aquaria.

Summary.—Males may maximize their fitness by being large, courting headwagging females, and selecting the largest available females. Small males court any female but are usually displaced by larger males and probably copulate rarely. Males of the same size stop following the female and display aggressively until one male leaves. Aggressive displays may last many minutes, indicating strong competition among males. As all females are not receptive at the same time, a male that aggressively excludes others from receptive females should achieve more copulations. Observations in stock aquaria suggest that the larger, brightly colored aggressive males do attempt copulation more than the smaller, paler subordinate males. Copulations seen in the laboratory and field involve only one pair of fish, suggesting that the male cannot copulate successfully in the presence of rival males.

Females do not store sperm and must be inseminated for each brood. Headwagging females generally attract many males and they may choose their mates. They do not copulate with every male that courts them. Females tend to mate with males their own size. Pregnant females that headwag may be avoiding male aggression. Goodeid courting behavior may also facilitate mating.

CUES USED IN MATE SELECTION

In this section, experiments were done to test if auditory, chemical, tactile and/or visual cues are used by goodeids in species identification and the selection of conspecific mates.

Test for Auditory Cues

Sound production during courtship has been demonstrated in several fish families (Gerald, 1971; Myrberg, 1965; Nelissen, 1978; Nelson, 1964; Rowland, 1978; Tavolga, 1956). A simple experiment was designed to determine if goodeids produce sounds during courtship.

Materials and methods.—To test for auditory cues in the Goodeidae, a pair of *Ilyodon furcidens tuxpan* was placed in a 5 gal aquarium to which a hydrophone (no. 41,759 Edmund Scientific Co.) had been attached. The hydrophone has a frequency response of 10-6000 Hz ± 4 db with ± 1 db in 10-2000 Hz range. The aquarium contained no gravel, plants or other objects.

Results.—The pair was introduced to the experimental aquarium simultaneously. Recording began with the release of the pair and was continued for 30 minutes. The pair began courting immediately and both fish were responsive. The displays became progressively more vigorous resulting in several copulation attempts by the male. Before and during courtship, no sounds were made by either fish.

Discussion.—It is unlikely that the fish emitted sounds outside the frequency response range of the hydrophone. When used within one meter of the sound source, the hydrophone largely covers the range of frequencies known to be produced by fishes (Demski et al., 1973; Fish and Mowbray, 1970). It is possible that the intensity of the sounds emitted is not great enough to be heard above background noise. Also, these fish may produce sounds facultatively during courtship. But this possibility appears remote. Results on Ilyodon may not be representative for all goodeid species.

Test for Chemical Cues

Although fishes use chemical cues in many different ways, pheromones leading to copulation have only been demonstrated in a few species (Bardach and Todd, 1970; MacGinitie, 1939; Parzefall, 1973; Tavolga, 1950). This series of experiments studies the responses of male goodeids to possible chemical cues released by females. Skiffia francesae was chosen as courting males often nuzzle the female's genital opening.

Materials and methods.—Four males of the same size were used. Two each were placed in separate 5-gal aquaria. The number of male-male interactions was recorded for each pair for 5 minutes before the experiments began. The interactions counted were biting and aggressive displays involving sigmoid posture and erected fins. Nuzzling, a courtship behavior, was also recorded but was rare. Aggressive interactions were tabulated separately from courting interactions. The first test, the control, consisted of adding a pint of dechlorinated tap water to the test aquaria. The water was slowly poured into one end of the aquarium. All aggressive interactions were counted for 5 minutes. Then a pint of "virgin female water", "parturition water", "pregnant female water", or "female water" was added to each aquarium and the number of interactions recorded. "Virgin female water" is water taken from an aquarium containing one female who has had a brood and has not had access to males after the birth of that brood. Female goodeids do not store sperm, so these females are considered "virgins". "Parturition water" is taken from an aquarium containing one female that has given birth to a brood within 24 hours prior to the start of the trial. "Pregnant female water" is taken from an aquarium containing a female that was near the end of her pregnancy as judged by her greatly distended abdomen. "Female water" is taken from an aquarium containing a female that is either not pregnant or in the early stages of pregnancy. For 5 minutes after the addition of a pint of water, the number of male-male interactions was recorded. The males were allowed a one minute period to recover from being disturbed by the additions, then recording began. Water in the aquaria containing the males was not changed between additions made on the same day, as cleaning upsets the males and they remain unresponsive on the bottom. In all, two pairs of males were tested for a total of 21 trials. Several days elapsed between trials so that the fishes would not acclimate to the experimental conditions. The order of presentation of the types of "female water" were changed in each trial. The data were analyzed separately for each pair of males by a nonparametric sign test (Conover, 1971).

Results.—The responses of the males to "pregnant female water", "parturition water" and "female water" were compared to each of two controls, tap water and "no addition". None of these pairwise comparisons were significant at the 0.01 level, but the sample sizes were small. The results suggest that the responses of males are independent of the additions. In Table 31, trials 13, 15, 16, 17 and 18 suggest no change in behavior or a sequential escalation or de-escalation of aggressive interactions over time. Once initiated, aggressive displays tend to escalate to a peak then drop off as one male establishes dominance over the other. In three trials, 10, 14 and 18, one male nuzzled the other several times. The sex of a conspecific may be determined by its behavior and color, and a pale male that does not display aggressively may be treated initially as a female. Nuzzling is reproductive behavior and is not included in Table 31. Chemical cues may be released by females in certain phases of pregnancy, but taken alone they did not appear to produce predictable responses in S. francesae males.

Discussion.—Parzefall (1973) found that males of Poecilia sphenops require direct nipping contact with a female before she is recognized as attractive. Females that had just borne a brood were attractive to males and preferentially courted. If such a female was removed and immediately presented again behind a pane of glass or in a form-fitting nylon bag, she was no longer recognized as attractive. Parzefall suggests that males must taste a substance

Table 31. Responses of male *Skiffia francesae* to the addition of water from aquaria containing females in different phases of the reproductive cycle. See text for explanation. Several days elapsed between trials.

			Number of aggressive interactions in 5 minutes with:					
Trial	order of treatments	males used	a) no addition	b) tap water	c) pregnant ♀	d) parturition	e) female	f) virgin
1	a,b,c,d	1,2	0	3	17	0		
2	a,b,d,c	3,4	0	3	5	0		
3	a,b,e,d	1,2	0	0		1	0	
4	a,b,d,e	3,4	1	3		0	1	
5	a,b,c,e	1,2	6	2	7		2	
6	a,b,c	3,4	0	2	1			
7	a,b,e,c,d	1,2	0	0	1	2	0	
8	a,b,c	3,4	1	7	14			
9	a,b,e,c	1,2	14	15	8		8	
10	a,b,c	1,2	10	11	9			
11	a,b,e,c	3,4	2	4	1		4	
12	a,b,c	1,2	7	7	7			
13	a,b,c	3,4	3	10	17			
14	a,b,c	1,2	4	6	7			
15	a,b,f,c	3,4	13	13	20			13
16	a,b,c	1,2	15	12	13			
17	a,b,c	1,2	20	20	3			
18	a,b,c	3,4	37	15	9			
19	a,b,d,c	1,2	37	14	19	8		
20	a,c	3,4	10		11			
21	a,b,c	1,2	20	4	16			

produced by the females and that olfactory cues are not involved. In contrast to Parzefall's results, Betty Lou Brett (in prep.) found that in Poecilia chica, direct contact is not necessary. Males respond preferentially to "parturition water" that is added to their aquarium. Skiffia francesae clearly does not respond like P. chica, but may be similar to P. sphenops. Olfactory cues are probably not involved, but taste may be used to find females with mature eggs. Possibly the nuzzling behavior is necessary to stimulate females to cooperate during copulation. Only one other goodeid species, Skiffia multipunctata, nuzzles females. Taste cues are probably not used to find mates by other members of this family.

Test for Visual and Tactile Cues

Field and laboratory observations suggest that goodeids recognize conspecifics by largely visual means. A simple test was designed to determine if visual and tactile cues are important in species recognition and mate selection.

Materials and methods.—Allodontichthys tamazulae was chosen as the experimental animal. It occurs sympatrically with three other goodeid species. In the first series of trials, a male was given a choice between a conspecific female and a female of the sympatric subspecies Ilyodon xantusi latos. All three fishes were the same size (within 0-5 mm). Superficially female Ilyodon resemble female Allodontichthys in being slender, elongate fish with a lateral stripe. At least one day before the trial began, each female was placed in a 1 gal glass jar and the two jars placed inside and at opposite ends of a 20 gal aquarium. The aquarium had no gravel, plants or other objects in it. The water in the jars and the aquarium did not mix. This arrangement prevented any chemical or tactile cues from being transferred between the male and females. The male was then introduced to the center of the 20 gal aquarium between the two females. Recording began immediately upon release of the male. The behavior of all fishes and the amount of time spent by the male on each side of the aquarium are summarized in Table 32. Each trial was separated by two to four days to allow the fishes

Table 32. Visual choice experiments. *Allodontichthys tamazulae* is given a choice between a conspecific and a heterospecific partner.

test fish	time with conspecific	time with heterospecific	total time	comments on behavior
♂ #1	23 min 20 sec	6 min 40 sec	30 min	♂ spent 18 of first 20 min with conspecific ♀. Both display aggressively. ♂ does not aggress female *Ilyodon*. In next 10 min ♂ swims randomly and no longer displays.
♂ #1	15 min 51 sec	4 min 9 sec	20 min	♂ spent 9 min 56 sec of first 10 min displaying aggressively at conspecific ♀. ♀ returned the displays. The next 10 min the ♂ swims randomly.
♂ #2	21 min 20 sec	3 min 40 sec	25 min	♂ spent most of first 10 min with conspecific ♀. Both display aggressively. The last 15 min the ♂ courted the ♀, the ♀ no longer displays aggressively.
♂ #2	23 min 15 sec	1 min 45 sec	25 min	♂ displays aggressively to conspecific ♀ in first 10 min, courts ♀ in next 15 min.
♀ #1	20 min 20 sec	4 min 40 sec	25 min	♀ displays aggressively to conspecific ♂, ♂ does not display. *Ilyodon* ♂ tries to bite ♀ through glass.
♀ #1	10 min 10 sec	4 min 50 sec	15 min	♀ does not display. *Ilyodon* ♂ tries to bite ♀ through glass.

to recover. The male was tested twice, then the experiment repeated two more times with a second conspecific male. Finally a female A. tamazulae was given a choice of a conspecific male or a male of Ilyodon xantusi latos. All specimens of A. tamazulae were laboratory-reared and had no prior experience with other goodeids.

Results.—The test fish spent greater than 80% of their time with the conspecific partner (Table 32). All aggressive displays and all courting displays were directed only to conspecific fish. The biting attempts by the Ilyodon male may result from being confined to a gallon jar. In contrast to the A. tamazulae individuals, this male was caught in the field. Ilyodon xantusi latos is the largest goodeid species where it occurs and may be the most aggressive.

Discussion.—Allodontichthys tamazulae appears to recognize conspecifics largely by visual cues, although chemical or tactile cues may reinforce visual recognition. The removal of tactile cues, as in this experiment, did not prevent the fish from distinguishing between conspecifics and other goodeid species. Sex may be determined visually, but laboratory observations suggest that the female's response to the presence or behavior of the male dictates whether courtship will ensue. A male responds identically to an aggressive female or male. If the female does not display aggressively in response to initial aggressive displays by the male, he often ceases the aggressive displays and begins courting the female. When a pair is placed together or a partition between them removed, often a brief aggressive bout occurs which is then followed by courtship.

The experiments in the laboratory were performed in clear water. When the water is turbid, as it now is in many goodeid habitats, tactile, chemical and auditory cues may be more important than visual cues in species identification. Where only one goodeid occurs in a habitat, turbidity may not interfere with reproduction. Where several goodeid species coexist, mistakes in identification would seem possible. Most sympatric species of goodeids represent different genera and differ greatly in morphology. Differences in body form alone might permit species identification by tactile means. If mistakes in species identification are made in turbid habitats, physiological barriers may prevent successful hybridization. Despite many forced mating experiments by Fitzsimons (1974, pers. comm.) and the author, hybrid offspring were obtained only from congeneric crosses. There are few turbid habitats containing congeneric species. It is also possible that goodeids may be able to identify conspecifics visually even in turbid water.

Summary.—The preliminary data presented here suggest that visual cues are important in species recognition in at least one goodeid species, *Allodontichthys tamazulae*. Tactile and chemical cues were eliminated, and the fish still responded to conspecifics in preference to other species. Chemical cues do not appear important in *Skiffia francesae*, despite observations that males nuzzle females during courtship. Sound production does not occur during the courtship of *Ilyodon furcidens tuxpan*. Additional tests using more species are required to determine if these results apply to all goodeids.

MORPHOLOGICAL STUDY OF THE GENUS ILYODON

Figure 12 shows the known distribution of Ilyodon. Data from collections representing all known localities from which Ilyodon has been obtained were analyzed by means of Principal Components Analysis. The collections used are assigned numbers in Table 33 and will be identified by number in the discussions to follow. The geographical locations of these collections are given in Fig. 13.

Sexual Dimorphism

Goodeids are sexually dimorphic. Several approaches were used to examine these differences.

Materials and methods.—Counts and proportional measurements for six males and six females from populations 1-21 were examined by an analysis of variance. While the sample sizes were small, and there are some problems in applying this methodology to ratio data, differences between males and females for a given population were considered important only if the mean for a measurement in one sex was not contained in the confidence interval around the mean for the other sex (Table 34, indicated by a single asterisk), or when the confidence intervals did not overlap (Table 34, indicated by double asterisks). Principal Components Ordination is also helpful in visualizing sexual dimorphism. Males and females of Ilyodon furcidens tuxpan (#6) and Ilyodon whitei (#9) were compared. Also the data for females and males in populations 1-21 were examined separately.

Results.—Each proportional measurement is sexually dimorphic in at least two populations (Table 34). Dorsal fin length (basal, depressed) is sexually dimorphic in all populations and pelvic length and predorsal length are different in most populations.

Fig. 12. Known distribution of fishes of the genus *Ilyodon*. Large regions of the Balsas drainage have not been collected. 1. Ameca drainage 2. Armería drainage 3. Coahuayana drainage 4. Balsas drainage 5. Río Coalcomán 6. Río Nexpa 7. Río Chula 8. Río Arteaga

Fig. 12.

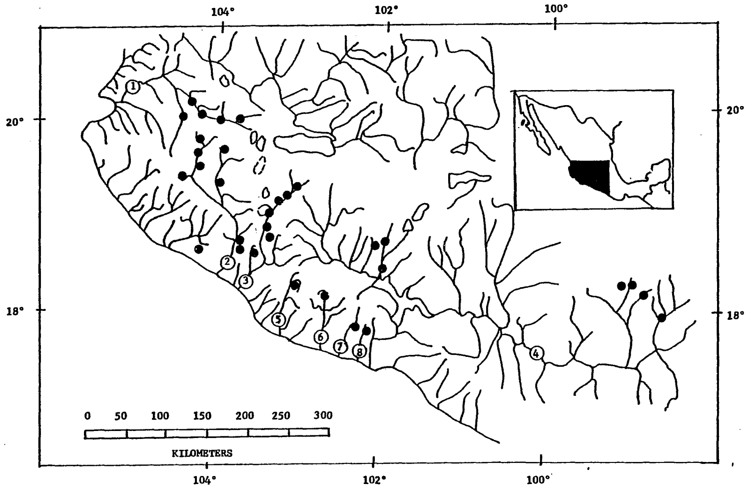


Table 33. List of collections examined in the morphological study. Each collection is assigned a number 1-69.

1. UMMZ 198845, outlet of Presa Santa Rosa near Unión de Tula
2. UMMZ 192193, small stream SW of Colotitlán
3. UMMZ 189586, Río de la Pola
4. UMMZ 189601, Río Terrero
5. UMMZ 198840, Río Terrero
6. UMMZ 145307, Río Tamazula at Tuxpan
7. UMMZ 189595, Río de Comala
8. UMMZ 172160, Río San Rafael at San Rafael bridge
9. UMMZ 192423, Presa Cupatitzio
10. UMMZ 192431, Río Cupatitzio
11. UMMZ 181313, Río Nexapa
12. UMMZ 178419, Río Aguacate
13. UMMZ 178411, Río Aguililla
14. UMMZ 189594, Río de Comala
15. UMMZ 172132, Arroyo Pueblo Nuevo
16. UMMZ 160775, trib. Río Colima
    UMMZ 166444, trib. Río Salado
    UMMZ 173589, Río Salado
    UMMZ 160760, Río Colima
    UMMZ 145308, Río Colima
17. UMMZ 192234, trib. Río San Pedro at Apulco
    UMMZ 192235, trib. Río San Pedro at Apulco
    UMMZ 192236, trib. Río San Pedro at Apulco
18. UMMZ 169841, Río Coalcomán
19. UMMZ 178358, Río Mascota
20. UMMZ 189591, Río Tuxpan near Atenquique
    UMMZ 189592, Río Tuxpan near Atenquique
21. UMMZ 178421, Río Arteaga
22. UMMZ 189080, Río de Tecalitlán at Tecalitlán
23. UMMZ 201952, trib. Río Naranjo
24. UMMZ 172154, trib. Río Naranjo
25. UMMZ 202617, Río Tamazula near San Rafael
26. UMMZ 202613, Río Tamazula at Tamazula
27. UMMZ 202620, river below Fereria
28. UMMZ 202612, Río Tamazula at Hwy 110 bridge
29. UMMZ 169846, Río Cupatitzio
30. UMMZ 178352, Río Atenguillo
31. UMMZ 189592, Río Tuxpan near Atenquique
32. UMMZ 192251, Río Tuxpan N of Tamazula
33. UMMZ 192247, Río Tuxpan S of junction of Hwy 110 and highway to Cd. Guzman
34. UMMZ 192256, trib. Río Tuxpan W Soyatlán de Afuera
35. UMMZ 192436, trib. S of Tocumbo
36. UMMZ 192183, trib. Río Ameca
37. UMMZ 192202, trib. Río Atenguillo
38. UMMZ 108627, Río Cuautla
39. UMMZ 138691, Río Tuxpan at Tuxpan
40. UMMZ 189675, Río Cuautla

Table 33. continued...

41. UMMZ 65229, Río Yautepec
42. UMMZ 192200, Río Mascota
43. UMMZ 189674, Río Yautepec
44. UMMZ 192198, trib. Río Ameca
45. UMMZ 169842, Río Chiquito near Coalcomán
46. UMMZ 173795, near San Gabriel
47. UMMZ 172217, trib. Río San Pedro
48. UMMZ 166445, trib. Río Salado
49. UMMZ 192222, Río Salado
50. UMMZ 172147, Río Salado
51. UMMZ 192223, Río Salado
52. UMMZ 166443, trib. Río Salado
53. UMMZ 160776, trib. Río Colima
54. UMMZ 145304, Río Colima
55. UMMZ 145309, Colima river
56. UMMZ 172166, trib. Río Tamazula, near La Garita
57. UMMZ 192205, trib. Río San Pedro
58. UMMZ 192206, trib. Río San Pedro
59. UMMZ 192195, stream W of junction of Mascota road with Hwy 80
60. UMMZ 178364, Río de Ayutla
61. UMMZ 160777, trib. Río Colima
62. UMMZ 160761, Río Colima
63. UMMZ 160762, Río Colima
64. UMMZ 172208, trib. Río San Pedro
65. UMMZ 178344, Río Potrero Grande
66. UMMZ 192229, stream E of Río Salado
67. UMMZ 145313, Río Salado
68. UMMZ 145306, Río Salado
69. UMMZ 192228, stream E of Río Salado

Fig. 13. The geographic locations of collections of Ilyodon used in the study. The insert in the top right corner shows the collections made in the eastern section of the Balsas drainage.

Fig. 13.

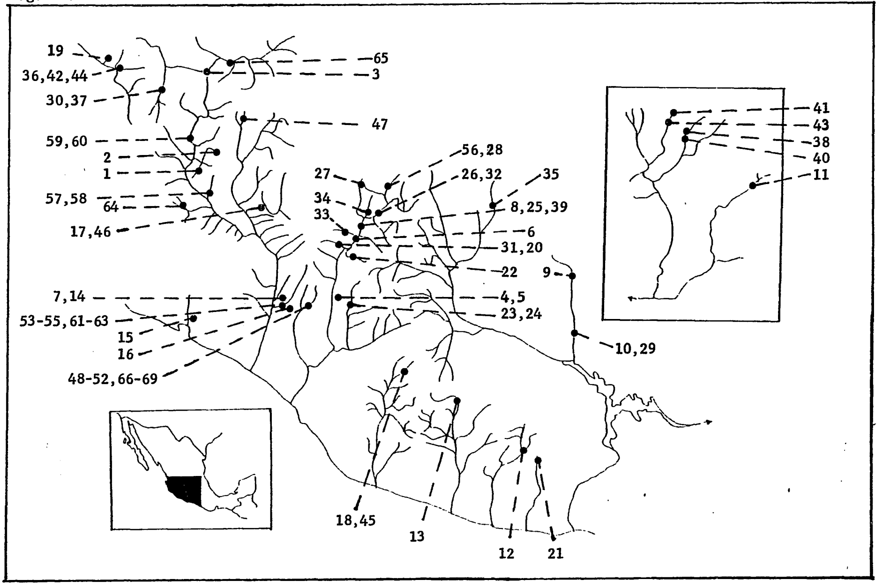

19
36,42,44
30,37
59,60
2
1
57,58
64
17,46
7,14
53-55,61-63
15
16
48-52,66-69
65
3
47
27
34
33
56,28
26,32
35
8,25,39
6
31,20
22
9
4,5
23,24
10,29
18,45
13
12
21
41
43
38
40
11

Table 34. Sexual dimorphism in the genus <u>Ilyodon</u>. Six males and six females compared for each population. * = mean of each sex not contained in the 95% confidence interval around the mean for the other sex ** = non-overlapping confidence intervals around the mean at the 95% level.

	Population																				
Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Dorsal fin rays																					
Anal fin rays																					
Pectoral fin rays																					
Pelvic fin rays																					
Caudal fin rays														*							
Lateral scales			*																		
Dorsal to anal scales					*															**	
Scales around body																			*		
Predorsal scales		*																	*		*
Scales around caudal peduncle							*													*	
Gill rakers										*											
Vertebrae																					
Mandibular pores																					
Preopercular pores																					
Lacrimal pores																					
Standard length									*	*	*										
Predorsal length		**	**	**	**	**	**	**	**	*		**	**	**	**	**	**	*	**	**	*
Prepelvic length			**		*		*					*			*					*	*
Anal origin to caudal base			*		*			*	*	**	**									*	*
Body, greatest depth											*								**		
Width								*		**	*	*			**				**		
Head, length						*			**						*				*		*
Depth			*	**			*			**	**	**			*					*	**
Width												*		*							
Caudal peduncle, length			**			*		**		*		*						*		**	
Least depth					**				**										**		

Table 34. continued...

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Population																				
Interorbital, least bony width										*								*			*
Preorbital width		*						*		**	*						*			*	
Postorbital length										*										*	
Snout length		*			*					**				*	*			*	*		
Orbit length					*	*			**	*									*		
Mouth width			**								*				*				**		
Mandible length						**					**			*		*					
Dorsal fin, basal length	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Depressed length	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Anal fin, basal length						*					*			*		*		*	**		*
Depressed length					*				*	*	**								*	*	
Middle caudal rays, length			*	*					**				*							*	*
Pectoral length			*	*	**	**			**			*		*		*	*		**	*	**
Pelvic length	*	**	**	*	**	**	**	*	*		*	**	*	**	*	*	**		**	**	**
Upper jaw length			*		*	*								*	*			*	**		
Opercle length						*			*												

Males generally have longer fins than females (Table 34, Fig. 14). In contrast, most meristic data do not differ between the sexes. These results can also be visualized by Principal Components Analysis. Specimens of Ilyodon furcidens tuxpan (#6) and Ilyodon whitei (#9) are shown to separate along the first principal component (Fig. 14). Within each population, the sexes separate along the second principal component. The pattern of clusters formed on the first and second principal component axes using only female data was similar to the pattern formed using only male data (Figs. 15, 16). The position of the species and subspecies clusters shifted slightly, but in general the relationships among the clusters remained similar. For instance, Ilyodon furcidens amecae overlapped with Ilyodon furcidens furcidens and these two populations formed clusters in the lower halves of the figures. Ilyodon xantusi xantusi and Ilyodon xantusi latos formed clusters in the upper halves of the same figures.

Discussion.—As a result of this marked sexual dimorphism, sexes were analyzed separately in all subsequent analyses. Because of time limitations and because of the similarities in the ordinations based on male and female data, only males were considered in detail for the remainder of the study. The limited data available for females support the conclusions resulting from analyses based on the data for males.

Ecophenotypic Variation

Morphological differences among populations may be caused by environmental factors rather than by genetic differences. To determine the interrelationships among populations, these environmentally controlled characters should be identified. Although it is difficult to prove that all the observed morphological differences among populations are genetically controlled, this assumption is usually made. Two independent experiments allow a reasonable determination of the ecophenotypic characters in Ilyodon.

Materials and methods.—The building of a dam across the Río Cupatitzio in the Río Balsas system south of Uruapan isolated a population of Ilyodon whitei in a reservoir. The reservoir is an

Fig. 14. Sexual dimorphism in the genus Ilyodon. Two populations are shown to separate along the first principal component. Ilyodon furcidens tuxpan (#6), from the Río Tuxpan at Tuxpan, is represented by squares; Ilyodon whitei (#9), from the Río Cupatitzio is represented by circles. Males and females of each population separate along the second principal component. PC I = 31.7% PC II = 17.9%

Fig. 14.

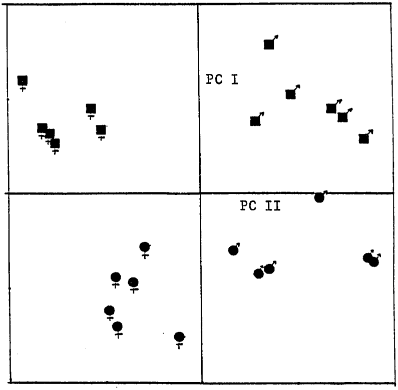


Fig. 15. Outline of Principal Components Ordination of 25 males each for populations 1-21. PC I = 23.0% PC II = 11.4%

	Population
— — —	*Ilyodon* sp. (#13)
———	*Ilyodon* sp. (#12, 21)
— · — ·	*Ilyodon furcidens amecae* (#3, 19)
— · · —	*I. furcidens furcidens* (#1, 2, 4, 7)
-+-+-+-+-	*I. furcidens tuxpan* (#6, 8, 20)
· · · · · ·	*I. furcidens variabilis* (#17)
═══	*I. xantusi latos* (#5)
= = =	*I. xantusi xantusi* (#14, 15, 18)
-•-•-•-•-	*I. whitei* (#9, 10, 11)
★	*I. furcidens* x *I. xantusi* hybrids (#16)

Fig. 15.

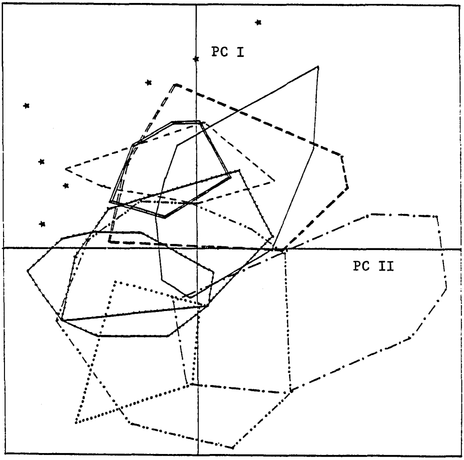
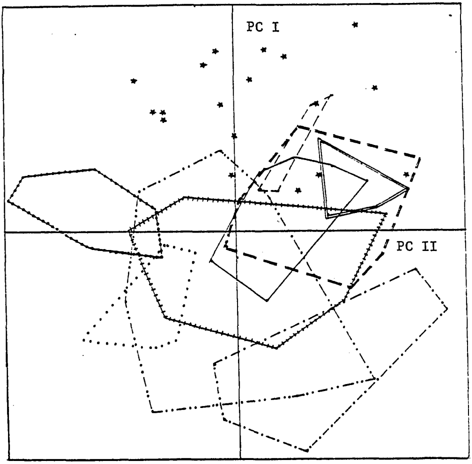


Fig. 16. Outline of Principal Components Ordination of six females each for populations 1-21. PC I = 23.1% PC II = 16.6% Key as in Fig. 15.

Fig. 16.



unusual habitat for this riverine fish. A comparison of the riverine (#10) and reservoir (#9) populations using Principal Components Analysis provides one test for identifying environmentally plastic characters. Only seven males were available from the riverine collection, but 33 males were measured from the reservoir collection. In the second test, a stock of I. whitei maintained in the laboratory for 12 years was compared to preserved material taken from the same locality three years after the live stock was collected. Ten laboratory specimens were compared to 25 field-caught males (#11).

Results.—When the reservoir population (#9) is compared to the river population (#10), two distinct clusters are obtained (Fig. 17). The ranges of sizes of the fish overlap (39.9-74.5 mm SL, $\overline{X}$=63.3 mm SL for the reservoir population and 30.7-66.1 mm SL, $\overline{X}$=43.0 mm SL for the riverine population). All are adult males. The populations separate along the first and second principal components but not along the first and third principal components. Characters with heavy loadings (greater than or equal to .23) on the first principal component are dorsal fin length (basal, depressed), pelvic fin length, snout length, caudal peduncle depth, orbit length, body depth, postorbital length and the number of caudal fin rays. Characters with heavy loadings (greater than or equal to .23) on the second principal component are preorbital width, anal fin length (basal), body depth, upper jaw length, gill rakers, scales around the body and caudal fin rays.

When the laboratory stock (M66-12) is compared to the field-caught material (#11), two separate clusters are formed along the first principal component (Fig. 18). The lengths of the fish largely overlap, ranging from 32.7-60.0 mm SL for the laboratory specimens and 33.3-49.8 mm SL for the field specimens. There is no separation along the second or third principal components. The characters with heavy loadings (greater than or equal to .23) on the first principal component are postorbital length, caudal peduncle depth, head depth, head length, snout length, body depth, anal fin length (depressed), orbit length and caudal fin rays.

Discussion.—The characters with heavy loadings in both comparisons

Fig. 17. Adult males from two populations of *Ilyodon whitei* compared by Principal Components Analysis. One collection (#9, represented by circles) taken from a reservoir, the other (#10, represented by squares) from the river below the reservoir and dam.
PC I = 20.3% PC II = 12.6%

Fig. 17.

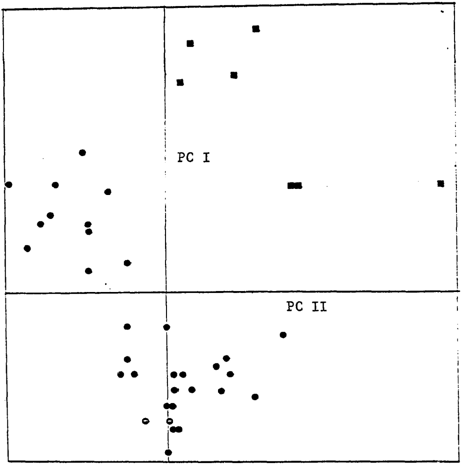
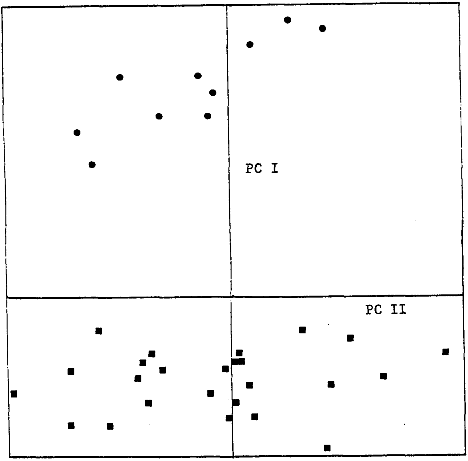


Fig. 18. Adult males of Ilyodon whitei from a field collection (#11, represented by squares) compared to laboratory stock (represented by circles) descended from fishes from the same locality. PC I = 30.4% PC II = 15.5%

Fig. 18.



are: postorbital length, caudal peduncle depth, snout length, body depth, orbit length and caudal fin rays. They represent some of the characters that show ecophenotypic influence in the genus Ilyodon. It is unlikely that a reservoir habitat and an aquarium habitat select for changes in the same characters. Changes in these characters probably reflect environmental control. It seems likely that these characters are also environmentally controlled in I. furcidens and I. xantusi, as will be discussed later. However, there are other factors known to alter measurements, such as the process of preserving fish in formalin (Yeh and Hodson, 1975). In this study there is no obvious clustering of specimens by age of the collection or by collector, suggesting that differences among collectors in handling and preserving specimens did not alter the morphology of these specimens significantly.

Pairwise Comparisons Among Populations

The results of this section aided in the identification of species and subspecies of the genus Ilyodon. Pairwise comparisons using Principal Components Analysis were interpreted according to the guidelines of Bailey et al. (1954). These authors suggest that "a species is properly divisible into subspecies when data have been suitably published to demonstrate that it consists of two or more allopatric populations, each displaying a high degree of uniformity over its range and differing with high constancy (a figure of at least 93 per cent of individuals is suggested) from other forms, each of which intergrades over a relatively narrow geographic area with at least one other form." Cases in this study where populations overlap by one fish appear to meet these criteria and these populations are generally treated as subspecies. Although some of these populations exhibit well defined differences, especially in mouth characteristics and field coloration, examination of all available populations (1-69) indicates some overlap in characters. Zones of intergradation are suggested where adequate material is available. Bailey et al. (1954) suggest that "a form which differs with 100 per cent constancy from related allopatric forms but does not intergrade with them, or for which no intergradation has been demonstrated, should, in the absence of modifying evidence (i.e., experimental), be treated as a full species." Using these criteria, full species should exhibit no overlap in their clusters. Ilyodon xantusi and Ilyodon furcidens show this pattern, although they are believed to hybridize in part of their range. Where there is "an inadequate body of published data or insufficient material" the complex of forms is "best treated provisionally as a full species without division into named races." Ilyodon whitei and populations of Ilyodon in the Aguacate, Arteaga and Aguililla rivers fall into this category.

Materials and methods.—Populations 1-21 were examined in detail by Principal Components Analysis. Two populations were assigned the same taxon if in pairwise comparisons their clusters overlapped by four or more fish. If with sample sizes of 25, two populations overlapped by four or more fish, it is likely that with larger sample sizes the populations would show greater overlap. Increasing the sample size will tend to increase the ranges of all counts and measurements recorded for that population and result in a greater spread of scores along the principal component axes. When two populations did not overlap with each other, but each overlapped with a third population, all three populations were considered one geographically variable taxon.

Five males (where available) were measured for all characters for each of the remaining collections 22-69. All were referable morphologically to one of the three species and six subspecies to be described for the genus and appeared identical or closely related to one of the populations 1-21. The collections in the Colima and Salado rivers presented a problem and will be discussed in detail in this section. Most of these collections are small.

Mahalanobis distances were calculated using the values of the first eight principal components for populations 1-21. Rather than perform all 220 possible pairwise comparisons, only populations with distance values of 19 or less and nearest neighbors (geographically) were compared by Principal Components Analysis. As all comparisons having greater than a one-fish overlap had distance values of less than or equal to 15, there is little need to compare populations with larger values. The distances are given in Table 35. The degrees of overlap for these pairwise comparisons are summarized in Table 36 and Fig. 19. In Fig. 19, populations that show broad overlap (four or more specimens) are connected by solid lines or lines with a dash and dot combination. Populations that show narrow overlap (one specimen) are connected by dashed or dotted lines. Table 37 lists the populations tested that did not have overlapping clusters and gives the characters with heavy loadings along the separating axes.

The anomalous pattern of Ilyodon whitei.—The one-fish overlap of the reservoir population of *I. whitei* (#9) with *I. furcidens tuxpan* (#6) and *I. furcidens furcidens* (#4) is anomalous and probably results from selection and environmental influences caused by its atypical habitat. Separation between *I. furcidens tuxpan* (#6) and *I. whitei* (#9) is almost complete along the second principal component and the characters with high loadings (greater than or equal to .23) are body width, head depth, preorbital width, middle caudal ray length and upper jaw length. Separation between *I. whitei* (#9) and *I. furcidens furcidens* (#4) occurs primarily along the first principal component and characters with high loadings (greater than or equal to .23) are head length, head width, caudal peduncle depth, postorbital length, orbit length, dorsal fin length (basal) and pelvic fin length (Table 37). The riverine population of *I. whitei* (#10) did not overlap with *I. furcidens furcidens* (#4) or *I. furcidens tuxpan* (#6).

The taxonomic status of Ilyodon whitei.—The lack of material from the Balsas system makes comparisons of populations of *I. whitei* difficult, as presently there is access only to two areas at opposite ends of the drainage. Until new material becomes available from throughout the drainage, *I. whitei* is best considered as one species including all the *Ilyodon* in the Balsas drainage. Although there is no overlap between populations #11 and #12 (Fig. 13), it is likely that this dichotomy will disappear once adequate collections are made.

Table 35. Mahalanobis distances. Principal Components I-VIII used as variables in the computation of distances.

Population	Population																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1																					
2	14																				
3	30	39																			
4	42	10	68																		
5	88	45	86	28																	
6	35	8	62	2	32																
7	36	10	68	10	34	15															
8	43	17	61	14	15	13	19														
9	53	29	77	19	46	12	41	36													
10	63	36	105	29	71	32	28	66	28												
11	41	21	77	23	79	25	25	59	27	8											
12	86	37	72	19	15	26	28	27	42	57	56										
13	92	56	111	39	45	47	37	50	46	37	44	40									
14	91	48	105	35	12	45	24	30	62	53	66	26	30								
15	69	36	80	30	13	38	17	24	59	49	59	25	36	3							
16	116	60	140	39	30	52	31	51	66	43	57	32	27	9	18						
17	20	18	67	30	76	29	20	43	40	27	20	72	41	62	50	72					
18	72	37	88	28	24	39	18	18	74	73	71	29	36	17	15	33	50				
19	19	27	10	53	77	41	56	53	47	76	57	69	106	97	73	127	52	94			
20	27	7	56	10	38	10	9	8	39	53	39	35	50	44	34	59	23	20	49		
21	58	24	68	7	26	14	19	20	26	37	36	15	30	34	29	43	39	24	62	20	

Table 36. Pairwise comparisons of populations in the genus <u>Ilyodon</u>. Populations with distance values of 19 or less are compared, as well as nearest neighbors. + = overlapping clusters − = no overlap 1 = one fish overlap. Blanks indicate no comparison made.

Population	Population 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1																					
2	+																				
3	−																				
4		−																			
5				−																	
6		−		+																	
7		1		+		−															
8		−		1	−	+	−														
9				1		1															
10									−												
11										−											
12				−	−					−											
13										−		−									
14					1		−						−								
15					−		−						−	+							
16													−	−	−						
17	−	−					1														
18							−	−					−	−	+						
19	1		−																		
20		+		−	−	−	−	+													
21				−		−	−			−		+	−								

Fig. 19. The results of pairwise comparisons of populations 1-21, using Principal Components Analysis. Populations that overlap by one fish are connected by dashed or dotted lines; all other overlapping populations are connected by solid lines or lines composed of a dot and dash combination.

● *Ilyodon furcidens*

□ *Ilyodon xantusi*

★ *Ilyodon* sp.

☆ *Ilyodon whitei*

Fig. 19.

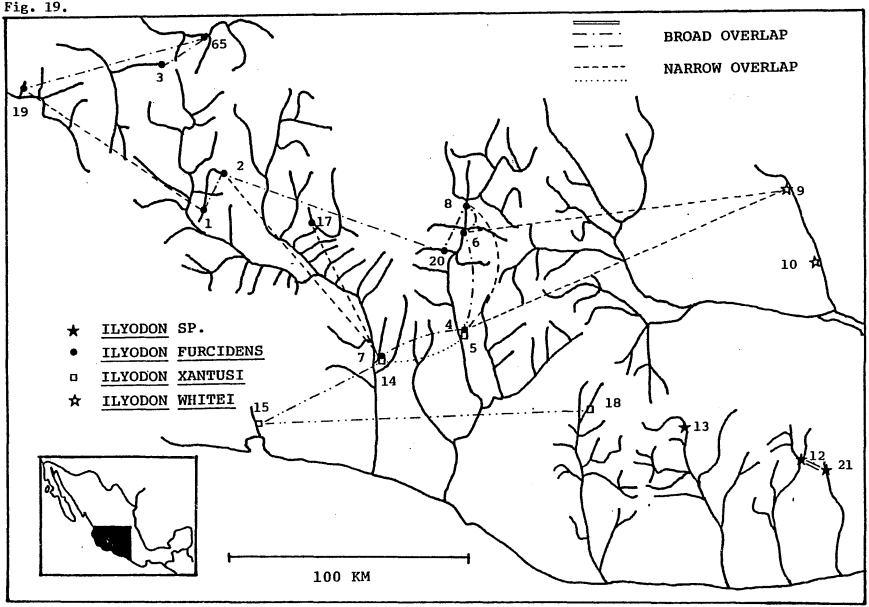

BROAD OVERLAP
NARROW OVERLAP
ILYODON SP.
ILYODON FURCIDENS
ILYODON XANTUSI
ILYODON WHITEI
100 KM
65
3
19
2
1
17
8
6
20
4
5
7
14
15
18
9
10
13
12
21

Table 37. Pairwise comparisons of populations of the genus *Ilyodon*. Axes of separation and characters having heavy loadings (greater than or equal to .23) on those axes are given. Populations showing a one-fish overlap are also included. Asterisks denote major axes of separation. The variance explained by each component is given in parentheses.

Populations compared	Axes of separation	Characters with heavy loadings
I. furcidens furcidens (1), *I. furcidens amecae* (3)	PC I* (34.2%)	Predorsal length, anal origin to caudal base length, head length interorbital width, mouth width, middle caudal fin rays length
I. furcidens furcidens (1), *I. furcidens variabilis* (17)	PC I* (16.8%)	Scales in lateral series, predorsal scales, body depth, head depth, caudal peduncle depth, middle caudal fin rays, pelvic fin length
	PC II* (14.2%)	Predorsal length, prepelvic length, head length, postorbital length, anal fin basal length, upper jaw length
I. furcidens furcidens (1), *I. furcidens amecae* (19)	PC I (25.4%)	Predorsal length, head length, interorbital width, postorbital length, mouth width, middle caudal fin rays length
	PC II (14.6%)	Pectoral fin rays, preopercular pores, body depth, body width, anal fin basal length, pectoral fin length
I. furcidens furcidens (2), *I. furcidens furcidens* (4)	PC I* (18.3%)	Scales in lateral series, predorsal scales, anal origin to caudal base length, head width, caudal peduncle depth, interorbital width, middle caudal fin rays length, mouth width
	PC II (13.3%)	Gill rakers, head length, preorbital width, postorbital length, mandible length, dorsal fin basal length, dorsal fin depressed length
I. furcidens furcidens (2), *I. furcidens tuxpan* (6)	PC I* (19.5%)	Predorsal scales, predorsal length, interorbital width, mouth width, mandible length, upper jaw length
	PC II (12.3%)	Gill rakers, prepelvic length, body depth, head length, preorbital width, snout length, orbit length

Table 37. continued...

Populations compared	Axes of separation	Characters with heavy loadings
I. furcidens furcidens (2), *I. furcidens furcidens* (7)	PC II (12.3%)	Pectoral fin rays, scales in lateral series, predorsal scales, predorsal length, caudal peduncle depth, dorsal fin depressed length, pelvic fin length
I. furcidens furcidens (2), *I. furcidens tuxpan* (8)	PC I* (24.1%)	Predorsal scales, interorbital width, preorbital width, snout length, orbit length, mouth width, mandible length, dorsal fin basal length, upper jaw length
	PC II* (13.3%)	Body depth, head length, caudal peduncle depth, postorbital length, middle caudal fin rays length, pelvic fin length, opercle length
I. furcidens furcidens (2), *I. furcidens variabilis* (17)	PC I* (20.9%)	Body width, head length, postorbital length, orbit length, mandible length, upper jaw length, opercle length
	PC II (10.3%)	Gill rakers, body depth, caudal peduncle depth, interorbital width, mouth width, pelvic fin length
I. furcidens amecae (3), *I. furcidens amecae* (19)	PC I* (30.5%)	Predorsal length, anal origin to caudal base length, head length, caudal peduncle length, interorbital width, mouth width
I. furcidens furcidens (4), *I. xantusi latos* (5)	PC I* (25.3%)	Gill rakers, head length, interorbital width, snout length, mouth width, mandible length, upper jaw length
I. furcidens furcidens (4), *I. furcidens tuxpan* (8)	PC I (23.7%)	Gill rakers, preorbital width, snout length, orbit length, mouth width, mandible length, dorsal fin basal length, anal fin depressed length
	PC II (13.3%)	Anal fin rays, scales in lateral series, vertebrae, predorsal length, body depth, head length, interorbital width, postorbital length, pelvic fin length

Table 37. continued...

Populations compared	Axes of separation	Characters with heavy loadings
I. furcidens furcidens (4), *I. whitei* (9)	PC I (19.9%)	Head length, head width, caudal peduncle depth, postorbital length, orbit length, dorsal fin basal length, pelvic fin length
	PC II (11.9%)	Gill rakers, preorbital width, snout length, mouth width, dorsal fin depressed length, upper jaw length
	PC III (7.7%)	Dorsal fin rays, anal fin rays, pectoral fin rays, scales in lateral series, vertebrae, body depth, mandible length, anal fin basal length, anal fin depressed length
I. furcidens furcidens (4), *Ilyodon* sp. (12)	PC I* (32.4%)	Anal origin to caudal base length, head length, head width, interorbital width, snout length, mouth width, mandible length, pectoral fin length
	PC III (7.4%)	Preorbital width, postorbital length, dorsal fin depressed length, opercle length
I. furcidens furcidens (4), *I. furcidens tuxpan* (20)	PC I (20.0%)	Scales in lateral series, body depth, caudal peduncle depth, orbit length, dorsal fin basal length, anal fin depressed length, middle caudal fin rays length
	PC III (11.2%)	Scales around body, anal origin to caudal base length, body width, caudal peduncle length, snout length, mouth width, dorsal fin depressed length, pelvic fin length
I. furcidens furcidens (4), *Ilyodon* sp. (21)	PC I* (16.5%)	Dorsal fin rays, anal fin rays, scales in lateral series, anal origin to caudal base length, head length, interorbital width, mandible length
	PC II* (15.5%)	Pectoral fin rays, snout length, mouth width, dorsal fin basal length, dorsal fin depressed length

Table 37. continued...

Populations compared	Axes of separation	Characters with heavy loadings
I. xantusi latos (5), *I. furcidens tuxpan* (8)	PC I* (26.2%)	Gill rakers, head length, interorbital width, mouth width, mandible length, middle caudal fin rays length, pectoral fin length, pelvic fin length
	PC II* (9.1%)	Anal fin rays, caudal fin rays, body depth, body width, preorbital width, postorbital length, orbit length, dorsal fin basal length, opercle length
I. xantusi latos (5), *Ilyodon* sp. (12)	PC I* (26.5%)	Gill rakers, predorsal length, anal origin to caudal base length, head length, head depth, head width, caudal peduncle length, orbit length, middle caudal fin rays length
I. xantusi latos (5), *I. xantusi xantusi* (14)	PC I (17.0%)	Caudal fin rays, head length, snout length, mouth width, mandible length, dorsal fin basal length, dorsal fin depressed length, middle caudal fin rays length, upper jaw length
	PC II (15.0%)	Predorsal length, body depth, body width, head width, caudal peduncle length, caudal peduncle depth, postorbital length, opercle length
I. xantusi latos (5), *I. xantusi xantusi* (15)	PC I* (20.5%)	Dorsal fin rays, caudal fin rays, caudal peduncle length, mouth width, mandible length, middle caudal fin rays length
I. xantusi latos (5), *I. furcidens tuxpan* (20)	PC I* (26.7%)	Scales in lateral series, gill rakers, interorbital width, snout length, mouth width, mandible length, middle caudal fin rays length, pectoral fin length, pelvic fin length, upper jaw length
	PC II (11.5%)	Predorsal length, anal origin to caudal base length, head width, caudal peduncle length, orbit length, opercle length

Table 37. continued...

Populations compared	Axes of separation	Characters with heavy loadings
I. furcidens tuxpan (6), *I. furcidens furcidens* (7)	PC I* (19.4%)	Pectoral fin rays, head length, caudal peduncle length, snout length, orbit length, upper jaw length
	PC II* (16.0%)	Body width, mouth width, mandible length, dorsal fin basal length, dorsal fin depressed length, middle caudal fin rays length, pectoral fin length, pelvic fin length
I. furcidens tuxpan (6), *I. whitei* (9)	PC I (16.2%)	Gill rakers, body depth, postorbital length, snout length, orbit length, dorsal fin basal length, dorsal fin depressed length, pelvic fin length, opercle length
	PC II (13.2%)	Body width, head depth, preorbital width, middle caudal fin rays length, upper jaw length, opercle length
I. furcidens tuxpan (6), *I. furcidens tuxpan* (20)	PC I* (18.2%)	Prepelvic length, anal origin to caudal base length, body depth, head depth, caudal peduncle length, anal fin depressed length, middle caudal fin rays length
	PC II (13.8%)	Head length, orbit length, dorsal fin basal length, dorsal fin depressed length
I. furcidens tuxpan (6), *Ilyodon* sp. (21)	PC I* (24.1%)	Dorsal fin rays, scales in lateral series, predorsal scales, interorbital width
	PC III (9.9%)	Scales around body, caudal peduncle depth, preorbital width, anal fin depressed length, middle caudal fin rays length, pelvic fin length
I. furcidens furcidens (7), *I. furcidens tuxpan* (8)	PC I* (23.1%)	Pectoral fin rays, gill rakers, preorbital width, snout length, orbit length, mouth width, mandible length, dorsal fin basal length, upper jaw length
	PC II* (16.7%)	Body depth, head length, head width, postorbital length, middle caudal fin rays length, pelvic fin length

Table 37. continued...

Populations compared	Axes of separation	Characters with heavy loadings
I. furcidens furcidens (7), *I. xantusi xantusi* (14)	PC I* (24.6%)	Gill rakers, snout length, mouth width, mandible length, pelvic fin length, upper jaw length
	PC II* (14.1%)	Dorsal fin rays, caudal fin rays, dorsal to anal scales, scales around body, postorbital length, dorsal fin basal length, dorsal fin depressed length, anal fin basal length
I. furcidens furcidens (7), *I. xantusi xantusi* (15)	PC I* (21.3%)	Gill rakers, interorbital width, snout length, mouth width, mandible length, pelvic fin length, upper jaw length
I. furcidens furcidens (7), *I. furcidens variabilis* (17)	PC I (22.8%)	Head length, interorbital width, postorbital length, snout length, orbit length, opercle length
	PC II (10.3%)	Dorsal fin rays, dorsal to anal scales, preorbital width, dorsal fin basal length, dorsal fin depressed length, anal fin depressed length, pectoral fin length, pelvic fin length
I. furcidens furcidens (7), *I. xantusi xantusi* (18)	PC I* (25.9%)	Prepelvic length, anal origin to caudal base length, body depth, body width, head width, mouth width, mandible length, upper jaw length
	PC III* (10.4%)	Gill rakers, vertebrae, head length, postorbital length, orbit length, middle caudal fin rays length, opercle length
I. furcidens furcidens (7), *I. furcidens tuxpan* (20)	PC II* (13.3%)	Scales in lateral series, caudal peduncle depth, interorbital width, orbit length, dorsal fin basal length, dorsal fin depressed length, upper jaw length
	PC III* (12.0%)	Pectoral fin rays, scales around body, gill rakers, prepelvic length, anal origin to caudal base length, preorbital width, anal fin basal length

Table 37. continued...

Populations compared	Axes of separation	Characters with heavy loadings
I. furcidens furcidens (7), *Ilyodon* sp. (21)	PC I* (22.6%)	Dorsal fin rays, anal fin rays, predorsal scales, body depth, body width, preorbital width, snout length, dorsal fin basal length, anal fin basal length, opercle length
	PC II* (17.7%)	Vertebrae, anal origin to caudal base length, head length, head width, mouth width, mandible length, pelvic fin length
I. furcidens tuxpan (8), *I. xantusi xantusi* (18)	PC I* (28.9%)	Predorsal length, body depth, head width, caudal peduncle length, caudal peduncle depth, orbit length, dorsal fin basal length
	PC II* (11.3%)	Gill rakers, preorbital width, snout length, mouth width, mandible length
I. whitei (9), *I. whitei* (10)	PC I* (20.3%)	Caudal fin rays, body depth, head length, head depth, caudal peduncle depth, snout length, orbit length, mouth width, anal fin depressed length
I. whitei (10), *I. whitei* (11)	PC I (20.6%)	Gill rakers, predorsal length, anal origin to caudal base length, body depth, body width, preorbital width, orbit length, dorsal fin basal length, dorsal fin depressed length, pelvic fin length
	PC II* (13.7%)	Caudal fin rays, anal origin to caudal base length, caudal peduncle length, preorbital width, snout length, anal fin basal length, upper jaw length, opercle length
I. whitei (10), *Ilyodon* sp. (12)	PC I* (38.8%)	Anal origin to caudal base length, head length, head width, mouth width
	PC III (8.7%)	Predorsal length, body depth, body width, caudal peduncle depth, dorsal fin basal length, dorsal fin depressed length, anal fin depressed length, pectoral fin length

Table 37. continued...

Populations compared	Axes of separation	Characters with heavy loadings
I. whitei (10), *Ilyodon* sp. (13)	PC I* (36.2%)	Body depth, body width, head width, snout length, mouth width
	PC II (12.6%)	Predorsal length, head length, orbit length, dorsal fin basal length, dorsal fin depressed length, upper jaw length
I. whitei (10), *Ilyodon* sp. (21)	PC I* (27.8%)	Anal fin rays, anal origin to caudal base length, head length, head width, dorsal fin depressed length, anal fin basal length
Ilyodon sp. (12), *Ilyodon* sp. (13)	PC I* (25.7%)	Gill rakers, body depth, body width, head length, caudal peduncle length, caudal peduncle depth, preorbital width, orbit length, upper jaw length
	PC II (11.6%)	Dorsal fin rays, caudal fin rays, predorsal length, prepelvic length, head width, interorbital width, dorsal fin basal length, dorsal fin depressed length, pectoral fin length
Ilyodon sp. (13), *I. xantusi xantusi* (14)	PC I* (23.7%)	Scales around caudal peduncle, body depth, body width, caudal peduncle depth, middle caudal fin rays length
	PC III (11.0%)	Dorsal fin rays, caudal fin rays, mandible length, dorsal fin basal length, dorsal fin depressed length, pelvic fin length
Ilyodon sp. (13), *I. xantusi xantusi* (15)	PC I* (26.5%)	Scales around caudal peduncle, vertebrae, body depth, body width, caudal peduncle length, caudal peduncle depth, preorbital width, middle caudal fin rays length, pelvic fin length
Ilyodon sp. (13), hybrids (16)	PC I* (23.5%)	Body depth, body width, head length, interorbital width, postorbital length, orbit length, upper jaw length, opercle length
	PC II* (17.9%)	Dorsal fin rays, vertebrae, prepelvic length, anal origin to caudal base length, head width, mouth width, middle caudal fin rays length

Table 37. continued...

Populations compared	Axes of separation	Characters with heavy loadings
Ilyodon sp. (13), *I. xantusi xantusi* (18)	PC I* (25.9%)	Caudal peduncle length, caudal peduncle depth, orbit length, middle caudal fin rays length, pelvic fin length, upper jaw length
Ilyodon sp. (13), *Ilyodon* sp. (21)	PC I* (31.9%)	Gill rakers, body depth, body width, caudal peduncle depth, preorbital width, snout length, mouth width, pelvic fin length
I. xantusi xantusi (14), hybrids (16)	PC I* (20.9%)	Head length, head width, interorbital width, postorbital length, orbit length, middle caudal fin rays length
	PC III* (12.7%)	Body depth, caudal peduncle depth, snout length, mouth width, mandible length
I. xantusi xantusi (14), *I. xantusi xantusi* (18)	PC I* (18.5%)	Caudal fin rays, gill rakers, prepelvic length, head width, caudal peduncle length, anal fin depressed length, pelvic fin length
	PC II* (12.9%)	Dorsal to anal scales, head length, postorbital length, snout length, mouth width, mandible length, middle caudal fin rays length, upper jaw length
I. xantusi xantusi (15), hybrids (16)	PC I* (25.7%)	Caudal peduncle depth, interorbital width, postorbital length, anal fin depressed length, middle caudal fin rays length, opercle length
	PC II* (15.4%)	Gill rakers, anal origin to caudal base length, head length, caudal peduncle length, orbit length, dorsal fin basal length, dorsal fin depressed length, anal fin basal length

Ilyodon alone among goodeids has managed to reach the Balsas, whereas many fishes commonly associated with it, such as *Algansea aphanea* and *Moxostoma mascotae*, have not. If this dispersal event took place only once, as seems likely, all *Ilyodon* in the Balsas drainage are derived from a common ancestral population and probably represent one species or species complex.

The taxonomic status of populations from the Arteaga, Chala and Nexpa drainages.—The taxonomic placements of populations from the Río Aguacate (#12), Río Aguililla (#13) and Río Arteaga (#21) are uncertain at this time. Populations from the Río Aguacate (#12) and Río Arteaga (#21) represent the same taxon, but neither this group nor the population from the Río Aguililla (#13) appear morphologically similar to any other population examined (Fig. 19, Tables 35, 36). Once collections become available from neighboring branches of the Balsas, the positions of these populations will be better understood. They are isolated from the rest of the genus and may represent new taxa.

Ilyodon xantusi complex.—Populations from the Río de Comala (#14), Arroyo Pueblo Nuevo (#15), Río Coalcomán (#18) and Río Chiquito (#45) represent geographically variable populations of *I. xantusi xantusi*, a broad-mouthed form. Populations from the Río de Comala (#14) and Río Coalcomán (#18) do not overlap, but both overlap with a population from Arroyo Pueblo Nuevo (#15) (Table 36, Fig. 19). The population from the Río Terrero in the Coahuayana drainage, *Ilyodon xantusi latos*, may be elevated to species status in the future once populations of the *I. xantusi* complex are adequately karyotyped. Preliminary data by B. J. Turner and D. I. Kingston indicate that *I. xantusi latos* is karyotypically distinct from *I. xantusi xantusi*. The population of *I. xantusi latos* (#5) overlaps with the population of *I. xantusi xantusi* (#14) by only one fish. Laboratory forced matings of these two subspecies produce viable young.

Ilyodon furcidens amecae.—*Ilyodon furcidens amecae* includes populations from the Río de la Pola (#3) and Río Mascota (#19). Although these populations separate from each other (Table 37), specimens from all available collections in the Ameca drainage, when added to the study, indicate that they represent the extremes in a series of overlapping populations (Fig. 20). Populations from the Río Atenguillo (#30, #37), the Río Mascota (#42), the Río Potrero Grande (#65) and other tributaries of the Río Ameca (#36, #44) form an unbroken chain of overlapping populations connecting populations #3 and #19. Pairwise comparisons of the population from the Río Potrero Grande (#65) with #3 and with #19 demonstrate it overlaps with both (Fig. 19). Also, a population near Mascota is similar morphologically to populations of *I. furcidens furcidens* in the upper Ayutla, a part of the Armería drainage (Fig. 20). This population (#59) separates slightly from the populations in the Ameca drainage along the first and third principal components. The fish fauna in these areas is also similar, suggesting that part of the upper Armería cut back and captured a tributary of the Ameca system.

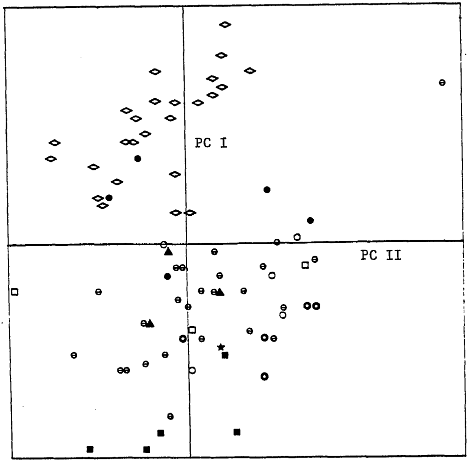
Ilyodon furcidens variabilis.—A population in the Río la Labor near Apulco (#17) was originally catalogued as a hybrid swarm of *I. furcidens* x *I. xantusi*. But Principal Components Analysis revealed that it had little in common with *I. xantusi* and was distinct from *I. furcidens furcidens* (Tables 35, 36). Specimens from this locality identified as the parental species overlapped with the so-called "hybrids". Examination of the specimens revealed that they had small but variable mouth widths. This population is provisionally included in the *I. furcidens* complex as *I. furcidens variabilis* as it shows a narrow overlap with *I. furcidens furcidens* (#7) from Colima.

Ilyodon furcidens furcidens.—With the exception of the population from Apulco (#17), the populations from the upper Armería are similar morphologically (#1, #2). The population at the outlet of the Presa Santa Rosa (#1) occurs in a stream that becomes reduced to isolated pools during part of the year. This atypical habitat may explain the extreme variation observed in this population. In the field, these fish have a turquoise-blue cast which fades once they are kept in the laboratory. These populations and those from the

Fig. 20. Populations of *Ilyodon* from the Ameca drainage (#3, 19, 30, 36, 37, 42, 44, 65) and upper Armería drainage (#59). All specimens are adult males. The odd specimen of population #19 in the upper right corner of the graph is a deformed specimen.
PC I = 26.5% PC II = 10.2%

Species	Population	Locality
I. furcidens amecae	◇ #3	Río de la Pola
I. furcidens amecae	⊖ #19	Río Mascota
I. furcidens amecae	● #65	Río Potrero Grande
I. furcidens furcidens	■ #59	trib. upper Armería
I. furcidens amecae	○ #30	Río Atenguillo
I. furcidens amecae	□ #36	trib. Río Ameca
I. furcidens amecae	★ #37	trib. Río Atenguillo
I. furcidens amecae	✪ #42	Río Mascota
I. furcidens amecae	▲ #44	trib. Río Ameca

Fig. 20.



lower Armería and Coahuayana form one geographically variable subspecies, *I. furcidens furcidens*. Barrier falls along the Armería probably limit gene flow among these populations at this time and contribute to the maintenance of the geographic differences seen in this species. The populations of *I. furcidens furcidens* around Colima (#7) and in the Río Terrero (#4) are the most similar with greater than 50% overlap of the clusters. Little is known about the dispersal of fishes in this area, but part of the Río Salado (Coahuayana drainage) is adjacent to tributaries of the Río Armería in the vicinity of Colima City. During the flood season, there may have been, or perhaps still are, faunal connections between these two drainages. Stream capture may also have occurred in this region. The genus *Allodontichthys* in the family Goodeidae shows a similar distribution to that of *Ilyodon*.

Ilyodon furcidens tuxpan.—The upper Coahuayana contains at least one other subspecies, *I. furcidens tuxpan*, represented by populations at Tuxpan (#6), San Rafael (#8) and Atenquique (#20). This subspecies appears most similar morphologically to *I. furcidens furcidens* in the lower Coahuayana, overlapping with it because of a 40-year old collection of *I. furcidens tuxpan* made at Tuxpan (#6). Recent collections made at Atenquique do not overlap with *I. furcidens furcidens*. The age of collection #6 suggests that *Ilyodon* in the upper and lower Tuxpan have diverged morphologically in the last 40 years or that there has been a shift in the ranges of the two subspecies, *I. furcidens furcidens* and *I. furcidens tuxpan*. Recent karyotypic evidence (Turner and Kingston, in prep.) suggests that there are two (#8, #20), possibly more, karyotypically distinct populations of *I. furcidens tuxpan* which differ from *I. furcidens furcidens*. No data are available to determine if these populations interbreed, as the zone of sympatry has not been found or sampled. Unfortunately, there is no karyotypic data for the Tuxpan collection (#6). As populations in the upper Tuxpan are similar morphologically, they are provisionally treated here as one taxon. They are characterized by an intermediate, but variable mouth width.

The recent history of the Río Tuxpan suggests a change in the direction of selection. Collections made at the same localities over the last 20 years indicate a progressive deterioration of the habitat resulting from increasing organic pollution. A large sugar cane factory at Tamazula has fouled the Río Tuxpan and brought about a loss of algae. There has been a shift in the fish fauna. Poecilia butleri is now common, although not present 20 years ago. The karyotypic divergence of Ilyodon may reflect a genetic response to this altered environment. Only Ilyodon in the Coahuayana has been shown to exhibit chromosomal polymorphism. White (1978) notes that karyotypic orthoselection, or "the tendency for the same type of rearrangement to occur over and over again in different chromosomes of the same species", is a common occurrence. Populations of I. furcidens tuxpan seem to have undergone this process.

The overlap between populations from Atenquique (#20) and Colotitlán (#2) is best explained as a case of morphological convergence, as neither the population from Tuxpan (#6) or the population from San Rafael (#8) show any overlap with the population from Colotitlán (#2). Morphological data are not sufficient to test this hypothesis.

Ilyodon xantusi x Ilyodon furcidens hybrids.—One population (#16) (Fig. 13) consists of small specimens believed to be hybrids of I. xantusi x I. furcidens (Hubbs and Turner, 1939). It does not form an intermediate cluster between the parentals, as might be expected of hybrids. Hybrids are often intermediate in morphology and meristics when compared to the parental species (Hubbs, 1955; Hubbs and Kuronuma, 1942; Hubbs et al., 1943; Hubbs and Strawn, 1957a; Trautman, 1948, 1957). But several cases of non-intermediate hybrids are also known (Bailey and Gilbert, 1960; Hubbs and Bailey, 1952; Hubbs and Strawn, 1957b). To determine whether the specimens of population #16 were hybrids, they were included in a study of populations inhabiting the Colima and Salado rivers (Figs. 21, 22). Fishes in the Colima and Salado rivers show more variability than do those in the Comala and Terrero rivers but are readily assignable to I. furcidens or I. xantusi on the basis of head and mouth characteristics. Some of the specimens from population #16

Fig. 21. Populations of _Ilyodon_ from four river systems. The two populations of _I. furcidens_ are outlined in solid lines. The two populations of _I. xantusi_ are outlined in dashed lines. PC I = 18.0% PC II = 15.2%

■ Río Terrero

● Río de Comala

◇ Río Colima

⊖ Río Salado

Fig. 21.

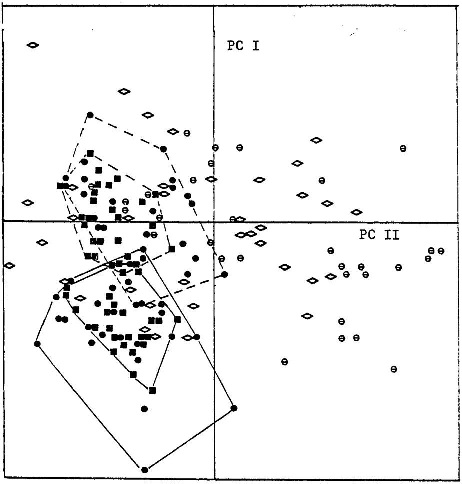


Fig. 22. Populations of *Ilyodon* from four river systems. The two populations of *I. furcidens* are oultined in solid lines. The two populations of *I. xantusi* are outlined in dashed lines. PC I = 18.0% PC III = 9.3%

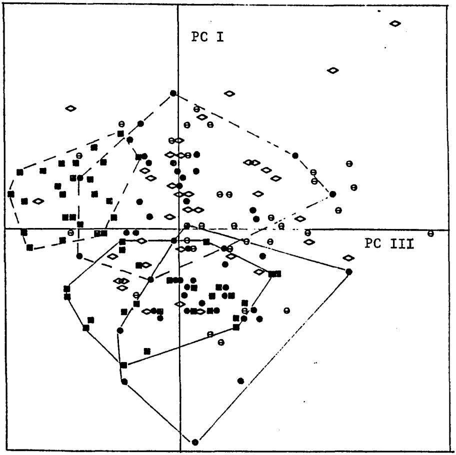
■ Río Terrero

● Río de Comala

◇ Río Colima

⊖ Río Salado

Fig. 22.



remained outside the clusters of the parental species. There are at least three hypotheses that could explain the variability in these fishes.

Hypothesis I: ecophenotypic variation in Ilyodon xantusi and Ilyodon furcidens.—The Colima and Salado collections tend to spread along the second principal component when compared to the Comala and Terrero populations (Fig. 21). The characters with heavy loadings (greater than or equal to .23) on the second principal component are head length, orbit length, body depth, caudal peduncle depth and pelvic length. Most of these characters show ecophenotypic influence as determined by studies on *I. whitei*. They probably do not indicate large genetic differences among these populations. Figure 22 shows the same populations plotted on the first and third principal components, with the effects of the characters loading on the second principal component largely removed. The Colima and Salado populations now appear to be a part of the *I. furcidens* and *I. xantusi* complex, except for several hybrid specimens that lie above the clusters of the parental species. Visual inspection of the preserved specimens agrees with this interpretation.

Hypothesis II: hybrid swarm.—The second hypothesis is that the Colima and Salado populations represent a complex hybrid swarm of F_1, F_2 and backcross progeny. Laboratory forced mating experiments reveal that *I. furcidens* x *I. xantusi* crosses produce fertile F_1 and F_2 offspring (Table 38). The sex ratios and the brood sizes of the hybrids appear the same as for the parental species. Unlike Hubbs and Turner's hybrids, these hybrids are very variable. Hubbs and Turner's field-caught hybrids were described as intermediate in the teeth, jaws and mouth characteristics when compared to the parental species, *I. furcidens* and *I. xantusi*. In coloration and color they approached the more deeply and brightly colored parent, *I. xantusi*. But the hybrids produced in the laboratory may resemble either parent, be intermediate between the parents or may show a mosaic of characters. Some have aberrant black pigmentation and others show shortened, deeper bodies than the parentals. An F_1 hybrid may have the mouth width of one parent and the coloration of

Table 38. Results of forced mating experiments with populations of the genus *Ilyodon*. Live stocks of *I. xantusi latos* and *I. furcidens tuxpan* obtained in April, 1978. Other stocks obtained in February, 1976. Female parent given first in crosses.

Cross	Locality of ♀ parent	Locality of ♂ parent	Date set up	# of young	Date brood born	Description of hybrids
I. f. furcidens x *I. x. xantusi*	M76-31	M76-31	12:2:77	4	6:30:78	Narrow-mouthed. 2♂♂, 2♀♀ Deep short bodies. Faint yellow cast in caudal, dorsal fins of some. Black pigmentation vivid.
				7	2:12:79	
I. x. xantusi x *I. f. furcidens*	M76-31	M76-31	4:18:77	4	3:27:78	Broad-mouthed. 1♂, 3♀♀. No yellow in fins, ♂ like father in coloration.
				4	4:5:78	Mouth width narrow to broad. 1♂, 2♀♀ (1 died). ♂ with faint yellow cast in caudal, dorsal fins.
				4	5:25:78	Mouth intermediate. 1♂, 1♀ (2 died). ♂ with bright yellow in caudal fin, more diffuse than in *I. xantusi*.
				5	11:2:78	2♂♂, 3♀♀
				5	11:4:78	3♂♂, 2♀♀.
(*I. x. xantusi* x *I. f. furcidens*)[1]				5	9:28:78	Narrow but variable mouth width, yellow in caudal, dorsal fins. Fast growing
				7	10:17:78	4♂♂, 1♀ (2 died). ♂♂ with yellow streaks in caudal, dorsal fins.

Table 38. continued...

Cross	Locality of ♀ parent	Locality of ♂ parent	Date set up	# of young	Date brood born	Description of hybrids
I. x. xantusi x *I. f. furcidens*	M76-31	M76-30	1:10:78	6	4:30:78	Mouth width intermediate to broad. 3♂♂, 6 ♀♀ (1 died). ♂♂ with bright yellow cast or streaks in caudal fins. All with vivid black pigmentation
				4	5:13:78	
				6	11:14:78	6♂♂, 8♀♀. Some with yellow streaks in dorsal, caudal fins.
				8	11:20:78	
I. f. furcidens x *I. x. xantusi*	M76-30	M76-31	1:10:78	4	11:20:78	2♂♂, 2♀♀. 1♂ with yellow streaks in dorsal, caudal fins.
(*I. x. xantusi* x *I. f. furcidens*)[1]*				2	11:6:78	Born dead, preserved.
				5	11:6:78	Preserved when born.
				2	11:17:78	1 born dead, preserved. 1♂.
				5	11:24:78	3♂♂, 2♀♀. Some with diffuse yellow streaks in dorsal, caudal fins.
I. f. furcidens x *I. f. furcidens*	M76-31	M76-30	5:8:78	8	12:6:78	5♂♂, 3♀♀.
I. f. furcidens x *I. f. furcidens*	M76-30	M76-31	1:11:78	7	6:20:78	Narrow-mouthed. 4♂♂, 2♀♀ (1 died). 1♂ with bright yellow cast in all fins. Other ♂♂ with less yellow No yellow in ♀♀.
(*I. f. furcidens* x *I. f. furcidens*)[1]*						No young yet produced.

Table 38. continued...

Cross	Locality of ♀ parent	Locality of ♂ parent	Date set up	# of young	Date brood born	Description of hybrids
I. f. tuxpan x *I. f. tuxpan*	K78-12	K78-11	7:17:78	7	11:26:78	3♂♂, 4♀♀.
				6	3:1:79	
I. f. tuxpan x *I. f. tuxpan*	K78-11	K78-12	5:16:78	5	11:2:78	2♂♂, 3♀♀.
(*I. f. tuxpan* x *I. f. tuxpan*)^1 *						2 near-term pregnant ♀♀.
I. f. furcidens x *I. x. latos*	K78-9	K78-9	6:12:78			No young produced
I. x. latos x *I. f. furcidens*	K78-9	K78-9	6:9:78			No young produced
I. x. xantusi x *I. x. latos*	M76-31	K78-9	10:9:78	6	2:12:79	
				4	2:15:79	
I. x. latos x *I. x. xantusi*	K78-9	M76-31	10:9:78	6	2:15:79	

* Crosses of F_1 hybrids are designated by a superscript of "1".

the other parent, indicating independent inheritance of these two characters. Mouth width may vary among siblings making some hybrids indistinguishable from the parental species. The fishes showing aberrant pigmentation that Hubbs and Turner describe in their 1939 revision are probably F_1 hybrids or backcross products. It is possible that some of their specimens identified as *I. furcidens* or *I. xantusi* may also be hybrids, since some of the laboratory-generated hybrids resemble the parental species strongly. Some field caught hybrids may be impossible to distinguish from the parental species by morphological means. It is not known if hybrids frequently live to maturity in the field, but they appear vigorous in the laboratory. In at least two localities, in the Río de Comala and Río Terrero, field observations indicate that *I. furcidens* and *I. xantusi* coexist sympatrically with little or no hybridization, and most specimens collected in the Salado and Colima rivers appear assignable to either *I. furcidens* or *I. xantusi*. Perhaps hybrids only occur in disturbed areas as has been indicated for other fishes (Hubbs et al., 1953; Hubbs and Strawn, 1956).

Hypothesis III: repeated evolution of broad-mouthed and narrow-mouthed forms.—The third hypothesis is that the population in the Colima and Salado rivers represents the ancestral population from which sympatric narrow-mouthed and broad-mouthed species have arisen independently several times. This hypothesis seems unlikely as all specimens from the Colima and Salado rivers are either broad-mouthed or narrow-mouthed. They differ from the Comala and Terrero populations in other characteristics. Although the Comala and Terrero populations are morphologically more similar to each other than to the Colima and Salado populations (Fig. 21), the habitats at Comala and Terrero differ in altitude, water volume, current and other factors. There are no obvious environmental parameters in common to only these two localities that could select for parallel evolution of two morphotypes.

Evidence for recognizing Ilyodon furcidens and Ilyodon xantusi as valid species.—The morphological evidence supports the first explanation. There are only two species, *I. furcidens* and *I.*

xantusi, in the Colima, Comala, Salado and Terrero rivers, but they vary considerably in characters showing ecophenotypic influence. Interspecific hybrids may be occasionally produced, but most collections appear to contain only the parental species. Laboratory stocks of *I. furcidens furcidens* derived from field caught fish produce narrow-mouthed offspring, and stocks of *I. xantusi xantusi* produce only broad-mouthed offspring, suggesting that hybridization is rare or hybrids are selected against in the field.

Field observations on *I. furcidens furcidens* (#4) and *I. xantusi latos* (#5) at the Río Terrero support the conclusion that *I. xantusi* and *I. furcidens* are valid species, despite the ability of some populations to hybridize. At the Río Terrero, no specimens with intermediate mouth width have been caught. *Ilyodon xantusi latos* appears to grow larger than *I. furcidens furcidens*. It grazes on algae and Aufwuchs off the bottom but was never seen to feed off the surface. *Ilyodon furcidens furcidens* also grazes, but readily feeds off the surface. *Ilyodon xantusi latos* also stole food from *I. furcidens furcidens*, if the food was carried below the surface. *Ilyodon furcidens furcidens* and *I. xantusi latos* appear to have slightly different breeding seasons. All but two out of 37 young collected in April, 1978 were *I. furcidens furcidens*. The two young of *I. xantusi latos* were larger and probably about a month older, as judged by laboratory stocks. In 40 courting interactions, 35 involved *I. furcidens* pairs, five involved *I. xantusi latos* pairs (mostly females headwagging at conspecific males) and no cases of interspecific courting were observed. Further, courting males of *I. furcidens furcidens* develop black borders in the dorsal and caudal fins. This coloration has not been observed in *I. xantusi latos*. Preliminary data indicate that *I. xantusi latos* is karyotypically polymorphic (Turner and Kingston, in prep.). This chromosomal variability may limit or prevent successful hybridization with *I. furcidens furcidens*. Although negative evidence cannot be weighed too heavily, forced mating experiments have yielded hybrid young for all crosses except those between *Ilyodon furcidens furcidens* (#4) and *Ilyodon xantusi latos* (#5) (Table 38). Behavioral or physiological barriers may prevent hybridization.

B. J. Turner (pers. comm.) has found that I. furcidens furcidens (#4) and I. xantusi latos (#5) are either fixed for the same alleles, or where they are polymorphic, have the same alleles in the same frequencies. Electrophoretic data on I. furcidens furcidens (#7) and I. xantusi xantusi (#14) at the Río de Comala indicate that they share most of the same alleles and frequencies. He examined glycolytic enzymes controlled by 30 loci. These similarities can be interpreted to mean that I. furcidens and I. xantusi represent one interbreeding population or species, or that similarity in alleles and allelic frequencies for glycolytic enzymes are a response to identical selective regimes. Both species occur together sharing the same conditions of temperature and current and the same predators and competitors at each locality. As noted earlier, the localities differ in a number of physical parameters. The electrophoretic differences between localities is greater than the differences between species within a locality (Table 39; Turner, pers. comm.). This evidence suggests that the allelic similarity within localities results from selective forces acting at those localities and not panmixia within a locality. Laboratory stocks derived from these species breed true to the morphotype of their parents. Principal Components Analysis yields two separate clusters at each locality. Even removing the diagnostic character, mouth width, does not alter the results. It thus seems best to regard these populations as representing two species.

Summary.—Sexual dimorphism is marked in the genus Ilyodon. Morphological studies should consider males and females separately.

Comparisons of reservoir and riverine populations and of field and laboratory specimens of Ilyodon whitei suggest that the following characters show ecophenotypic influence: postorbital length, caudal peduncle depth, snout length, body depth, orbit length and caudal fin rays. Many of these characters also contribute to the variation seen among populations of Ilyodon furcidens and Ilyodon xantusi in the Colima and Salado rivers.

Inadequate material is available to determine the

Table 39. Informative loci for four populations of *Ilyodon* representing two localities. a = the most common allele b = the alternate allele a/b = heterozygotes. N = 16. The small sample size precluded calculations of allelic frequencies and Nei distances.

Locality	Species	mdh a	a/b	mdh b	idh a	a/b	idh b	agpd a	a/b	agpd b	idh a	a/b	idh b
Río Terrero, Jalisco	*I. furcidens furcidens*	3	0	0	2	0	1	3	0	0	3	0	0
Río Terrero, Jalisco	*I. xantusi latos*	1	0	0	1	0	0	1	0	0	1	0	0
Río de Comala, Colima	*I. furcidens furcidens*	5	1	0	6	0	0	0	0	6	4	0	2
Río de Comala, Colima	*I. xantusi xantusi*	4	2	0	6	0	0	0	0	6	3	3	0

relationships of populations in the Balsas, Aguacate, Aguililla and Arteaga rivers. Several taxa may be represented in these rivers. *Ilyodon xantusi xantusi* includes populations in the Comalá, Colima, Coalcomán and Salado rivers. *Ilyodon xantusi latos* is known from the Río Terrero. Populations in the Ameca drainage are *Ilyodon furcidens amecae* and resemble some of the populations in the upper Armería. The upper Armería may have cut back and captured a tributary of the Ameca system. The upper Armería contains two subspecies, *Ilyodon furcidens variabilis*, known only from Apulco, and *Ilyodon furcidens furcidens*. Populations of *I. furcidens furcidens* in the upper Armería differ slightly from those in the lower Armería. These differences are probably maintained because of barrier falls along the Armería that limit gene flow. *Ilyodon furcidens furcidens* is also found in the Salado and Terrero rivers. *Ilyodon furcidens tuxpan* lives in the upper Coahuayana and may include several chromosomally polymorphic populations.

Hybrids of *Ilyodon furcidens* and *Ilyodon xantusi* have been collected in some areas where these two species are sympatric but not in the Río Terrero. Laboratory-generated hybrids are more variable than previously thought (Hubbs and Turner, 1939). Available evidence suggests that hybrids in nature rarely reproduce. Stocks derived from field caught specimens produce offspring like the parental species. There may be behavioral and/or physiological barriers to gene flow between these species. Field observations indicate that only conspecifics court and suggest some temporal separation of breeding seasons.

REVISION OF THE GENUS ILYODON

The genus Ilyodon Eigenmann, as presently recognized, contains three described species, Ilyodon furcidens (Jordan and Gilbert), Ilyodon whitei (Meek) and Ilyodon xantusi (Hubbs and Turner). The earliest record of the genus is of specimens described as Characodon furcidens (Jordan and Gilbert, 1882a, 1882b). The localities given were Cape San Lucas and Colima. The first locality is erroneous, as noted by Hubbs (1931, 1932), Hubbs and Turner (1939) and Evermann (1908). This error was repeated in the works of Eigenman (1893), Jordan (1885), Jordan and Evermann (1896), Meek (1904) and Regan (1907). Pellegrin (1901) described this species from the Río Tuxpan, Jalisco, and Regan (1907) reported it from the Río de Mascota, Jalisco. Meek (1902) doubted if the males had a modified anal fin. The color description of the dorsal and especially the anal fin indicates that his description may have been based on females. In 1907, Eigenmann described the genus Ilyodon, giving Ilyodon paraguayense as the type of the genus. The specimen described may have been female judging by the coloration of the anal fin. Ilyodon was said to differ from Characodon by having one series of teeth rather than several. Hubbs and Turner (1939) concluded that the locality was erroneous and that the type specimen had fine teeth in a broad inner band, contrary to Eigenmann's description. They also found the specimen to be conspecific with the types of Characodon furcidens, assigning them all to Ilyodon furcidens.

Meek (1904) described Goodea whitei from the Balsas drainage and this species was later assigned to a new genus, Balsadichthys (Hubbs, 1926). Ahl (1935) gave Tlapa, Guerrero as an additional locality. Hubbs and Turner (1939) described a third species, Balsadichthys xantusi, from the vicinity of Colima and noted that hybrids between it and *Ilyodon furcidens* occurred naturally. They found the two genera to differ in characteristics of the trophotaeniae, mouth, caudal peduncle and teeth. In 1971, Miller and Fitzsimons synonymized *Ilyodon* and *Balsadichthys* on morphological grounds and because these fishes hybridized readily and frequently in nature. They demonstrated that trophotaeniae were more variable within species than Hubbs and Turner realized.

The present study was spurred by field work in 1976. Collecting *Ilyodon* in the Armería, Coahuayana and Ameca drainages revealed seemingly distinct populations, varying in meristic counts, morphology and coloration. An intensive study began, representing all known localities from which *Ilyodon* have been collected. Field work revealed that all populations of *Ilyodon* are riverine fishes. These fishes are subject to seasonal fluctuations in water volume, turbidity and food abundance. They are elongate, slender fishes able to maintain their positions in fast-flowing water. *Ilyodon* also survives in reservoirs and in streams that are reduced seasonally to isolated pools. Although seeming to prefer clean, clear water, they persist in rivers polluted by sugar cane effluent. Barrier falls along the Armería impose natural limitations to gene flow, which is possible in a downstream direction but not upstream. The complex volcanic history of the region has shifted drainages, possibly resulting in isolation of some populations and mixing of others. Human activities, such as dam building, pollution, water diversion and connecting previously isolated systems by canals have altered the selective forces acting on some populations. With these complications in mind, the results of this study indicate that the genus *Ilyodon* consists of a complex array of geographically variant populations, most of which are not reproductively isolated or morphologically distinct from neighboring populations. With the possible exception of the populations of *Ilyodon* in the Aguililla, Aguacate and Arteaga rivers, independent tributaries between the mouths of the Balsas and Coahuayana rivers, the evidence supports the existence of three geographically variant species. The taxonomic status of populations in the Balsas drainage and the Aguililla, Aguacate and Arteaga rivers must remain uncertain until more material is collected. Their treatment here is provisional.

Systematics of the Genus Ilyodon

Herein are described four new subspecies of Ilyodon, based on preserved and live specimens in the University of Michigan Museum of Zoology (UMMZ). Counts were made as described by Miller (1948) with modifications of Fitzsimons (1970, 1972). The last two rays in both dorsal and anal fins are counted as one because they share a common pterygiophore. In some specimens, one of the caudal vertebrae might have been included in the precaudal count due to the difficulty in determining the transitional vertebrae. The hypural complex is included in the vertebral count. All gill rakers and rudiments of the first arch were counted. Head pores were counted on both sides. Pelvic and pectoral fin rays were counted for both fins. Measurements were made to the nearest 0.1 mm using Helios dial calipers. Numbers in parentheses, given in the subspecies descriptions, represent the number of specimens with the indicated counts. Counts of the holotype are designated by asterisks.

Genus Ilyodon Eigenmann

Ilyodon.—Eigenmann, 1907:427 (original diagnosis; compared with Characodon); 1910:455 (listed). Hubbs, 1924:4 (relationships doubtful). Turner, 1937:496, 503, 505-506, 512 (synonymy; trophotaeniae). Orthotype, Ilyodon paraguayense Eigenmann.

Balsadichthys.—Hubbs, 1926:19 (original description). Jordan, Evermann and Clark, 1930:183 (listed). Hubbs, 1932:68 (type). Turner, 1933a:93 (spelled Balsdichthys; structures related to viviparity); 1933c:209, 211 (classification and distribution); 1937: 503-504, 512 (trophotaeniae). Hubbs and Turner, 1939:63-67 (closely related to Ilyodon, natural hybrids). Miller and Fitzsimons, 1971: 10 (Balsadichthys synonymized with Ilyodon).

Ilyodon furcidens (Jordan and Gilbert)

Characodon furcidens.—Jordan and Gilbert, 1882a:354-355 (original description; "Cape San Lucas" incorrect locality as pointed out by subsequent authors); 1882b:371 (Colima). Jordan, 1885:368 (Cape San Lucas). Eigenmann, 1893:56 (listed). Garman, 1895: 36-37 (description, after Jordan and Gilbert; Cape San Lucas). Jordan and Evermann, 1896:669-670 (description; about Cape San Lucas, or, probably, lagoons near La Paz; also about Colima); 1896a:314 (listed). Pellegrin, 1901:205 (fresh colors - but description of "saffron yellow back" doubtful, not present in extant populations; Río Tuxpan, Jalisco). Meek, 1902:96 (modification of anal doubted, color description of anal appears to be that of females); 1904: xxxvii, xxxix, xlvi, 119, 122-123 (range; description, after Jordan and Evermann). Regan, 1907:88, 90, Pl. 12, Fig. 2 (description; Cape San Lucas or lagoons near La Paz; Río de Mascota in Jalisco). Evermann, 1908:29 (type locality doubted; other possible localities in lower California suggested). Eigenmann, 1910:456 (range). Jordan, Evermann and Clark, 1930:183 (listed). Hubbs, 1931:2 (distribution; Lower California locality held to be an error); 1932:68 (distribution).

Ilyodon furcidens.—Turner, 1937:496, 505 (synonymy; trophotaeniae). Hubbs and Turner, 1939:57-63 (artificial and analytical keys). Miller and Fitzsimons, 1971:10 (Balsadichthys synonymized with Ilyodon).

Ilyodon paraguayense.—Eigenmann, 1907:428-429 (original description; Paraguay, locality incorrect as pointed out by Hubbs and Turner); 1910:455 (spelling corrected to paraguayensis; listed). Von Ihering, 1931:246 (classification, characters).

Diagnosis.—A species of Ilyodon with generally narrow mouth (74-127, in thousandths of SL), narrow caudal peduncle (95-133, in thousandths of SL), 25-41 gill rakers (80% with 34 or less, except for Ilyodon furcidens variabilis which tends to have more), 20-30 teeth, each jaw (not including several individuals of Ilyodon furcidens tuxpan with up to 45 teeth, each jaw), inner rows of bifid and conical teeth and 44-68 scales in lateral series (90% with 49 or more). Mouth with moderate gape (Fig. 23). Populations in the Ameca drainage and some *Ilyodon furcidens tuxpan* with widest mouths.

Range.—Río Armería, Río Coahuayana (including Río Salado, Río Terrero), Río Ameca, Colima and Jalisco.

Comparisons.—Finer scales, fewer gill rakers and narrower mouth than *I. xantusi*. No populations of *I. furcidens* with yellow streaks in dorsal and caudal fins. Inner rows of small conical and bifid teeth present in *I. furcidens* but not in *I. xantusi* or *I. whitei*.

Ilyodon furcidens furcidens

Figs. 23-25; Table 40

Material.—Counts and measurements based on UMMZ 189595, 25 males, 15 females, coll. by R. R. Miller and J. M. Fitzsimons, 24 Feb 1970; Río de Comala just above and below second bridge S of Comala, ca. 8 km N of Colima, Colima, México. Original description by Jordan and Gilbert (1882), detailed description given in Hubbs and Turner (1939).

Diagnosis.—A subspecies of *Ilyodon furcidens* with narrow mouth width (76-104, in thousandths of SL), 25-37 gill rakers (90% with 35 or less), 38-49 scales around body (60% with 43 or more), 44-63 lateral scales (80% with 56 or less), 28-43 predorsal scales (85% with less than 38), 18-24 dorsal to anal scales (90% with 22 or less), 13-18 dorsal fin rays (90% with 15 or more) and ca. 20 teeth in each jaw.

Range.—Río Armería drainage, parts of the Coahuayana drainage (Río Salado, Río Terrero), Colima and Jalisco.

Description.—Form and coloration of mature adults as in Figs. 24-25, proportional measurements given in Table 40. Fin rays: dorsal 13(1), 14(2), 15(13), 16(18), 17(6); anal 11(2), 12(29), 13(9); pectoral 15(23), 16(48), 17(9); pelvic 5(1), 6(79); caudal 18(1), 19(5), 20(11), 21(15), 22(3), 23(4), 24(1). Scales: in lateral series 46(1), 47(1), 48(4), 49(6), 50(8), 51(3), 52(6), 53(5), 54(3), 55(3); between dorsal and anal 20(17), 21(13), 22(9), 23(1); predorsal 30(2), 31(5), 32(7), 33(5), 34(11), 35(6), 36(3), 37(1); around caudal peduncle 20(2), 21(5), 22(26), 23(7); around body

Fig. 23. Comparison of mouth widths in *Ilyodon furcidens furcidens*, a narrow-mouthed form (bottom), and *Ilyodon xantusi latos*, a broad-mouthed form (top). Males of the same size are compared.

Fig. 24. *Ilyodon furcidens furcidens*. Male, 63.9 mm SL (UMMZ 189595).

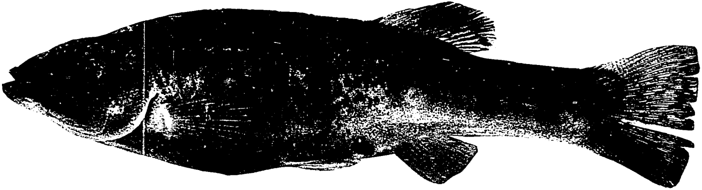


Fig. 25. *Ilyodon furcidens furcidens*. Female, 54.7 mm SL (UMMZ 189595).

Table 40. Proportional measurements, in thousandths of standard length, of *Ilyodon furcidens furcidens* (Based on UMMZ 189595). Means in parentheses.

Measurement	25 Males	SD	6 Females	SD
Standard length, mm	32.2-63.9 (45.4)	6.73	32.4-78.5 (50.6)	15.64
Predorsal length	558-613 (581)	11.28	606-624 (613)	6.17
Prepelvic length	465-525 (491)	12.39	491-511 (502)	9.06
Anal origin to caudal base	341-385 (363)	9.53	351-373 (364)	7.89
Body, greatest depth	254-313 (282)	13.13	272-316 (287)	15.50
Width	129-167 (149)	10.69	161-181 (166)	7.54
Head, length	237-279 (266)	11.97	248-278 (268)	11.02
Depth	157-195 (174)	11.95	161-174 (169)	4.87
Width	161-192 (176)	8.01	169-184 (176)	4.81
Caudal peduncle, length	255-298 (284)	9.53	265-286 (275)	8.99
Least depth	112-132 (122)	5.20	122-130 (127)	2.75
Interorbital, least bony width	113-129 (120)	4.13	117-121 (119)	1.55
Preorbital width	32-40 (36)	2.54	36-40 (38)	1.59
Postorbital length	98-115 (107)	4.11	106-112 (108)	2.96
Snout length	71-89 (82)	4.89	80-88 (82)	3.13
Orbit length	77-96 (87)	5.52	69-99 (87)	10.66
Mouth width	76-104 (90)	6.02	85-102 (93)	6.07
Mandible length	61-81 (70)	5.06	74-78 (76)	1.82
Dorsal fin, basal length	169-219 (197)	16.10	156-182 (165)	10.13
Depressed length	259-335 (292)	19.39	225-259 (239)	11.32
Anal fin, basal length	66-87 (78)	5.92	78-86 (82)	3.33
Depressed length	130-170 (143)	8.74	141-160 (149)	7.06
Middle caudal rays, length	159-196 (181)	9.94	162-196 (182)	12.81
Pectoral length	142-185 (168)	10.03	153-179 (166)	10.21
Pelvic length	114-144 (133)	6.84	124-136 (131)	4.22
Upper jaw length	30-53 (42)	5.95	50-59 (53)	3.69
Opercle length	81-99 (90)	4.81	85-93 (89)	2.82

39(1), 40(1), 41(4), 42(4), 43(6), 44(10), 45(6), 46(4), 47(1), 48(2), 49(1). Total vertebrae: 36(3), 37(16), 38(11), 39(2); eight specimens with double neural spine on penultimate vertebra (perhaps indicating fusion of two vertebrae) not included in counts. Precaudal vertebrae: 17(3), 18(25), 19(4); caudal: 18(2), 19(17), 20(13). Gill rakers 28(2), 29(2), 30(5), 31(7), 32(6), 33(7), 34(2), 35(3), 36(1), 37(4), 40(1). Head pores: mandibular 3(80); preopercular 7(77), 8(3); lacrimal 4(80).

Outer row of large bifid teeth, ca. 20 in upper jaw (both sides), the same in lower jaw. Variable number of small bifid teeth in inner row.

Dimorphism and coloration.—Predorsal length, prepelvic length and upper jaw length greater in females, dorsal fin length (basal, depressed) greater in males. A detailed description of color pattern is given in Hubbs and Turner (1939). Live coloration: coloration of both sexes variable; lateral black stripe present in most. Stripe formed by lateral series of black flecks. Males with black flecks in dorsal, caudal and pelvic fins and irridescent patches in anal and pelvic fins. Dominant, courting males with black terminal margins in dorsal, caudal and pelvic fins. Females with black subterminal band in anal fin.

Habitat.—The Río de Comala is clear with a moderate to swift current. The bottom consists of rocks, boulders, gravel and silt and is easily roiled. Aquatic vegetation consists largely of green algae growing on rocks.

Associates.—Goodeidae: Ilyodon xantusi xantusi, Allodontichthys zonistius; Gobiidae: Sicydium multipunctatum.

Ilyodon furcidens amecae n. subsp.

Figs. 26-27; Table 41

Types.—Holotype (UMMZ 203259), mature male 58.7 mm SL; coll. by R. R. Miller and J. M. Fitzsimons, 21 Feb 1970; Río de la Pola, trib. to Río Atenguillo, ca. 4 km E of Guachinango and 40 km W of Ameca, Jalisco, México. Allotype (UMMZ 203260), adult female 62.7

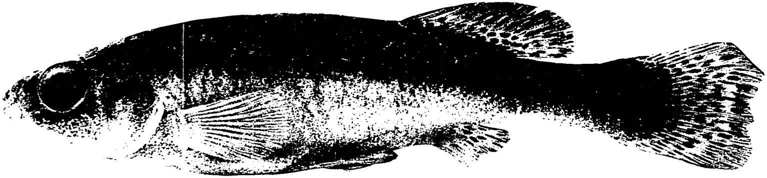


Fig. 26. *Ilyodon furcidens amecae* n. subsp. Male holotype, UMMZ 203259, 58.7 mm SL.

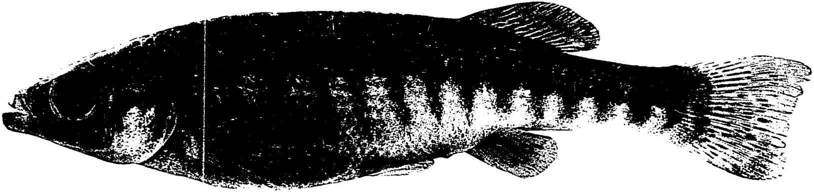


Fig. 27. *Ilyodon furcidens amecae* n. subsp. Female allotype, UMMZ 203260, 62.7 mm SL.

Table 41. Proportional measurements, in thousandths of standard length, of <u>Ilyodon furcidens amecae</u> (Based on UMMZ 189586, 203259 holotype, 203260 allotype). Means in parentheses.

Measurement	Holotype ♂	25 Males	SD	6 Females	SD
Standard length, mm	58.7	42.3-67.6 (50.3)	5.91	43.3-62.7 (51.9)	7.00
Predorsal length	625	613-645 (631)	9.19	655-672 (663)	6.98
Prepelvic length	487	484-542 (508)	13.85	523-537 (529)	5.33
Anal origin to caudal base	341	318-348 (335)	8.60	314-336 (325)	9.63
Body, greatest depth	269	245-289 (270)	10.51	253-289 (272)	15.35
Width	170	140-180 (159)	9.45	166-179 (171)	5.22
Head, length	272	254-279 (267)	5.92	260-279 (270)	6.96
Depth	155	151-172 (162)	5.81	147-158 (152)	4.41
Width	175	167-185 (175)	5.11	171-186 (179)	6.40
Caudal peduncle, length	274	253-282 (269)	6.70	242-255 (248)	5.08
Least depth	102	99-117 (106)	3.65	104-115 (110)	4.61
Interorbital, least bony width	119	117-130 (121)	3.91	115-128 (121)	4.55
Preorbital width	39	30-39 (33)	2.36	32-37 (34)	2.08
Postorbital length	117	102-117 (107)	3.72	108-115 (111)	3.02
Snout length	87	77-94 (84)	3.94	81-87 (85)	2.39
Orbit length	83	76-89 (83)	3.41	75-87 (83)	4.46
Mouth width	109	95-120 (107)	6.96	112-124 (118)	5.01
Mandible length	82	65-91 (77)	6.75	80-87 (83)	2.95
Dorsal fin, basal length	191	168-206 (187)	9.70	152-162 (157)	4.14
Depressed length	291	273-303 (286)	9.68	219-233 (226)	5.23
Anal fin, basal length	70	57-75 (65)	5.21	69-80 (73)	4.11
Depressed length	136	109-149 (132)	9.77	132-148 (139)	6.83
Middle caudal rays, length	189	161-198 (178)	8.31	167-180 (177)	4.87
Pectoral length	174	159-184 (171)	6.38	151-163 (159)	4.07
Pelvic length	136	122-145 (135)	5.64	118-131 (125)	4.43
Upper jaw length	53	38-69 (55)	8.42	59-71 (65)	5.20
Opercle length	95	79-95 (86)	4.44	82-97 (90)	4.99

mm SL, and 611 paratopotypes (UMMZ 189586), 17-69 mm SL, taken with holotype, including three cleared and stained (male, female, juvenile); 179 juvenile to adult paratopotypes (UMMZ 178347), 11-67 mm SL.

Diagnosis.—A subspecies of Ilyodon furcidens with intermediate mouth width (95-124, in thousandths of SL), 26-37 gill rakers (95% with 35 or less), 40-49 scales around body (85% with 43 or more), 53-64 lateral scales (90% with 56 or more), 34-44 predorsal scales (80% with 38 or more), 20-24 dorsal to anal scales (80% with 22 or less), 13-16 dorsal fin rays (90% with 15 or less) and 20-30 teeth in each jaw.

Range.—Río Ameca drainage, Jalisco.

Description.—Form and coloration of mature adults as in Figs. 26-27, proportional measurements given in Table 41. Fin rays: dorsal 13(5), 14*(24), 15(11); anal 10*(6), 11(25), 12(9); pectoral 14(5), 15*(41), 16*(32), 17(2); pelvic 6*(79), 7(1); caudal 17(1), 18*(11), 19(20), 20(7), 21(1). Scales: in lateral series 53(1), 54(1), 55(1), 56(2), 57(3), 58(7), 59(6), 60(5), 61(1), 62(4), 63(6), 64(1), 65*(1), 68(1); between dorsal and anal 20(2), 21(11), 22*(24), 23(2), 24(1); predorsal 36(1), 37(2), 38(10), 39(5), 40(8), 41(8), 42*(3), 43(1), 44(2); around caudal peduncle 22(3), 23(14), 24(9), 25*(13), 26(1); around body 42(1), 43(6), 44(5), 45(10), 46(7), 47*(6), 48(3), 49(2). Total vertebrae: 36(1), 37(22), 38*(12); five specimens with double neural spine on penultimate vertebra (perhaps indicating fusion of two vertebrae) not included in counts. Precaudal vertebrae: 18(4), 19*(31); caudal: 18*(20), 19(15). Gill rakers 27(1), 28(1), 29(1), 30*(7), 31(4), 32(8), 33(7), 34(6), 35(3), 36(1), 37(1). Head pores: mandibular 0*(1), 2(2), 3*(77); preopercular 7*(52), 8*(27), 9(1); lacrimal 3(2), 4*(76), 5(2).

Outer row of large bifid teeth, ca. 20-33 teeth in upper jaw (both sides), the same in lower jaw. Variable number of small bifid and conical teeth in inner rows.

Dimorphism and coloration.—Sexual dimorphism marked in some proportional measurements. Dorsal (basal, depressed), pectoral and pelvic fins, caudal peduncle length and anal origin to caudal base length greater in males. Predorsal length, prepelvic length, mouth width, and upper jaw length greater in females. Coloration of both sexes variable. Live coloration: some males with lateral black stripe, others without. Faint yellow in dorsal, anal, pelvic and pectoral fins, especially along bases of fins. Males with irridescent patches in anal and pelvic fins, and black terminal border in dorsal and caudal fins. Females with a variable number of black bars along body. In ethyl alcohol: most males with vertical black bars of variable length, a few without. All with a variable number of round black spots dorsally above bars in an irregular row. Males with black flecks in dorsal, caudal and anal fins and black terminal tips to dorsal, pelvic and caudal fins. Females with subterminal black band in dorsal and anal fins, no black in pelvic fins.

Habitat.—The Río de la Pola is clear with a slight current in the dry season. The bottom consists of sand, gravel, rocks, boulders, bedrock and some silt. Aquatic vegetation is scarce, consisting largely of green algae. The salinity was 0.1 ppt and the elevation ca. 1590 m.

Associates.—Catostomidae: Moxostoma mascotae; Goodeidae: Allodontichthys sp.

Etymology.—This subspecies is named for the Río Ameca drainage to which it is restricted.

Ilyodon furcidens tuxpan n. subsp.

Figs. 28-29; Table 42

Types.—Holotype (UMMZ 203257), mature male 63.4 mm SL; coll. by R. R. Miller and J. T. Greenbank, 8 March 1955; Río Tuxpan at Hwy 110 bridge, (at San Rafael), Jalisco, México. Allotype (UMMZ 203258) adult female, 64.9 mm SL and 517 juvenile to adult paratopotypes (UMMZ 172160), 15-86 mm SL including three cleared and stained (two males, one female), taken with holotype; 316 juvenile to adult paratopotypes (UMMZ 189075), 21-78 mm SL; 45 juvenile to adult paratopotypes (UMMZ 202434), 25-39 mm SL.

Diagnosis.—A subspecies of Ilyodon furcidens with intermediate but

Fig. 28. *Ilyodon furcidens tuxpan* n. subsp. Male holotype, UMMZ 203257, 63.4 mm SL.

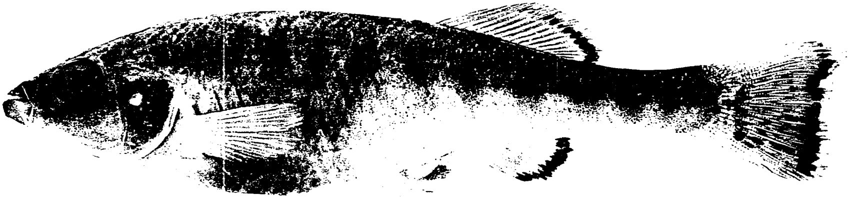


Fig. 29. *Ilyodon furcidens tuxpan* n. subsp. Female allotype, UMMZ 203258, 64.9 mm SL.

Table 42. Proportional measurements, in thousandths of standard length, of <u>Ilyodon furcidens tuxpan</u> (Based on UMMZ 189586, 203257 holotype, 203258 allotype). Means in parentheses.

Measurement	Holotype ♂	25 Males	SD	6 Females	SD
Standard length, mm	63.4	37.4-71.6 (54.7)	8.89	36.4-66.7 (51.4)	11.46
Predorsal length	572	545-601 (571)	12.65	607-629 (616)	7.62
Prepelvic length	506	477-519 (500)	10.40	505-529 (518)	9.83
Anal origin to caudal base	377	337-391 (365)	10.65	335-358 (345)	8.54
Body, greatest depth	298	253-298 (275)	10.58	261-321 (295)	24.88
Width	164	138-167 (153)	7.39	156-213 (184)	22.40
Head, length	267	250-279 (263)	7.95	249-282 (261)	12.14
Depth	165	160-184 (174)	6.54	148-166 (159)	7.32
Width	180	160-184 (174)	5.96	171-193 (181)	9.55
Caudal peduncle, length	312	279-312 (295)	9.72	250-276 (261)	8.58
Least depth	118	104-118 (110)	4.29	105-119 (112)	4.39
Interorbital, least bony width	121	114-127 (120)	3.37	117-124 (121)	2.63
Preorbital width	44	32-45 (39)	3.04	36-39 (37)	1.25
Postorbital length	113	100-115 (107)	3.71	90-113 (104)	8.07
Snout length	90	77-98 (89)	5.18	77-92 (86)	5.81
Orbit length	73	68-87 (75)	5.31	67-89 (78)	8.82
Mouth width	126	92-127 (111)	10.34	91-117 (109)	11.13
Mandible length	91	69-91 (81)	5.55	66-84 (78)	7.65
Dorsal fin, basal length	218	198-232 (217)	9.26	163-183 (173)	7.24
Depressed length	317	281-331 (306)	12.82	232-245 (238)	5.70
Anal fin, basal length	69	68-79 (72)	2.80	60-82 (71)	8.43
Depressed length	139	126-152 (137)	6.60	129-151 (139)	8.39
Middle caudal rays, length	175	165-187 (175)	6.06	168-183 (175)	5.59
Pectoral length	170	157-189 (172)	8.11	153-171 (160)	6.78
Pelvic length	143	126-143 (134)	5.02	118-133 (126)	6.39
Upper jaw length	57	38-66 (54)	6.69	49-57 (54)	2.53
Opercle length	91	75-96 (86)	4.58	83-93 (87)	3.90

variable mouth width (91-127, in thousandths of SL), 29-38 gill rakers (85% with less than 35), 38-47 scales around body (85% with 43 or less), 47-58 lateral scales (95% with 56 or less), 29-38 predorsal scales (99% with less than 38), 19-25 dorsal to anal scales (90% with 22 or less), 15-18 dorsal fin rays (100% with 15 or more) and 30-45 teeth in each jaw. Chromosomally polymorphic.

Range.—Upper portions of the Coahuayana drainage (Río Tuxpan), Jalisco.

Description.—Form and coloration of mature adults as in Figs. 28-29, proportional measurements given in Table 42. Fin rays: dorsal 15(10), 16*(24), 17(5), 18(1); anal 11*(18), 12(20), 13(2); pectoral 14(3), 15*(62), 16(15); pelvic 6*(80); caudal 18(7), 19(20), 20*(12), 21(1). Scales: in lateral series 47(1), 48(1), 49(1), 50(4), 51(5), 52*(7), 53(7), 54(4), 55(7), 56(1), 58(2); between dorsal and anal 19(5), 20(8), 21(19), 22*(5), 23(3); predorsal 29(1), 30(5), 31(4), 32*(11), 33(6), 34(7), 35(5), 37(1); around caudal peduncle 20(4), 21(8), 22(17), 23*(10), 24(1); around body 38(2), 39(7), 40(12), 41*(5), 42(6), 43(4), 44(1), 45(2), 46(1). Total vertebrae: 36(1), 37*(17), 38(17), 39(1); four specimens with double neural spine on penultimate vertebra (perhaps indicating fusion of two vertebrae) not included in counts. Precaudal vertebrae: 17(3), 18(23), 19*(10); caudal: 18*(5), 19(15), 20(16). Gill rakers 27(1), 28(2), 29(2), 30(2), 31(3), 32(6), 33(2), 34(6), 35(3), 36(4), 37(2), 38(3), 39(3), 40*(1). Head pores: mandibular 2(1), 3*(78), 4(1); preopercular 7*(77), 8(3); lacrimal 3(2), 4*(76), 5*(2).

Outer row of large bifid teeth, ca. 28-46 in upper jaw (both sides), the same in lower jaw. Inner rows of small conical and bifid teeth in upper and lower jaws of most.

Dimorphism and coloration.—Sexual dimorphism marked in some proportional measurements. Length of dorsal (basal, depressed) and pectoral fins, anal origin to caudal base length, head depth and caudal peduncle length greater in males. Predorsal length, prepelvic length, body depth and body width greater in females. Live coloration: males and females with black lateral stripe. Females with black subterminal margin in dorsal, anal and caudal fins. Some males with small black flecks along sides of body and in caudal and dorsal fins. In ethyl alcohol: most males uniform brown with scattered black flecks at posterior margins of scales, faint terminal black band in caudal fin, small flecks in caudal and dorsal fins. Females with variable number (seven to 11) short black bars, especially on caudal peduncle, black subterminal bar in caudal, dorsal and anal fins. Some with black flecks in caudal fin.

Habitat.—In 1955, the broad, open Río Tuxpan was murky, but by 1968, the water was greyish and heavily polluted. The bottom consists of sand, rocks, a few boulders and silt. The current is moderate to fairly swift. There is no aquatic vegetation.

Associates.—Characidae: *Astyanax fasciatus*; Goodeidae: *Xenotoca eiseni*, *Xenotoca melanosoma*, *Allodontichthys tamazulae*; Poeciliidae: *Poecilia butleri*.

Etymology.—This subspecies is named for the Río Tuxpan to which it is presumably confined.

Ilyodon furcidens variabilis n. subsp.

Figs. 30-31; Table 43

Types.—Holotype (UMMZ 203261), mature male 56.4 mm SL; coll. by C. D. Barbour and R. J. Douglass, 26 April 1969; trib. of Río San Pedro at Apulco, Jalisco, México. Allotype (UMMZ 203262), adult female, 57.0 mm SL, and 409 juvenile to adult paratopotypes (UMMZ 192236), 20-78 mm SL taken with holotype; 90 juvenile to adult paratopotypes (UMMZ 192235), 22-79 mm SL; 147 juvenile to adult paratopotypes (UMMZ 192234), 22-63 mm SL.

Diagnosis.—A subspecies of *Ilyodon furcidens* with narrow but variable mouth width (70-108, in thousandths of SL), 30-46 gill rakers (70% with 35 or more), 40-49 scales around body (85% with 43 or more), 45-61 lateral scales (90% with 56 or less), 31-38 predorsal scales (98% with less than 38), 20-25 dorsal to anal scales (75% with 22 or more), 14-17 dorsal fin rays (90% with 15 or more) and ca. 20 teeth in each jaw.

Range.—Upper Armería (Río la Labor), Jalisco.

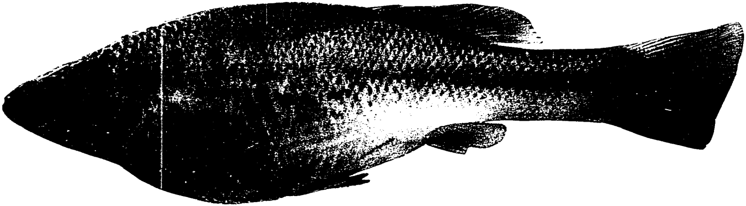


Fig. 30. *Ilyodon furcidens variabilis* n. subsp. Male holotype, UMMZ 203261, 56.4 mm SL.

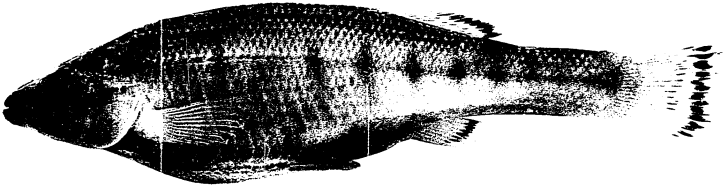


Fig. 31. *Ilyodon furcidens variabilis* n. subsp. Female allotype, UMMZ 203262, 57.0 mm SL.

Table 43. Proportional measurements, in thousandths of standard length, of *Ilyodon furcidens variabilis* (Based on UMMZ 192234, 192235, 192236, 203261 holotype, 203262 allotype). Means in parentheses.

Measurement	Holotype ♂	45 Males	SD	6 Females	SD
Standard length, mm	56.4	45.2-79.7 (57.1)	7.79	44.8-77.9 (59.9)	12.09
Predorsal length	589	569-619 (588)	10.88	603-623 (615)	6.43
Prepelvic length	496	463-519 (490)	11.79	487-511 (500)	9.24
Anal origin to caudal base	356	342-384 (362)	10.51	361-391 (373)	12.83
Body, greatest depth	330	277-338 (310)	13.32	294-320 (309)	11.21
Width	156	139-183 (161)	9.47	146-168 (157)	8.04
Head, length	239	227-257 (240)	7.38	229-255 (239)	11.72
Depth	174	146-178 (164)	6.81	143-165 (157)	8.63
Width	161	151-177 (167)	5.87	156-174 (165)	6.24
Caudal peduncle, length	277	264-310 (287)	10.84	276-299 (290)	8.50
Least depth	119	105-133 (123)	5.29	117-132 (123)	4.85
Interorbital, least bony width	110	99-122 (112)	4.62	103-118 (112)	5.58
Preorbital width	34	29-39 (35)	2.51	32-37 (35)	1.98
Postorbital length	94	88-111 (99)	4.26	93-107 (100)	5.31
Snout length	71	65-82 (73)	4.03	70-75 (72)	1.77
Orbit length	78	61-86 (77)	4.95	68-87 (78)	6.18
Mouth width	74	70-108 (85)	9.01	77-88 (83)	4.00
Mandible length	60	50-75 (64)	5.69	64-75 (69)	3.55
Dorsal fin, basal length	199	174-221 (200)	10.87	153-172 (162)	7.41
Depressed length	284	247-325 (289)	16.05	221-240 (232)	7.18
Anal fin, basal length	73	59-83 (71)	4.96	64-85 (73)	8.07
Depressed length	140	126-157 (143)	7.15	141-153 (149)	4.79
Middle caudal rays, length	174	163-199 (177)	7.70	167-187 (177)	6.43
Pectoral length	158	149-182 (166)	8.22	149-174 (163)	9.03
Pelvic length	131	119-149 (137)	6.59	123-132 (128)	3.09
Upper jaw length	39	30-48 (38)	4.62	42-50 (46)	3.13
Opercle length	74	71-99 (82)	5.35	75-91 (83)	6.06

Description.—Form and coloration of mature adults as in Figs. 30-31, proportional measurements given in Table 43. Fin rays: dorsal 14(6), 15(30), 16*(22), 17(2); anal 11(5), 12*(33), 13(20), 14(2); pectoral 13(1), 14*(12), 15*(74), 16(33); pelvic 5(2), 6*(118); caudal 18(3), 19(4), 20(16), 21(22), 22*(9), 23(5), 24(1). Scales: in lateral series 45(1), 46(1), 48(2), 49(2), 50(5), 51(8), 52(6), 53(8), 54(10), 55(9), 56*(3), 58(3), 59(1), 61(1); between dorsal and anal 20(2), 21(14), 22(14), 23(14), 24*(12), 25(4); predorsal 31(2), 32(7), 33(12), 34*(13), 35(12), 36(5), 37(8), 38(1); around caudal peduncle 21(2), 22(13), 23(23), 24*(15), 25(7); around body 40(1), 41(1), 42(7), 43(8), 44(11), 45*(18), 46(6), 47(6), 48(1), 49(1). Total vertebrae: 36(1), 37*(23), 38(22), 39(8); six specimens with double neural spine on penultimate vertebra (perhaps indicating fusion of two vertebrae) not included in counts. Precaudal vertebrae: 17(2), 18(31), 19*(20), 20(1); caudal 18*(5), 19(29), 20(18), 21(2). Gill rakers 30(2), 31(4), 32(3), 33(4), 34*(6), 35(8), 36(6), 37(6), 38(9), 39(4), 40(2), 41(3), 42(1), 43(1), 46(1). Head pores: mandibular 1(1), 2(1), 3*(117), 4(1); preopercular 6(3), 7*(113), 8(4); lacrimal 3(2), 4*(118).

Outer row of large bifid teeth, ca. 20 in upper jaw (both sides), the same in lower jaw. Inner rows of small conical and bifid teeth in upper and lower jaws.

Dimorphism and coloration.—Sexual dimorphism marked in some proportional measurements. Males with greater dorsal fin length (basal, depressed). Predorsal length, prepelvic length and anal origin to caudal base length greater in females. In ethyl alcohol: males with subterminal band in dorsal and caudal fins and some black flecks in dorsal and caudal fins. Black flecks along sides of body in some. Females with subterminal black margins in dorsal, anal and caudal fins. Variable number (five to 10) of short black bars along sides of body.

Habitat.—The river is turbid. The bottom consists of gravel and boulders. The current is slight. There is no aquatic vegetation in this section of the Armería.

Associates.—Characidae: Astyanax fasciatus; Catostomidae:

Moxostoma mascotae; *Poeciliidae*: *Poecilia butleri*.

Etymology.—This subspecies is named for its variable mouth width.

Ilyodon xantusi (Hubbs and Turner)

Fig. 23

Characodon furcidens.—Jordan and Gilbert, 1882a:354-355; and 1882b: 371 (type specimens of *I. xantusi* included in the two cotype series of *C. furcidens*, but apparently not used in type description.

Balsadichthys xantusi.—Turner, 1937: 496, 505 (merely mentioned as not studied); Hubbs and Turner, 1939:63-67, Pl. 4, Fig. 3 (original description; Río Colima basin).

Diagnosis.—A species of *Ilyodon* with wide mouth (80-143, in thousandths of SL), deep caudal peduncle (109-137, in thousandths of SL), 30-52 gill rakers (90% with 34 or more), 30-45 teeth, each jaw, inner rows of teeth usually obsolete (rarely with few small bifid teeth) and 43-54 scales in lateral series (90% with 50 or less). Head bulky, mouth almost strictly transverse (Fig. 23). In many populations, males with bright yellow streaks in dorsal and caudal fins. Populations in the Río Coalcomán with narrowest mouths and fewest gill rakers.

Range.—Lower Armería and lower Coahuayana drainages (including Río Terrero, Río Salado), Río Coalcomán, Río de Chacala, Colima, Jalisco and Michoacán.

Comparisons.—More gill rakers and teeth, wider mouth, longer upper jaw and mandible and larger scales than *I. furcidens* and *I. whitei*. Teeth of inner jaw usually obsolete, unlike *I. furcidens*.

Ilyodon xantusi xantusi

Figs. 32-33; Table 44

Material.—Counts and measurements based on UMMZ 189594, 25 males, 15 females, coll. by R. R. Miller and J. M. Fitzsimons, 24 Feb 1970; Río de Comala just above and below second bridge S of Comala, ca. 8 km N of Colima, Colima, México. Original description by Hubbs and Turner (1939).

Diagnosis.—A subspecies of *Ilyodon xantusi* with wide mouth (80-139, in thousandths of SL), long mandible (70-101, in thousandths of SL),

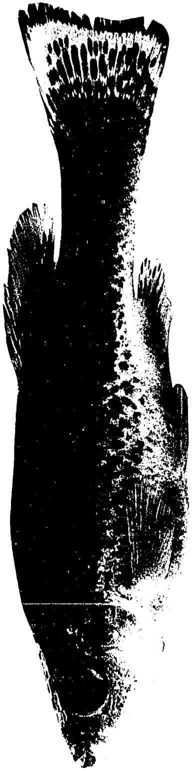


Fig. 32. *Ilyodon xantusi xantusi*. Male, 58.0 mm SL (UMMZ 189594).

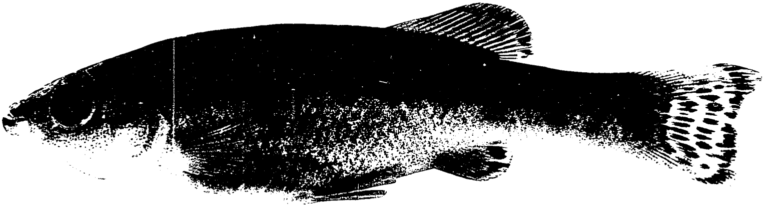


Fig. 33. Ilyodon xantusi xantusi. Female, 58.0 mm SL (UMMZ 189594).

Table 44. Proportional measurements, in thousandths of standard length, of *Ilyodon xantusi xantusi* (Based on UMMZ 189594). Means in parentheses.

Measurement	25 Males	SD	6 Females	SD
Standard length, mm	42.3-70.4 (53.3)	7.54	31.9-78.6 (54.9)	16.46
Predorsal length	573-618 (588)	10.45	590-629 (616)	13.80
Prepelvic length	461-529 (498)	15.29	480-505 (489)	10.39
Anal origin to caudal base	287-371 (356)	16.11	345-375 (363)	10.13
Body, greatest depth	269-323 (296)	13.97	271-297 (287)	11.13
Width	137-175 (158)	8.32	159-171 (165)	4.52
Head, length	255-289 (269)	10.81	233-285 (259)	18.03
Depth	158-199 (179)	12.49	149-172 (161)	7.65
Width	169-193 (180)	6.42	160-176 (171)	6.05
Caudal peduncle, length	273-298 (286)	7.56	255-289 (279)	12.31
Least depth	118-137 (126)	4.30	113-135 (123)	7.40
Interorbital, least bony width	118-141 (128)	5.27	120-129 (123)	3.87
Preorbital width	30-43 (36)	3.09	33-37 (35)	1.29
Postorbital length	101-111 (107)	2.85	97-110 (105)	5.11
Snout length	84-101 (92)	5.41	81-91 (87)	4.13
Orbit length	72-92 (82)	5.88	66-97 (80)	10.52
Mouth width	99-139 (119)	10.69	99-122 (110)	9.03
Mandible length	73-101 (87)	7.53	81-96 (90)	5.21
Dorsal fin, basal length	162-226 (195)	15.02	141-175 (156)	11.95
Depressed length	267-345 (300)	18.32	226-249 (235)	8.53
Anal fin, basal length	65-84 (72)	5.29	77-89 (84)	4.82
Depressed length	136-164 (149)	7.58	144-163 (149)	7.08
Middle caudal rays, length	164-203 (181)	10.81	163-197 (177)	12.79
Pectoral length	161-193 (176)	8.23	142-169 (157)	8.96
Pelvic length	133-158 (142)	5.71	121-135 (128)	4.48
Upper jaw length	42-73 (57)	7.94	52-63 (58)	3.77
Opercle length	82-101 (91)	4.04	81-97 (90)	5.85

and upper jaw (34-73, in thousandths of SL), deep body (264-349, in thousandths of SL), 43-54 lateral scales (60% with 47 or less) and ca. 40 teeth in each jaw. Males with bright yellow streaks in dorsal and caudal fins.

Range.—Lower Armería and lower Coahuayana drainages (Río Salado), Río Coalcomán, Río de Chacala, Colima, Jalisco and Michoacán.

Description.—Form and coloration of mature adults as in Figs. 32-33, proportional measurements given in Table 44. Fin rays: dorsal 14(6), 15(19), 16(12), 17(3); anal 10(1), 11(9), 12(24), 13(6); pectoral 15(13), 16(56), 17(11); pelvic 5(3), 6(76), 7(1); caudal 19(2), 20(6), 21(12), 22(12), 23(7), 24(1). Scales: in lateral series 43(4), 44(4), 45(6), 46(5), 47(8), 48(5), 49(2), 50(3), 51(1), 52(1), 54(1); between dorsal and anal 18(1), 19(8), 20(25), 21(5), 22(1); predorsal 28(2), 30(9), 31(12), 32(9), 33(3), 34(4), 36(1); around caudal peduncle 19(2), 20(8), 21(18), 22(10), 23(2); around body 38(4), 39(3), 40(6), 41(8), 42(12), 43(5), 44(2). Total vertebrae: 36(3), 37(23), 38(9), 39(1); four specimens with double neural spine on penultimate vertebra (perhaps indicating fusion of two vertebrae) not included in counts. Precaudal vertebrae: 17(1), 18(29), 19(6); caudal: 18(3), 19(27), 20(6). Gill rakers 35(2), 36(1), 37(5), 38(3), 39(3), 40(4), 41(2), 42(3), 43(3), 44(2), 45(3), 46(3), 47(4), 51(1), 52(1). Head pores: mandibular 3(80); preopercular 7(80); lacrimal 4(79), 5(1).

Single outer row of large bifid teeth, ca. 40 in upper jaw (both sides), the same in lower jaw.

Dimorphism and coloration.—Sexual dimorphism marked in some proportional measurements. Dorsal (basal, depressed), pectoral and pelvic fins longer in male. Head length and depth greater in male. Predorsal length and anal fin length (basal) greater in female. A detailed description of color pattern given in Hubbs and Turner (1939). Live coloration: both sexes with lateral black stripe. Courting males with bright yellow streaks in dorsal and caudal fins. Black pigmentation more pronounced in courting fish. Males with black terminal margin in caudal fin; some with black terminal margin in dorsal fin; black flecks in dorsal and caudal fins. Females with little or no yellow coloration; black subterminal band in dorsal and anal fins.

Habitat.—Same as that for I. furcidens furcidens.

Associates.—Goodeidae: Ilyodon furcidens furcidens, Allodontichthys zonistius; Gobiidae: Sicydium multipunctatum.

Ilyodon xantusi latos n. subsp.

Figs. 23, 34-35; Table 45

Types.—Holotype (UMMZ 203255), mature male 62.1 mm SL; coll. by R. R. Miller, F. H. Miller and D. I. Kingston, 18 Feb 1976; Río Terrero, at road crossing 0.8 km W of 21 de Noviembre, which is on Hwy 110 15.8 km N of Pihuamo, Jalisco, México. Allotype (UMMZ 203256), adult female, 56.0 mm SL and 107 paratopotypes (UMMZ 198840), 34-66 mm SL including four cleared and stained (three males, one female) taken with holotype; 348 juvenile to adult paratopotypes (UMMZ 172154), 15-78 mm SL; 286 juvenile to adult paratopotypes (UMMZ 189600), 17-66 mm SL; 148 juvenile to adult paratopotypes (UMMZ 191680), 13-62 mm SL; 56 juvenile to adult paratopotypes (UMMZ 202431), 19-68 mm SL.

Diagnosis.—A subspecies of Ilyodon xantusi with extremely broad mouth (117-143, in thousandths of SL), long mandible (83-103, in thousandths of SL) and upper jaw (50-77, in thousandths of SL), slender body (258-296, in thousandths of SL), 45-53 lateral scales (80% with more than 47) and 40-50 teeth in each jaw. No yellow pigmentation in either sex. Chromosomally polymorphic.

Range.—Lower Coahuayana drainage (Río Terrero), Jalisco.

Description.—Form and coloration of mature adults as in Figs. 34-35, proportional measurements given in Table 45. Fin rays: dorsal 15*(15), 16(24), 17(1); anal 11*(23), 12(17); pectoral 14(2), 15(42), 16*(34), 17(2); pelvic 5(2), 6*(78); caudal 17(1), 18(4), 19(13), 20*(13), 21(8), 22(1). Scales: in lateral series 45(2), 46(4), 47*(2), 48(10), 49(6), 50(11), 51(2), 52(1), 53(2); between dorsal and anal 18(2), 19(16), 20(18), 21*(3), 22(1); predorsal 29(1), 30(11), 31*(11), 32(10), 33(5), 34(1), 36(1); around caudal peduncle

Fig. 34. *Ilyodon xantusi latos* n. subsp. Male holotype, UMMZ 203255, 62.1 mm SL.

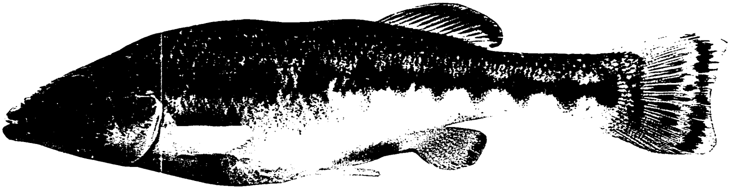


Fig. 35. *Ilyodon xantusi latos* n. subsp. Female allotype, UMMZ 203256, 56.0 mm SL.

Table 45. Proportional measurements, in thousandths of standard length, of _Ilyodon xantusi latos_ (Based on UMMZ 198840, 203255 holotype, 203256 allotype). Means in parentheses.

Measurement	Holotype ♂	25 Males	SD	6 Females	SD
Standard length, mm	62.1	38.9-62.1 (51.6)	5.56	41.9-63.0 (54.7)	7.37
Predorsal length	565	565-591 (577)	6.65	605-616 (610)	5.05
Prepelvic length	481	481-514 (500)	9.51	491-511 (500)	8.71
Anal origin to caudal base	373	353-381 (367)	6.29	341-365 (357)	8.87
Body, greatest depth	288	258-296 (279)	10.55	273-282 (278)	3.76
Width	163	139-167 (153)	7.60	155-170 (161)	5.48
Head, length	267	257-279 (271)	5.94	255-282 (266)	8.76
Depth	174	162-194 (175)	7.90	160-174 (166)	5.38
Width	180	174-190 (180)	4.88	171-186 (177)	5.11
Caudal peduncle, length	301	280-309 (292)	6.74	266-293 (282)	10.40
Least depth	116	104-126 (115)	5.62	118-126 (122)	3.75
Interorbital, least bony width	129	119-136 (128)	4.09	124-131 (127)	2.53
Preorbital width	35	31-38 (35)	1.85	29-37 (34)	2.61
Postorbital length	105	97-112 (106)	3.85	100-107 (104)	2.55
Snout length	95	85-101 (94)	4.08	88-96 (93)	2.97
Orbit length	77	75-88 (81)	3.42	71-83 (78)	4.38
Mouth width	135	117-143 (131)	6.84	126-143 (135)	6.14
Mandible length	103	83-103 (90)	5.28	93-100 (98)	2.47
Dorsal fin, basal length	222	193-231 (208)	9.32	156-172 (165)	5.39
Depressed length	338	289-343 (312)	13.60	231-255 (242)	8.41
Anal fin, basal length	66	59-77 (69)	4.54	67-77(73)	3.90
Depressed length	150	129-157 (144)	7.01	133-145 (139)	5.52
Middle caudal rays, length	201	162-201 (187)	8.23	175-203 (184)	9.91
Pectoral length	183	172-201 (184)	7.33	157-174 (163)	6.48
Pelvic length	143	129-150 (141)	5.19	123-138 (129)	6.20
Upper jaw length	68	50-77 (64)	7.06	67-75 (71)	2.99
Opercle length	87	78-98 (87)	4.60	81-86 (84)	1.81

20(1), 21*(23), 22(9), 23(7); around body 37(1), 38(7), 39(7), 40(11), 41*(5), 42(4), 43(4), 44(1). Total vertebrae: 36*(2), 37(22), 38(11); five specimens with double neural spine on penultimate vertebra (perhaps indicating fusion of two vertebrae) not included in counts. Precaudal vertebrae: 17*(6), 18(28), 19(1); caudal: 18(1), 19*(19), 20(15). Gill rakers 34(1), 37(3), 38(2), 39(7), 40(7), 41*(4), 42(6), 43(2), 44(3), 45(1), 46(1), 47(2), 49(1). Head pores: mandibular 3*(80); preopercular 7*(79), 8(1); lacrimal 3(1), 4*(78), 5(1).

Outer row of large bifid teeth, ca. 38-50 in upper jaw (both sides), the same in lower jaw. In some, small irregularly placed conical teeth in upper jaw.

Dimorphism and coloration.—Sexual dimorphism marked in some proportional measurements. Dorsal (basal, depressed), pectoral and pelvic fins longer in males. Caudal peduncle length and anal origin to caudal base length greater in males. Predorsal length greater in females. Live coloration: females with lateral black stripe extending from eye to caudal base, black subterminal band in dorsal and anal fins. Black speckling in caudal fin, some with black subterminal bar in caudal fin. Males with black lateral stripe, small light flecks in caudal, dorsal and anal fins. None observed with black band in caudal fin. In ethyl alcohol: males with large black spots especially concentrated in lateral band, forming a black lateral stripe. Males with black flecks in dorsal, anal and caudal fins, some with faint terminal black band in caudal fin. Females with variable number (four to 12) of black bars along sides of body, the bars of variable length. Some females with black flecks laterally, forming a stripe. Females with black subterminal band in caudal, dorsal and anal fins and some black flecks in caudal fin.

Habitat.—In the dry season the Río Terrero is clear with a slight current. The bottom consists of rocks, boulders, gravel and silt. Green algae growing on rocks is the only aquatic vegetation. The bottom is covered with fallen leaves. The river is well shaded.

Associates.—Cyprinidae: *Algansea aphanea*; Goodeidae: *Ilyodon*

furcidens furcidens, *Allodontichthys tamazulae*, an undescribed genus and species (See Uyeno and Miller, 1972).
Etymology.—This subspecies is named for its broad mouth.

Ilyodon whitei (Meek)

Table 46

Goodea whitei.—Meek, 1904:xlvi, lv, 137-138, Fig. 40 (original description; Cuautla; Yautepec). Regan, 1907:90, 92 (*Goodea whitii*; description). Eigenmann, 1910:458-459 (listed).
Balsadichthys whitei.—Hubbs, 1926:19 (listed). Jordan, Evermann and Clark, 1930:183 (listed). Turner, 1933b:218, 236-241, Pl. 1, Fig. 9, and Pl. 3, Fig. 13 (viviparity and related structures). Ahl, 1935:107 (Tlapa, Guerrero). Turner, 1937:496, 504, 506-507, Pl. 1, Fig. 6, and Pl. 4, Figs. 22 and 23 (trophotaeniae). Hubbs and Turner, 1939:63, Pl. 3, Fig. 2 (trophotaeniae).

The diagnosis provided here is provisional as inadequate material is available to determine the taxonomic status of *Ilyodon whitei*. New collections from the Balsas drainage may require a later revision of the diagnosis and description presented here.
Diagnosis.—A species of *Ilyodon* with generally narrow mouth (79-111, in thousandths of SL), deep caudal peduncle (105-152, in thousandths of SL), 27-41 gill rakers (75% with 34 or less), 25-30 teeth, each jaw, inner rows of teeth usually obsolete (rarely with few small bifid teeth), and 45-56 scales in lateral series (80% with 49 or more).
Range.—Balsas drainage, may also include populations in the Río Arteaga, Río Aguililla and Río Aguacate, Michoacán and Morelos.
Comparisons.—Fewer teeth and gill rakers, more scales, narrower mouth and less bulky head than *I. xantusi*. Differing from *I. furcidens* in having more teeth in the outer row and teeth of inner row usually obsolete. Caudal peduncle deeper than in *I. furcidens* or *I. xantusi*.
Material.—Counts and measurements based on UMMZ 181313, 25 males, six females, coll. by R. R. Miller and R. J. Schultz, 5 March 1963;

Table 46. Proportional measurements, in thousandths of standard length, of <u>Ilyodon</u> <u>whitei</u> (Based on UMMZ 181313). Means in parentheses.

Measurement	25 Males	SD	6 Females	SD
Standard length, mm	33.3-49.8 (41.2)	5.12	34.9-48.4 (39.6)	5.62
Predorsal length	577-610 (592)	9.34	597-612 (608)	5.59
Prepelvic length	469-511 (487)	11.59	485-501 (495)	5.54
Anal origin to caudal base	347-375 (362)	7.26	363-386 (378)	8.84
Body, greatest depth	263-317 (292)	12.94	274-301 (291)	9.71
Width	137-159 (149)	6.05	132-151 (142)	8.05
Head, length	240-261 (251)	5.47	240-258 (249)	6.89
Depth	148-170 (159)	6.15	137-146 (142)	3.64
Width	161-178 (169)	4.45	163-173 (170)	3.59
Caudal peduncle, length	260-286 (274)	7.16	271-287 (279)	5.87
Least depth	119-138 (130)	3.75	128-136 (132)	2.89
Interorbital, least bony width	114-125 (120)	3.19	118-128 (123)	3.81
Preorbital width	25-37 (31)	3.10	31-33 (32)	0.96
Postorbital length	92-114 (106)	4.35	101-113 (109)	4.45
Snout length	65-76 (71)	2.84	63-76 (69)	4.48
Orbit length	74-90 (80)	4.38	74-86 (80)	4.71
Mouth width	79-89 (85)	2.59	87-90 (89)	1.36
Mandible length	58-73 (64)	2.97	66-72 (69)	2.67
Dorsal fin, basal length	167-205 (188)	10.47	151-162 (157)	4.09
Depressed length	258-311 (283)	16.64	234-247 (240)	4.63
Anal fin, basal length	70-87 (78)	4.71	79-90 (86)	4.60
Depressed length	145-163 (153)	4.66	155-159 (157)	1.82
Middle caudal rays, length	191-219 (207)	6.85	196-215 (205)	8.35
Pectoral length	168-194 (183)	6.58	175-189 (182)	4.83
Pelvic length	126-150 (140)	5.92	132-140 (137)	3.32
Upper jaw length	33-56 (40)	6.15	49-55 (51)	2.20
Opercle length	83-96 (90)	3.35	88-96 (91)	3.61

Río Nexapa ca. 32 km WSW of Izucar Matamoras on highway to Cuernavaca, Puebla-Morelos line.

Description.—Fin rays: dorsal 13(1), 14(6), 15(22), 16(2); anal 11(3), 12(27), 13(1); pectoral 14(1), 15(41), 16(20); pelvic 6(62); caudal 18(2), 19(5), 20(18), 21(6). Scales: in lateral series 45(1), 47(2), 48(4), 49(6), 50(7), 51(3), 52(4), 53(3), 55(1); between dorsal and anal 20(7), 21(12), 22(10), 24(2); predorsal 29(3), 30(2), 31(3), 32(8), 33(11), 34(3), 36(1); around caudal peduncle 21(2), 22(7), 23(13), 24(8), 25(1); around body 40(3), 41(1), 42(8), 43(9), 44(6), 45(4). Total vertebrae: 36(3), 37(16), 38(7); five specimens with double neural spine on penultimate vertebra (perhaps indicating fusion of two vertebrae) not included in counts. Precaudal vertebrae: 17(3), 18(20), 19(3); caudal: 18(2), 19(18), 20(6). Gill rakers 27(1), 28(6), 29(6), 30(3), 31(2), 32(4), 33(6), 34(2), 35(1). Head pores: mandibular 2(1), 3(61); preopercular 6(4), 7(57), 8(1); lacrimal 3(5), 4(57).

Outer row of large bifid teeth, ca. 25-30 in upper jaw (both sides), the same in lower jaw. Inner row of small bifid teeth rare.

Dimorphism and coloration.—Sexual dimorphism marked in some proportional measurements. Dorsal fin (basal, depressed) longer in males. Head depth greater in males. Predorsal length and upper jaw length greater in females. Live coloration (based on laboratory stock): courting males and some females with black terminal margin on dorsal and caudal fins. Females with black subterminal border on anal fin. Most with black lateral stripe, some males without stripe. Some males with black border on pelvic fins. In ethyl alcohol: males with subterminal black band in dorsal and caudal fins. Some with small, faint flecks in caudal fin and black terminal tips to pelvic fins. Most males and females with series of dark flecks along body forming lateral stripe. Females with faint black subterminal bar in dorsal fin.

Habitat.—In the dry season, the Río Nexapa has a slight to moderate current. The bottom consists of rocks and boulders on the riffles and mud and sand in the pools. The water is easily roiled. Dense green algae, attached and floating, and some *Potamogeton* are present. *Associates*.—Characidae: *Astyanax fasciatus*; Cyprinidae: *Hybopsis boucardi*; Poeciliidae: *Poecilia sphenops*, *Poeciliopsis balsas*; Atherinidae: *Melaniris balsanus*; Cichlidae: *Cichlasoma istlanum*.

Comparisons

Ilyodon furcidens amecae has longer predorsal and prepelvic, shorter caudal peduncle and anal origin to caudal base, more scales (lateral, predorsal) and fewer dorsal fin rays than other taxa of *Ilyodon* (Tables 40-46). It differs further from *I. xantusi* in having fewer caudal fin rays, gill rakers, teeth and caudal vertebrae, more scales (all), a slenderer caudal peduncle and shorter mandible and dorsal fin (depressed). The snout is shorter and mouth narrower than in *I. xantusi latos*. It has a slenderer body, shorter anal fin (depressed) and fewer anal fin rays than *I. xantusi xantusi*. It differs from *I. whitei* in having fewer anal fin rays and caudal fin rays and more scales (around body). It has a slenderer, thinner body and slenderer caudal peduncle than *I. whitei*. It further differs from *I. whitei* in having a longer head, mandible, upper jaw and snout, broader mouth, and shorter anal fin (basal, depressed), pectoral fin and middle caudal rays. It differs from *I. furcidens tuxpan* in having a thinner head and shorter dorsal fin (basal, depressed), fewer anal fin rays and teeth and more scales (around the caudal peduncle, around the body). It differs from *I. furcidens variabilis* and *I. furcidens furcidens* in having a slenderer body and caudal peduncle, shorter dorsal fin (basal) and anal fin (depressed), fewer anal and caudal fin rays and a wider mouth and longer upper jaw. It has longer head, snout and mandible and fewer gill rakers than *I. furcidens variabilis* and a thinner head, shorter anal fin (basal) and more scales (around the caudal peduncle) than *I. furcidens furcidens*.

Ilyodon furcidens tuxpan differs from *I. xantusi* in having more scales (dorsal to anal, lateral), fewer caudal fin rays and gill rakers and a shorter mandible (Tables 40-46). The mouth is narrower, and it has shorter upper jaw and middle caudal rays than

I. xantusi latos. The caudal peduncle is slenderer and anal fin (depressed) shorter than in *I. xantusi xantusi* and it has a longer dorsal fin (basal), and more dorsal fin rays and scales (around the caudal peduncle). It has more scales (lateral) and gill rakers than *I. whitei*. It further differs from *I. whitei* in having longer prepelvic, head, snout, mandible and dorsal fin (basal), deeper head, slenderer caudal peduncle, broader mouth and shorter middle caudal rays and anal fin (depressed) and pectoral fins. It has longer prepelvic and upper jaw, a wider mouth, a slenderer caudal peduncle and more teeth than *I. furcidens variabilis* and *I. furcidens furcidens*. Compared to *I. furcidens variabilis*, it has fewer anal and caudal fin rays, fewer scales (dorsal to anal, predorsal, around the caudal peduncle) and longer head, snout and mandible. Compared to *I. furcidens furcidens*, it has fewer pectoral and caudal fin rays and fewer scales (around the body). It has longer caudal peduncle and anal origin to caudal base, a shorter predorsal, more dorsal fin rays and caudal vertebrae and fewer scales than *I. furcidens amecae*. Males have longer dorsal fins (basal, depressed) than other subspecies of *I. furcidens*.

Ilyodon furcidens variabilis has shorter head, snout, mandible and upper jaw, a narrower mouth and interorbital and deeper body than *I. furcidens amecae*, *I. furcidens tuxpan* or *I. xantusi* (Tables 40-46). It differs further from *I. xantusi* in having a slenderer head, fewer teeth and gill rakers and more anal fin rays and scales (all). Compared to *I. xantusi xantusi*, it has a shorter prepelvic. It has a shorter dorsal fin (depressed) and more caudal fin rays than *I. xantusi latos*. Compared to *I. whitei*, it has more scales (lateral, between dorsal and anal, predorsal, around the body) and gill rakers, deeper, wider body, shorter head, middle caudal rays and pectoral fins and longer caudal peduncle and dorsal fin (depressed). *Ilyodon furcidens variabilis* has a slenderer head, more gill rakers and scales (lateral, dorsal to anal, around the caudal peduncle, around the body) than *I. furcidens furcidens*. It has a shorter prepelvic, deeper caudal peduncle and more anal and caudal fin rays than *I. furcidens amecae* or *I. furcidens tuxpan*.

It further differs from I. furcidens tuxpan in having a shorter dorsal fin (basal, depressed). Compared to I. furcidens amecae, it has longer dorsal fin (basal), anal fin (depressed), caudal peduncle, anal origin to caudal base, a shorter predorsal, more dorsal fin rays and gill rakers and fewer scales (lateral, predorsal).

Ilyodon xantusi latos has a wider mouth than other subspecies of Ilyodon (Tables 40-46). It has longer snout, mandible and upper jaw, more teeth, fewer anal fin rays and fewer scales (dorsal to anal, around the body) than I. furcidens furcidens and I. f. variabilis. Males have longer dorsal fins (depressed). Compared to I. furcidens variabilis, it has a longer, deeper and wider head, wider interorbital, slenderer body and fewer scales (all). It differs from I. furcidens tuxpan in having longer mandible, upper jaw and middle caudal rays, a shorter dorsal fin (basal), more gill rakers and fewer scales (lateral, dorsal to anal, predorsal). Compared to I. furcidens amecae, it has a longer and deeper caudal peduncle, a deeper head, and longer snout, mandible, anal origin to caudal base and dorsal fin (basal, depressed), a shorter predorsal, fewer scales (all) and more dorsal fin rays and teeth. Compared to I. xantusi xantusi, it has a longer dorsal fin (basal, depressed), a slenderer body and lacks bright yellow coloration in the dorsal and caudal fins. It has more dorsal fin rays and gill rakers, fewer scales (between dorsal and anal, predorsal, around the caudal peduncle, around the body), slenderer body and caudal peduncle, wider mouth, shorter middle caudal rays, longer snout, mandible and upper jaw and a longer, deeper head than I. whitei.

Ilyodon whitei appears to have fewer teeth and gill rakers, a narrower mouth and more scales than I. xantusi. It differs from I. furcidens in that it generally lacks teeth in the inner jaw and tends towards more teeth in the outer row. It has a deeper caudal peduncle.

SUMMARY

Behavioral Study

Description of goodeid behaviors.—The courtship of the Goodeidae includes introductory, headflick, quiver, zig zag dance, headwag and displacement behaviors. Orient, Follow, Parallel Swim, Frontal Wheeling and Lead are introductory behaviors, commonly performed at the beginning of a courtship sequence. Headflick behaviors are performed by males from side, frontal, lead or oblique positions. They usually precede quiver behaviors and follow introductory behaviors. Headflicks are erratic undulations of the male's body with the dorsal, anal and caudal fins held relaxed and partly folded. Quiver displays, performed by males, are done in the same four positions as the headflick behaviors and generally follow them. The male's body quivers in small amplitude, rapid, regularly-spaced undulations with the dorsal, anal, caudal and pelvic fins generally held erect. In the Zig Zag Dance, a male swims back and forth in front of the female. The dance is often accompanied by headflicking or quivering. Copulation attempts generally follow quiver behaviors. Sperm are probably transferred when both male and female are clasped and quivering synchronously. Fertilization is internal. Headwag behavior, performed by females, consists of large amplitude, relatively slow undulations, primarily of the head region. It appears to signal female sexual receptivity. Displacement behaviors, "irrelevant" to the context of courtship, are infrequent during active bouts of courting. They include Feeding, Sigmoid, Scraping, Biting, Circling and Chase and are performed by both sexes.

Aggressive behavior is commonly observed between conspecific males of the same size, rarely between females or males and females. During aggressive displays, the color of the males intensifies and a vertical black bar forms through each eye. Defeated fish or fish involved in prolonged displays may develop completely blackened eyes. Aggressive fish Tailbeat by erecting fins and snapping their bodies in slow "S" undulations. They also circle and bite. In two species, *Allotoca dugesi* and *Alloophorus robustus*, jaw tugging occurs.

Similarities in courtship behaviors.—Most goodeids appear to share the same courtship behaviors, contrary to what was previously thought (Fitzsimons, 1970, 1972; Nelson, 1975). Failure to observe certain behaviors for some species resulted from the small number of adult pairs available for study, seasonal fluctuations in the availability of courting pairs and lack of control over the "readiness" of both members of a pair to court. But despite these problems, species representing six genera have been observed to share the same courtship behaviors. They are: *Ameca splendens*, *Chapalichthys pardalis*, *Goodea atripinnis*, *Ilyodon furcidens furcidens*, *Ilyodon furcidens amecae*, *Skiffia lermae*, *Xenotoca eiseni* and *Xenotoca variata*. Additional observations may add other species to this list.

Differences in courtship behaviors.—Some differences among species appear real. The two species of the genus *Girardinichthys* have the simplest courtship, consisting of following, sidling and copulation. The two species of the genus *Allotoca* show a unique behavior, Lunge and Retreat, in addition to most or all of the courting behaviors of other goodeids. The Lunge and Retreat behavior is done in front of, alongside or behind the female. Generally the male darts towards the female then backs up slowly, tail down. Other modifications of courtship include: the apparent replacement of headwag behavior by quiver behavior in sexually receptive females of *Skiffia bilineata* and *Skiffia francesae*; nuzzling of females by males of *S. francesae* and *Skiffia multipunctata*; modified headflick behaviors in *Skiffia lermae*; rolling in *Zoogoneticus quitzeoensis* and modified headflick behavior in two species of *Allotoca*, *Characodon lateralis* and an undescribed species from the Ameca drainage.

Individual variation in courting behavior.—Individual males varied from day to day in the behaviors they performed and their frequencies and sequences. Females varied in the number and frequency of headwags they performed each day even when placed with the same male.

Different pairs of fishes of the same species differed in the frequency and behaviors observed in a given period of time. There are no obvious controls for individual variation in activity, making quantitative comparisons among species difficult for taxonomic inferences.

Comparisons of sequence data.—Taxonomic comparisons based on sequence data appear to be difficult if not impossible. Laboratory-derived data are not comparable to field data because only one pair of fish is permitted to interact. Long uninterrupted sequences of courting behaviors are obtained by this method, but field observations indicate that there are virtually no instances where only one pair of fish interacts. Individuals also differ in the number of courting behaviors they perform per unit time and the intensity with which these behaviors are performed. Further, populations containing fewer courting fish may generate more sequence data than populations in which most individuals are courting. The greater the number of courting males, the greater the likelihood that the courtship of any one female is interrupted by male-male interactions and the shorter the behavioral sequence observed. This variation in courting activity among populations observed at the same time of year is reflected in the field-derived sequence matrices.

Communication between males and females.—Most sequence matrices indicated that female behavior was not independent of male behavior. Two exceptional cases were populations in which few females headwagged. In one of these populations, virtually all the females were pregnant. Females of *Ilyodon furcidens furcidens* did not appear to respond to the same male behaviors consistently. Females of other species responded to different male behaviors, but in light of the findings for *I. furcidens furcidens*, these differences may not be valid for taxonomic comparisons.

Reproductive biology.—All goodeids are viviparous. Females do not store sperm and do not have superfetation. Females nourish the developing young from 30 to 90 days. Some species produce sequential broods.

The headwag behavior of females attracts males and may increase the probability that a male will court and thus the probability that the eggs will be fertilized. In *Skiffia lermae*, females appear to choose among available males.

Males compete aggressively for females. Larger males displace smaller ones, but males of the same size will tailbeat, circle and bite. Fighting males are brightly colored. Females are nearly always courted by males their own size. They do not copulate with every male that courts them. Goodeid courting behavior may also facilitate mating.

Males occasionally court pregnant females, especially in populations in which most of the females are pregnant. As females do not store sperm, this effort by the male would appear to be wasted. Headwagging females were sometimes seen in populations containing few if any courting males. Pregnant females occasionally headwag, perhaps to ward off aggression by the males.

Cues used in mate selection.—Preliminary studies suggest that visual cues may be most important in mate selection. An actively courting pair of *Ilyodon furcidens tuxpan* did not produce any sounds during courtship. Auditory cues are apparently not used by this fish. The responses of *Skiffia francesae* males suggest that if pheromones are released by females during some phases of the reproductive cycle, they fail to produce consistent responses in the males. Instead of detecting pheromones, "nuzzling" behavior by these males may act to stimulate the females to copulate. Experiments with *Allodontichthys tamazulae* indicate that this species can identify conspecifics from other sympatric species by visual cues alone. In choice experiments, the test fish spent greater than 80% of their time with the conspecific partner. All aggressive and courting behaviors were directed to the conspecific fish. These experiments need to be repeated for other goodeid species to determine if the results are generally applicable. In turbid water, auditory, chemical and/or tactile cues may be important.

Morphological Study of the Genus Ilyodon

Sexual dimorphism.—Each proportional measurement is sexually dimorphic in at least two populations of Ilyodon. The lengths of the dorsal fin (basal, depressed), pelvic fin and predorsal differ in most populations. Coloration is especially different in courting fishes. However, meristic data generally do not differ between the sexes.

Ecophenotypic variation.—The building of a dam across the Río Cupatitzio in the Balsas drainage isolated a population of Ilyodon whitei in a reservoir. Principal Components Analysis revealed that the population in the reservoir differed from the riverine population. Characters with heavy loadings on the separating axes were: dorsal fin (basal, depressed), anal fin (basal), pelvic fin, upper jaw, snout, orbit and postorbital lengths, caudal peduncle and body depths, scales around the body, gill rakers and caudal fin rays.

When laboratory stock was compared to field caught Ilyodon whitei, two separate clusters formed. Characters with heavy loadings on the separating axis were: postorbital, head, snout, orbit and anal fin (depressed) lengths, caudal peduncle, body and head depths and caudal fin rays. Characters with heavy loadings in both comparisons were: postorbital, snout and orbit lengths, caudal peduncle and body depths and caudal fin rays. As the reservoir habitat and aquarium habitat probably do not select for changes in the same characters, these characters most likely reflect environmental control.

Species and subspecies criteria.—Bailey et al. (1954) suggested guidelines for determining species and subspecies. These guidelines were applied to the genus Ilyodon. "Forms differing with 100 percent constancy" were treated as full species. They formed separate clusters in pairwise comparisons using Principal Components Analysis. Although Ilyodon furcidens and I. xantusi hybridize in a part of their range, there are areas of sympatry in which they apparently do not interbreed. They are treated here as two species.

Subspecies are recognized when allopatric populations differ with "high constancy from other forms", each displays "a high degree of uniformity over its range" and each "intergrades over a relatively narrow geographic area with at least one other form". Subspecies generally overlapped by one fish in pairwise comparisons.

One species, *Ilyodon whitei*, is provisionally recognized from the Balsas drainage as inadequate material is available to determine the relationships among populations in this area. Populations in the Río Aguacate and Río Arteaga represent the same taxon, but neither this group nor the population from the Río Aguililla appear morphologically similar to any other population examined. It is not clear if they should be treated as geographically variable populations of *I. whitei*.

The remaining two species, *Ilyodon xantusi* and *I. furcidens*, are better understood. *Ilyodon xantusi xantusi* is represented by populations in the Río de Comala, Arroyo Pueblo Nuevo, Río Coalcomán and Río Chiquito. *Ilyodon xantusi latos* occurs in the Río Terrero, part of the Coahuayana drainage.

Populations in the Ameca drainage are *Ilyodon furcidens amecae*. The presence of populations of *I. furcidens furcidens* that are similar to *I. furcidens amecae* in the upper Ayutla suggests that the upper Armería cut back and captured a tributary of the Ameca system. The Río la Labor, the other large tributary to the Armería, contains *I. furcidens variabilis*.

Populations of *I. furcidens furcidens* vary geographically. With the exception of *I. furcidens variabilis*, populations in the upper Armería are similar morphologically and differ slightly from populations of *I. furcidens furcidens* in the lower Coahuayana and Armería drainages. Barrier falls along the Armería may limit gene flow and contribute to the maintenance of these geographic differences.

Ilyodon furcidens tuxpan, a chromosomally polymorphic subspecies, occurs in the Río Tuxpan, part of the Coahuayana drainage. The karyotypic divergence in *I. furcidens tuxpan* may reflect genetic responses to increasing pollution.

Extreme variation is found for some characters in populations of *I. furcidens* and *I. xantusi* in the Río Salado and Río

Colima. These characters are: head, orbit and pelvic lengths and caudal peduncle and body depths. Most of these characters show ecophenotypic influence as suggested by studies on *I. whitei*. When their effects are removed from the analysis, two clusters corresponding to *I. furcidens* and *I. xantusi* are formed.

Populations in the Río Salado and Río Colima appear to contain occasional hybrids between *I. furcidens* and *I. xantusi*. Hubbs and Turner (1939) described some of these hybrids, indicating that their measurements were intermediate between the parental species. But laboratory produced hybrids are more variable and may resemble either parent, be intermediate between them or show a mosaic of characters. It is not known if hybrids live to maturity in the field. However, laboratory stocks of *I. furcidens furcidens* derived from field caught fish produce narrow-mouthed offspring, and stocks of *I. xantusi xantusi* produce only broad-mouthed offspring. These observations suggest that hybridization is rare or hybrids are selected against in the field. Field observations indicate that in some areas, *I. furcidens* and *I. xantusi* occur sympatrically with no hybridization. They differ in feeding habits and possibly breeding seasons. Courting behavior was directed only to conspecifics.

Electrophoretic data indicate greater differences in alleles and allelic frequencies between *Ilyodon* at two localities than between the two *Ilyodon* species within each locality. Localities differ in a number of physical parameters suggesting that the allelic similarity within localites results from selective forces acting at those localities and not from panmixia within a locality.

Revision of the genus Ilyodon.—The three species, *Ilyodon furcidens*, *Ilyodon xantusi* and *Ilyodon whitei* differ primarily in mouth width, caudal peduncle depth, presence or absence of inner rows of teeth and number of gill rakers, teeth and lateral scales. *Ilyodon furcidens* has fewer gill rakers, finer scales and a narrower mouth than *I. xantusi*. It has inner rows of small bifid and conical teeth unlike *I. xantusi* or *I. whitei*. *Ilyodon xantusi* has a broad mouth and bulky head. In many populations, males have bright yellow streaks of pigment in their dorsal and caudal fins. A provisional diagnosis only of *I. whitei* is given since the material available is inadequate to determine its taxonomic status. *Ilyodon whitei* has fewer teeth and gill rakers, more scales, a narrower mouth and less bulky head than *I. xantusi*. It differs from *I. furcidens* in having more teeth in the outer row and usually no inner rows of teeth. It tends toward a deeper caudal peduncle than *I. furcidens* or *I. xantusi*.

Four new subspecies of *Ilyodon* are described. *Ilyodon furcidens furcidens* has a narrow mouth (76-104, in thousandths of SL), 25-37 gill rakers (90% with 35 or less), 38-49 scales around body (60% with 43 or more), 44-63 lateral scales (80% with 56 or less), 28-43 predorsal scales (85% with less than 38), 18-24 dorsal to anal scales (90% with 22 or less), 13-18 dorsal fin rays (90% with 15 or more) and ca. 20 teeth in each jaw. *Ilyodon furcidens amecae* n. subsp. has an intermediate mouth width (95-124, in thousandths of SL), 26-37 gill rakers (95% with 35 or less), 40-49 scales around body (85% with 43 or more), 53-64 lateral scales (90% with 56 or more), 34-44 predorsal scales (80% with 38 or more), 20-24 dorsal to anal scales (80% with 22 or less), 13-16 dorsal fin rays (90% with 15 or less) and 20-30 teeth in each jaw. *Ilyodon furcidens tuxpan* n. subsp. has an intermediate but variable mouth width (91-127, in thousandths of SL), 29-38 gill rakers (85% with less than 35), 38-47 scales around body (85% with 43 or less), 47-58 lateral scales (95% with 56 or less), 29-38 predorsal scales (99% with less than 38), 19-25 dorsal to anal scales (90% with 22 or less), 15-18 dorsal fin rays (100% with 15 or more) and 30-45 teeth in each jaw. It is chromosomally polymorphic. *Ilyodon furcidens variabilis* n. subsp. has a narrow but variable mouth width (70-108, in thousandths of SL), 30-46 gill rakers (70% with 35 or more), 40-49 scales around body (85% with 43 or more), 45-61 lateral scales (90% with 56 or less), 31-38 predorsal scales (98% with less than 38), 20-25 dorsal to anal scales (75% with 22 or more), 14-17 dorsal fin rays (90% with 15 or more) and ca. 20 teeth in each jaw. *Ilyodon xantusi xantusi* has a broad mouth (80-139, in thousandths of SL), long mandible (70-101, in thousandths of SL), and upper jaw

(34-73, in thousandths of SL), deep body (264-349, in thousandths of SL), 43-54 lateral scales (60% with 47 or less) and ca. 40 teeth in each jaw. Males have bright yellow streaks in the dorsal and caudal fins. Ilyodon xantusi latos n. subsp. has an extremely broad mouth (117-143, in thousandths of SL), long mandible (83-103, in thousandths of SL) and upper jaw (50-77, in thousandths of SL), slenderer body (258-296, in thousandths of SL), 45-53 lateral scales (80% with more than 47) and 40-50 teeth in each jaw. It has no yellow pigmentation. Ilyodon whitei has a generally narrow mouth (79-111, in thousandths of SL), deep caudal peduncle (105-152, in thousandths of SL), 27-41 gill rakers (75% with 34 or less), 25-30 teeth in each jaw, inner rows of teeth usually obsolete, and 45-56 scales in the lateral series (80% with 49 or more).

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BEHAVIORAL AND MORPHOLOGICAL STUDIES OF THE GOODEID GENUS ILYODON, AND COMPARATIVE BEHAVIOR OF FISHES OF THE FAMILY GOODEIDAE

VOLUME II

by

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APPENDICES

- A. Care and Maintenance of Goodeid Stocks
- B. Observations on Ten Goodeid Habitats
- C. Data for Morphological Study of the Genus Ilyodon
- D. Descriptive Statistics for Populations of the Genus Ilyodon

APPENDIX A

CARE AND MAINTENANCE OF GOODEID STOCKS

Most goodeid species are aggressive. Stock aquaria should be large with abundant cover. In crowded aquaria, aeration is necessary. All but Girardinichthys multiradiatus reproduced when placed in a 12-hour light-dark cycle and fed Purina trout chow supplemented by newly hatched brine shrimp and Daphnia. Removing the largest fish when thinning stocks eliminates older fish which have reduced reproduction. Larger fish also eat newborn young and large males tend to kill developing males and smaller ones. In captivity, different species live from barely one year to three or more years.

Pregnant females should be isolated early in their pregnancy and placed in brood traps with lids. The shock of moving near-term pregnant females may result in stillborn young, deformed young or a weak premature brood. Vegetation added to the brood trap enhances survivorship of the young as it interferes with the female's attempts to eat them. Where females repeatedly abort young when moved (i.e. Neoophorus catarinae), it is necessary to remove all but the pregnant female from the aquarium, add abundant cover and rescue the young at birth. Females after parturition are weak and should be kept isolated for several days. Males may otherwise kill them. A female's first brood is often small.

Young should be watched closely as unequal growth can result in loss of greater than 50% of the brood. The larger young harrass the smaller ones. In the laboratory, most goodeid species can reproduce more than once a year. Individual females of some species produce two or more sequential broods, and most stocks contain pregnant females throughout the year (Table 47). Diet may be important in determining whether sequential broods are produced. Alloophorus robustus females produce one brood a year unless placed on a fish diet. Table 48 gives brood records based on laboratory stocks of 37 populations of goodeids.

Table 47. Months for which broods of goodeids were recorded in the laboratory. Blanks indicate no broods were recorded for that month.

Species	Months for which broods recorded											
	1	2	3	4	5	6	7	8	9	10	11	12
Allodontichthys sp.	x	x			x	x	x				x	x
Allodontichthys tamazulae	x		x		x	x	x	x	x			x
Alloophorus robustus			x		x	x	x			x		
Allotoca sp.			x	x	x	x	x	x	x	x	x	x
Allotoca dugesi						x	x		x	x	x	x
Ameca splendens	x	x	x	x	x	x	x	x	x	x	x	x
Ataeniobius toweri	x	x	x	x	x	x	x	x	x	x	x	
Chapalichthys encaustus	x		x	x		x		x	x		x	x
Chapalichthys pardalis	x					x	x		x	x	x	
Characodon lateralis	x	x	x	x	x	x	x	x	x	x	x	x
Girardinichthys viviparus			x	x		x	x	x	x			
Goodea atripinnis	x		x			x	x	x	x	x	x	
Goodea gracilis		x		x						x		
Goodea luitpoldi		x		x								
Ilyodon furcidens amecae						x	x	x			x	
Ilyodon furcidens furcidens	x	x	x	x			x	x	x	x	x	x
Ilyodon furcidens tuxpan	x	x	x				x		x	x	x	x
Ilyodon xantusi latos											x	
Ilyodon xantusi xantusi	x	x						x		x	x	
Ilyodon whitei	x	x	x	x	x		x	x		x	x	x
Neoophorus catarinae		x	x					x		x	x	x
Neoophorus diazi	x		x	x				x	x		x	
Neoophorus meeki			x						x			
Skiffia bilineata	x	x	x	x		x				x	x	x
Skiffia francesae	x	x	x		x	x	x	x	x	x	x	
Skiffia lermae		x	x	x	x				x		x	
Skiffia multipunctata		x	x		x	x			x	x	x	x

Table 47. continued...

Species	Months for which broods recorded											
	1	2	3	4	5	6	7	8	9	10	11	12
Xenoophorus captivus		x			x	x				x		
Xenotaenia resolanae	x	x	x	x	x	x	x		x	x	x	
Xenotoca eiseni	x		x	x	x	x	x	x	x	x	x	x
Xenotoca melanosoma			x		x		x	x		x	x	
Xenotoca variata	x	x	x	x	x	x	x	x	x	x	x	x
Zoogoneticus quitzeoensis	x	x	x	x	x	x	x		x	x	x	
Undescribed sp. Ameca drainage	x			x					x		x	x
Undescribed genus and species								x				

Table 48. Brood records of laboratory goodeid stocks. Numbers in parentheses give the number of broods recorded with the indicated number of young.

Species	Brood records
Allodontichthys sp.	1(1), 2(1), 4(3), 7(1), 11(1), 12(1), 14(1)
Allodontichthys tamazulae	5(2), 6(1), 8(1), 9(3), 10(1), 12(1), 13(1)
Alloophorus robustus	4(1), 7(1), 17(1), 29(1)
Allotoca sp.	2(1), 3(1), 4(4), 5(1), 7(3), 8(2), 9(5), 14(2), 15(1), 17(2), 20(1)
Allotoca dugesi	8(1), 10(2), 17(1), 19(1), 21(1)
Ameca splendens	2(1), 6(1), 7(1), 8(1), 9(1), 10(2), 11(1), 12(2)
Ataeniobius toweri	5(1), 6(1), 8(1), 9(1), 11(1), 12(1), 14(3), 20(1), 26(1)
Chapalichthys encaustus	8(2), 9(2), 13(1), 19(1)
Chapalichthys pardalis	12(1), 13(1)
Characodon lateralis	3(4), 4(2), 5(2), 7(3), 8(3), 9(1), 12(3), 14(1), 20(1)
Girardinichthys viviparus	1(1), 3(1), 4(1), 5(2), 8(2), 9(1), 10(1), 11(1), 25(1), 26(1)
Goodea atripinnis	8(3), 10(1), 12(1), 15(1), 21(1), 28(2), 31(1)
Goodea gracilis	6(1), 10(1), 19(1), 24(1)
Goodea luitpoldi	3(1)
Ilyodon furcidens amecae	7(3), 9(1), 10(1), 11(1), 15(1), 16(1)
Ilyodon furcidens furcidens	2(2), 4(1), 6(2), 7(1), 8(2), 9(3), 10(2), 12(1), 16(1), 20(1), 22(1), 25(1)
Ilyodon furcidens tuxpan	2(1), 3(1), 4(1), 6(1), 7(2), 11(1), 17(2)
Ilyodon xantusi latos	10(1)
Ilyodon xantusi xantusi	9(1), 34(1)
Ilyodon whitei	1(1), 2(2), 6(1), 9(1), 14(1), 20(1), 21(1), 24(1), 33(1), 43(1)
Neoophorus catarinae	1(1), 3(1), 8(1), 12(1), 18(1), 34(1)
Neoophorus diazi	4(2), 5(1), 6(1), 7(2), 10(3), 11(1), 14(1), 15(1), 19(1), 22(1)
Neoophorus meeki	22(1), 27(1)
Skiffia bilineata	6(1), 9(2), 14(2), 15(1), 19(1), 21(1), 28(1), 29(1)
Skiffia francesae	5(2), 6(3), 8(1), 9(1), 12(1), 14(2), 15(1)
Skiffia lermae	1(1), 4(2), 6(1), 7(2), 9(1), 10(3)
Skiffia multipunctata	2(2), 5(1), 7(1), 9(1), 10(1), 11(2), 12(1), 14(1)

Table 48. continued...

Species	Brood records
Xenoophorus captivus	6(1), 9(1), 13(1), 14(1), 16(1), 18(1)
Xenotaenia resolanae	5(1), 7(2), 11(1), 12(1), 14(2), 15(1), 20(2), 23(1)
Xenotoca eiseni	3(1), 7(1), 11(1), 12(1), 13(1), 23(2), 28(1), 29(1), 35(1), 37(1)
Xenotoca melanosoma	7(1), 11(1), 12(1), 13(1), 21(1), 23(1)
Xenotoca variata	3(1), 5(1), 13(1), 17(1), 18(1), 21(1)
Zoogoneticus quitzeoensis	2(1), 3(1), 4(2), 5(1), 6(3), 7(1), 9(1), 10(1), 15(1)
Undescribed sp. Ameca drainage	10(1), 15(1), 16(2)
Undescribed genus and species	3(1)

APPENDIX B

OBSERVATIONS ON TEN GOODEID HABITATS

General ecological and behavioral information is given for 19 species of goodeids observed in ten localities. All but the first locality were visited in April, 1978.

Roadside Pond, San Luis Potosí

In January, 1976, underwater observations were made on Ataeniobius toweri at a spring-fed pond on the east side of the highway from Rioverde to Pedro Montoyo, 10 km south of Rioverde. The fish occur in a shallow, quiet pond, less than 1.5 m deep, at an elevation of about 1000 m. The pond contains Scirpus, water lilies, Juncus and other broad-leaved submerged vegetation. The water is clear but easily roiled. The bottom is limestone marl, flocculent silt and stones. The water temperature was 24°C, the air 21°C, and the salinity 1.2 ppt. The associates of A. toweri were Characidae: Astyanax mexicanus; Cyprinidae: Dionda dichroma, Dionda mandibularis; Cyprinodontidae: Cualac tessellatus; Cichlidae: Cichlasoma labridens and Cichlasoma bartoni. All adults of A. toweri were estimated to be 3-8 cm long. No young, no pregnant females and no courting males were observed. Males are distinguished from females by a chalky blue patch on the larger lobe of the anal fin and on the inner portion of the caudal fin. The fish generally swim along the bottom and midwater near or among the vegetation. They form loose "schools" of changing numbers which move for short distances. Solitary individuals are also seen. Ataeniobius toweri is abundant. Thirty or more occur in a cubic meter of water. There is no fighting or signs of territoriality. Feeding is on Aufwuchs growing on stems of submerged vegetation and on rocks. They do not feed on the surface. A few were afflicted with a white fungus. At night, the fish are inactive. At this time of year, the cichlids defend nests placed 15 cm to 1 m apart. Water snakes are the only obvious fish predators.

El Rincón, Teuchitlán, Jalisco

The upper, main spring has been made into a deep, concrete-walled swimming pool. It overflows into a second walled pool and then into a large swamp. The two pools have a natural rock and gravel bottom with much leaf litter. Water from the main spring is also used to fill two shallow swimming pools which are drained nightly. These two pools contain no fish. The water is clear and shallow, less than 1 m deep in the lower pools, but the source pool is about 3 m deep. Despite heavy use by bathers, especially on weekends, many species of fishes are present. In the main pool, the fish community must have largely maintained itself since the building of the concrete walls, as only the young could escape through the gratings into the lower pool and swamp, and no obvious route is available for upward migration into the source pool. Some fishes may be continuously introduced into the main pool by Mexicans. The lower pool is connected directly to the swamp. A small falls of about 15 cm hinders the movement of fishes into it from the swamp. The water temperature fluctuated from 26°C at 9 AM to 28°C in the afternoon on 3 April 1978. Air temperatures ranged from 17°C to 31°C. Most observations were made in pools 1 and 2 (Fig. 36), but some were made where the swamp ended against the retaining wall of a restaurant. The vegetation, mostly water hyacinth, is cleared from this area by Mexicans who harvest it to feed their burros. Once the deep silt and ooze are disturbed, the water in this area is too turbid for observations. There are also springs between El Rincón and the highway, but these are used for livestock and the silt bottom makes observation difficult. The springs are largely devoid of vegetation except for algae growing along rock surfaces and tree roots.

The goodeid species observed were Ameca splendens, Goodea atripinnis, Xenotoca melanosoma and Zoogoneticus quitzeoensis. Associates included Cyprinidae: Cyprinus carpio; Ictaluridae: Ictalurus dugesi; Poeciliidae: Xiphophorus maculatus, a species of Poecilia, Poeciliopsis infans; Cichlidae: Tilapia aurea; and

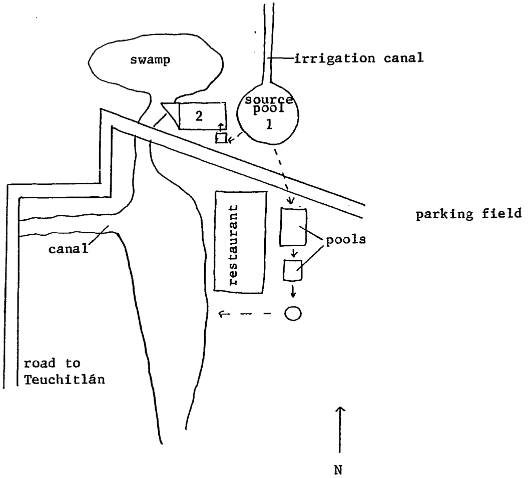

Fig. 36. Map of the springs at El Rincón, Teuchitlán, Jalisco, México.

possibly a sucker called "chompa". No specimens of the "chompa" were available for study. Orange-colored crabs are present but are said to be introduced. Fish predators include egrets, kingfishers and cranes. Other vertebrates present include small blackbirds, bats, two species of frogs (the larger is eaten), and a small mammal, possibly an opossum. Mexicans fish for carp, catfish, "chompa" and Tilapia.

None of the goodeid species at this locality schooled or exhibited territorial behavior. Few fish court at any one time. Virtually all interactions are with conspecifics and all courtship and aggressive displays are directed only to conspecifics. In a few cases, males nipped or lunged at a fish that came between them and the female they courted. Observed sex ratios are equal for all goodeid species. Most of the day, the fishes graze on Aufwuchs and algae. They gradually become more active about an hour after dawn. They are inactive at night. The fishes generally ignore bathers and extreme water agitation, continuing to feed and court. Aggressive displays involving tailbeating, circling and biting are seen only between males of the same size.

Adult and juvenile Ameca splendens are seen to swim at all levels in the main pool. They graze by pulling free individual algal filaments. They readily took insects and a white spider that landed on the water surface, coming quickly to the surface whenever anything hit it. White objects attract them which may be a learned response resulting from Mexicans throwing white tortilla scraps in the water. Goodeids readily eat tortillas. Males of Ameca splendens are dark brown dorsally with a darker gray-black lateral band and silver abdomen when viewed underwater. They have irridescent scales, especially below the rear margin of the dorsal fins. The dorsal and anal fins are gray-black with yellow borders. The caudal fin has a vivid black band and a bright terminal yellow band. Females are lighter in color. The lateral band is absent and they are speckled with black spots in the upper two-thirds of the body. Some large individuals were missing scales, probably as a result of human activity. Males interact aggressively, but females are tolerated and not attacked. Several times successful copulation involving synchronous quivering of a pair for several seconds was observed. Males rarely attempted copulation with pregnant females.

Few adults of Goodea atripinnis were actively courting although some females had black dorsal, anal and caudal fins. Black fins occur mainly in receptive females and may reinforce headwagging as a signal to males. Males never develop black fins, although fin color darkens in aggressive males. No courting males were noted. Goodea atripinnis at this locality has a broad mouth with well developed lips. They feed by forming their thick fleshy upper and lower lips into a round suction cup. The lips do not move but are attached to a surface covered by algae. The fish appear to feed by a plunger-like action which probably involves the hyoid and opercular. During part of the day, they form large stationary aggregates of several hundred fish, all facing in different directions. Aggregates reform when disturbed. Adult G. atripinnis that obtain food are not challenged by other goodeids, but they will steal food from Ameca splendens if the food is taken below the surface. Color is variable in G. atripinnis, some having a blue-gray cast, others being more tan. Body color is not correlated with sex.

Few Xenotoca melanosoma occur in the lower pool. Small adults are yellow-olive dorsally with a lighter abdomen. Large adults, greater than 15 cm total length, occur in the main pool where they generally remain on the bottom. They have gray-black backs but can be identified by their deep body and rounded heads. They are less common than A. splendens and G. atripinnis and difficult to observe. Xenotoca melanosoma also appears to graze on Aufwuchs but may take larger food items. The adults seen in the main pool undoubtably exceeded 85 mm SL which is the maximum length recorded for this species by Fitzsimons (1970), but the large size may be an artifact created by life in a man-made pool.

Zoogoneticus quitzeoensis occurs under rocky ledges or close to them. Males of this small species chase larger fish out of the way while pursuing a female. They graze on Aufwuchs. Females and courting males are a mottled gray with two black spots at the base of the caudal peduncle. Males have orange-bordered dorsal and anal fins. During aggressive bouts, males become completely black except for the bright orange borders on these fins. They may attempt copulation with a pregnant female. Pregnant females have a thin golden lateral stripe when viewed underwater. Other females have a series of golden "dashes", but males lack golden markings.

All goodeids appear to be inactive at night as revealed by flashlight. Juveniles of *Tilapia aurea* are the only schooling fish. They frighten easily, taking cover under submerged tree roots and water hyacinth.

Las Fuentes, near Teuchitlán, Jalisco

Near the road to Teuchitlán, another set of springs has been enclosed by concrete. The salinity was 0.1 ppt. As well as containing the species present at El Rincón, two pairs of *Skiffia francesae* were noted. *Xiphophorus maculatus* is rare in the springs but occurs in great numbers in the silt-bottomed shallow river. The bottoms of the springs consist of gravel, rock, mud, silt and dead leaves. The lower pool is about 1 m deep and the fish were followed on foot and observed underwater. The fish largely ignore bathers and women doing laundry. Observed sex ratios of all goodeids are equal. Fish predators include water snakes, cranes, and a small black wading bird.

Skiffia francesae, once common at this locality, has virtually vanished, perhaps as a result of competition with the introduced red platy, *X. maculatus*. The few individuals seen fed along the bottom, picking up small pebbles and chewing Aufwuchs. A male immediately began courting a passing female. He had a faintly orange-colored caudal peduncle. Recognition of the conspecific female appeared to be largely visual, as the female was swimming rapidly toward him and not quivering. When another fish separated the pair, the male could not relocate the female. The second male seen was completely pale. A detailed description of this species is given in Kingston (1978).

Zoogoneticus quitzeoensis is scarce. Small adults of Xenotoca melanosoma occur near the spring source. Two males displayed aggressively but no courting was seen. Ameca splendens is common. Small males do not show the yellow and black caudal bands seen in dominant males. They are attracted to white. Goodea atripinnis is numerous, but few courted.

El Molino, Michoacán

At El Molino, the spring is surrounded by trees, a stone fence and pasture. The salinity was 0.1 ppt and the elevation about 2210 m (Fig. 37). The water temperature varied from 18°C to 21°C, the air from 11°C to 21°C. The water is slightly milky-colored, but clear. The spring contains much rooted vegetation including Potamogeton, Lemna minor, Salvinia and Juncus. The depth of the spring varies with the operation of a water gate. The bottom consists of rocks, mud, silt, leaves and branches. A small creek flows out of the main spring and in this creek Allotoca dugesi occurs. A marsh to which trout and carp have been introduced lies about 1 km below the spring. Goodeids are abundant in the spring, especially Skiffia lermae. Insects and large leeches are common. Two species of snail, crayfish, several species of water beetles, frogs, turtles, toads, lizards, water snakes, kingfishers and many other species of birds are present. The snakes, kingfishers and probably the turtles prey upon goodeids. In the late morning when large aggregates of S. lermae lie at the surface, passing shadows caused by birds, leaves and clouds elicit a dramatic fear response. The fish dive for cover in the wake of the shadow, creating a tremendous splashing as they break the surface. On overcast or windy days, less courting occurs and S. lermae swims deeper. The fish in this spring are very wary. Children catch them in buckets and in cloth bags on poles to feed to chickens, turkeys and cats.

Skiffia lermae, the most abundant fish, was represented by all age classes, newborn to large adult. This species swims in large numbers just under the surface when the sun shines fully on the

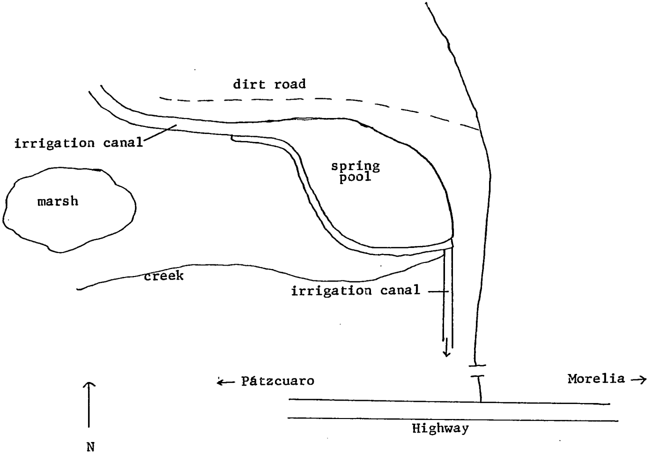

Fig. 37. Map of the springs at El Molino, Michoacán, México.

water. Young often swim in schools of three to 15 fish along the banks. They feed on Aufwuchs growing on the submerged stems of tules and on the bottom, as well as on insects taken off the surface. Two males were noted with spinal deformities. Birds and children are the major predators. Many pregnant females were present in the population in April, 1978 and in February, 1976, indicating that females produce several sequential broods a year. Many aggressive encounters occur between males of the same size. These males have black heads and orange caudal peduncles. Both brightly-colored males and pale males court females, but no successful copulations were seen. Occasionally males court females half their size. Females are often followed by several males. In a few cases, the female fled until only one male remained in pursuit. She then stopped and headwagged. Sporadic courting begins shortly after dawn but the large aggregates become most active by late morning.

Goodea luitpoldi is abundant and present as juveniles and at least two size classes of adults. The presence of size classes suggests that this species may produce one or few broods a year. *Goodea luitpoldi* generally swims from midwater to the bottom. They grow to 20 cm SL and are eaten by Mexicans who call them "tiros". During the day, they feed on Aufwuchs growing along the bottom. At dawn and dusk, fish about 10 cm long jumped for insects. They were too large for *S. lermae* or *Neoophorus diazi* and were probably *G. luitpoldi*. It is also possible, however, that the jumping fish were *Alloophorus robustus* as this species is known to occur in nearby Lake Pátzcuaro and may also occur in the spring. Some individuals of *G. luitpoldi* have an orange cast to the fins. Several females have black fins. This species also forms aggregates of stationary fish just off the bottom. One had an eye deformity, probably a tumor.

Neoophorus diazi is less common. This species is cryptically colored, blending with the bottom and hugging banks and vegetation. They are difficult to observe. Juveniles and adults, identically colored, are a mottled brown. Adults attain lengths of 8 cm. The larger ones are caught by children on a knotted string baited with a worm. Only N. diazi is caught this way. Pregnant females were present but little courtship was seen. Juveniles eat Aufwuchs off submerged tules, but this species prefers eating insects off the surface. They orient and follow low-flying insects. They do not school and, in fact, are largely solitary. They often remain motionless for long periods of time under floating debris.

No courting Allotoca dugesi adults were observed. They are caught only in the outflowing creek in a few centimeters of water. This creek is clear with a rock and pebble bottom. Algae, rooted vegetation and duckweed are present. Children helped to establish this first record of A. dugesi at this locality. I discovered them among the fishes that they were feeding to the chickens. Pregnant females were present.

Goodeid species do not interact at this locality. All observed displays were between conspecifics. Another species of fish, called "cumura" locally, is present in the spring. Several large individuals were seen from the shore, but none was caught. The fish is elongate, about 25 cm long, gray with white pelvic and pectoral fins and swims along the bottom. It may be a sucker. The local people did not know if it was native to the spring. Another fish, "chinchorros", supposedly white in coloration, is said to occur in the area but was not seen. All goodeids are inactive at night.

Lago Zirahuén, Michoacán

In February, 1976, the lake was calm and fish could be observed. Allotoca dugesi and Neoophorus meeki were caught in large numbers between the shore and a bed of tules. They were present in the rooted vegetation. In April, 1978, it was windy with white caps on the lake. Wave action and the movement of livestock disturbed the mud and silt bottom, making the water too turbid for observations. The lake level had dropped so that the area fished in 1976 was dry. Other backwater areas protected from the wind were clear but stagnant. They consisted of deep mud, algae and grass. A small creek had fish where it joined the lake but not farther upstream. Between 7 AM and 9 AM the wind died and the water was clear. Diving startled three juvenile N. meeki out of the bottom vegetation. Seining in several localities resulted in the capture of only one fish, a juvenile, spinally-deformed Chirostoma attennatum. Presumably at this time of year, goodeids seek deeper, quieter areas where they encounter less abrasion from wind and wave action. The water temperature in April, 1978 was 19°C, the air 20°C at 8:30 AM. The salinity was 0.0 ppt and the elevation about 2200 m.

Santa Catarina, Uruapan, Michoacán

This tributary to the Río Cupatitzio is stocked with trout and carp. The native goodeid, Neoophorus catarinae, is very wary, darting among rocks and seeking cover in rooted vegetation. When placed in aquaria, these fish dive and bunch together in a dense writhing ball along the bottom. Each fish appears to be trying to swim to the center of the "ball". This behavior is evidently a learned response to avoid predation. Laboratory-reared offspring do not show it. Birds flying overhead elicit no response. The water is clear and the bottom consists of rocks, mud and vegetation. The elevation is about 1730 m. More males than females were collected in February, 1976 and more males seen in April, 1978. These observations may be artifacts of collecting or a result of selective predation on females. Pregnant females would be slower and easier to catch than males. No courting was observed in April, 1978 and no pregnant females were seen or caught. No young were seen, but juveniles were present. Thunderstorms developed in the late afternoon and evening all three days spent at this locality. At these times, the fish sought cover and were not visible. The water was cool, 17 to 17.5°C, while the air temperature varied from 14°C to 24°C. The water may be too cool at this time of year for the goodeid to reproduce. The fish graze on Aufwuchs or grab mouthfuls of silt from the bottom. Water striders, although abundant, are not eaten. Only once did I observe a fish eat an insect at the surface. Males chase each other occasionally, but all fish are largely stationary, facing into the current. One fish nipped a tadpole four times its size to evict it from a crevice. Many insects, tadpoles, anoles and birds are present at this locality but no turtles, snakes or kingfishers were seen. Swimmers are largely ignored. This species is inactive at night.

Lago de Camécuaro, Michoacán

Observations in the lake cannot be made if the deep silt bottom is disturbed. Floating on an air mattress, using a face mask proved an excellent method of observing fishes without disturbing the bottom.

Many native and exotic fishes occur in the lake. Carp, Algansea tincella, a catfish, Poeciliopsis infans, Lebistes reticulatus and bass occur together with four species of goodeids: Alloophorus robustus, Goodea atripinnis, Skiffia multipunctata and Zoogoneticus quitzeoensis. The lake is crystal clear, fed by numerous springs welling up from the bottom and alongside the lake. The salinity was 0.1 ppt. The deepest section may be 10 m but fishes along the bottom can be seen and identified. The water temperature in the adjacent springs was about 19°C, reaching 25°C in pools along the margin of the lake and in a heavily polluted ditch on one side of the lake. Air temperatures ranged from 4°C at 6:30 AM to 29°C at 3:30 PM in April. The springs feeding into the lake have bottoms consisting of rocks, boulders and silt. Dense mats of green algae occur in the deep end of the lake. Green and brown algae, water hyacinth, tules and other rooted vegetation occur in the shallow, outflow region of the lake. The banks are deeply undercut and form a floating bog. Fishes and turtles take refuge under these banks. The upper, spring-fed portion of the lake is the deepest section and is surrounded by large cypress trees. Bass and turtles hover in the submerged roots of these trees. Juvenile fish are seen mostly along the shallow banks of the lake and when startled, emerge from rooted vegetation. Water beetles, crayfish, crabs, frogs, domestic ducks, kingfishers, owls, two species of water snake, lizards, rats and bats also occur in or around the lake. Large aquatic Lethocerus beetles are abundant and significant predators on goodeids, especially in the polluted ditch. They are too large for the largest fish in the ditch, Alloophorus robustus, to eat. These insects capture and feed on small fishes by injecting digestive fluids into the prey's body. Water snakes eat live and dead Skiffia multipunctata. All goodeid species are inactive at night. Aggressive displays were between conspecific males of the same size.

All goodeid species present in the lake are also present in the spring pools at the upper end of the lake. In the springs, Alloophorus robustus adults scrutinize rocky crevices looking for prey. Small fishes, largely Zoogoneticus quitzeoensis, attract their attention and are stalked. White objects are also eaten, probably a learned response resulting from tortilla scraps falling in the water. They do not graze on Aufwuchs. Mexicans catch them by hook and line using worms for bait. In the lake, they are either solitary or join several other conspecifics and swim with large schools of several hundred Goodea atripinnis. Most of the fishes in these mixed schools are about the same size and color when viewed underwater. A few individuals grow to 25 cm in total length. Alloophorus robustus may use schools of G. atripinnis as camouflage. As G. atripinnis does not eat fish, not even young (as determined in the laboratory), they would not elicit a fear reaction in smaller fishes. Alloophorus robustus may capitalize on this fact. Certainly the human eye has trouble distinguishing them from G. atripinnis when viewed underwater. Alternately, large schools of G. atripinnis may startle small fishes hiding in the submerged vegetation, providing food for the Alloophorus.

At dusk, the large mixed schools rise to the surface. Many goodeid-sized fishes leap out of the water for insects about an hour before total darkness. Floating on an air mattress at dusk failed to reveal if Goodea or Alloophorus or both jump. In the failing light, jumping fish were too far away to identify with certainty. But Alloophorus robustus lies just under the surface and is the likely choice. An analysis of stomach contents of these individuals might determine which fishes jump, but no preserved specimens are available from the lake. Seining is impossible as a consequence of the depth of the lake and the deep silt bottom. At dawn, a dense fog covers the lake and the air temperature is 5°C to 7°C. No insects are active and no fishes jump. The air temperature gradually increases during the day. On one day, some jumping fishes were seen at about 10 AM. Near-term pregnant Alloophorus robustus and Goodea atripinnis were seen in the lake, but no courting behavior was observed among the fishes in the schools.

In the large spring pools, G. atripinnis of the same size also schools to some extent. They are largely solitary in the narrow polluted ditch. The schools startle easily, responding quickly to disturbances by retreating under ledges. Perhaps schooling behavior is innate in Goodea but is rarely expressed as a result of environmental constraints. Certainly other populations at other localities do not school. Goodea atripinnis grazes on Aufwuchs. They do not feed off the surface, but accept food readily if it sinks. This population has smaller mouths than the population at Teuchitlán and they feed by tugging at algal filaments. Pregnant females and females with black fins were seen in the lake and ditch. Active courting was observed only in the ditch which was slightly warmer than the lake and springs. Copulation was observed in this species. Males often display aggressively wherever females are actively courted. Kodric-Brown (1977) also found aggressive encounters in pupfish are most common when spawning activity is most intense. At times, males even break the surface during displays or chases. The fish in the springs frequently exhibit an unusual behavior in which they swim to the spring source and then relax and let themselves be carried away by the current.

Zoogoneticus quitzeoensis is present in all size classes, young to adult. Pregnant females were noted. They feed on Aufwuchs and are attracted to white debris. Males are aggressive and even chase the larger Goodea atripinnis out of the way when pursuing females. They are conspicuous when fighting, turning entirely black except for orange margins on the dorsal and anal fins. Aggressive displays can last several minutes. In the spring pools, this species tends to hover near rock surfaces. The larger, older fish are hunch-backed. This deformity also occurs in laboratory stocks of this species. The spinal deformity progressively worsens with age in laboratory fish and may be due to a nutrient deficiency. The spring pools are not rich in food and are largely isolated from the lake. Alternately, the deformity might be the result of inbreeding. Young might find their way out of the pools through rock interstices, but it is unlikely that adults can move freely in or out of the pools. Because of the small number of adults in the population, a mutation for spinal deformity might spread. In the lake, large individuals form schools in the shallow, heavily vegetated areas.

Skiffia multipunctata occurs in great numbers in the polluted ditch but is rare in the springs and lake. Males are variable in coloration, differing in the amounts of black, yellow and orange pigmentation. The black pigmented spots are asymmetrical in individual males. Several males, identified by their distinctive markings, appeared to remain in the same area of the ditch. Males court females from dawn to dusk, but the greatest activity begins in the late morning when the sun is shining fully on the water and large numbers of Skiffia are at the surface. Males occasionally court pregnant females. At times G. atripinnis is chased when coming between a male and a female. Skiffia multipunctata travels in small schools. They graze on Aufwuchs and floating debris and are attracted to white. Courting males nudge and nip females near the genital opening as they follow them. This species darts away from the heads of water snakes. They also dive for cover when a shadow passes overhead.

Springs at Tangancicuaro, Michoacán

Local informants directed us to the springs in

Tangancicuaro (Fig. 38). One set of springs is a town park, enclosed by a high chain link fence. The springs originate in the upper part of a marshy pond. The water is clear but easily roiled. The bottom of the pond is mud, silt, rocks and "quicksand" at the sites where the springs originate. Rooted grasses, tules and submerged plants are abundant. The pond is a little over a meter deep and had a temperature of 19°C. *Skiffia multipunctata* was the most abundant fish. *Zoogoneticus quitzeoensis* was common, and juvenile *Moxostoma austrinum* and a few adult *Lampetra geminis* were present. Four of the nonparasitic lampreys were caught by hand with a small aquarium dipnet over a pebble and rock bottom at the outflow end of the pond. *Goodea atripinnis* was absent from this spring. Tadpoles, crayfish and numerous insects were present. The crayfish are said to be native. All size classes of *S. multipunctata* and *Z. quitzeoensis* were present, indicating an extended breeding season and/or sequential broods for these two species. *Skiffia multipunctata* at Tangancicuaro are more melanistic than those in Lake Camécuaro. Even some females have black patches, especially on the caudal peduncle.

The second set of springs forms two pools just outside of the town. They supply the town with drinking water and are also used for irrigation and bathing. The bottoms are firm mud and silt and the water is easily roiled. The water temperature was 19°C. There is little vegetation except along the banks. Concrete walls surround one of the springs. The pools are greater than 2 m deep in places. Again, *Skiffia multipunctata* was the most abundant fish, but *Goodea atripinnis*, *Zoogoneticus quitzeoensis* and *Algansea tincella* were also common. The Mexicans eat the minnow, which is called "conguron". They are said to grow large. Crayfish, frogs and many insects were present. All size classes of *S. multipunctata* were seen, as well as pregnant females. These springs are said to drain into Lake Camécuaro, which seems likely as all fish species in the springs occur in the lake. Another spring with fishes is said to occur at Carapán but was not investigated.

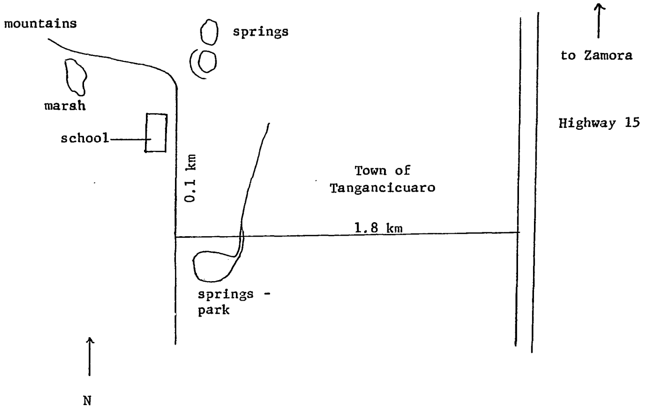

Fig. 38. Map of the springs at Tangancicuaro, Michoacán, México.

Balneario at Tocumbo, Michoacán

The spring at Tocumbo is totally encased in concrete, including the bottom. The pool is used for bathing and washing. The water level is controlled by a gate. The bottom and walls are covered by green algae and leaves, but there is no rooted vegetation. The maximum depth is about 2 m. The water temperature ranged from 21°C to 24°C, the air from 8°C at 6:30 AM to 32°C at 4 PM. Three species live in the pool and its outflowing creek. Two, Chapalichthys pardalis and Poeciliopsis infans, are abundant. The third, a rare fish, appears to be related to or identical with Alloophorus regalis (Alvarez). The creek is shallow with a rock and mud bottom. Grass, water hyacinth and rooted vegetation are abundant. It is filled with much debris and garbage. Bullfrogs are present in the creek. Shortly after leaving the pool, the creek falls about 30 m to join a river. This falls barrier prevents migration upstream into the pool. Because of the water gate, it is unlikely that fish can freely enter or leave the pool.

All size classes of Chapalichthys pardalis were seen. They feed on algae and Aufwuchs and orient to low-flying insects. They readily eat tortillas. The sex ratio is even. Males of the same size display aggressively, but unlike other goodeids, one male is often inclined head-down at a 45° angle. Females are often pursued by more than one male. Males frequently ceased pursuing females, probably because most of the females were pregnant and not receptive. Little headwagging was seen. During the day, aggregates of C. pardalis, comprised mostly of females, form in the sunniest corner of the pool. Chapalichthys pardalis is frightened by shadows, suggesting frequent predation by birds. Water snakes and children also prey on these fish. They school when frightened.

Alloophorus regalis is presumably piscivorous, judging by its jaws and reduced number of gill rakers. Only three specimens were caught. At night, all fish are inactive.

Río Terrero, Jalisco

This river has been lowered by diversion of 95% of its water into irrigation canals. The canals are dated 1960, but local informants say that a smaller canal existed prior to 1960. The river is also used for bathing, laundry and watering livestock. In April, it dries up into a series of shallow pools connected by a trickle of water. Water temperatures ranged from 19°C to 30°C in these pools, air temperatures from 10°C to 33°C. In some areas, the water moves underground leaving fishes stranded in pools. Water snakes, bullfrogs, toads (*Bufo marinus*), tadpoles, crabs, iguanas, mice, bats, turtles, numerous insects and many birds, including hummingbirds and kingfishers, live in or near the river. *Ilyodon furcidens furcidens*, *Ilyodon xantusi latos*, and a few *Allodontichthys tamazulae* persist in the pools, but a fourth goodeid, an undescribed genus and species (Uyeno and Miller, 1972), can only be found above the dam before the water is diverted into fields of sugar cane. This species occurs only in rocky riffles and in the initial segment of the canal where the water is deepest and swiftest. It is scarce even there. Two days of intensive seining netted only 12 individuals, mostly juveniles. A minnow, *Algansea aphanea*, also survives in the river in the deeper pools, retreating under deeply cut banks.

Some *Ilyodon furcidens furcidens* actively court in April, but although *Ilyodon xantusi latos* females occasionally headwagged to conspecific males, they were not courted. Conspecific males periodically displayed aggressively. In rare instances, *I. xantusi latos* males lunged at *I. furcidens furcidens* males and the latter retreated without displaying. Many young *Ilyodon* are present in April. In a preserved collection, all but two were *I. furcidens furcidens*. The two *I. xantusi latos* young were larger and probably born earlier in the season. These observations suggest that there may be some temporal separation in the breeding seasons of these two species. All 33 courting interactions occurred between conspecifics. Recognition of the appropriate mate may be by head characteristics which differ greatly between these two species. Human observers can readily identify live and preserved specimens by these characters (Fig. 23). Courting and aggressive *I. furcidens furcidens* males have a vivid black terminal bar on the caudal fin. Aggressive *I. xantusi latos* males do not. It is not known if they develop such coloration during courtship, but it seems unlikely. In all other goodeids observed, coloration in aggressive males is either the same as or more intense than in courting males. Although both species of *Ilyodon* graze on Aufwuchs, *I. furcidens furcidens* also feeds off the surface. They are attracted to white. *Ilyodon xantusi latos* was never seen to feed at the surface, but would steal food from *I. furcidens furcidens* if it was carried below the surface. Several times they stole a plume of algae or other food from *I. furcidens furcidens*. Adults were also seen to mouth small water beetles, stealing them from each other. But the beetles were eventually dropped and not eaten.

Allodontichthys tamazulae is more abundant above the dam, although it occurs downstream in the pools. They are generally found in the current, darting from rock to rock along the bottom. They do not appear to exert much effort in swimming, in contrast to the two species of *Ilyodon* which swim constantly to maintain positions in the current. *Allodontichthys tamazulae* may largely avoid the current by swimming in the downstream shadow of rocks and by hovering close to the bottom. They are solitary and aggressive. When two individuals meet, one chases or flees from the other. One near-term pregnant female was observed in the same two meter area for two consecutive days, suggesting that these fishes may be relatively sedentary. Large individuals chase encroaching *Ilyodon* away and even intimidate crabs and steal their food. These fish also pull at filaments of algae. They are readily identified by their mode of swimming and coloration, having small black spots dorsally. In April, no courting and no young were observed. Juveniles were several months old as judged by laboratory broods. Newborn young are negatively buoyant.

The undescribed genus and species of goodeid is a solitary fish. It swims like a slow-moving tadpole, hovering over rock surfaces. It does not dart. It is easily identified by its yellow beady eyes and by irregular mottled black and yellow markings on the body. The fish moves effortlessly over and around rocks, perhaps swimming in calm areas caused by rocks disrupting the turbulent stream flow. It often remains still and is the last fish to flee a disturbance. In the laboratory, young, juveniles and adults are aggressive. Keeping even two together results in one being injured. Adults and newborn are negatively buoyant and graze along the bottom. In April, no courting was observed for this species, although juveniles about a month or older were present.

All four goodeid species are inactive at night and sluggish the first hour after dawn. The two species of Ilyodon frighten easily, especially those confined to pools. The shadow of a bird or butterfly send all diving for cover, disrupting feeding for about one minute. Few interspecific interactions were seen, and all aggressive and courtship displays were directed only to conspecifics.

APPENDIX C

DATA FOR THE MORPHOLOGICAL STUDY OF THE GENUS ILYODON

The counts and measurements for the 852 specimens used in the morphological study of the genus Ilyodon, family Goodeidae, are given. Data for 138 females are listed first, followed by data for 714 males.

The first column is a unique label for each specimen. Data for each specimen are recorded in three consecutive rows. The second column numbers these rows. Counts are given in the first row, columns three to 17 for the following characters (in order): dorsal fin rays, anal fin rays, pectoral fin rays, pelvic fin rays, caudal fin rays, scales in lateral series, dorsal to anal scales, scales around body, predorsal scales, scales around caudal peduncle, gill rakers, vertebrae, mandibular pores, preopercular pores and lacrimal pores. Each collection was assigned a number, 1-69 (Table 33). Column three in rows two and three gives this number. Row two, columns four to 17 gives the following measurements (expressed in tenths of millimeters): standard length, predorsal length, prepelvic length, anal origin to caudal base length, body depth, body width, head length, head depth, head width, caudal peduncle length, caudal peduncle depth, interorbital width, preorbital width and postorbital length. Row three, columns four to 16 gives the following measurements (expressed in tenths of millimeters): snout length, orbit length, mouth width, mandible length, basal length of dorsal fin, depressed length of dorsal fin, basal length of anal fin, depressed length of anal fin, middle caudal ray length, pectoral fin length, pelvic fin length, upper jaw length and opercle length.

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SP16 1  16  12  31  12  20  58  20  45  37  23  35  38   6  14   8
SP16 2   1 850 552 442 278 250 162 200 125 145 210  95  98  31  81
SP16 3   1  67  58  77  56 139 193  70 119 134 118  97  44  66
SP18 1  16  12  29  12  17  61  22  48  38  23  33  38   6  14   8
SP18 2   1 774 522 405 241 251 161 191 120 139 185  94  92  30  83
SP18 3   1  63  53  71  52 123 178  58 102 119 116  97  41  70
SP21 1  14  13  28  12  20  53  21  43  36  22  40  39   6  14   8
SP21 2   1 695 442 346 253 177 119 158  92 111 191  76  71  26  65
SP21 3   1  47  44  55  46 108 153  59  98 111 103  83  32  50
SP24 1  15  12  28  12  19  49  21  40  34  22  30  39   6  14   8
SP24 2   1 589 372 284 213 161 105 137  87 103 164  63  62  19  55
SP24 3   1  40  40  47  38  99 139  48  82  95  90  76  26  42
SP27 1  13  11  26  12  16  44  20  41  32  21  31  38   6  14   8
SP27 2   1 553 357 283 186 161 100 140  85  94 138  65  71  20  60
SP27 3   1  43  42  53  37  87 130  44  80 100  91  77  27  48
SP30 1  17  13  29  12  20  58  21  44  37  23  25  38   6  14   8
SP30 2   1 364 222 175 136  93  54  92  55  60  99  45  43  13  40
SP30 3   1  26  31  28  21  63  86  33  54  57  55  46  18  33
A?17 1  15  13  30  12  21  56  19  39  38  21  35  38   6  14   8
A?17 2   2 658 409 332 243 170  88 162 102  97 189  70  71  22  69
A?17 3   2  48  51  51  49 109 151  49  99 113 110  82  31  57
A?19 1  16  12  30  12  19  53  21  43  38  22  35  37   6  14   8
A?19 2   2 583 363 299 217 172  81 141  92  91 159  63  65  19  59
A?19 3   2  44  48  46  41  97 131  44  87 104  97  80  29  49
A?21 1  15  12  32  12  21  52  21  43  37  22  35  37   6  14   8
A?21 2   2 525 339 269 184 152  76 134  86  84 140  61  58  19  55
A?21 3   2  42  43  47  41  81 115  36  80  97  90  72  26  47
A?24 1  15  12  32  12  19  53  22  44  38  22  31  37   6  14   7
A?24 2   2 535 343 264 189 160  77 138  88  88 142  59  61  18  56
A?24 3   2  40  46  47  39  88 125  36  78  99  92  68  29  50
A?27 1  16  12  30  12  20  57  21  42  37  23  31  37   5  14   8
A?27 2   2 450 281 226 164 137  60 117  76  71 122  53  50  16  49
A?27 3   2  32  41  37  34  79 106  35  68  78  74  54  21  40
A?30 1  16  13  30  12  21  53  20  45  36  22  33  38   6  14   8
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A?30 2   2 416 258 216 157 116  61 107  71  69 122  47  47  13  43
A?30 3   2  32  38  37  32  71  95  33  61  73  73  51  22  37
AM16 1  14  11  30  12  19  58  20  43  39  22  30  37   6  16   8
AM16 2   3 627 411 328 197 170 104 163  92 107 157  65  72  21  68
AM16 3   3  53  47  70  50  97 137  44  83 105  95  74  37  57
AM18 1  14  11  32  12  20  59  21  42  39  23  34  37   6  14   8
AM18 2   3 564 372 303 178 143 101 154  89  97 138  60  72  21  64
AM18 3   3  49  45  70  48  86 125  45  83 100  90  73  33  50
AM21 1  13  11  32  12  18  53  21  46  41  24  32  37   6  16   8
AM21 2   3 521 350 277 167 148  89 141  77  97 127  60  63  19  58
AM21 3   3  45  44  62  42  80 119  37  70  94  85  68  35  48
AM24 1  15  12  32  12  19  60  22  45  42  23  31  37   6  14   8
AM24 2   3 506 334 265 170 128  84 138  77  91 127  54  62  17  55
AM24 3   3  44  43  58  41  82 115  38  71  91  81  63  34  44
AM27 1  14  11  29  12  19  59  22  47  38  25  32  37   6  14   8
AM27 2   3 462 305 245 155 129  79 122  72  83 118  52  54  15  50
AM27 3   3  40  40  57  40  72 105  32  62  83  73  58  31  38
AM30 1  15  11  30  12  18  55  22  45  38  23  33  37   6  14   9
AM30 2   3 433 291 230 142 125  76 121  65  80 105  49  53  14  50
AM30 3   3  35  37  50  37  70 101  33  64  77  70  54  31  42
IA16 1  16  11  29  12  20  51  21  43  38  21  33  37   7  14   8
IA16 2   4 580 357 287 206 154  84 143  87  99 167  67  68  20  60
IA16 3   4  49  44  58  46  99 137  42  80 105  92  69  32  50
IA18 1  16  12  30  12  19  47  19  42  31  22  31  36   6  14   8
IA18 2   4 519 318 251 184 160 101 135  86  98 144  66  65  18  57
IA18 3   4  40  40  53  40  87 131  40  83  98  88  64  28  48
IA21 1  16  11  29  12  19  50  19  40      21  31  36   6  14   8
IA21 2   4 437 272 221 158 123  61 117  69  77 127  50  52  16  48
IA21 3   4  35  37  41  33  67 104  31  64  83  73  57  23  41
IA24 1  16  11  30  12  18  46  21  44  31  21  29  37   6  14   8
IA24 2   4 392 244 189 142 112  58 100  62  67 110  48  46  14  42
IA24 3   4  31  35  36  27  64  95  29  58  74  62  51  20  34
IA27 1  16  12  30  12  22  46  19  38  30  21  30  37   6  14   8
IA27 2   4 375 227 183 143  99  51  97  57  62 109  44  44  14  41
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IA27	3	4	29	32	33	24	58	90	29	58	73	63	49	20	34	
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WH33 2    9  682  382  328  247  178   99  164  114  110  208   78   74   21   66
WH33 3    9   57   46   66   52  147  223   45  101  142  133  113   32   60
WH34 1   15   12   30   12   19   52   21   40   31   21   37   37    6   14    7
WH34 2    9  652  364  315  250  175   88  160  112  106  203   75   76   21   66
WH34 3    9   51   48   64   47  149  224   47  105  135  128  103   33   57
WH35 1   15   12   30   12   20   49   21   42   31   23   36   38    6   14    8
WH35 2    9  597  343  282  222  160   83  144  107   92  181   66   68   17   60
WH35 3    9   46   45   59   47  121  179   42   82  114  117   93   22   50
WH36 1   14   12   30   12   22   53   23   40   35   23   34   37    6   12    8
WH36 2    9  584  328  272  214  154   86  140  106   99  167   71   68   19   61
WH36 3    9   44   43   51   38  135  198   43   92  121  112   93   26   50
WH37 1   14   12   30   12   20   50   22   41   33   22   34   37    6   14    8
WH37 2    9  615  354  287  218  161   93  147  106  101  170   66   71   20   59
WH37 3    9   49   46   57   43  133  196   46   87  118  109   93   30   52
WH38 1   15   12   30   12   21   54   22   40   32   23   33   38    6   14    8
WH38 2    9  589  336  284  221  158   84  140  103  101  179   67   66   19   58
WH38 3    9   43   44   61   42  130  192   39   92  114  110   90   26   46
WH39 1   15   12   30   12   20   47   21   40   29   21   32   37    6   14    8
WH39 2    9  578  324  272  224  154   81  141  104   98  169   68   73   17   60
WH39 3    9   42   46   64   45  119  170   42   88  115  111   87   29   47
WH40 1   15   12   28   12   19   49   21   40   31   22   32   37    7   14    8
WH40 2    9  544  305  262  205  138   77  140   95   86  156   60   63   17   54
WH40 3    9   46   40   57   44  122  170   39   85  110  101   86   30   44
WH41 1   14   12   29   12   19   50   22   37   30   22   31   37    6   13    8
WH41 2    9  493  287  234  181  145   74  124   86   83  147   58   54   14   54
WH41 3    9   39   38   45   39   95  134   35   74   98   91   69   22   40
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WH43	1	16	12	30	12	20	50	23	40	31	23	27	37	6	13	8
WH43	2	9	460	258	213	177	116	59	110	79	74	138	51	53	12	47
WH43	3	9	32	36	38	33	90	141	32	68	96	86	68	19	40	
WH44	1	16	12	28	12	19	50	21	38	28	22	31	37	6	14	8
WH44	2	9	444	251	208	170	121	62	108	78	74	134	53	53	12	49
WH44	3	9	30	35	41	31	85	126	30	67	94	78	65	20	40	
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WH45	2	9	438	245	201	169	118	63	107	77	73	133	52	50	11	47
WH45	3	9	29	34	39	32	87	130	34	69	86	72	58	20	40	
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WH46	2	9	422	242	197	159	117	59	107	72	71	126	51	47	11	45
WH46	3	9	30	36	36	32	78	113	28	59	86	75	58	18	38	
WH47	1	16	12	30	12	19	49	23	42	32	23	31	37	6	14	8
WH47	2	9	402	236	203	145	119	57	105	74	68	120	51	50	10	45
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WH48	2	9	401	235	189	152	111	56	106	72	65	117	49	46	12	43
WH48	3	9	30	34	37	29	70	116	28	59	88	71	59	18	34	
WH49	1	16	12	30	12	20	50	24	40	33	24	29	37	6	14	8
WH49	2	9	402	232	195	146	111	57	102	68	70	113	48	47	11	43
WH49	3	9	30	34	37	32	83	118	29	60	84	73	60	17	35	
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WH50	2	9	399	227	193	150	111	55	102	73	62	115	44	44	11	44
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W1 1	3	10	49	42	59	42	128	185	49	97	128	112	95	31	55	
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W1 2	3	10	44	41	51	40	118	172	49	90	114	106	89	30	48	
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W1 3	2	10	528	313	266	204	171	84	133	85	90	159	78	66	20	55

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W1 4 3   10   33   33   36   31   81  120   38   66   84   81   62   23   38
W1 5 1   15   12   29   12   22   48   22   44   30   24   33   36    6   14    8
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W1 7 2   10  352  205  171  136  104   47   90   60   52  100   47   40   10   37
W1 7 3   10   24   28   29   26   58   90   31   58   71   62   49   17   32
W1 8 1   17   11   30   12        55   23   43   33   26   30   38    6   14    8
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W1 9 2   10  361  207  172  139  102   48   89   56   59  105   47   42   11   37
W1 9 3   10   25   30   29   24   61   94   28   57   74   63   50   17   29
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W212 2   11 423 250 205 151 127  62 102  67  75 115  57  52  13  44
W212 3   11  30  33  35  27  82 128  32  64  89  79  62  14  38
W213 1   14  12  30  12  20  50  21  44  32  23  32  37   6  14   8
W213 2   11 429 255 209 155 124  64 103  71  70 119  56  49  12  44
W213 3   11  31  33  35  28  77 116  30  64  82  72  58  16  36
W214 1   15  12  31  12  20  48  20  42  31  23  31  37   6  13   8
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W214 3   11  29  33  36  28  81 119  32  66  87  76  58  15  36
W215 1   15  12  30  12  20  48  20  40  31  22  33  37   6  14   8
W215 2   11 412 241 199 149 122  60 103  64  71 115  54  48  13  44
W215 3   11  30  33  34  26  81 120  30  66  83  73  53  16  36
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W232	3	11	25	31	31	24	65	98	31	59	79	69	51	12	32	
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W234	3	11	25	29	30	22	60	94	28	54	72	65	48	13	33	
W235	1	16	12	30	12	20	53	21	43	33	24	29	37	6	14	7
W235	2	11	365	219	186	131	107	58	94	58	62	95	48	45	11	39
W235	3	11	26	31	32	24	69	100	31	57	77	68	52	14	32	
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W236	2	11	366	216	177	134	101	54	90	59	60	101	47	43	10	39
W236	3	11	24	30	30	24	66	97	27	56	75	70	52	13	33	
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W238	3	11	24	31	31	26	64	93	28	54	71	65	47	13	33	
W239	1	15	12	30	12	20	50	21	43	34	22	28	38	6	14	8
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W239	3	11	23	29	29	22	57	89	26	51	69	59	45	13	30	
W240	1	15	12	30	12	19	49	20	44	30	24	29	37	5	14	7
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W240	3	11	23	30	29	22	58	86	25	50	73	60	42	13	32	
LB 1	1	15	12	31	12	18	46	20	41	31	21	31	37	6	14	8
LB 1	2	11	600	360	301	211	158	100	157	105	108	169	62	75	24	54
LB 1	3	11	55	50	55	41	118	169	39	75	107	109	76	27	48	
LB 2	1	15	12	32	12	18	49	21	41	32	21	34	37	6	15	7
LB 2	2	11	508	310	257	179	131	81	139	88	91	134	52	64	19	49

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LB  3 1   14  12  30  12  17  47  21  44  31  21  32  37   6  14   7
LB  3 2   11 452 270 228 153 117  68 123  81  82 121  47  58  14  46
LB  3 3   11  38  44  41  30  84 125  32  60  86  80  62  19  41
LB  4 1   15  12  32  12  17  46  21  44  32  22  29  37   6  14   7
LB  4 2   11 464 268 223 159 112  67 118  79  78 130  47  57  16  41
LB  4 3   11  40  43  40  32  90 133  32  62  91  85  63  18  35
LB  5 1   15  12  31  12  17  47  20  43  32  21  30  37   6  15   8
LB  5 2   11 438 264 218 146 117  65 119  80  78 113  49  56  15  43
LB  5 3   11  38  40  42  33  84 126  32  62  87  81  60  19  37
LB  6 1   16  12  30  12  17  49  22  45  32  23  30  37   5  14   8
LB  6 2   11 401 235 199 138 100  60 110  72  75 112  44  52  13  39
LB  6 3   11  35  42  35  29  87 123  30  58  81  76  56  15  30
LB  7 1   15  13  32  12  17  49  21  42  33  20  30  37   6  14   8
LB  7 2   11 402 241 196 140 101  59 106  71  73 108  42  49  13  40
LB  7 3   11  32  39  35  27  79 115  29  58  77  70  53  19  36
LB  8 1   15  12  30  12  17  47  20  43  33  22  28  37   6  14   9
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LB  8 3   11  34  38  36  25  73 106  25  54  70  64  50  16  31
LB  9 1   14  12  31  12  17  50  23  42  31  22  27  37   6  14   8
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LB  9 3   11  26  34  31  23  63  92  25  50  64  62  41  14  30
LB10 1    14  12  30  12  18  47  21  43  30  21  26  37   6  14   8
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LB10 3    11  25  32  29  25  59  89  22  45  64  58  41  13  29
W3  1 1   16  11  30  12  19  49  21  42  31  23  36  36   6  14   8
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W3  2 3   12  34  40  47  36  88 134  34  62  83  77  60  24  38
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W3  3 2   12 415 235 203 151 113  60 118  74  78 117  51  55  14  45
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W3 4	3	12	35	37	50	34	79	122	31	59	79	74	60	27	34	
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W3 5	2	12	401	238	199	141	108	56	114	70	73	110	48	50	13	44
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W3 6	2	12	380	221	188	139	103	54	110	70	71	109	47	49	12	43
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W3 7	2	12	457	263	239	157	122	64	132	81	85	127	56	57	15	48
W3 7	3	12	48	41	60	45	96	138	34	65	88	85	66	27	39	
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W311	2	12	399	232	199	139	102	61	114	72	75	108	48	53	12	40
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W314	3	12	37	36	53	38	71	113	26	53	78	71	54	24	33	
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AR 3 3   60   51   48   53   39  133  188   45   89  118  118   87   22   57
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AR 5 3   60   53   46   58   44  138  192   44   85  106  108   81   26   51
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AR 7 3   60   49   47   53   41  128  181   45   91  109  107   87   23   53
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BA 4 3   29   46   41   50   41  122  171   47   86  112  105   84   29   44
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BC  1 3   38  30  37  34  27  68 112  28  57  86  67  56  18  35
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BD33 3    40  31  33  39  31  70 121  32  66  91  75  58  19  39
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BF  1 3   41  47  46  60  46 132 196  46  96 124 115  92  32  53
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BF41 3    43  50  46  65  49 148 208  57  92 134 126  96  32  61
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BF44	3	43	29	34	38	33	73	107	27	63	93	80	61	20	41	
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TA69	3	22	43	38	49	35	118	162	42	82	95	82	71	27	46	
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TA70	2	22	503	289	259	190	133	74	128	84	95	151	55	59	20	53
TA70	3	22	45	36	51	38	110	154	38	72	89	83	70	27	45	
TA71	1	15	12	32	12	18	51	22	37	34	21	34	38	6	14	8
TA71	2	22	457	266	230	176	121	62	119	76	81	134	48	52	19	47
TA71	3	22	41	35	48	35	93	135	34	67	85	78	60	27	40	
TA72	1	15	11	30	12	19	54	21	39	30	22	30	38	6	14	8
TA72	2	22	450	250	219	168	125	65	119	79	78	129	52	52	15	46
TA72	3	22	41	36	48	36	100	136	34	71	83	82	65	28	40	
TA73	1	17	12	30	12	20	51	21	38	29	21	32	38	6	14	8
TA73	2	22	431	246	219	164	122	64	118	78	79	124	50	52	15	46
TA73	3	22	36	32	45	32	103	137	32	65	77	72	58	27	36	
TB74	1	14	11	30	12	19	51	20	39	33	22	30	38	6	14	8
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TB74	3	23	36	33	38	32	81	119	31	66	78	73	55	19	34	
TB75	1	16	12	27	12	19	42	21	38	29	21	32	37	6	14	8
TB75	2	23	438	254	218	162	124	70	117	82	80	129	52	55	15	48
TB75	3	23	36	35	41	29	93	131	30	65	84	77	59	21	40	
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TB76	2	23	436	245	218	164	123	68	110	74	78	133	52	52	15	43

TB76	3	23	33	36	39	32	89	127	33	66	72	71	56	20	34	
TB77	1	15	12	30	11	19	49	20	39	32	21	31	37	6	14	8
TB77	2	23	412	241	204	154	121	62	106	68	69	119	53	46	13	43
TB77	3	23	32	33	35	28	79	113	31	61	74	68	54	20	35	
TB78	1	15	11	32	12	21	47	19	39	32	22	30	37	6	14	8
TB78	2	23	385	230	189	142	102	59	98	63	68	118	49	45	14	41
TB78	3	23	30	31	34	24	73	105	25	54	74	66	47	18	31	
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TC79	2	24	695	400	349	262	197	122	178	125	122	203	77	87	27	69
TC79	3	24	63	48	84	58	149	230	54	107	134	124	102	49	56	
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TC80	3	24	48	41	70	48	105	158	36	80	100	99	73	39	44	
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TC83	3	24	41	34	48	36	88	132	31	62	84	78	59	28	35	
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TD84	2	25	665	381	341	241	183	103	172	116	124	187	75	83	31	74
TD84	3	25	59	45	64	52	151	212	51	101	123	117	98	32	56	
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TD85	2	25	674	388	350	248	177	101	174	117	123	194	77	80	32	78
TD85	3	25	60	44	65	50	151	213	49	99	127	118	93	36	66	
TD86	1	16	12	30	12	18	53	21	40	33	22	29	37	6	14	8
TD86	2	25	529	293	260	194	132	76	128	83	90	163	59	61	22	57
TD86	3	25	43	35	47	37	117	158	38	70	91	83	72	22	44	
TD87	1	17	13	30	12	19	51	21	42	29	22	31	38	6	14	8
TD87	2	25	500	279	250	182	124	67	126	80	85	141	52	58	20	54
TD87	3	25	40	35	46	34	109	147	38	73	90	86	68	23	44	

TD88	1	16	12	30	12	20	50	20	41	33	21	31	38	6	14	8
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TD88	3	25	34	32	40	30	83	127	34	62	82	73	60	23	36	
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TF89	2	26	620	358	315	219	171	95	155	99	108	179	61	73	23	64
TF89	3	26	54	42	65	52	131	179	43	81	107	109	106	34	63	
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TF90	2	26	559	318	284	200	168	97	142	92	104	163	60	68	23	59
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TF93	1	15	11	30	12	19	52	19	41	33	22	30	38	6	14	8
TF93	2	26	371	217	188	136	106	57	94	65	65	106	40	44	11	39
TF93	3	26	28	30	36	29	70	90	24	53	63	56	47	19	33	
TF94	1	17	12	30	12	19	54	21	43	32	22	31	37	6	15	8
TF94	2	27	728	408	359	264	220	128	179	126	141	204	88	86	30	76
TF94	3	27	63	47	75	54	174	240	57	109	131	122	105	38	58	
TF95	1	16	12	28	12	19	51	21	40	32	21	36	37	6	14	8
TF95	2	27	674	389	343	241	200	117	169	119	121	186	82	82	25	71
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TG98	2	28	449	261	230	157	125	72	123	79	82	127	49	56	17	47
TG98	3	28	42	36	52	41	98	136	30	59	83	82	63	33	41	
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TH49	3	31	63	52	73	60	163	232	54	101	135	133	102	39	65	
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TH50	2	31	633	352	315	225	176	97	159	106	114	187	70	73	20	67
TH50	3	31	50	47	67	45	156	212	45	82	114	113	86	35	53	
TH51	1	16	11	31	12	20	54	23	42	31	23	33	37	6	14	8
TH51	2	31	543	319	273	192	152	84	144	96	100	156	58	62	20	58
TH51	3	31	48	43	57	51	125	173	39	78	100	93	76	29	50	
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TH52	2	31	533	308	267	195	153	86	141	97	100	155	59	60	20	56
TH52	3	31	46	42	55	44	116	161	41	79	98	94	74	29	51	
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TH53	2	31	504	285	249	178	143	73	126	83	90	138	52	60	16	51
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TI56	1	16	11	32	12	19	51	22	41	33	22	33	37	6	14	8
TI56	2	32	466	273	228	172	144	82	116	84	89	138	53	53	16	46
TI56	3	32	36	38	45	36	106	145	35	59	77	81	62	25	41	
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TI57	2	32	391	231	209	150	119	68	103	70	70	121	45	47	11	44
TI57	3	32	29	31	40	31	83	100	25	54	77	69	53	24	37	
TI58	1	15	12	29	12	19	54	21	43	35	24	32	37	6	14	8
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TT58	3	32	31	32	37	31	77	99	27	51	66	58	49	23	33	
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TK65	2	34	531	305	268	186	169	94	135	91	98	157	58	64	20	56
TK65	3	34	44	40	52	38	118	165	32	72	95	99	74	27	49	
TK66	1	15	11	28	12	20	48	20	41	30	21	32	38	6	14	8
TK66	2	34	504	300	249	182	166	91	123	91	96	145	57	59	14	53
TK66	3	34	35	38	47	34	101	145	33	65	86	94	70	25	53	
TK67	1	16	12	30	12	18	56	20	41	32	22	33	38	7	14	8
TK67	2	34	476	268	240	169	132	80	122	82	85	135	54	56	18	53
TK67	3	34	40	39	48	35	99	138	33	72	87	90	63	27	39	
TK68	1	16	11	30	12	20	56	20	43	33	23	30	37	5	14	8
TK68	2	34	445	262	218	161	141	79	118	82	87	127	54	55	14	50
TK68	3	34	38	37	48	35	97	128	30	57	83	87	62	27	44	
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TL 1	2	39	492	284	239	186	130	64	124	77	81	150	59	57	17	51
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TM 1 2   46 499 281 249 179 122  69 127  78  83 147  51  57  15  51
TM 1 3   46  39  38  51  41 106 145  32  58  84  88  67  22  41
TM 2 1   16  12  32  12  21  58  24  48  35  27  28  37   6  14   8
TM 2 2   46 404 224 199 151 100  50  94  60  63 121  48  46  12  41
TM 2 3   46  28  33  33  24  81 117  28  58  73  70  54  17  34
TM11 1   17  12  31  12  20  56  22  47  39  25  31  38   6  14   8
TM11 2   46 335 197 167 123  84  38  76  51  54  96  38  39   9  33
TM11 3   46  24  28  31  26  56  85  19  45  62  53  42  18  30
TN 1 1   16  12  29  12  19  50  19  37  32  20  32  37   6  14   8
TN 1 2   56 721 388 343 294 192 115 181 123 127 233  80  79  26  81
TN 1 3   56  57  49  66  49 175 246  58 105 131 125 106  40  67
TN 2 1   17  12  30  12  21  58  20  41  31  22  34  38   6  14   8
TN 2 2   56 540 300 266 204 141  85 139  88  99 165  54  62  19  58
TN 2 3   56  47  39  60  46 125 169  42  78  95  94  75  36  50
TN 3 1   17  12  29  12  20  57  22  42  36  23  32  38   6  14   8
TN 3 2   56 510 286 245 190 137  89 131  83  93 153  57  60  19  53
TN 3 3   56  44  38  54  45 114 159  38  70  92  87  72  30  46
TN 4 1   15  12  30  12  20  50  21  41  35  21  31  38   6  14   8
TN 4 2   56 528 305 259 203 135  77 130  82  84 158  56  58  19  55
TN 4 3   56  42  35  46  39 113 159  43  79  94  86  71  26  44
TN 6 1   17  12  30  12  20  52  20  41  35  21  31  38   6  14   8
TN 6 2   56 425 244 203 151 114  60 111  68  72 123  48  50  16  43
TN 6 3   56  34  32  42  34  82 127  37  64  79  73  58  20  35
SA 1 1   16  12  30  12  23  48  24  45  29  23  49  38   2  14   8
SA 1 2   48 721 410 349 270 232 117 189 132 135 212 104  96  27  76
SA 1 3   48  67  53  95  62 164 256  59 124 143 138 119  45  60
SA 4 1   15  11  32  12  22  43  21  44  32  22  47  37   6  14   8
SA 4 2   48 614 358 303 218 186  97 163 110 109 173  85  85  22  64
SA 4 3   48  57  48  78  55 124 196  48  96 121 121  94  42  56
SA 5 1   16  11  32  12  22  46  21  41  29  21  45  37   6  14   8
SA 5 2   48 578 326 287 202 177  90 155 107 106 163  80  77  22  60
SA 5 3   48  53  47  74  52 125 193  45  96 116 116  87  39  50
SA 7 1   15  12  32  12  23  44  21  39  31  20  48  37   6  14   8
```

SA	7	2	48	563	331	285	202	170	90	152	100	102	157	76	77	22	59
SA	7	3	48	51	45	71	46	116	170	39	81	105	104	80	33	47	
SA	8	1	17	13	30	12	23	42	22	45	27	22	43	36	6	14	7
SA	8	2	48	479	274	242	170	136	70	133	88	90	133	64	66	19	52
SA	8	3	48	44	42	62	43	102	158	38	81	101	96	73	30	44	
SB	1	1	16	12	33	12	25	45	19	42	31	22	48	36	6	14	8
SB	1	2	49	625	373	309	242	227	111	157	103	107	193	97	77	23	64
SB	1	3	49	49	47	48	42	121	189	47	103	125	118	99	20	51	
SB	2	1	16	12	32	12	24	46	21	42	31	23	41	36	6	14	8
SB	2	2	49	611	351	299	231	197	91	143	105	98	179	90	77	23	60
SB	2	3	49	48	44	50	36	117	174	49	90	120	109	87	20	52	
SB	3	1	16	13	34	12	24	45	21	43	32	23	41	38	6	14	8
SB	3	2	49	608	355	290	230	200	98	138	104	104	185	88	74	21	56
SB	3	3	49	44	43	42	35	115	185	46	93	110	102	94	19	48	
SB	4	1	15	13	33	12	24	50	22	44	34	23	40	37	6	14	8
SB	4	2	49	537	315	265	204	175	79	131	93	86	164	78	67	21	56
SB	4	3	49	41	39	41	32	98	158	43	86	109	101	87	17	47	
SC	1	1	15	12	32	12	23	47	22	40	28	22	38	38	6	14	8
SC	1	2	50	491	292	248	181	151	75	125	79	85	140	73	63	19	49
SC	1	3	50	40	40	46	33	97	155	46	82	101	96	77	21	41	
SD10	1		16	12	30	12	22	46	21	44	29	22	51	38	6	14	8
SD10	2		51	1018	594	474	398	344	184	236	175	178	322	152	134	39	98
SD10	3		51	87	66	109	71	207	351	78	153	190	185	164	56	83	
SD11	1		15	12	32	12	23	44	21	40	30	22	49	38	6	14	8
SD11	2		51	706	416	343	246	234	122	168	121	119	205	104	91	25	68
SD11	3		51	57	52	71	50	138	226	51	102	134	124	104	35	54	
SD12	1		15	13	32	12	23	49	21	43	31	24	49	38	6	14	8
SD12	2		51	635	371	317	240	214	101	154	113	105	185	93	81	24	63
SD12	3		51	54	44	63	42	120	201	54	98	126	122	97	35	51	
SD13	1		16	12	29	12	25	46	21	41	29	23	49	37	6	13	8
SD13	2		51	619	350	297	229	179	96	145	105	103	179	89	78	22	58
SD13	3		51	48	42	59	42	122	185	48	86	119	108	86	31	48	
SD14	1		16	13	32	12	23	49	22	43	33	23	47	37	6	14	8
SD14	2		51	520	308	253	192	148	81	123	79	88	153	71	63	18	51

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SD14 3   51  38  41  48  35  95 148  41  76  98  91  74  25  40
SF15 1   14  12  30  12  21  45  21  40  28  22  34  37   6  14   8
SF15 2   52 357 208 187 130 100  48 100  62  66  97  50  48  12  41
SF15 3   52  29  34  35  26  68 108  31  57  72  66  51  18  35
SF  5 1  14  13  30  11  21  46  20  40  30  21  52  38   6  14   8
SF  5 2  66 951 552 479 336 346 182 235 181 177 276 148 134  37  96
SF  5 3  66  77  66  96  65 215 353  69 152 191 186 160  46  88
SF  6 1  13  12  29  12  22  45  21  38  29  20  49  38   6  14   8
SF  6 2  66 919 540 431 342 310 155 214 147 161 277 141 118  34  90
SF  6 3  66  72  59  84  57 182 311  69 151 178 174 145  43  80
SF  7 1  14  12  30  12  21  47  20  42  31  22  53  37   6  14   8
SF  7 2  66 588 343 287 222 183 101 144  94  99 172  86  78  23  58
SF  7 3  66  44  44  56  38 106 172  49  87 111 115  88  27  50
SF  8 1  14  12  30  12  24  47  21  41  28  20  47  38   6  14   8
SF  8 2  66 529 309 253 197 154  79 127  88  90 157  77  69  20  52
SF  8 3  66  38  41  54  34  98 158  38  86 106 105  85  21  45
SF  9 1  15  12  29  12  23  48  22  40  29  24  41  37   6  14   8
SF  9 2  66 352 210 176 132 108  50  94  61  58 105  55  49  10  39
SF  9 3  66  25  35  33  24  50  97  24  59  86  68  51  16  35
SG  1 1  14  11  31  12  23  45  22  44  33  22  36  37   6  14   8
SG  1 2  67 409 244 209 149 121  62 104  71  75 116  60  54  15  43
SG  1 3  67  32  34  39  28  73 123  30  64  81  83  60  15  32
SG  2 1  16  12  31  12  22  45  21  43  32  21  35  37   6  14   8
SG  2 2  67 352 210 178 125 105  55  96  60  68 100  49  47  13  40
SG  2 3  67  30  33  35  22  64  98  28  56  68  66  53  13  31
SH  1 1  14  12  32  12  21  44  21  39  29  21  42  37   6  14   8
SH  1 2  68 488 277 246 174 153  77 133  86  92 144  75  67  16  54
SH  1 3  68  44  43  56  38 112 170  40  79  98  94  77  28  45
SH  2 1  15  12  33  12  23  44  22  41  28  21  41  37   3  14   8
SH  2 2  68 420 240 207 152 126  64 110  76  75 118  58  54  15  44
SH  2 3  68  36  35  46  31  83 130  32  67  85  75  63  23  36
SH  3 1  15  13  32  12  20  48  24  43  31  23  41  37   6  14   8
SH  3 2  68 399 230 195 149 115  59 110  74  75 112  56  56  14  43
SH  3 3  68  34  35  48  34  77 128  31  62  77  73  55  23  36
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SH	4	1	15	12	32	12	20	45	20	38	32	21	35	38	6	14	8
SH	4	2	68	383	228	183	135	116	64	100	63	69	107	52	51	11	40
SH	4	3	68	28	35	40	29	70	117	31	58	80	76	58	20	33	
SI	1	1	13	11	28	12	22	40	21	36	28	19	37	36	6	14	8
SI	1	2	69	735	439	346	285	232	122	186	129	130	235	105	90	29	65
SI	1	3	69	54	58	51	40	149	261	57	117	152	151	127	23	62	

APPENDIX D

DESCRIPTIVE STATISTICS FOR POPULATIONS OF THE GENUS *ILYODON*

Descriptive statistics are given for the 69 populations of *Ilyodon* used in the morphological study. Populations are identified by a number (Table 33) immediately following the title "Descriptive Measures". Data for females for 21 populations are given first followed by the data for males for 69 populations.

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<DESCRIBE BYSTRATA VAR=1-15,17,44-69 CASES=1-138 STRAT=V16 VALUES=0 LEVELS=.95>

DESCRIPTIVE MEASURES  <1> V16:1  CASES=CASE#:1-138

   VARIABLE         N  MINIMUM     MAXIMUM     MEAN        STD DEV    .9500 CONFIDENCE INT

    1.V1            6  13.000      17.000      15.167      1.4720     (13.622,16.711)

    2.V2            6  11.000      13.000      12.167      .75277     (11.377,12.957)

    3.V3            6  26.000      31.000      28.500      1.6432     (26.776,30.224)

    4.V4            6  12.000      12.000      12.000

    5.V5            6  16.000      20.000      18.667      1.7512     (16.829,20.504)

    6.V6            6  44.000      61.000      53.833      6.4317     (47.084,60.583)

    7.V7            6  20.000      22.000      20.833      .75277     (20.043,21.623)

    8.V8            6  40.000      48.000      43.500      2.8810     (40.477,46.523)

    9.V9            6  32.000      38.000      35.667      2.2509     (33.304,38.029)

   10.V10           6  21.000      23.000      22.333      .81650     (21.476,23.190)

   11.V11           6  25.000      40.000      32.333      5.0465     (27.037,37.629)

   12.V12           6  38.000      39.000      38.333      .51640     (37.791,38.875)

   13.V13           6  6.0000      6.0000      6.0000

   14.V14           6  14.000      14.000      14.000

   15.V15           6  8.0000      8.0000      8.0000

   17.V17           6  364.00      850.00      637.50      174.01     (454.89,820.11)

   44.V44           6  .60989      .67442      .64114      .21402 -1 (.61868,.66360)

   45.V45           6  .48077      .52326      .50263      .18599 -1 (.48311,.52215)

   46.V46           6  .31137      .37363      .34568      .24426 -1 (.32004,.37131)

   47.V47           6  .25468      .32429      .28218      .26618 -1 (.25424,.31011)

   48.V48           6  .14835      .20801      .17955      .19889 -1 (.15867,.20042)

   49.V49           6  .22734      .25316      .24132      .11031 -1 (.22974,.25290)

   50.V50           6  .13237      .15504      .14783      .82059 -2 (.13922,.15644)

   51.V51           6  .15971      .17959      .16993      .70495 -2 (.16253,.17733)

   52.V52           6  .23902      .27844      .26014      .16852 -1 (.24246,.27783)

   53.V53           6  .10696      .12363      .11512      .67726 -2 (.10801,.12222)

   54.V54           6  .10216      .12839      .11468      .96254 -2 (.10458,.12478)

   55.V55           6  .32258 -1   .38760 -1   .36130 -1   .21834 -2 (.33839 -1,.38421 -1)
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56.V56                 6  .93379 -1  .10989     .10130     .80014 -2 (.92907 -1,.10970)
57.V57                 6  .67626 -1  .81395 -1  .74157 -1  .59370 -2 (.67927 -1,.80388 -1)
58.V58                 6  .63309 -1  .85165 -1  .71508 -1  .78268 -2 (.63294 -1,.79721 -1)
59.V59                 6  .76923 -1  .95841 -1  .85669 -1  .79758 -2 (.77299 -1,.94040 -1)
60.V60                 6  .57692 -1  .67183 -1  .64728 -1  .35718 -2 (.60980 -1,.68477 -1)
61.V61                 6  .15540     .17308     .16272     .68398 -2 (.15554,.16990)
62.V62                 6  .22014     .23626     .23075     .63776 -2 (.22406,.23745)
63.V63                 6  .74935 -1  .90659 -1  .82317 -1  .52718 -2 (.76784 -1,.87849 -1)
64.V64                 6  .13178     .14835     .14084     .55938 -2 (.13497,.14671)
65.V65                 6  .15375     .18083     .16164     .97558 -2 (.15140,.17188)
66.V66                 6  .13882     .16456     .15089     .82988 -2 (.14218,.15960)
67.V67                 6  .11412     .13924     .12559     .85849 -2 (.11658,.13459)
68.V68                 6  .44143 -1  .52972 -1  .48866 -1  .33431 -2 (.45358 -1,.52375 -1)
69.V69                 6  .71307 -1  .90659 -1  .81466 -1  .89662 -2 (.72056 -1,.90875 -1)

DESCRIPTIVE MEASURES  <2> V16:2  CASES=CASE#:1-138
    VARIABLE          N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
     1.V1              6  15.000      16.000      15.500      .54772     (14.925,16.075)
     2.V2              6  12.000      13.000      12.333      .51640     (11.791,12.875)
     3.V3              6  30.000      32.000      30.667      1.0328     (29.583,31.751)
     4.V4              6  12.000      12.000      12.000
     5.V5              6  19.000      21.000      20.167      .98319     (19.135,21.198)
     6.V6              6  52.000      57.000      54.000      2.0000     (51.901,56.099)
     7.V7              6  19.000      22.000      20.667      1.0328     (19.583,21.751)
     8.V8              6  39.000      45.000      42.667      2.0656     (40.499,44.834)
     9.V9              6  36.000      38.000      37.333      .81650     (36.476,38.190)
    10.V10             6  21.000      23.000      22.000      .63246     (21.336,22.664)
    11.V11             6  31.000      35.000      33.333      1.9664     (31.270,35.397)
    12.V12             6  37.000      38.000      37.333      .51640     (36.791,37.875)
    13.V13             6  5.0000      6.0000      5.8333      .40825     (5.4049,6.2618)
    14.V14             6  14.000      14.000      14.000
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15.V15             6  7.0000      8.0000      7.8333      .40825     (7.4049,8.2618)
17.V17             6  416.00      658.00      527.83      87.876     (435.61,620.05)
44.V44             6  .62019      .64571      .62928      .11132 -1 (.61760,.64096)
45.V45             6  .49346      .51923      .50745      .92074 -2 (.49779,.51712)
46.V46             6  .35048      .37740      .36452      .10694 -1 (.35330,.37574)
47.V47             6  .25836      .30444      .28754      .16767 -1 (.26995,.30514)
48.V48             6  .13333      .14663      .14022      .57721 -2 (.13416,.14628)
49.V49             6  .24185      .26000      .25307      .73028 -2 (.24541,.26074)
50.V50             6  .15502      .17067      .16345      .60988 -2 (.15705,.16985)
51.V51             6  .14742      .16587      .15861      .66550 -2 (.15162,.16559)
52.V52             6  .26542      .29327      .27607      .11472 -1 (.26403,.28811)
53.V53             6  .10638      .11778      .11195      .45145 -2 (.10721,.11668)
54.V54             6  .10790      .11402      .11133      .21215 -2 (.10910,.11356)
55.V55             6  .31250 -1   .36190 -1   .33778 -1   .18394 -2 (.31847 -1,.35708 -1)
56.V56             6  .10120      .10889      .10463      .25128 -2 (.10199,.10726)
57.V57             6  .71111 -1   .80000 -1   .75203 -1   .31003 -2 (.71950 -1,.78457 -1)
58.V58             6  .77508 -1   .91346 -1   .85031 -1   .55029 -2 (.79256 -1,.90806 -1)
59.V59             6  .77508 -1   .89524 -1   .84158 -1   .53087 -2 (.78587 -1,.89729 -1)
60.V60             6  .70326 -1   .78095 -1   .74711 -1   .28156 -2 (.71756 -1,.77666 -1)
61.V61             6  .15429      .17556      .16617      .71098 -2 (.15871,.17363)
62.V62             6  .21905      .23556      .22847      .60169 -2 (.22215,.23478)
63.V63             6  .67290 -1   .79327 -1   .73818 -1   .48853 -2 (.68691 -1,.78944 -1)
64.V64             6  .14579      .15238      .14927      .25885 -2 (.14655,.15198)
65.V65             6  .17173      .18505      .17812      .57069 -2 (.17213,.18411)
66.V66             6  .16444      .17548      .16948      .41534 -2 (.16512,.17384)
67.V67             6  .12000      .13722      .12811      .74024 -2 (.12035,.13588)
68.V68             6  .46667 -1   .54206 -1   .50023 -1   .30248 -2 (.46848 -1,.53197 -1)
69.V69             6  .84048 -1   .93458 -1   .88581 -1   .31390 -2 (.85287 -1,.91875 -1)

DESCRIPTIVE MEASURES  <3> V16:3  CASES=CASE#:1-138
    VARIABLE       N  MINIMUM     MAXIMUM       MEAN      STD DEV    .9500 CONFIDENCE INT
```

```
 1.V1          6  13.000      15.000      14.167      .75277      (13.377,14.957)
 2.V2          6  11.000      12.000      11.167      .40825      (10.738,11.595)
 3.V3          6  29.000      32.000      30.833      1.3292      (29.438,32.228)
 4.V4          6  12.000      12.000      12.000
 5.V5          6  18.000      20.000      18.833      .75277      (18.043,19.623)
 6.V6          6  53.000      60.000      57.333      2.7325      (54.466,60.201)
 7.V7          6  20.000      22.000      21.333      .81650      (20.476,22.190)
 8.V8          6  42.000      47.000      44.667      1.8619      (42.713,46.621)
 9.V9          6  38.000      42.000      39.500      1.6432      (37.776,41.224)
10.V10         6  22.000      25.000      23.333      1.0328      (22.249,24.417)
11.V11         6  30.000      34.000      32.000      1.4142      (30.516,33.484)
12.V12         6  37.000      37.000      37.000
13.V13         6  6.0000      6.0000      6.0000
14.V14         6  14.000      16.000      14.667      1.0328      (13.583,15.751)
15.V15         6  8.0000      9.0000      8.1667      .40825      (7.7382,8.5951)
17.V17         6  433.00      627.00      518.83      70.010      (445.36,592.30)
44.V44         6  .65550      .67206      .66319      .69774 -2 (.65587,.67052)
45.V45         6  .52313      .53723      .52954      .53304 -2 (.52394,.53513)
46.V46         6  .31419      .33597      .32496      .96348 -2 (.31485,.33507)
47.V47         6  .25296      .28868      .27160      .15355 -1 (.25549,.28772)
48.V48         6  .16587      .17908      .17138      .52169 -2 (.16591,.17686)
49.V49         6  .25997      .27945      .26998      .69595 -2 (.26268,.27729)
50.V50         6  .14673      .15780      .15174      .44066 -2 (.14712,.15637)
51.V51         6  .17065      .18618      .17885      .63962 -2 (.17213,.18556)
52.V52         6  .24249      .25541      .24796      .50772 -2 (.24263,.25328)
53.V53         6  .10367      .11516      .10961      .46089 -2 (.10477,.11445)
54.V54         6  .11483      .12766      .12087      .45508 -2 (.11610,.12565)
55.V55         6  .32333 -1   .37234 -1   .34265 -1   .20822 -2 (.32080 -1,.36450 -1)
56.V56         6  .10823      .11547      .11094      .30239 -2 (.10777,.11411)
57.V57         6  .80831 -1   .86957 -1   .85358 -1   .23904 -2 (.82850 -1,.87867 -1)
```

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58.V58               6  .74960 -1  .86580 -1  .82702 -1  .44560 -2 (.78026 -1,.87378 -1)
59.V59               6  .11164     .12411     .11804     .50094 -2 (.11278,.12330)
60.V60               6  .79745 -1  .86580 -1  .83087 -1  .29459 -2 (.79996 -1,.86179 -1)
61.V61               6  .15248     .16206     .15672     .41407 -2 (.15237,.16106)
62.V62               6  .21850     .23326     .22606     .52344 -2 (.22056,.23155)
63.V63               6  .69264 -1  .79787 -1  .73593 -1  .41122 -2 (.69277 -1,.77908 -1)
64.V64               6  .13238     .14781     .13937     .68348 -2 (.13220,.14654)
65.V65               6  .16746     .18042     .17709     .48683 -2 (.17198,.18219)
66.V66               6  .15152     .16315     .15900     .40693 -2 (.15473,.16327)
67.V67               6  .11802     .13052     .12546     .44309 -2 (.12081,.13011)
68.V68               6  .58511 -1  .71594 -1  .65098 -1  .52031 -2 (.59638 -1,.70558 -1)
69.V69               6  .82251 -1  .96998 -1  .89650 -1  .49944 -2 (.84408 -1,.94891 -1)

DESCRIPTIVE MEASURES   <4> V16:4   CASES=CASE#:1-138
    VARIABLE        N  MINIMUM     MAXIMUM     MEAN      STD DEV     .9500 CONFIDENCE INT
     1.V1           6  15.000      16.000      15.833     .40825     (15.405,16.262)
     2.V2           6  11.000      12.000      11.333     .51640     (10.791,11.875)
     3.V3           6  29.000      30.000      29.667     .51640     (29.125,30.209)
     4.V4           6  12.000      12.000      12.000
     5.V5           6  18.000      22.000      19.667     1.3663     (18.233,21.100)
     6.V6           6  46.000      51.000      48.167     2.1370     (45.924,50.409)
     7.V7           6  18.000      21.000      19.500     1.2247     (18.215,20.785)
     8.V8           6  38.000      44.000      41.000     2.3664     (38.517,43.483)
     9.V9           5  30.000      38.000      32.400     3.2094     (28.415,36.385)
    10.V10          6  20.000      22.000      21.000     .63246     (20.336,21.664)
    11.V11          6  28.000      33.000      30.333     1.7512     (28.496,32.171)
    12.V12          6  36.000      37.000      36.667     .51640     (36.125,37.209)
    13.V13          6  6.0000      7.0000      6.1667     .40825     (5.7382,6.5951)
    14.V14          6  14.000      14.000      14.000
    15.V15          6  8.0000      8.0000      8.0000
    17.V17          6  325.00      580.00      438.00     95.478     (337.80,538.20)
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44.V44            6  .60533      .62245      .61615      .65359 -2 (.60929,.62301)
45.V45            6  .48214      .50769      .49367      .11038 -1 (.48208,.50525)
46.V46            6  .35077      .38133      .36093      .10916 -1 (.34948,.37239)
47.V47            6  .26400      .30829      .28237      .16445 -1 (.26511,.29963)
48.V48            6  .13600      .19461      .15486      .22111 -1 (.13165,.17806)
49.V49            6  .24655      .26773      .25931      .80347 -2 (.25088,.26774)
50.V50            6  .15000      .16570      .15781      .60816 -2 (.15142,.16419)
51.V51            6  .16533      .18882      .17558      .85082 -2 (.16666,.18451)
52.V52            6  .26769      .29067      .28250      .90593 -2 (.27299,.29200)
53.V53            6  .11442      .13231      .12153      .71155 -2 (.11406,.12900)
54.V54            6  .11692      .12524      .11885      .32163 -2 (.11547,.12222)
55.V55            6  .33846 -1   .37333 -1   .35445 -1   .13467 -2 (.34032 -1,.36859 -1)
56.V56            6  .10345      .11385      .10891      .34410 -2 (.10530,.11252)
57.V57            6  .73846 -1   .84483 -1   .78651 -1   .35662 -2 (.74909 -1,.82394 -1)
58.V58            6  .75862 -1   .89286 -1   .83575 -1   .58425 -2 (.77444 -1,.89707 -1)
59.V59            6  .88000 -1   .10212      .94168 -1   .57483 -2 (.88136 -1,.10020)
60.V60            6  .64000 -1   .79310 -1   .72591 -1   .57391 -2 (.66568 -1,.78613 -1)
61.V61            6  .15332      .17069      .16108      .71928 -2 (.15353,.16863)
62.V62            6  .23621      .25241      .24252      .59628 -2 (.23626,.24877)
63.V63            6  .70938 -1   .77333 -1   .74777 -1   .27335 -2 (.71908 -1,.77645 -1)
64.V64            6  .13793      .16000      .15116      .86561 -2 (.14207,.16024)
65.V65            6  .18103      .19467      .18849      .43964 -2 (.18387,.19310)
66.V66            6  .15816      .16956      .16459      .49340 -2 (.15941,.16977)
67.V67            6  .11897      .13067      .12558      .54757 -2 (.11983,.13133)
68.V68            6  .51020 -1   .55172 -1   .53069 -1   .14309 -2 (.51568 -1,.54571 -1)
69.V69            6  .86207 -1   .95385 -1   .90883 -1   .37574 -2 (.86940 -1,.94826 -1)

DESCRIPTIVE MEASURES  <5> V16:5  CASES=CASE#:1-138

    VARIABLE        N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
  1.V1              6  15.000      16.000      15.667     .51640     (15.125,16.209)
  2.V2              6  11.000      11.000      11.000
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3.V3        6  30.000     32.000     30.833     .98319     (29.802,31.865)
4.V4        6  12.000     12.000     12.000
5.V5        6  18.000     21.000     19.500     1.0488     (18.399,20.601)
6.V6        6  49.000     50.000     49.667     .51640     (49.125,50.209)
7.V7        6  19.000     20.000     19.333     .51640     (18.791,19.875)
8.V8        6  39.000     44.000     40.500     1.7607     (38.652,42.348)
9.V9        6  30.000     32.000     31.000     .63246     (30.336,31.664)
10.V10      6  21.000     23.000     21.833     .98319     (20.802,22.865)
11.V11      6  38.000     49.000     41.333     4.1312     (36.998,45.669)
12.V12      6  37.000     38.000     37.500     .54772     (36.925,38.075)
13.V13      6  6.0000     6.0000     6.0000
14.V14      6  14.000     14.000     14.000
15.V15      6  7.0000     9.0000     8.0000     .63246     (7.3363,8.6637)
17.V17      6  419.00     630.00     546.83     73.744     (469.44,624.22)
44.V44      6  .60504     .61607     .61023     .50513 -2 (.60492,.61553)
45.V45      6  .49113     .51074     .49998     .87154 -2 (.49084,.50913)
46.V46      6  .34107     .36508     .35686     .88738 -2 (.34755,.36617)
47.V47      6  .27302     .28214     .27793     .37645 -2 (.27398,.28188)
48.V48      6  .15536     .17021     .16081     .54814 -2 (.15506,.16656)
49.V49      6  .25556     .28162     .26637     .87619 -2 (.25717,.27556)
50.V50      6  .15990     .17376     .16639     .53776 -2 (.16075,.17204)
51.V51      6  .17143     .18616     .17727     .51059 -2 (.17192,.18263)
52.V52      6  .26607     .29255     .28197     .10397 -1 (.27106,.29288)
53.V53      6  .11765     .12649     .12203     .37480 -2 (.11810,.12597)
54.V54      6  .12381     .13126     .12733     .25319 -2 (.12467,.12999)
55.V55      6  .29240 -1  .36508 -1  .34076 -1  .26050 -2 (.31343 -1,.36810 -1)
56.V56      6  .10000     .10714     .10436     .25547 -2 (.10168,.10704)
57.V57      6  .87719 -1  .95798 -1  .92877 -1  .29686 -2 (.89762 -1,.95992 -1)
58.V58      6  .71429 -1  .83532 -1  .77877 -1  .43767 -2 (.73284 -1,.82470 -1)
59.V59      6  .12649     .14286     .13542     .61441 -2 (.12897,.14187)
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60.V60               6  .93567 -1  .10024     .98132 -1  .24715 -2 (.95538 -1,.10073)
61.V61               6  .15603     .17184     .16544     .53901 -2 (.15978,.17109)
62.V62               6  .23050     .25537     .24164     .84086 -2 (.23282,.25047)
63.V63               6  .67376 -1  .77311 -1  .73329 -1  .39005 -2 (.69236 -1,.77422 -1)
64.V64               6  .13333     .14558     .13866     .55233 -2 (.12286,.14446)
65.V65               6  .17500     .20286     .18435     .99056 -2 (.17396,.19475)
66.V66               6  .15714     .17422     .16295     .64776 -2 (.15616,.16975)
67.V67               6  .12321     .13842     .12869     .61992 -2 (.12218,.13519)
68.V68               6  .67227 -1  .75000 -1  .70752 -1  .29914 -2 (.67613 -1,.73891 -1)
69.V69               6  .80952 -1  .85919 -1  .83962 -1  .18099 -2 (.82063 -1,.85862 -1)

DESCRIPTIVE MEASURES  <6> V16:6  CASES=CASE#:1-138
   VARIABLE         N  MINIMUM     MAXIMUM       MEAN     STD DEV     .9500 CONFIDENCE INT
    1.V1            6  15.000      17.000      15.833     .75277      (15.043,16.623)
    2.V2            6  11.000      12.000      11.333     .51640      (10.791,11.875)
    3.V3            6  29.000      31.000      30.000     .89443      (29.061,30.939)
    4.V4            6  11.000      12.000      11.833     .40825      (11.405,12.262)
    5.V5            6  20.000      21.000      20.167     .40825      (19.738,20.595)
    6.V6            6  47.000      55.000      50.000     3.8987      (45.909,54.091)
    7.V7            6  20.000      22.000      20.667     1.0328      (19.583,21.751)
    8.V8            6  37.000      43.000      40.667     2.2509      (38.304,43.029)
    9.V9            6  30.000      34.000      32.167     1.6021      (30.485,33.848)
   10.V10           6  21.000      23.000      22.000     .89443      (21.061,22.939)
   11.V11           6  25.000      37.000      29.833     4.0208      (25.614,34.053)
   12.V12           6  37.000      38.000      37.167     .40825      (36.738,37.595)
   13.V13           6  6.0000      6.0000      6.0000
   14.V14           6  14.000      14.000      14.000
   15.V15           6  8.0000      8.0000      8.0000
   17.V17           6  334.00      541.00      431.83     69.548      (358.85,504.82)
   44.V44           6  .58383      .60934      .59351     .97826 -2 (.58324,.60378)
   45.V45           6  .47494      .50106      .49097     .91580 -2 (.48136,.50058)
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46.V46            6  .35244     .37709     .36916     .90050 -2 (.35971,.37861)
47.V47            6  .23355     .30353     .27233     .24115 -1 (.24703,.29764)
48.V48            6  .14650     .16958     .15819     .89546 -2 (.14879,.16759)
49.V49            6  .23628     .25449     .24308     .66924 -2 (.23606,.25011)
50.V50            6  .15212     .16451     .15843     .45257 -2 (.15368,.16317)
51.V51            6  .16348     .18862     .17621     .88117 -2 (.16697,.18546)
52.V52            6  .26327     .29676     .28437     .11310 -1 (.27250,.29624)
53.V53            6  .10616     .12172     .11590     .58033 -2 (.10981,.12199)
54.V54            6  .10906     .12275     .11631     .44517 -2 (.11164,.12099)
55.V55            6  .32419 -1  .38186 -1  .35400 -1  .23807 -2 (.32902 -1,.37898 -1)
56.V56            6  .97665 -1  .11078     .10462     .43749 -2 (.10003,.10921)
57.V57            6  .70240 -1  .77844 -1  .74409 -1  .30898 -2 (.71166 -1,.77651 -1)
58.V58            6  .68392 -1  .77844 -1  .72571 -1  .33263 -2 (.69080 -1,.76061 -1)
59.V59            6  .88725 -1  .10224     .94274 -1  .51901 -2 (.88828 -1,.99721 -1)
60.V60            6  .59150 -1  .67941 -1  .62976 -1  .34380 -2 (.59368 -1,.66584 -1)
61.V61            6  .16467     .17955     .17117     .60244 -2 (.16485,.17750)
62.V62            6  .23765     .24954     .24568     .41870 -2 (.24128,.25007)
63.V63            6  .72089 -1  .87059 -1  .79954 -1  .52220 -2 (.74474 -1,.85434 -1)
64.V64            6  .14418     .15269     .14865     .37658 -2 (.14470,.15261)
65.V65            6  .16958     .19461     .18074     .10194 -1 (.17004,.19143)
66.V66            6  .14787     .16468     .15889     .64519 -2 (.15212,.16566)
67.V67            6  .11830     .13163     .12483     .51480 -2 (.11943,.13023)
68.V68            6  .50119 -1  .55453 -1  .53172 -1  .18214 -2 (.51260 -1,.55083 -1)
69.V69            6  .80679 -1  .87282 -1  .84485 -1  .24251 -2 (.81940 -1,.87030 -1)

DESCRIPTIVE MEASURES   <7> V16:7   CASES=CASE#:1-138

    VARIABLE          N  MINIMUM     MAXIMUM       MEAN      STD DEV    .9500 CONFIDENCE INT

   1.V1               6   15.000      16.000      15.333     .51640     (14.791,15.875)
   2.V2               6   11.000      13.000      12.000     .63246     (11.336,12.664)
   3.V3               6   30.000      33.000      31.333     1.0328     (30.249,32.417)
   4.V4               6   12.000      12.000      12.000
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 5.V5             6  19.000        21.000        20.167        .75277    (19.377,20.957)
 6.V6             6  48.000        52.000        49.833        1.3292    (48.438,51.228)
 7.V7             6  20.000        21.000        20.500        .54772    (19.925,21.075)
 8.V8             6  43.000        48.000        44.500        1.8708    (42.537,46.463)
 9.V9             6  31.000        35.000        32.500        1.6432    (30.776,34.224)
10.V10            6  22.000        23.000        22.333        .51640    (21.791,22.875)
11.V11            6  29.000        37.000        33.667        3.0768    (30.438,36.896)
12.V12            6  36.000        38.000        37.167        .75277    (36.377,37.957)
13.V13            6  6.0000        6.0000        6.0000
14.V14            6  14.000        14.000        14.000
15.V15            6  8.0000        8.0000        8.0000
17.V17            6  324.00        785.00        506.17        156.37    (342.06,670.27)
44.V44            6  .60621        .62420        .61335        .61750 -2 (.60687,.61983)
45.V45            6  .49074        .51083        .50240        .90570 -2 (.49289,.51190)
46.V46            6  .35141        .37325        .36418        .78895 -2 (.35590,.37246)
47.V47            6  .27160        .31592        .28758        .15497 -1 (.27132,.30385)
48.V48            6  .16052        .18089        .16628        .75441 -2 (.15836,.17419)
49.V49            6  .24841        .27778        .26770        .11016 -1 (.25614,.27926)
50.V50            6  .16051        .17365        .16894        .48674 -2 (.16383,.17405)
51.V51            6  .16943        .18363        .17634        .48104 -2 (.17130,.18139)
52.V52            6  .26464        .28640        .27541        .89852 -2 (.26598,.28484)
53.V53            6  .12172        .12963        .12686        .27546 -2 (.12397,.12975)
54.V54            6  .11714        .12066        .11908        .15494 -2 (.11745,.12070)
55.V55            6  .35800 -1     .40219 -1     .37828 -1     .15959 -2 (.36153 -1,.39503 -1)
56.V56            6  .10573        .11217        .10785        .29591 -2 (.10475,.11096)
57.V57            6  .80247 -1     .87824 -1     .82418 -1     .31277 -2 (.79136 -1,.85701 -1)
58.V58            6  .68790 -1     .98765 -1     .87008 -1     .10663 -1 (.75818 -1,.98199 -1)
59.V59            6  .85350 -1     .10180        .92591 -1     .60729 -2 (.86217 -1,.98964 -1)
60.V60            6  .73885 -1     .78091 -1     .76175 -1     .18178 -2 (.74267 -1,.78083 -1)
61.V61            6  .15569        .18210        .16464        .10128 -1 (.15401,.17527)
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62.V62               6  .22555     .25926     .23887     .11316 -1 (.22700,.25075)
63.V63               6  .77844 -1  .86420 -1  .81691 -1  .33294 -2 (.78197 -1,.85185 -1)
64.V64               6  .14081     .16049     .14886     .70603 -2 (.14145,.15627)
65.V65               6  .16178     .19561     .18179     .12805 -1 (.16835,.19523)
66.V66               6  .15274     .17901     .16601     .10213 -1 (.15529,.17672)
67.V67               6  .12411     .13580     .13056     .42178 -2 (.12613,.13499)
68.V68               6  .49682 -1  .58568 -1  .52502 -1  .36946 -2 (.48625 -1,.56379 -1)
69.V69               6  .84599 -1  .93079 -1  .89172 -1  .28247 -2 (.86208 -1,.92137 -1)

DESCRIPTIVE MEASURES  <8> V16:8  CASES=CASE#:1-138
    VARIABLE         N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
     1.V1            6  15.000     16.000     15.667     .51640     (15.125,16.209)
     2.V2            6  11.000     12.000     11.500     .54772     (10.925,12.075)
     3.V3            6  30.000     31.000     30.167     .40825     (29.738,30.595)
     4.V4            6  12.000     12.000     12.000
     5.V5            6  18.000     20.000     19.333     .81650     (18.476,20.190)
     6.V6            6  51.000     55.000     52.833     1.4720     (51.289,54.378)
     7.V7            6  19.000     23.000     21.000     1.2649     (19.673,22.327)
     8.V8            6  39.000     45.000     41.500     2.2583     (39.130,43.870)
     9.V9            6  31.000     35.000     33.167     1.7224     (31.359,34.974)
    10.V10           6  21.000     24.000     22.500     1.0488     (21.399,23.601)
    11.V11           6  30.000     38.000     32.500     3.0822     (29.265,35.735)
    12.V12           6  36.000     38.000     37.167     .75277     (36.377,37.957)
    13.V13           6  5.0000     6.0000     5.8333     .40825     (5.4049,6.2618)
    14.V14           6  14.000     15.000     14.167     .40825     (13.738,14.595)
    15.V15           6  8.0000     9.0000     8.1667     .40825     (7.7382,8.5951)
    17.V17           6  364.00     667.00     514.00     114.59     (393.75,634.25)
    44.V44           6  .60757     .62871     .61583     .76247 -2 (.60782,.62383)
    45.V45           6  .50495     .52891     .51797     .98299 -2 (.50765,.52829)
    46.V46           6  .33453     .35832     .34465     .85449 -2 (.33568,.35362)
    47.V47           6  .26087     .32143     .29543     .24878 -1 (.26932,.32153)
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48.V48              6  .15592      .21287      .18383      .22396 -1 (.16032,.20733)
49.V49              6  .24888      .28218      .26097      .12142 -1 (.24823,.27371)
50.V50              6  .14848      .16584      .15891      .73221 -2 (.15122,.16659)
51.V51              6  .17131      .19307      .18136      .95541 -2 (.17134,.19139)
52.V52              6  .25000      .27586      .26088      .85806 -2 (.25188,.26989)
53.V53              6  .10558      .11881      .11223      .43877 -2 (.10762,.11683)
54.V54              6  .11753      .12376      .12052      .26294 -2 (.11776,.12328)
55.V55              6  .35714 -1  .39116 -1  .37144 -1  .12555 -2 (.35826 -1,.38462 -1)
56.V56              6  .89641 -1  .11264      .10442      .80696 -2 (.95956 -1,.11289)
57.V57              6  .76923 -1  .91633 -1  .86070 -1  .58141 -2 (.79968 -1,.92171 -1)
58.V58              6  .67466 -1  .89109 -1  .77791 -1  .88211 -2 (.68534 -1,.87048 -1)
59.V59              6  .90659 -1  .11753      .10917      .11129 -1 (.97492 -1,.12085)
60.V60              6  .65934 -1  .84158 -1  .77658 -1  .76494 -2 (.69631 -1,.85686 -1)
61.V61              6  .16342      .18327      .17257      .72416 -2 (.16497,.18017)
62.V62              6  .23238      .24502      .23787      .56982 -2 (.23189,.24385)
63.V63              6  .60440 -1  .81683 -1  .71469 -1  .84300 -2 (.62622 -1,.80316 -1)
64.V64              6  .12880      .15110      .13887      .83933 -2 (.13006,.14767)
65.V65              6  .16792      .18317      .17472      .55945 -2 (.16885,.18059)
66.V66              6  .15292      .17079      .15964      .67770 -2 (.15252,.16675)
67.V67              6  .11813      .13343      .12617      .63923 -2 (.11946,.13287)
68.V68              6  .49475 -1  .56931 -1  .54169 -1  .25349 -2 (.51509 -1,.56829 -1)
69.V69              6  .83333 -1  .93407 -1  .87590 -1  .38966 -2 (.83501 -1,.91679 -1)

DESCRIPTIVE MEASURES  <9> V16:9  CASES=CASE#:1-138
     VARIABLE         N  MINIMUM     MAXIMUM       MEAN      STD DEV    .9500 CONFIDENCE INT
   1.V1               6  15.000      16.000      15.333      .51640     (14.791,15.875)
   2.V2               6  11.000      12.000      11.833      .40825     (11.405,12.262)
   3.V3               6  28.000      30.000      29.333      .81650     (28.476,30.190)
   4.V4               6  12.000      12.000      12.000
   5.V5               6  20.000      22.000      20.833      .75277     (20.043,21.623)
   6.V6               6  48.000      54.000      50.833      2.0412     (48.691,52.975)
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 7.V7          6  20.000    23.000    21.167    1.1690    (19.940,22.394)
 8.V8          6  39.000    43.000    41.500    1.7607    (39.652,43.348)
 9.V9          6  30.000    34.000    32.167    1.7224    (30.359,33.974)
10.V10         6  23.000    24.000    23.333    .51640    (22.791,23.875)
11.V11         6  34.000    41.000    36.500    2.5100    (33.866,39.134)
12.V12         6  36.000    37.000    36.500    .54772    (35.925,37.075)
13.V13         6  6.0000    6.0000    6.0000
14.V14         6  13.000    16.000    14.000    1.0954    (12.850,15.150)
15.V15         6  6.0000    8.0000    7.6667    .81650    (6.8098,8.5235)
17.V17         6  692.00    876.00    784.50    67.278    (713.90,855.10)
44.V44         6  .59085    .61416    .60579    .83113 -2 (.59707,.61451)
45.V45         6  .45548    .46958    .46279    .49902 -2 (.45756,.46803)
46.V46         6  .35536    .38128    .36701    .11075 -1 (.35539,.37864)
47.V47         6  .22880    .32045    .28752    .32458 -1 (.25346,.32159)
48.V48         6  .14401    .17207    .16064    .11187 -1 (.14890,.17238)
49.V49         6  .23149    .24105    .23608    .38307 -2 (.23206,.24010)
50.V50         6  .15343    .17052    .16444    .57669 -2 (.15839,.17049)
51.V51         6  .16151    .17196    .16573    .39286 -2 (.16161,.16986)
52.V52         6  .27646    .30365    .28955    .10977 -1 (.27803,.30107)
53.V53         6  .11709    .12434    .11980    .24437 -2 (.11724,.12237)
54.V54         6  .11306    .11758    .11546    .17066 -2 (.11367,.11725)
55.V55         6  .26012 -1 .35800 -1 .32291 -1 .34596 -2 (.28661 -1,.35922 -1)
56.V56         6  .95890 -1 .10100    .98368 -1 .18233 -2 (.96455 -1,.10028)
57.V57         6  .72751 -1 .87900 -1 .79813 -1 .55745 -2 (.73963 -1,.85663 -1)
58.V58         6  .63927 -1 .71429 -1 .67048 -1 .25566 -2 (.64365 -1,.69731 -1)
59.V59         6  .95376 -1 .10582    .99617 -1 .37871 -2 (.95643 -1,.10359)
60.V60         6  .76060 -1 .84475 -1 .80254 -1 .32687 -2 (.76824 -1,.83684 -1)
61.V61         6  .15607    .19178    .17752    .12269 -1 (.16464,.19039)
62.V62         6  .24855    .28196    .26470    .12210 -1 (.25189,.27752)
63.V63         6  .72319 -1 .78062 -1 .76120 -1 .22406 -2 (.73769 -1,.78471 -1)
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   64.V64                    6  .14713     .16618     .15429      .64408 -2 (.14753,.16105)
   65.V65                    6  .18786     .19825     .19328      .39111 -2 (.18918,.19739)
   66.V66                    6  .15871     .16459     .16123      .25213 -2 (.15859,.16388)
   67.V67                    6  .14536     .15212     .14809      .24054 -2 (.14557,.15061)
   68.V68                    6  .48926 -1  .59249 -1  .53868 -1   .35433 -2 (.50150 -1,.57587 -1)
   69.V69                    6  .78767 -1  .83815 -1  .81426 -1   .21308 -2 (.79190 -1,.83662 -1)

DESCRIPTIVE MEASURES   <10> V16:10   CASES=CASE#:1-138
      VARIABLE              N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
    1.V1                    6  15.000      16.000      15.167      .40825     (14.738,15.595)
    2.V2                    6  11.000      13.000      12.000      .63246     (11.336,12.664)
    3.V3                    6  29.000      30.000      29.833      .40825     (29.405,30.262)
    4.V4                    6  12.000      12.000      12.000
    5.V5                    6  20.000      21.000      20.667      .51640     (20.125,21.209)
    6.V6                    6  51.000      56.000      53.500      1.8708     (51.537,55.463)
    7.V7                    6  21.000      22.000      21.500      .54772     (20.925,22.075)
    8.V8                    6  42.000      46.000      43.833      1.6021     (42.152,45.515)
    9.V9                    6  30.000      33.000      31.667      1.2111     (30.396,32.938)
   10.V10                   6  24.000      26.000      24.833      .75277     (24.083,25.623)
   11.V11                   6  28.000      32.000      29.667      1.3663     (28.233,31.100)
   12.V12                   6  36.000      38.000      37.000      .63246     (36.336,37.664)
   13.V13                   6  5.0000      6.0000      5.8333      .40825     (5.4049,6.2618)
   14.V14                   6  13.000      14.000      13.833      .40825     (13.405,14.262)
   15.V15                   6  8.0000      8.0000      8.0000
   17.V17                   6  316.00      384.00      343.83      24.252     (318.38,369.28)
   44.V44                   6  .58286      .60127      .59339      .72346 -2 (.58580,.60098)
   45.V45                   6  .48000      .50000      .48854      .67493 -2 (.48146,.49563)
   46.V46                   6  .40286      .42373      .41745      .76504 -2 (.40942,.42548)
   47.V47                   6  .27865      .29379      .28507      .60519 -2 (.27872,.29142)
   48.V48                   6  .12424      .14063      .13160      .59657 -2 (.12534,.13786)
   49.V49                   6  .24012      .25455      .24633      .56806 -2 (.24037,.25229)
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50.V50              6  .14571      .15805      .15177      .43409 -2 (.14722,.15633)
51.V51              6  .15758      .17405      .16446      .56801 -2 (.15850,.17042)
52.V52              6  .30063      .31921      .31101      .75548 -2 (.30308,.31893)
53.V53              6  .13021      .13842      .13333      .34690 -2 (.12969,.13697)
54.V54              6  .11550      .11979      .11773      .14841 -2 (.11617,.11928)
55.V55              6  .30303 -1   .33854 -1   .31450 -1   .12953 -2 (.30091 -1,.32809 -1)
56.V56              6  .10417      .10857      .10669      .15261 -2 (.10509,.10829)
57.V57              6  .60127 -1   .72917 -1   .67223 -1   .45487 -2 (.62449 -1,.71996 -1)
58.V58              6  .78125 -1   .88146 -1   .84533 -1   .37146 -2 (.80634 -1,.88431 -1)
59.V59              6  .79114 -1   .88571 -1   .85732 -1   .35584 -2 (.81998 -1,.89467 -1)
60.V60              6  .62857 -1   .78788 -1   .70316 -1   .54694 -2 (.64576 -1,.76055 -1)
61.V61              6  .14583      .17429      .15824      .97408 -2 (.14802,.16847)
62.V62              6  .23636      .27714      .24611      .15349 -1 (.23000,.26222)
63.V63              6  .84746 -1   .10127      .92908 -1   .70094 -2 (.85552 -1,.10026)
64.V64              6  .15714      .17405      .16455      .66093 -2 (.15761,.17149)
65.V65              6  .20000      .21203      .20753      .41669 -2 (.20316,.21190)
66.V66              6  .17514      .18229      .17882      .28363 -2 (.17585,.18180)
67.V67              6  .13030      .14063      .13659      .38766 -2 (.13252,.14066)
68.V68              6  .47468 -1   .54711 -1   .52324 -1   .28389 -2 (.49344 -1,.55303 -1)
69.V69              6  .80729 -1   .94937 -1   .88031 -1   .54078 -2 (.82356 -1,.93706 -1)

DESCRIPTIVE MEASURES  <11> V16:11  CASES=CASE#:1-138
    VARIABLE         N  MINIMUM     MAXIMUM       MEAN     STD DEV    .9500 CONFIDENCE INTERV
   1.V1              6  14.000      15.000      14.667      .51640    (14.125,15.209)
   2.V2              6  11.000      12.000      11.667      .51640    (11.125,12.209)
   3.V3              6  30.000      32.000      30.667      1.0328    (29.583,31.751)
   4.V4              6  12.000      12.000      12.000
   5.V5              6  19.000      21.000      20.000      .63246    (19.336,20.664)
   6.V6              6  48.000      55.000      50.333      2.5820    (47.624,53.043)
   7.V7              6  20.000      22.000      21.167      .75277    (20.377,21.957)
   8.V8              6  40.000      45.000      43.000      1.7889    (41.123,44.877)
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 9.V9               6  32.000     36.000     33.167     1.6021     (31.485,34.848)
10.V10              6  21.000     24.000     22.833     .98319     (21.802,23.865)
11.V11              6  27.000     35.000     30.167     2.7869     (27.242,33.091)
12.V12              6  36.000     38.000     37.333     .81650     (36.476,38.190)
13.V13              6  6.0000     6.0000     6.0000
14.V14              6  12.000     15.000     13.833     .98319     (12.802,14.865)
15.V15              6  8.0000     8.0000     8.0000
17.V17              6  349.00     484.00     396.33     56.220     (337.33,455.33)
44.V44              6  .59726     .61247     .60828     .55927 -2 (.60241,.61415)
45.V45              6  .48552     .50137     .49460     .55421 -2 (.48878,.50042)
46.V46              6  .36303     .38630     .37766     .88442 -2 (.36838,.38694)
47.V47              6  .27397     .30053     .29082     .97055 -2 (.28063,.30100)
48.V48              6  .13239     .15145     .14176     .80501 -2 (.13331,.15020)
49.V49              6  .23967     .25788     .24854     .68928 -2 (.24131,.25578)
50.V50              6  .13754     .14648     .14176     .36380 -2 (.13794,.14558)
51.V51              6  .16322     .17287     .16971     .35927 -2 (.16594,.17348)
52.V52              6  .27123     .28719     .27852     .58657 -2 (.27237,.28468)
53.V53              6  .12810     .13564     .13182     .28931 -2 (.12878,.13485)
54.V54              6  .11777     .12766     .12271     .38052 -2 (.11872,.12670)
55.V55              6  .30986 -1  .33408 -1  .32294 -1  .96115 -3 (.31285 -1,.33302 -1)
56.V56              6  .10124     .11268     .10892     .44541 -2 (.10424,.11359)
57.V57              6  .63014 -1  .75724 -1  .68986 -1  .44795 -2 (.64285 -1,.73687 -1)
58.V58              6  .74380 -1  .85960 -1  .80412 -1  .47111 -2 (.75468 -1,.85356 -1)
59.V59              6  .86860 -1  .90411 -1  .88808 -1  .13586 -2 (.87382 -1,.90233 -1)
60.V60              6  .65753 -1  .71809 -1  .69129 -1  .26686 -2 (.66329 -1,.71930 -1)
61.V61              6  .15083     .16164     .15758     .40851 -2 (.15329,.16186)
62.V62              6  .23404     .24658     .23989     .46276 -2 (.23504,.24475)
63.V63              6  .78512 -1  .90411 -1  .85760 -1  .45989 -2 (.80933 -1,.90586 -1)
64.V64              6  .15473     .15957     .15731     .18216 -2 (.15540,.15922)
65.V65              6  .19599     .21490     .20502     .83501 -2 (.19625,.21378)
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66.V66             6  .17553     .18904     .18160     .48310 -2 (.17653,.18667)
67.V67             6  .13239     .14031     .13655     .33247 -2 (.13306,.14004)
68.V68             6  .48998 -1  .54795 -1  .51475 -1  .22033 -2 (.49163 -1,.53787 -1)
69.V69             6  .87671 -1  .95768 -1  .91260 -1  .36056 -2 (.87477 -1,.95044 -1)

DESCRIPTIVE MEASURES  <12> V16:12  CASES=CASE#:1-138
  VARIABLE        N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
   1.V1            6  15.000     16.000     15.333     .51640     (14.791,15.875)
   2.V2            6  11.000     11.000     11.000
   3.V3            6  30.000     32.000     30.833     .98319     (29.802,31.865)
   4.V4            6  12.000     12.000     12.000
   5.V5            6  18.000     20.000     18.833     .75277     (18.043,19.623)
   6.V6            6  46.000     51.000     47.833     1.9408     (45.797,49.870)
   7.V7            6  19.000     21.000     20.333     .81650     (19.476,21.190)
   8.V8            6  42.000     47.000     44.167     1.7224     (42.359,45.974)
   9.V9            6  28.000     33.000     30.833     1.8348     (28.908,32.759)
  10.V10           6  21.000     23.000     21.833     .98319     (20.802,22.865)
  11.V11           6  31.000     37.000     35.167     2.3166     (32.736,37.598)
  12.V12           6  36.000     37.000     36.500     .54772     (35.925,37.075)
  13.V13           6  6.0000     6.0000     6.0000
  14.V14           6  14.000     15.000     14.167     .40825     (13.738,14.595)
  15.V15           6  8.0000     8.0000     8.0000
  17.V17           6  360.00     625.00     449.83     91.957     (353.33,546.34)
  44.V44           6  .59360     .62864     .61613     .12399 -1 (.60312,.62914)
  45.V45           6  .50240     .52349     .50788     .79382 -2 (.49955,.51621)
  46.V46           6  .34752     .36667     .35842     .88689 -2 (.34911,.36773)
  47.V47           6  .26111     .30425     .28210     .14786 -1 (.26658,.29762)
  48.V48           6  .14720     .17226     .15760     .11030 -1 (.14603,.16918)
  49.V49           6  .26080     .28369     .27453     .77620 -2 (.26638,.28268)
  50.V50           6  .16000     .16944     .16535     .35875 -2 (.16159,.16912)
  51.V51           6  .17120     .18333     .17696     .42784 -2 (.17247,.18145)
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52.V52            6  .26478      .28333      .27370      .64331 -2 (.26694,.28045)
53.V53            6  .11633      .12304      .12064      .27270 -2 (.11778,.12350)
54.V54            6  .12304      .12778      .12494      .16857 -2 (.12317,.12671)
55.V55            6  .30227 -1   .36111 -1   .32591 -1   .22361 -2 (.30245 -1,.34938 -1)
56.V56            6  .10080      .11111      .10654      .36261 -2 (.10274,.11035)
57.V57            6  .83333 -1   .96197 -1   .89456 -1   .44050 -2 (.84834 -1,.94079 -1)
58.V58            6  .80000 -1   .10000      .92335 -1   .71999 -2 (.84779 -1,.99890 -1)
59.V59            6  .11111      .13098      .12035      .86579 -2 (.11126,.12943)
60.V60            6  .77778 -1   .88161 -1   .83532 -1   .41301 -2 (.79198 -1,.87857 -1)
61.V61            6  .15278      .17600      .16129      .80941 -2 (.15279,.16978)
62.V62            6  .23174      .24960      .23644      .66572 -2 (.22945,.24343)
63.V63            6  .75650 -1   .83333 -1   .78039 -1   .28017 -2 (.75098 -1,.80979 -1)
64.V64            6  .13647      .15200      .14438      .51216 -2 (.13900,.14975)
65.V65            6  .18792      .20556      .19733      .74644 -2 (.18950,.20517)
66.V66            6  .16331      .17632      .17087      .48123 -2 (.16582,.17592)
67.V67            6  .12778      .13870      .13326      .44321 -2 (.12861,.13791)
68.V68            6  .58166 -1   .70922 -1   .65181 -1   .43592 -2 (.60606 -1,.69756 -1)
69.V69            6  .80605 -1   .89485 -1   .86950 -1   .32223 -2 (.83568 -1,.90331 -1)

DESCRIPTIVE MEASURES  <13> V16:13  CASES=CASE#:1-138
    VARIABLE         N  MINIMUM     MAXIMUM       MEAN      STD DEV    .9500 CONFIDENCE INT
      1.V1           6   15.000      15.000      15.000
      2.V2           6   11.000      11.000      11.000
      3.V3           6   30.000      32.000      31.500      .83666     (30.622,32.378)
      4.V4           6   12.000      12.000      12.000
      5.V5           6   19.000      21.000      20.167      .75277     (19.377,20.957)
      6.V6           6   46.000      49.000      48.000      1.0954     (46.850,49.150)
      7.V7           6   20.000      24.000      21.500      1.5166     (19.908,23.092)
      8.V8           6   40.000      47.000      43.167      2.3166     (40.736,45.598)
      9.V9           6   30.000      32.000      31.333      .81650     (30.476,32.190)
     10.V10          6   21.000      24.000      22.333      1.0328     (21.249,23.417)
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11.V11          6  33.000     38.000     35.167     2.1370     (32.924,37.409)
12.V12          6  36.000     37.000     36.167     .40825     (35.738,36.595)
13.V13          6  6.0000     6.0000     6.0000
14.V14          6  14.000     14.000     14.000
15.V15          6  8.0000     8.0000     8.0000
17.V17          6  406.00     832.00     588.83     168.13     (412.39,765.28)
44.V44          6  .60776     .62380     .61628     .66671 -2 (.60929,.62328)
45.V45          6  .51082     .53664     .52279     .10599 -1 (.51167,.53391)
46.V46          6  .36298     .37439     .37120     .46441 -2 (.36632,.37607)
47.V47          6  .30529     .33834     .32010     .12899 -1 (.30656,.33364)
48.V48          6  .16810     .18554     .17587     .67960 -2 (.16874,.18300)
49.V49          6  .24557     .28325     .26208     .13294 -1 (.24813,.27603)
50.V50          6  .16098     .18295     .17344     .81374 -2 (.16490,.18198)
51.V51          6  .17504     .19951     .18651     .10321 -1 (.17568,.19734)
52.V52          6  .27877     .29332     .28887     .51812 -2 (.28343,.29430)
53.V53          6  .13290     .14553     .13838     .48863 -2 (.13325,.14350)
54.V54          6  .12380     .13547     .13069     .40963 -2 (.12639,.13499)
55.V55          6  .36946 -1  .39501 -1  .38466 -1  .86568 -3 (.37558 -1,.39375 -1)
56.V56          6  .98226 -1  .11330     .10798     .53819 -2 (.10233,.11363)
57.V57          6  .83744 -1  .92769 -1  .87861 -1  .35412 -2 (.84145 -1,.91578 -1)
58.V58          6  .66106 -1  .88670 -1  .77125 -1  .92385 -2 (.67430 -1,.86821 -1)
59.V59          6  .10232     .11084     .10767     .32380 -2 (.10427,.11107)
60.V60          6  .74554 -1  .86207 -1  .80302 -1  .39586 -2 (.76148 -1,.84456 -1)
61.V61          6  .16045     .17308     .16860     .45068 -2 (.16387,.17333)
62.V62          6  .23501     .25156     .24613     .57981 -2 (.24004,.25221)
63.V63          6  .73317 -1  .83744 -1  .79124 -1  .44718 -2 (.74431 -1,.83817 -1)
64.V64          6  .14425     .15416     .14764     .35923 -2 (.14387,.15141)
65.V65          6  .19111     .20443     .19840     .52737 -2 (.19287,.20394)
66.V66          6  .16045     .17734     .16978     .65908 -2 (.16286,.17669)
67.V67          6  .13702     .15007     .14379     .51333 -2 (.13840,.14917)
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  68.V68                6  .51683 -1  .66502 -1  .58650 -1  .65791 -2 (.51746 -1,.65555 -1)
  69.V69                6  .83220 -1  .93555 -1  .89218 -1  .35309 -2 (.85512 -1,.92923 -1)

DESCRIPTIVE MEASURES  <14> V16:14  CASES=CASE#:1-138
     VARIABLE           N  MINIMUM    MAXIMUM     MEAN       STD DEV    .9500 CONFIDENCE INT
   1.V1                 6  14.000     17.000     15.167     .98319     (14.135,16.198)
   2.V2                 6  10.000     12.000     11.333     .81650     (10.476,12.190)
   3.V3                 6  30.000     34.000     31.833     1.3292     (30.438,33.228)
   4.V4                 6  11.000     12.000     11.833     .40825     (11.405,12.262)
   5.V5                 6  21.000     23.000     22.167     .75277     (21.377,22.957)
   6.V6                 6  44.000     52.000     47.500     2.7386     (44.626,50.374)
   7.V7                 6  19.000     20.000     19.667     .51640     (19.125,20.209)
   8.V8                 6  40.000     42.000     41.167     .75277     (40.377,41.957)
   9.V9                 6  30.000     34.000     31.500     1.5166     (29.908,33.092)
  10.V10                6  19.000     22.000     20.333     1.2111     (19.062,21.604)
  11.V11                6  35.000     52.000     42.500     6.0910     (36.108,48.892)
  12.V12                6  37.000     38.000     37.500     .54772     (36.925,38.075)
  13.V13                6  6.0000     6.0000     6.0000
  14.V14                6  14.000     14.000     14.000
  15.V15                6  8.0000     8.0000     8.0000
  17.V17                6  319.00     786.00     549.50     164.58     (376.78,722.22)
  44.V44                6  .59033     .62882     .61612     .13803 -1 (.60163,.63061)
  45.V45                6  .47964     .50470     .48851     .10390 -1 (.47761,.49942)
  46.V46                6  .34498     .37477     .36345     .10127 -1 (.35282,.37408)
  47.V47                6  .27099     .29651     .28663     .11129 -1 (.27495,.29831)
  48.V48                6  .15955     .17084     .16452     .45235 -2 (.15977,.16926)
  49.V49                6  .23282     .28527     .25907     .18025 -1 (.24015,.27798)
  50.V50                6  .14922     .17241     .16134     .76501 -2 (.15331,.16937)
  51.V51                6  .16031     .17625     .17128     .60518 -2 (.16493,.17763)
  52.V52                6  .25546     .28942     .27874     .12307 -1 (.26583,.29166)
  53.V53                6  .11323     .13480     .12326     .74032 -2 (.11549,.13102)
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 54.V54              6  .12016     .12853     .12342     .38666 -2 (.11937,.12748)
 55.V55              6  .32946 -1  .36896 -1  .34976 -1  .12856 -2 (.33627 -1,.36325 -1)
 56.V56              6  .96692 -1  .10972     .10453     .51083 -2 (.99171 -1,.10989)
 57.V57              6  .81425 -1  .91311 -1  .87496 -1  .41267 -2 (.83166 -1,.91827 -1)
 58.V58              6  .66158 -1  .97179 -1  .80227 -1  .10524 -1 (.69183 -1,.91271 -1)
 59.V59              6  .99237 -1  .12227     .11017     .90321 -2 (.10069,.11965)
 60.V60              6  .81425 -1  .96070 -1  .90089 -1  .52133 -2 (.84618 -1,.95560 -1)
 61.V61              6  .14107     .17557     .15601     .11951 -1 (.14346,.16855)
 62.V62              6  .22571     .24936     .23485     .85326 -2 (.22589,.24380)
 63.V63              6  .76583 -1  .89520 -1  .83798 -1  .48199 -2 (.78740 -1,.88856 -1)
 64.V64              6  .14433     .16301     .14940     .70818 -2 (.14197,.15683)
 65.V65              6  .16285     .19749     .17664     .12795 -1 (.16321,.19007)
 66.V66              6  .14249     .16928     .15746     .89636 -2 (.14805,.16686)
 67.V67              6  .12087     .13480     .12841     .44760 -2 (.12371,.13311)
 68.V68              6  .52326 -1  .63319 -1  .58389 -1  .37752 -2 (.54427 -1,.62351 -1)
 69.V69              6  .81425 -1  .97179 -1  .89916 -1  .58476 -2 (.83779 -1,.96052 -1)

DESCRIPTIVE MEASURES  <15> V16:15  CASES=CASE#:1-138
    VARIABLE         N  MINIMUM    MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
     1.V1            6   14.000     16.000     15.000     .63246     (14.336,15.664)
     2.V2            6   11.000     12.000     11.500     .54772     (10.925,12.075)
     3.V3            6   30.000     33.000     31.833     1.4720     (30.289,33.378)
     4.V4            6   12.000     12.000     12.000
     5.V5            5   21.000     23.000     21.400     .89443     (20.289,22.511)
     6.V6            6   46.000     50.000     48.000     1.4142     (46.516,49.484)
     7.V7            6   20.000     21.000     20.500     .54772     (19.925,21.075)
     8.V8            6   44.000     48.000     46.167     1.8348     (44.241,48.092)
     9.V9            6   30.000     34.000     32.667     1.6330     (30.953,34.380)
    10.V10           6   21.000     22.000     21.167     .40825     (20.738,21.595)
    11.V11           6   33.000     40.000     37.667     2.5820     (34.957,40.376)
    12.V12           6   37.000     37.000     37.000
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13.V13          6  6.0000     6.0000     6.0000
14.V14          6  14.000     14.000     14.000
15.V15          6  8.0000     8.0000     8.0000
17.V17          6  330.00     640.00     520.17     107.57    (407.28,633.05)
44.V44          6  .60606     .62842     .61760     .86854 -2 (.60849,.62672)
45.V45          6  .49446     .51261     .50229     .65485 -2 (.49542,.50916)
46.V46          6  .33750     .36667     .34675     .11076 -1 (.33512,.35837)
47.V47          6  .27273     .30312     .29169     .13915 -1 (.27709,.30629)
48.V48          6  .16667     .19687     .18346     .12532 -1 (.17031,.19661)
49.V49          6  .24844     .27273     .25981     .80963 -2 (.25131,.26830)
50.V50          6  .15455     .17122     .16276     .63146 -2 (.15613,.16938)
51.V51          6  .17637     .18281     .17900     .23226 -2 (.17656,.18144)
52.V52          6  .25156     .27879     .26668     .98753 -2 (.25632,.27705)
53.V53          6  .10938     .12727     .11887     .64472 -2 (.11211,.12564)
54.V54          6  .12362     .12842     .12537     .22610 -2 (.12300,.12774)
55.V55          6  .31365 -1  .35959 -1  .33615 -1  .15662 -2 (.31972 -1,.35259 -1)
56.V56          6  .95941 -1  .10909     .10063     .44801 -2 (.95933 -1,.10534)
57.V57          6  .85616 -1  .93750 -1  .88836 -1  .30924 -2 (.85591 -1,.92081 -1)
58.V58          6  .78125 -1  .96970 -1  .84733 -1  .68455 -2 (.77549 -1,.91917 -1)
59.V59          6  .10000     .11111     .10555     .40692 -2 (.10128,.10982)
60.V60          6  .75342 -1  .83789 -1  .78744 -1  .34006 -2 (.75175 -1,.82313 -1)
61.V61          6  .14936     .16387     .15515     .51288 -2 (.14977,.16053)
62.V62          6  .21562     .23950     .22510     .80499 -2 (.21665,.23354)
63.V63          6  .66421 -1  .81818 -1  .72611 -1  .61043 -2 (.66205 -1,.79017 -1)
64.V64          6  .13699     .14545     .14189     .29615 -2 (.13879,.14500)
65.V65          6  .16029     .17227     .16633     .48058 -2 (.16128,.17137)
66.V66          6  .15867     .17122     .16505     .43128 -2 (.16052,.16957)
67.V67          6  .12121     .13479     .12881     .50540 -2 (.12351,.13411)
68.V68          6  .53125 -1  .62731 -1  .58229 -1  .38455 -2 (.54193 -1,.62265 -1)
69.V69          6  .67187 -1  .90909 -1  .76330 -1  .84387 -2 (.67474 -1,.85185 -1)
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DESCRIPTIVE MEASURES  <16> V16:16  CASES=CASE#:1-138

   VARIABLE          N  MINIMUM    MAXIMUM     MEAN      STD DEV     .9500 CONFIDENCE INT.
  1.V1              18  14.000     16.000     15.222     .64676     (14.901,15.544)
  2.V2              18  11.000     13.000     12.000     .59409     (11.705,12.295)
  3.V3              18  30.000     32.000     30.778     .87820     (30.341,31.214)
  4.V4              18  12.000     12.000     12.000
  5.V5              18  16.000     25.000     21.111     1.8752     (20.179,22.044)
  6.V6              18  40.000     52.000     46.278     2.9467     (44.812,47.743)
  7.V7              18  18.000     22.000     20.000     1.1882     (19.409,20.591)
  8.V8              18  35.000     45.000     39.667     2.6568     (38.345,40.988)
  9.V9              18  28.000     34.000     30.611     1.6139     (29.809,31.414)
 10.V10             18  19.000     23.000     21.056     1.1618     (20.478,21.633)
 11.V11             18  32.000     49.000     38.111     5.0397     (35.605,40.617)
 12.V12             18  36.000     38.000     37.000     .68599     (36.659,37.341)
 13.V13             18  5.0000     7.0000     6.0000     .34300     (5.8294,6.1706)
 14.V14             18  13.000     14.000     13.944     .23570     (13.827,14.062)
 15.V15             18  7.0000     8.0000     7.9444     .23570     (7.8272,8.0617)
 17.V17             18  285.00     809.00     477.78     167.68     (394.39,561.17)
 44.V44             18  .57923     .62689     .60464     .13175 -1 (.59809,.61119)
 45.V45             19  .49239     .53595     .51316     .13586 -1 (.50641,.51992)
 46.V46             18  .34641     .40437     .38023     .14811 -1 (.37286,.38760)
 47.V47             18  .25175     .35385     .29592     .26744 -1 (.28262,.30922)
 48.V48             18  .13986     .18127     .15622     .13399 -1 (.14956,.16289)
 49.V49             18  .24896     .28793     .26876     .11152 -1 (.26321,.27430)
 50.V50             18  .16765     .18672     .17617     .61300 -2 (.17312,.17922)
 51.V51             18  .16699     .19608     .18204     .76539 -2 (.17824,.18585)
 52.V52             18  .26471     .30601     .28670     .98763 -2 (.28178,.29161)
 53.V53             18  .12621     .14840     .13898     .57103 -2 (.13614,.14182)
 54.V54             18  .12725     .14026     .13532     .40011 -2 (.13333,.13731)
 55.V55             18  .27972 -1  .46972 -1  .39102 -1  .48816 -2 (.36675 -1,.41530 -1)
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    56.V56            18  .10256     .11765     .11124     .41260 -2 (.10919,.11329)
    57.V57            18  .79235 -1  .93656 -1  .86126 -1  .38911 -2 (.84191 -1,.88061 -1)
    58.V58            18  .70735 -1  .10217     .85251 -1  .95662 -2 (.80493 -1,.90008 -1)
    59.V59            18  .91286 -1  .11480     .10353     .66438 -2 (.10023,.10684)
    60.V60            18  .71006 -1  .10217     .80489 -1  .88428 -2 (.76092 -1,.84886 -1)
    61.V61            18  .14769     .18102     .16966     .92712 -2 (.16505,.17427)
    62.V62            18  .20846     .25936     .23951     .15821 -1 (.23164,.24737)
    63.V63            18  .70997 -1  .99476 -1  .86629 -1  .83309 -2 (.82486 -1,.90772 -1)
    64.V64            18  .13595     .17160     .15888     .10429 -1 (.15369,.16406)
    65.V65            18  .15575     .20732     .18738     .13986 -1 (.18043,.19434)
    66.V66            18  .15575     .19195     .17399     .90606 -2 (.16949,.17850)
    67.V67            18  .12745     .15257     .13669     .58488 -2 (.13378,.13960)
    68.V68            18  .45643 -1  .78431 -1  .57555 -1  .87340 -2 (.53212 -1,.61898 -1)
    69.V69            18  .86093 -1  .10526     .94867 -1  .41122 -2 (.92823 -1,.96912 -1)

DESCRIPTIVE MEASURES  <17> V16:17  CASES=CASE#:1-138

       VARIABLE        N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
     1.V1              6  14.000     16.000     15.000     .63246     (14.336,15.664)
     2.V2              6  11.000     13.000     11.833     .75277     (11.043,12.623)
     3.V3              6  30.000     32.000     30.667     .81650     (29.810,31.524)
     4.V4              6  12.000     12.000     12.000
     5.V5              6  21.000     24.000     21.500     1.2247     (20.215,22.785)
     6.V6              6  50.000     59.000     54.500     3.6194     (50.702,58.298)
     7.V7              6  21.000     23.000     21.833     .98319     (20.802,22.865)
     8.V8              6  40.000     47.000     43.667     2.3381     (41.213,46.120)
     9.V9              6  34.000     37.000     35.500     1.2247     (34.215,36.785)
    10.V10             6  22.000     25.000     23.500     1.0488     (22.399,24.601)
    11.V11             6  31.000     41.000     35.167     4.0702     (30.895,39.438)
    12.V12             6  37.000     39.000     38.167     .98319     (37.135,39.198)
    13.V13             6  5.0000     6.0000     5.8333     .40825     (5.4049,6.2618)
    14.V14             6  14.000     14.000     14.000
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15.V15            6  8.0000      8.0000      8.0000
17.V17            6  448.00      779.00      598.50      120.85     (471.67,725.33)
44.V44            6  .60351      .62259      .61451      .64347 -2 (.60776,.62127)
45.V45            6  .48652      .51159      .50018      .92360 -2 (.49049,.50987)
46.V46            6  .36072      .39063      .37269      .12827 -1 (.35923,.38615)
47.V47            6  .29423      .31964      .30851      .11210 -1 (.29674,.32027)
48.V48            6  .14561      .16816      .15726      .80415 -2 (.14882,.16570)
49.V49            6  .22850      .25497      .23871      .11720 -1 (.22641,.25101)
50.V50            6  .14314      .16518      .15707      .86288 -2 (.14801,.16612)
51.V51            6  .15614      .17411      .16462      .62428 -2 (.15807,.17117)
52.V52            6  .27649      .29910      .29011      .84960 -2 (.28119,.29902)
53.V53            6  .11730      .13170      .12260      .48536 -2 (.11751,.12769)
54.V54            6  .10351      .11830      .11232      .55823 -2 (.10646,.11817)
55.V55            6  .31809 -1  .37227 -1  .35492 -1  .19812 -2 (.33413 -1,.37571 -1)
56.V56            6  .92982 -1  .10714      .99614 -1  .53138 -2 (.94037 -1,.10519)
57.V57            6  .69869 -1  .74503 -1  .71786 -1  .17745 -2 (.69924 -1,.73648 -1)
58.V58            6  .68036 -1  .87054 -1  .78379 -1  .61768 -2 (.71897 -1,.84861 -1)
59.V59            6  .77193 -1  .87748 -1  .83461 -1  .40010 -2 (.79262 -1,.87660 -1)
60.V60            6  .64185 -1  .74503 -1  .69546 -1  .35506 -2 (.65820 -1,.73272 -1)
61.V61            6  .15284      .17193      .16164      .74129 -2 (.15386,.16942)
62.V62            6  .22068      .24035      .23160      .71831 -2 (.22407,.23914)
63.V63            6  .64047 -1  .84821 -1  .72895 -1  .80731 -2 (.64423 -1,.81367 -1)
64.V64            6  .14119      .15308      .14956      .47906 -2 (.14453,.15459)
65.V65            6  .16688      .18688      .17697      .64324 -2 (.17022,.18372)
66.V66            6  .14891      .17384      .16314      .90332 -2 (.15366,.17262)
67.V67            6  .12323      .13246      .12770      .30947 -2 (.12445,.13095)
68.V68            6  .42213 -1  .49702 -1  .45836 -1  .31278 -2 (.42553 -1,.49118 -1)
69.V69            6  .75439 -1  .91518 -1  .83283 -1  .60633 -2 (.76920 -1,.89646 -1)

DESCRIPTIVE MEASURES  <18> V16:18  CASES=CASE#:1-138

    VARIABLE         N  MINIMUM     MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
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1.V1               6  15.000     17.000     15.833     .75277     (15.043,16.623)
2.V2               6  12.000     13.000     12.667     .51640     (12.125,13.209)
3.V3               6  30.000     32.000     31.667     .81650     (30.810,32.524)
4.V4               6  12.000     12.000     12.000
5.V5               6  19.000     21.000     19.833     .75277     (19.043,20.623)
6.V6               6  44.000     47.000     45.333     1.2111     (44.062,46.604)
7.V7               6  19.000     22.000     20.500     1.0488     (19.399,21.601)
8.V8               6  38.000     43.000     40.833     1.9408     (38.797,42.870)
9.V9               6  30.000     32.000     30.833     .75277     (30.043,31.623)
10.V10             6  20.000     21.000     20.667     .51640     (20.125,21.209)
11.V11             6  31.000     39.000     36.000     3.0332     (32.817,39.183)
12.V12             6  36.000     38.000     37.000     .63246     (36.336,37.664)
13.V13             6  6.0000     6.0000     6.0000
14.V14             6  14.000     14.000     14.000
15.V15             6  8.0000     8.0000     8.0000
17.V17             6  368.00     600.00     475.83     86.668     (384.88,566.79)
44.V44             6  .60076     .62673     .61116     .87880 -2 (.60193,.62038)
45.V45             6  .50611     .54147     .51853     .12146 -1 (.50578,.53127)
46.V46             6  .27717     .35941     .33626     .30007 -1 (.30477,.36775)
47.V47             6  .30116     .33252     .31902     .12885 -1 (.30550,.33254)
48.V48             6  .15830     .19315     .17414     .13748 -1 (.15971,.18856)
49.V49             6  .25483     .27419     .26562     .73261 -2 (.25793,.27330)
50.V50             6  .17000     .18433     .17813     .50626 -2 (.17282,.18344)
51.V51             6  .18000     .19071     .18435     .39108 -2 (.18025,.18845)
52.V52             6  .25806     .27413     .26675     .62382 -2 (.26021,.27330)
53.V53             6  .11333     .12673     .12204     .46327 -2 (.11718,.12691)
54.V54             6  .11833     .12673     .12215     .26855 -2 (.11933,.12497)
55.V55             6  .29891 -1  .36675 -1  .34456 -1  .26875 -2 (.31635 -1,.37276 -1)
56.V56             6  .10425     .11167     .10821     .27219 -2 (.10535,.11107)
57.V57             6  .77220 -1  .87452 -1  .82810 -1  .39928 -2 (.78620 -1,.87000 -1)
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  58.V58               6  .70000 -1  .86957 -1  .79052 -1  .68555 -2 (.71858 -1,.86246 -1)
  59.V59               6  .89674 -1  .12442     .10051     .13422 -1 (.86421 -1,.11459)
  60.V60               6  .65217 -1  .89862 -1  .77248 -1  .78787 -2 (.68979 -1,.85516 -1)
  61.V61               6  .16033     .17568     .16762     .61785 -2 (.16114,.17410)
  62.V62               6  .23041     .24905     .23934     .78951 -2 (.23105,.24762)
  63.V63               6  .68441 -1  .83130 -1  .75539 -1  .68853 -2 (.68314 -1,.82765 -1)
  64.V64               6  .13825     .14674     .14497     .33574 -2 (.14144,.14849)
  65.V65               6  .16848     .18251     .17395     .58042 -2 (.16786,.18004)
  66.V66               6  .16000     .18340     .17199     .84204 -2 (.16315,.18083)
  67.V67               6  .12469     .13167     .12774     .27646 -2 (.12483,.13064)
  68.V68               6  .48900 -1  .62212 -1  .54829 -1  .53483 -2 (.49216 -1,.60441 -1)
  69.V69               6  .83333 -1  .89674 -1  .86456 -1  .27342 -2 (.83586 -1,.89325 -1)

DESCRIPTIVE MEASURES   <19> V16:19   CASES=CASE#:1-138
     VARIABLE          N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1                6   15.000      15.000      15.000
   2.V2                6   11.000      12.000      11.167     .40825     (10.738,11.595)
   3.V3                6   30.000      32.000      31.333     .81650     (30.476,32.190)
   4.V4                6   11.000      12.000      11.833     .40825     (11.405,12.262)
   5.V5                6   18.000      21.000      19.333     1.0328     (18.249,20.417)
   6.V6                6   54.000      61.000      57.667     2.3381     (55.213,60.120)
   7.V7                6   21.000      24.000      22.167     .98319     (21.135,23.198)
   8.V8                6   42.000      47.000      45.167     1.8348     (43.241,47.092)
   9.V9                6   38.000      42.000      40.000     1.5492     (38.374,41.626)
  10.V10               6   23.000      26.000      24.667     1.0328     (23.583,25.751)
  11.V11               6   27.000      35.000      31.667     3.0768     (28.438,34.896)
  12.V12               6   38.000      38.000      38.000
  13.V13               6   4.0000      6.0000      5.6667     .81650     (4.8098,6.5235)
  14.V14               6   16.000      16.000      16.000
  15.V15               6   8.0000      8.0000      8.0000
  17.V17               6   446.00      760.00      609.50     134.64     (468.20,750.80)
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44.V44              6  .61883      .65798      .64155      .14632 -1 (.62620,.65690)
45.V45              6  .48663      .53221      .51219      .14939 -1 (.49651,.52787)
46.V46              6  .33219      .37444      .34700      .14755 -1 (.33152,.36249)
47.V47              6  .27105      .31748      .29001      .16583 -1 (.27261,.30742)
48.V48              6  .16143      .20706      .18227      .17443 -1 (.16397,.20058)
49.V49              6  .21925      .25532      .23703      .12207 -1 (.22422,.24984)
50.V50              6  .14114      .14724      .14421      .23541 -2 (.14174,.14668)
51.V51              6  .16184      .17791      .17059      .61730 -2 (.16412,.17707)
52.V52              6  .25526      .30493      .27405      .17410 -1 (.25578,.29232)
53.V53              6  .10843      .11503      .11232      .25044 -2 (.10969,.11495)
54.V54              6  .10843      .11489      .11163      .25927 -2 (.10891,.11435)
55.V55              6  .35874 -1  .38344 -1  .37152 -1  .12253 -2 (.35867 -1,.38438 -1)
56.V56              6  .89686 -1  .10638     .99441 -1  .64039 -2 (.92720 -1,.10616)
57.V57              6  .71749 -1  .80851 -1  .76312 -1  .37829 -2 (.72342 -1,.80282 -1)
58.V58              6  .64171 -1  .78475 -1  .69878 -1  .57409 -2 (.63853 -1,.75902 -1)
59.V59              6  .84211 -1  .92246 -1  .89435 -1  .31178 -2 (.86163 -1,.92707 -1)
60.V60              6  .64474 -1  .78475 -1  .70668 -1  .46518 -2 (.65787 -1,.75550 -1)
61.V61              6  .15146     .16711     .16010     .59349 -2 (.15387,.16633)
62.V62              6  .22203     .23797     .23065     .69517 -2 (.22336,.23795)
63.V63              6  .62780 -1  .73684 -1  .67803 -1  .44361 -2 (.63148 -1,.72458 -1)
64.V64              6  .12909     .14126     .13472     .47510 -2 (.12973,.13970)
65.V65              6  .15789     .17489     .16748     .65401 -2 (.16061,.17434)
66.V66              6  .14458     .15919     .15228     .55744 -2 (.14643,.15813)
67.V67              6  .11974     .12780     .12432     .30906 -2 (.12108,.12756)
68.V68              6  .44750 -1  .57447 -1  .49206 -1  .48632 -2 (.44102 -1,.54309 -1)
69.V69              6  .75731 -1  .85202 -1  .80179 -1  .36949 -2 (.76301 -1,.84056 -1)

DESCRIPTIVE MEASURES  <20> V16:20  CASES=CASE#:1-138

    VARIABLE        N  MINIMUM     MAXIMUM       MEAN      STD DEV    .9500 CONFIDENCE INT

   1.V1             6  16.000      17.000      16.333      .51640     (15.791,16.875)

   2.V2             6  11.000      12.000      11.667      .51640     (11.125,12.209)
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3.V3                 6  30.000     32.000     30.833     .98319     (29.802,31.865)
4.V4                 6  12.000     14.000     12.333     .81650     (11.476,13.190)
5.V5                 6  18.000     20.000     19.167     .98319     (18.135,20.198)
6.V6                 6  52.000     56.000     53.667     1.5055     (52.087,55.247)
7.V7                 6  20.000     22.000     20.833     .75277     (20.043,21.623)
8.V8                 6  41.000     47.000     43.667     2.0656     (41.499,45.834)
9.V9                 6  31.000     35.000     32.333     1.6330     (30.620,34.047)
10.V10               5  22.000     24.000     23.000     .70711     (22.122,23.878)
11.V11               6  29.000     35.000     31.833     2.4833     (29.227,34.439)
12.V12               6  36.000     38.000     37.333     .81650     (36.476,38.190)
13.V13               6  5.0000     6.0000     5.8333     .40825     (5.4049,6.2618)
14.V14               6  14.000     14.000     14.000
15.V15               6  8.0000     8.0000     8.0000
17.V17               6  413.00     542.00     454.83     47.885     (404.58,505.09)
44.V44               6  .58950     .62092     .60975     .11418 -1 (.59776,.62173)
45.V45               6  .50358     .55120     .52948     .17766 -1 (.51084,.54813)
46.V46               6  .33652     .35332     .34264     .62118 -2 (.33612,.34916)
47.V47               6  .27409     .33656     .31062     .24197 -1 (.28523,.33602)
48.V48               6  .13704     .17918     .16568     .14964 -1 (.14998,.18139)
49.V49               6  .24476     .26492     .25429     .65359 -2 (.24744,.26115)
50.V50               6  .16465     .17661     .17029     .44888 -2 (.16558,.17501)
51.V51               6  .16916     .18886     .18096     .72326 -2 (.17337,.18855)
52.V52               6  .25054     .27273     .26350     .78016 -2 (.25531,.27168)
53.V53               6  .96360 -1  .11456     .10948     .69716 -2 (.10217,.11680)
54.V54               6  .11135     .12172     .11682     .44111 -2 (.11219,.12145)
55.V55               6  .29979 -1  .35055 -1  .32918 -1  .22369 -2 (.30570 -1,.35265 -1)
56.V56               6  .97902 -1  .10501     .10197     .27101 -2 (.99130 -1,.10482)
57.V57               6  .72261 -1  .81181 -1  .76808 -1  .36177 -2 (.73011 -1,.80604 -1)
58.V58               6  .76372 -1  .83026 -1  .79329 -1  .23442 -2 (.76869 -1,.81789 -1)
59.V59               6  .74592 -1  .93682 -1  .87081 -1  .65619 -2 (.80195 -1,.93968 -1)
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   60.V60             6  .62937 -1  .78431 -1  .71525 -1  .62657 -2 (.64949 -1,.78100 -1)
   61.V61             6  .16550     .19188     .17970     .10009 -1 (.16920,.19021)
   62.V62             6  .22611     .26253     .24093     .13305 -1 (.22697,.25490)
   63.V63             6  .55944 -1  .71895 -1  .64093 -1  .57973 -2 (.58009 -1,.70176 -1)
   64.V64             6  .12915     .14133     .13502     .45681 -2 (.13023,.13982)
   65.V65             6  .15152     .17897     .16780     .94271 -2 (.15791,.17769)
   66.V66             6  .14452     .16060     .15462     .61944 -2 (.14812,.16112)
   67.V67             6  .11624     .12418     .11959     .32123 -2 (.11622,.12296)
   68.V68             6  .41958 -1  .58824 -1  .52095 -1  .59072 -2 (.45896 -1,.58294 -1)
   69.V69             6  .79336 -1  .90692 -1  .85286 -1  .44156 -2 (.80652 -1,.89920 -1)

DESCRIPTIVE MEASURES  <21> V16:21  CASES=CASE#:1-138
     VARIABLE        N  MINIMUM    MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
    1.V1              6  14.000     15.000     14.333     .51640    (13.791,14.875)
    2.V2              6  11.000     12.000     11.167     .40825    (10.738,11.595)
    3.V3              6  30.000     32.000     31.167     .75277    (30.377,31.957)
    4.V4              6  12.000     12.000     12.000
    5.V5              6  18.000     20.000     19.000     .89443    (18.061,19.939)
    6.V6              6  47.000     50.000     47.833     1.3292    (46.438,49.228)
    7.V7              6  19.000     22.000     20.500     1.0488    (19.399,21.601)
    8.V8              6  38.000     43.000     41.000     1.8974    (39.009,42.991)
    9.V9              6  29.000     32.000     30.667     1.5055    (29.087,32.247)
   10.V10             6  22.000     24.000     22.833     .98319    (21.802,23.865)
   11.V11             6  30.000     34.000     32.500     1.5166    (30.908,34.092)
   12.V12             6  36.000     38.000     36.833     .75277    (36.043,37.623)
   13.V13             6  6.0000     6.0000     6.0000
   14.V14             6  13.000     14.000     13.833     .40825    (13.405,14.262)
   15.V15             6  7.0000     8.0000     7.8333     .40825    (7.4049,8.2618)
   17.V17             6  355.00     433.00     401.17     30.505    (369.15,433.18)
   44.V44             6  .58310     .61381     .60233     .12147 -1 (.58959,.61508)
   45.V45             6  .49423     .51918     .50812     .91001 -2 (.49857,.51767)
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46.V46                6  .33962     .36338     .35229     .93019 -2 (.34253,.36206)
47.V47                6  .23785     .28538     .25854     .17444 -1 (.24023,.27684)
48.V48                6  .13803     .16273     .15181     .89808 -2 (.14238,.16123)
49.V49                6  .25000     .26005     .25517     .38446 -2 (.25114,.25921)
50.V50                6  .15566     .16785     .16374     .45629 -2 (.15896,.16853)
51.V51                6  .17321     .18203     .17785     .41194 -2 (.17353,.18217)
52.V52                6  .26651     .29014     .27719     .87988 -2 (.26795,.28642)
53.V53                6  .10986     .12336     .11548     .54134 -2 (.10980,.12116)
54.V54                6  .11792     .12532     .12135     .25299 -2 (.11870,.12401)
55.V55                6  .30660 -1  .36745 -1  .32419 -1  .23375 -2 (.29966 -1,.34872 -1)
56.V56                6  .99057 -1  .10704     .10355     .30749 -2 (.10033,.10678)
57.V57                6  .70423 -1  .85450 -1  .77046 -1  .55177 -2 (.71255 -1,.82836 -1)
58.V58                6  .75472 -1  .81841 -1  .78108 -1  .22662 -2 (.75729 -1,.80486 -1)
59.V59                6  .84507 -1  .10162     .95193 -1  .61392 -2 (.88750 -1,.10164)
60.V60                6  .70423 -1  .83141 -1  .77391 -1  .47754 -2 (.72380 -1,.82403 -1)
61.V61                6  .14066     .15330     .14727     .49025 -2 (.14212,.15241)
62.V62                6  .22251     .23113     .22845     .33893 -2 (.22489,.23200)
63.V63                6  .66038 -1  .76056 -1  .69593 -1  .42626 -2 (.65120 -1,.74066 -1)
64.V64                6  .14085     .15130     .14518     .44283 -2 (.14053,.14983)
65.V65                6  .16981     .18440     .17764     .68279 -2 (.17048,.18481)
66.V66                6  .15012     .16076     .15455     .46883 -2 (.14963,.15947)
67.V67                6  .12276     .12736     .12501     .16016 -2 (.12333,.12669)
68.V68                6  .48593 -1  .64665 -1  .56736 -1  .52327 -2 (.51244 -1,.62227 -1)
69.V69                6  .73903 -1  .86614 -1  .81480 -1  .45613 -2 (.76693 -1,.86267 -1)
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<DESCRIBE BYSTRATA VAR=1-15,17,44-69 CASES=139-852 STRAT=V16 VALUES=0 LEVELS=.95>
DESCRIPTIVE MEASURES  <1> V16:1  CASES=CASE#:139-852
    VARIABLE          N  MINIMUM    MAXIMUM     MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1               25  13.000     18.000     15.840     1.2477     (15.325,16.355)
   2.V2               25  11.000     13.000     12.160     .62450     (11.902,12.418)
   3.V3               25  26.000     32.000     29.480     1.4468     (28.883,30.077)
   4.V4               25  12.000     12.000     12.000
   5.V5               25  18.000     22.000     19.480     1.0456     (19.048,19.912)
   6.V6               25  46.000     63.000     56.760     3.9505     (55.129,58.391)
   7.V7               25  19.000     24.000     21.920     1.2557     (21.402,22.438)
   8.V8               25  39.000     48.000     44.520     2.0232     (43.685,45.355)
   9.V9               25  32.000     43.000     37.440     2.7246     (36.315,38.565)
  10.V10              25  20.000     26.000     23.120     1.4810     (22.509,23.731)
  11.V11              25  26.000     36.000     30.800     2.8284     (29.632,31.968)
  12.V12              25  37.000     39.000     38.200     .64550     (37.934,38.466)
  13.V13              25  4.0000     7.0000     5.9200     .64031     (5.6557,6.1843)
  14.V14              25  13.000     15.000     14.040     .35119     (13.895,14.185)
  15.V15              25  8.0000     8.0000     8.0000
  17.V17              25  373.00     767.00     525.08     129.97     (471.43,578.73)
  44.V44              25  .58012     .62896     .60593     .11976 -1 (.60098,.61087)
  45.V45              25  .47273     .52960     .49533     .13867 -1 (.48961,.50106)
  46.V46              25  .33645     .37728     .35820     .95868 -2 (.35424,.36215)
  47.V47              25  .23732     .32243     .27397     .18343 -1 (.26640,.28154)
  48.V48              25  .13187     .19938     .15816     .16643 -1 (.15129,.16503)
  49.V49              25  .22222     .26366     .24263     .96371 -2 (.23865,.24660)
  50.V50              25  .13682     .16600     .15308     .70625 -2 (.15017,.15600)
  51.V51              25  .15203     .18847     .16551     .81553 -2 (.16214,.16887)
  52.V52              25  .25701     .30020     .27967     .98097 -2 (.27562,.28372)
  53.V53              25  .94901 -1  .12617     .10867     .66590 -2 (.10592,.11142)
  54.V54              25  .10294     .12305     .11165     .45709 -2 (.10977,.11354)
  55.V55              25  .27160 -1  .40417 -1  .33793 -1  .32818 -2 (.32438 -1,.35148 -1)
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56.V56               25  .92369 -1  .11401      .10016      .50369 -2 (.98082 -1,.10224)
57.V57               25  .56180 -1  .84993 -1  .73786 -1  .67788 -2 (.70988 -1,.76584 -1)
58.V58               25  .66493 -1  .81498 -1  .74407 -1  .47402 -2 (.72450 -1,.76363 -1)
59.V59               25  .77670 -1  .98274 -1  .85654 -1  .44792 -2 (.83805 -1,.87503 -1)
60.V60               25  .51685 -1  .78353 -1  .65452 -1  .69927 -2 (.62566 -1,.68338 -1)
61.V61               25  .16890     .22897      .19649      .13850 -1 (.19077,.20221)
62.V62               25  .26292     .33956      .29390      .17987 -1 (.28647,.30132)
63.V63               25  .64343 -1  .87227 -1  .76157 -1  .55336 -2 (.73872 -1,.78441 -1)
64.V64               25  .13086     .15800      .14457      .71167 -2 (.14163,.14751)
65.V65               25  .14026     .17757      .15968      .92101 -2 (.15588,.16348)
66.V66               25  .14343     .17647      .15937      .86661 -2 (.15580,.16295)
67.V67               25  .11605     .14558      .13270      .71829 -2 (.12973,.13566)
68.V68               25  .36329 -1  .52036 -1  .44741 -1  .48180 -2 (.42752 -1,.46730 -1)
69.V69               25  .73171 -1  .90261 -1  .80670 -1  .45725 -2 (.78783 -1,.82558 -1)

DESCRIPTIVE MEASURES  <2> V16:2  CASES=CASE#:139-852

     VARIABLE          N  MINIMUM     MAXIMUM       MEAN       STD DEV     .9500 CONFIDENCE INT
       1.V1            25   13.000      17.000      15.440      .91652      (15.062,15.818)
       2.V2            25   11.000      13.000      12.000      .40825      (11.831,12.169)
       3.V3            25   28.000      [illegible]      30.240      .77889      (29.918,30.562)
       4.V4            25   12.000      12.000      12.000
       5.V5            25   19.000      22.000      20.000      .81650      (19.663,20.337)
       6.V6            25   50.000      57.000      53.480      2.2008      (52.572,54.388)
       7.V7            25   19.000      23.000      20.800      1.1547      (20.323,21.277)
       8.V8            25   39.000      49.000      43.040      2.3180      (42.083,43.997)
       9.V9            25   34.000      39.000      36.200      1.6583      (35.515,36.885)
      10.V10           25   20.000      24.000      22.320      1.0693      (21.879,22.761)
      11.V11           25   29.000      37.000      33.480      2.0841      (32.620,34.340)
      12.V12           25   36.000      39.000      37.480      .77028      (37.162,37.798)
      13.V13           25   6.0000      6.0000      6.0000
      14.V14           25   13.000      15.000      13.960      .35119      (13.815,14.105)
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15.V15              25  8.0000      8.0000      8.0000
17.V17              25  396.00      600.00      480.60      50.790     (459.64,501.56)
44.V44              25  .57007      .61124      .59681      .10791 -1 (.59235,.60126)
45.V45              25  .47084      .52535      .49546      .15294 -1 (.48915,.50178)
46.V46              25  .33483      .38021      .36065      .89535 -2 (.35696,.36435)
47.V47              25  .24379      .31749      .28869      .20641 -1 (.28017,.29721)
48.V48              25  .12415      .16629      .14270      .85444 -2 (.13917,.14622)
49.V49              25  .24500      .27778      .26075      .75617 -2 (.25762,.26387)
50.V50              25  .16000      .19002      .17358      .84331 -2 (.17010,.17706)
51.V51              25  .15302      .18359      .16831      .76311 -2 (.16516,.17146)
52.V52              25  .27435      .30333      .28574      .86539 -2 (.28216,.28931)
53.V53              25  .99138 -1  .12235      .11101      .62143 -2 (.10845,.11358)
54.V54              25  .10571      .12114      .11372      .46503 -2 (.11180,.11564)
55.V55              25  .30238 -1  .42596 -1  .34964 -1  .27740 -2 (.33819 -1,.36109 -1)
56.V56              25  .98739 -1  .11492      .10643      .39751 -2 (.10479,.10807)
57.V57              25  .68584 -1  .82353 -1  .75715 -1  .40666 -2 (.74036 -1,.77393 -1)
58.V58              25  .75000 -1  .97387 -1  .87561 -1  .58297 -2 (.85155 -1,.89968 -1)
59.V59              25  .74492 -1  .98039 -1  .87424 -1  .65332 -2 (.84727 -1,.90120 -1)
60.V60              25  .58333 -1  .84677 -1  .70824 -1  .70021 -2 (.67934 -1,.73715 -1)
61.V61              25  .17929      .22000      .20184      .11235 -1 (.19720,.20648)
62.V62              25  .26667      .32304      .30393      .14897 -1 (.29778,.31008)
63.V63              25  .57082 -1  .87886 -1  .72144 -1  .67080 -2 (.69375 -1,.74913 -1)
64.V64              25  .13000      .16000      .14546      .82010 -2 (.14208,.14885)
65.V65              25  .16593      .20518      .18044      .91855 -2 (.17664,.18423)
66.V66              25  .16027      .18290      .17225      .69279 -2 (.16939,.17511)
67.V67              25  .12879      .14718      .13735      .54483 -2 (.13510,.13960)
68.V68              25  .33708 -1  .56471 -1  .45269 -1  .56921 -2 (.42919 -1,.47618 -1)
69.V69              25  .80000 -1  .10081      .89177 -1  .53046 -2 (.86987 -1,.91366 -1)

DESCRIPTIVE MEASURES   <3> V16:3   CASES=CASE#:139-852

    VARIABLE          N  MINIMUM     MAXIMUM       MEAN     STD DEV    .9500 CONFIDENCE INT
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1.V1            25  13.000     15.000     14.160     .62450     (13.902,14.418)
2.V2            25  10.000     12.000     11.160     .62450     (10.902,11.418)
3.V3            25  29.000     34.000     30.720     1.2423     (30.207,31.233)
4.V4            25  12.000     13.000     12.040     .20000     (11.957,12.123)
5.V5            25  17.000     21.000     18.920     .90921     (18.545,19.295)
6.V6            25  56.000     68.000     60.640     2.9563     (59.420,61.860)
7.V7            25  20.000     24.000     21.840     .80000     (21.510,22.170)
8.V8            25  43.000     49.000     45.600     1.7559     (44.875,46.325)
9.V9            25  36.000     44.000     39.840     1.8859     (39.062,40.618)
10.V10          25  22.000     26.000     23.880     1.0536     (23.445,24.315)
11.V11          25  27.000     36.000     32.000     2.3274     (31.039,32.961)
12.V12          25  36.000     38.000     37.440     .58310     (37.199,37.681)
13.V13          24  5.0000     6.0000     5.9583     .20412     (5.8721,6.0445)
14.V14          25  14.000     17.000     14.720     .93630     (14.334,15.106)
15.V15          25  7.0000     9.0000     7.9600     .35119     (7.8150,8.1050)
17.V17          25  423.00     676.00     503.32     59.102     (478.92,527.72)
44.V44          25  .61317     .64471     .63054     .91891 -2 (.62675,.63434)
45.V45          25  .48361     .54184     .50792     .13846 -1 (.50221,.51364)
46.V46          25  .31818     .34774     .33524     .85970 -2 (.33169,.33878)
47.V47          25  .24486     .28942     .27012     .10505 -1 (.26578,.27446)
48.V48          25  .13992     .18047     .15873     .94535 -2 (.15483,.16264)
49.V49          25  .25421     .27911     .26653     .59200 -2 (.26409,.26897)
50.V50          25  .15152     .17166     .16180     .58154 -2 (.15940,.16420)
51.V51          25  .16667     .18491     .17495     .51154 -2 (.17284,.17707)
52.V52          25  .25323     .28189     .26870     .66997 -2 (.26594,.27147)
53.V53          25  .99548 -1  .11715     .10637     .36470 -2 (.10486,.10787)
54.V54          25  .11663     .13018     .12109     .39126 -2 (.11948,.12271)
55.V55          25  .29762 -1  .39182 -1  .32807 -1  .23565 -2 (.31835 -1,.33780 -1)
56.V56          25  .10163     .11755     .10747     .37202 -2 (.10594,.10901)
57.V57          25  .77103 -1  .93750 -1  .84302 -1  .39439 -2 (.82674 -1,.85930 -1)
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58.V58              25  .75758 -1  .88636 -1  .83571 -1  .34066 -2 (.82165 -1,.84977 -1)
59.V59              25  .94563 -1  .12015     .10705     .69645 -2 (.10418,.10993)
60.V60              25  .65476 -1  .90543 -1  .77423 -1  .67485 -2 (.74637 -1,.80208 -1)
61.V61              25  .16822     .20594     .18725     .97037 -2 (.18324,.19125)
62.V62              25  .27345     .30335     .28572     .96779 -2 (.28172,.28971)
63.V63              25  .56569 -1  .75055 -1  .65453 -1  .52155 -2 (.63300 -1,.67606 -1)
64.V64              25  .10949     .14894     .13180     .97714 -2 (.12777,.13583)
65.V65              25  .16150     .19773     .17848     .83070 -2 (.17505,.18191)
66.V66              25  .15894     .18410     .17140     .63849 -2 (.16876,.17403)
67.V67              25  .12168     .14549     .13512     .56367 -2 (.13280,.13745)
68.V68              25  .37825 -1  .68592 -1  .55425 -1  .84204 -2 (.51949 -1,.58901 -1)
69.V69              25  .79125 -1  .95400 -1  .86376 -1  .44361 -2 (.84545 -1,.88207 -1)

DESCRIPTIVE MEASURES  <4> V16:4  CASES=CASE#:139-852

    VARIABLE        N  MINIMUM    MAXIMUM     MEAN      STD DEV    .9500 CONFIDENCE INT
  1.V1              25  13.000     17.000     15.520     .96264    (15.123,15.917)
  2.V2              25  11.000     13.000     11.760     .59722    (11.513,12.007)
  3.V3              25  29.000     32.000     30.480     .96264    (30.083,30.877)
  4.V4              24  12.000     12.000     12.000
  5.V5              25  17.000     21.000     19.240     .96954    (18.840,19.640)
  6.V6              25  45.000     54.000     49.760     2.3678    (48.783,50.737)
  7.V7              25  19.000     22.000     20.520     .96264    (20.123,20.917)
  8.V8              25  38.000     45.000     40.920     1.9131    (40.130,41.710)
  9.V9              25  28.000     35.000     32.640     1.7767    (31.907,33.373)
 10.V10             25  20.000     23.000     21.760     1.0116    (21.342,22.178)
 11.V11             25  26.000     35.000     30.320     2.0559    (29.471,31.169)
 12.V12             25  36.000     38.000     36.880     .66583    (36.605,37.155)
 13.V13             25  5.0000     7.0000     6.0000     .28868    (5.8808,6.1192)
 14.V14             25  14.000     14.000     14.000
 15.V15             25  7.0000     8.0000     7.9600     .20000    (7.8774,8.0426)
 17.V17             25  340.00     636.00     418.04     72.252    (388.22,447.86)
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44.V44            25  .56513      .60102      .58157      .10315 -1 (.57731,.58582)
45.V45            25  .47287      .50874      .49235      .10181 -1 (.48815,.49655)
46.V46            25  .35534      .38337      .37236      .76748 -2 (.36919,.37553)
47.V47            25  .22727      .29070      .26879      .12508 -1 (.26362,.27395)
48.V48            25  .12672      .16710      .14318      .83599 -2 (.13973,.14663)
49.V49            25  .25201      .27473      .26155      .69042 -2 (.25870,.26440)
50.V50            25  .16354      .18310      .17371      .48259 -2 (.17171,.17570)
51.V51            25  .17092      .18564      .17760      .41653 -2 (.17589,.17932)
52.V52            25  .26840      .31417      .29440      .97739 -2 (.29036,.29843)
53.V53            25  .10924      .12778      .11964      .54094 -2 (.11741,.12187)
54.V54            25  .11176      .12747      .11913      .36405 -2 (.11762,.12063)
55.V55            25  .26471 -1  .40881 -1  .33068 -1  .37456 -2 (.31522 -1,.34615 -1)
56.V56            25  .88154 -1  .11434      .10673      .55208 -2 (.10445,.10901)
57.V57            25  .72165 -1  .87379 -1  .79254 -1  .40090 -2 (.77599 -1,.80909 -1)
58.V58            25  .73899 -1  .92958 -1  .84203 -1  .43795 -2 (.82396 -1,.86011 -1)
59.V59            25  .85294 -1  .10680      .93758 -1  .56135 -2 (.91440 -1,.96075 -1)
60.V60            25  .61584 -1  .83495 -1  .70823 -1  .54343 -2 (.68580 -1,.73066 -1)
61.V61            25  .17595      .22110      .19631      .13310 -1 (.19082,.20180)
62.V62            25  .27110      .32946      .30152      .16138 -1 (.29486,.30818)
63.V63            25  .61602 -1  .85193 -1  .71681 -1  .63192 -2 (.69072 -1,.74289 -1)
64.V64            25  .13288      .16389      .15212      .82783 -2 (.14871,.15554)
65.V65            25  .17889      .20779      .19203      .75582 -2 (.18891,.19515)
66.V66            25  .16117      .18470      .17293      .65223 -2 (.17023,.17562)
67.V67            25  .12162      .14725      .13511      .63078 -2 (.13251,.13772)
68.V68            25  .32258 -1  .62136 -1  .49954 -1  .86396 -2 (.46388 -1,.53520 -1)
69.V69            25  .78829 -1  .94787 -1  .86297 -1  .40817 -2 (.84612 -1,.87992 -1)

DESCRIPTIVE MEASURES  <5> V16:5  CASES=CASE#:139-852

    VARIABLE       N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
  1.V1            25  15.000      16.000      15.680      .47610     (15.483,15.877)
  2.V2            25  11.000      12.000      11.520      .50990     (11.310,11.730)
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3.V3             25  29.000    34.000    30.960    1.1358    (30.491,31.429)
4.V4             25  11.000    12.000    11.920    .27689    (11.806,12.034)
5.V5             25  18.000    22.000    19.840    1.0279    (19.416,20.264)
6.V6             25  45.000    53.000    48.440    2.2561    (47.509,49.371)
7.V7             25  19.000    22.000    19.920    .75939    (19.607,20.233)
8.V8             25  37.000    43.000    40.080    1.7776    (39.346,40.814)
9.V9             25  29.000    36.000    31.560    1.5567    (30.917,32.203)
10.V10           25  21.000    23.000    21.520    .77028    (21.202,21.838)
11.V11           25  34.000    47.000    40.720    2.9794    (39.490,41.950)
12.V12           25  36.000    38.000    37.280    .54160    (37.056,37.504)
13.V13           25  6.0000    6.0000    6.0000
14.V14           25  14.000    15.000    14.040    .20000    (13.957,14.123)
15.V15           25  8.0000    8.0000    8.0000
17.V17           25  389.00    621.00    515.64    55.576    (492.70,538.58)
44.V44           25  .56522    .59158    .57736    .66535 -2 (.57462,.58011)
45.V45           25  .48148    .51434    .49987    .95140 -2 (.49595,.50380)
46.V46           25  .35340    .38113    .36657    .62935 -2 (.36397,.36916)
47.V47           25  .25833    .29605    .27891    .10552 -1 (.27456,.28327)
48.V48           25  .13958    .16710    .15306    .76030 -2 (.14992,.15620)
49.V49           25  .25667    .27916    .27104    .59363 -2 (.26859,.27350)
50.V50           25  .16195    .19361    .17555    .79032 -2 (.17228,.17881)
51.V51           25  .17422    .19023    .18018    .48802 -2 (.17817,.18220)
52.V52           25  .27961    .30870    .29173    .67428 -2 (.28894,.29451)
53.V53           25  .10363    .12620    .11533    .56170 -2 (.11301,.11765)
54.V54           25  .11875    .13576    .12808    .40886 -2 (.12639,.12977)
55.V55           25  .30593 -1 .37657 -1 .34623 -1 .18549 -2 (.33857 -1,.35398 -1)
56.V56           25  .96509 -1 .11190    .10566    .38501 -2 (.10407,.10725)
57.V57           25  .85417 -1 .10134    .94093 -1 .40846 -2 (.92407 -1,.95779 -1)
58.V58           25  .75085 -1 .88421 -1 .80904 -1 .34177 -2 (.79493 -1,.82315 -1)
59.V59           25  .11744    .14340    .13051    .68374 -2 (.12768,.13333)
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60.V60              25  .82902 -1  .10306      .90274 -1  .52815 -2 (.88094 -1,.92454 -1)
61.V61              25  .19348     .23091      .20844     .93220 -2 (.20459,.21229)
62.V62              25  .28884     .34281      .31217     .13600 -1 (.30656,.31778)
63.V63              25  .59211 -1  .77393 -1  .69426 -1  .45361 -2 (.67554 -1,.71299 -1)
64.V64              25  .12948     .15728      .14430     .70153 -2 (.14140,.14719)
65.V65              25  .16235     .20129      .18749     .82270 -2 (.18409,.19089)
66.V66              25  .17224     .20076      .18406     .73289 -2 (.18104,.18709)
67.V67              25  .12948     .15000      .14073     .51876 -2 (.13859,.14287)
68.V68              25  .49801 -1  .76792 -1  .63736 -1  .70642 -2 (.60820 -1,.66652 -1)
69.V69              25  .78029 -1  .97691 -1  .86502 -1  .45981 -2 (.84604 -1,.88400 -1)

DESCRIPTIVE MEASURES  <6> V16:6  CASES=CASE#:139-852
    VARIABLE         N  MINIMUM     MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
  1.V1              12  15.000      17.000      16.000      .73855     (15.531,16.469)
  2.V2              12  11.000      12.000      11.667      .49237     (11.354,11.980)
  3.V3              12  29.000      30.000      29.833      .38925     (29.586,30.081)
  4.V4              12  12.000      12.000      12.000
  5.V5              11  18.000      22.000      19.364      1.1201     (18.611,20.116)
  6.V6              12  47.000      56.000      52.500      2.1950     (51.105,53.895)
  7.V7              12  20.000      23.000      21.167      .93744     (20.571,21.762)
  8.V8              12  39.000      46.000      42.000      2.2156     (40.592,43.408)
  9.V9              12  30.000      35.000      33.083      1.5643     (32.089,34.077)
 10.V10             12  20.000      23.000      21.833      1.1146     (21.125,22.542)
 11.V11             12  27.000      31.000      29.250      1.3568     (28.388,30.112)
 12.V12             12  36.000      38.000      37.250      .62158     (36.855,37.645)
 13.V13             12  6.0000      6.0000      6.0000
 14.V14             12  14.000      14.000      14.000
 15.V15             12  7.0000      8.0000      7.8333      .38925     (7.5860,8.0807)
 17.V17             12  297.00      580.00      381.00      81.966     (328.92,433.08)
 44.V44             12  .55211      .58195      .56992      .84241 -2 (.56457,.57527)
 45.V45             12  .46172      .50000      .47883      .11955 -1 (.47124,.48643)
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46.V46            12  .35154      .40059      .37316      .16168 -1 (.36289,.38344)
47.V47            12  .25223      .30172      .27458      .13941 -1 (.26572,.28343)
48.V48            12  .13650      .15924      .15030      .79825 -2 (.14523,.15537)
49.V49            12  .23966      .27078      .25564      .10040 -1 (.24926,.26202)
50.V50            12  .15690      .17197      .16489      .39255 -2 (.16240,.16739)
51.V51            12  .16379      .18471      .17453      .65004 -2 (.17040,.17866)
52.V52            12  .27946      .31210      .29925      .10325 -1 (.29269,.30581)
53.V53            12  .10926      .12048      .11440      .39354 -2 (.11190,.11690)
54.V54            12  .11276      .12420      .11875      .34709 -2 (.11655,.12096)
55.V55            12  .26403 -1   .39655 -1   .32723 -1   .45414 -2 (.29837 -1,.35608 -1)
56.V56            12  .90909 -1   .11551      .10560      .56902 -2 (.10198,.10922)
57.V57            12  .68966 -1   .81340 -1   .74636 -1   .46375 -2 (.71689 -1,.77582 -1)
58.V58            12  .70690 -1   .85809 -1   .79428 -1   .42101 -2 (.76753 -1,.82103 -1)
59.V59            12  .89172 -1   .10766      .96622 -1   .52171 -2 (.93307 -1,.99936 -1)
60.V60            12  .63253 -1   .87542 -1   .77818 -1   .66747 -2 (.73577 -1,.82059 -1)
61.V61            12  .19108      .22716      .20649      .12678 -1 (.19843,.21454)
62.V62            12  .26936      .34321      .31372      .21449 -1 (.30009,.32734)
63.V63            12  .66879 -1   .84337 -1   .74762 -1   .58913 -2 (.71018 -1,.78505 -1)
64.V64            12  .13966      .17162      .15454      .94037 -2 (.14856,.16051)
65.V65            12  .17069      .20792      .18841      .93264 -2 (.18248,.19434)
66.V66            12  .15775      .18152      .17363      .73102 -2 (.16898,.17927)
67.V67            12  .12121      .15086      .13810      .92983 -2 (.13219,.14401)
68.V68            12  .50445 -1   .59406 -1   .55887 -1   .23338 -2 (.54404 -1,.57370 -1)
69.V69            12  .83086 -1   .92486 -1   .88340 -1   .25880 -2 (.86696 -1,.89984 -1)

DESCRIPTIVE MEASURES   <7> V16:7  CASES=CASE#:139-852

    VARIABLE          N  MINIMUM     MAXIMUM       MEAN       STD DEV     .9500 CONFIDENCE INT'
  1.V1               25   13.000      17.000      15.520      .96264     (15.123,15.917)
  2.V2               25   11.000      13.000      12.160      .47258     (11.965,12.355)
  3.V3              '25   30.000      33.000      31.720      .93630     (31.334,32.106)
  4.V4               25   11.000      12.000      11.960      .20000     (11.877,12.043)
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5.V5           25  18.000    24.000    20.880    1.4236     (20.292,21.468)
6.V6           25  46.000    55.000    50.760    2.4542     (49.747,51.773)
7.V7           25  20.000    23.000    21.040    .93452     (20.654,21.426)
8.V8           25  39.000    49.000    43.360    2.2524     (42.430,44.290)
9.V9           24  30.000    36.000    33.417    1.5581     (32.759,34.075)
10.V10         25  20.000    23.000    21.800    .76376     (21.485,22.115)
11.V11         25  28.000    36.000    31.800    2.1794     (30.900,32.700)
12.V12         25  36.000    39.000    37.320    .74833     (37.011,37.629)
13.V13         25  6.0000    6.0000    6.0000
14.V14         25  14.000    15.000    14.080    .27689     (13.966,14.194)
15.V15         25  8.0000    8.0000    8.0000
17.V17         25  322.00    639.00    453.96    67.342     (426.16,481.76)
44.V44         25  .55832    .61264    .58115    .11281 -1 (.57649,.58581)
45.V45         25  .46559    .52473    .49068    .12387 -1 (.48557,.49579)
46.V46         25  .34066    .38462    .36356    .95284 -2 (.35963,.36749)
47.V47         25  .25373    .31315    .28222    .13133 -1 (.27680,.28764)
48.V48         25  .12935    .16745    .14959    .10693 -1 (.14518,.15400)
49.V49         25  .23696    .27876    .26600    .11968 -1 (.26106,.27094)
50.V50         25  .15696    .19545    .17385    .11946 -1 (.16892,.17878)
51.V51         25  .16087    .19248    .17572    .80080 -2 (.17242,.17903)
52.V52         25  .25549    .29769    .28419    .95269 -2 (.28026,.28812)
53.V53         25  .11211    .13199    .12186    .52031 -2 (.11972,.12401)
54.V54         25  .11264    .12880    .11999    .41308 -2 (.11828,.12169)
55.V55         25  .31792 -1 .40486 -1 .35939 -1 .25387 -2 (.34891 -1,.36997 -1)
56.V56         25  .97826 -1 .11522    .10672    .41105 -2 (.10502,.10842)
57.V57         25  .70850 -1 .89130 -1 .82029 -1 .48912 -2 (.80010 -1,.84048 -1)
58.V58         25  .76682 -1 .96273 -1 .86963 -1 .55208 -2 (.84684 -1,.89242 -1)
59.V59         25  .76087 -1 .10377    .90360 -1 .60241 -2 (.87874 -1,.92847 -1)
60.V60         25  .60538 -1 .80745 -1 .70001 -1 .50635 -2 (.67911 -1,.72091 -1)
61.V61         25  .16957    .21887    .19682    .16099 -1 (.19018,.20347)
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62.V62             25  .25870      .33453      .29240      .19395 -1 (.28439,.30040)
63.V63             25  .66474 -1   .87444 -1   .77940 -1   .59228 -2 (.75495 -1,.80384 -1)
64.V64             25  .13006      .16962      .14252      .87402 -2 (.13891,.14613)
65.V65             25  .15870      .19623      .18158      .99378 -2 (.17748,.18568)
66.V66             25  .14179      .18491      .16833      .10032 -1 (.16419,.17247)
67.V67             25  .11443      .14405      .13348      .68386 -2 (.13066,.13630)
68.V68             25  .30435 -1   .52795 -1   .41928 -1   .59516 -2 (.39471 -1,.44385 -1)
69.V69             25  .80925 -1   .99558 -1   .89848 -1   .48157 -2 (.87860 -1,.91836 -1)

DESCRIPTIVE MEASURES  <8> V16:8  CASES=CASE#:139-852
   VARIABLE        N  MINIMUM     MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
    1.V1           25  15.000      17.000      15.840      .55377    (15.611,16.069)
    2.V2           25  11.000      13.000      11.600      .57735    (11.362,11.838)
    3.V3           25  29.000      32.000      30.320      .80208    (29.989,30.651)
    4.V4           25  12.000      12.000      12.000
    5.V5           25  18.000      21.000      19.120      .78102    (18.798,19.442)
    6.V6           25  47.000      56.000      52.120      2.2789    (51.179,53.061)
    7.V7           25  19.000      22.000      20.560      .96090    (20.163,20.957)
    8.V8           25  38.000      46.000      40.560      1.8046    (39.815,41.305)
    9.V9           25  29.000      34.000      31.960      1.3687    (31.395,32.525)
   10.V10          25  20.000      23.000      21.720      1.0214    (21.298,22.142)
   11.V11          25  27.000      40.000      34.320      3.2879    (32.963,35.677)
   12.V12          25  37.000      39.000      37.520      .58595    (37.278,37.762)
   13.V13          25  6.0000      6.0000      6.0000
   14.V14          25  14.000      14.000      14.000
   15.V15          25  7.0000      9.0000      7.9600      .35119    (7.8150,8.1050)
   17.V17          25  374.00      716.00      547.52      88.930    (510.81,584.23)
   44.V44          25  .54488      .60124      .57152      .12651 -1 (.56630,.57674)
   45.V45          25  .47687      .51878      .49995      .10399 -1 (.49566,.50424)
   46.V46          25  .33705      .39055      .36529      .10646 -1 (.36090,.36968)
   47.V47          25  .25301      .29811      .27492      .10578 -1 (.27056,.27929)
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48.V48              25  .13776      .16667      .15295      .73940 -2 (.14990,.15600)
49.V49              25  .25039      .27902      .26309      .79530 -2 (.25981,.26637)
50.V50              25  .16043      .18388      .17374      .65370 -2 (.17104,.17643)
51.V51              25  .16000      .18367      .17419      .59564 -2 (.17173,.17665)
52.V52              25  .27855      .31230      .29487      .97186 -2 (.29086,.29888)
53.V53              25  .10367      .11830      .11048      .42865 -2 (.10871,.11225)
54.V54              25  .11446      .12667      .12029      .33652 -2 (.11890,.12167)
55.V55              25  .32129 -1  .44723 -1  .38792 -1  .30411 -2 (.37536 -1,.40047 -1)
56.V56              25  .10048      .11453      .10755      .37103 -2 (.10601,.10908)
57.V57              25  .76531 -1  .97756 -1  .88638 -1  .51798 -2 (.86500 -1,.90776 -1)
58.V58              25  .67717 -1  .86735 -1  .75522 -1  .53107 -2 (.73329 -1,.77714 -1)
59.V59              25  .91837 -1  .12667      .11055      .10337 -1 (.10628,.11482)
60.V60              25  .68878 -1  .91483 -1  .80981 -1  .55479 -2 (.78691 -1,.83271 -1)
61.V61              25  .19835      .23228      .21748      .92627 -2 (.21366,.22131)
62.V62              25  .28061      .33108      .30609      .12822 -1 (.30079,.31138)
63.V63              25  .67979 -1  .78740 -1  .71834 -1  .28027 -2 (.70677 -1,.72991 -1)
64.V64              25  .12598      .15223      .13757      .66041 -2 (.13484,.14029)
65.V65              25  .16508      .18750      .17534      .60636 -2 (.17284,.17785)
66.V66              25  .15686      .18919      .17176      .81059 -2 (.16842,.17511)
67.V67              25  .12598      .14353      .13387      .50222 -2 (.13179,.13594)
68.V68              25  .38153 -1  .66116 -1  .53825 -1  .66860 -2 (.51065 -1,.56585 -1)
69.V69              25  .74960 -1  .96369 -1  .86203 -1  .45823 -2 (.84312 -1,.88095 -1)

DESCRIPTIVE MEASURES  <9> V16:9  CASES=CASE#:139-852
   VARIABLE         N  MINIMUM     MAXIMUM       MEAN      STD DEV    .9500 CONFIDENCE INT
  1.V1             35   14.000      16.000      14.971      .78537    (14.702,15.241)
  2.V2             35   11.000      13.000      11.743      .56061    (11.550,11.935)
  3.V3             35   28.000      30.000      29.400      .84714    (29.109,29.691)
  4.V4             35   12.000      12.000      12.000
  5.V5             35   19.000      22.000      20.143      .84515    (19.853,20.433)
  6.V6             35   46.000      55.000      50.457      1.8840    (49.810,51.104)
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7.V7            35  21.000      24.000      22.057      .96841      (21.724,22.390)
8.V8            35  37.000      45.000      40.771      1.5920      (40.225,41.318)
9.V9            33  28.000      35.000      31.576      1.5619      (31.022,32.130)
10.V10          35  21.000      24.000      22.914      .95090      (22.588,23.241)
11.V11          35  27.000      37.000      32.457      2.9038      (31.460,33.455)
12.V12          35  36.000      38.000      37.029      .51368      (36.852,37.205)
13.V13          35  6.0000      7.0000      6.0286      .16903      (5.9705,6.0866)
14.V14          35  12.000      16.000      13.714      .71007      (13.470,13.958)
15.V15          35  7.0000      8.0000      7.8857      .32280      (7.7748,7.9966)
17.V17          35  399.00      745.00      575.83      108.10      (538.70,612.96)
44.V44          35  .55319      .59068      .57218      .11058 -1 (.56838,.57598)
45.V45          35  .45554      .50498      .47640      .12064 -1 (.47226,.48055)
46.V46          35  .35447      .39074      .37477      .94721 -2 (.37151,.37802)
47.V47          35  .23744      .29602      .26624      .14465 -1 (.26127,.27121)
48.V48          35  .12826      .15845      .14290      .78832 -2 (.14019,.14561)
49.V49          35  .23759      .26434      .24754      .73864 -2 (.24500,.25008)
50.V50          35  .16170      .18957      .17366      .66895 -2 (.17136,.17596)
51.V51          35  .15410      .18261      .16527      .61538 -2 (.16316,.16738)
52.V52          35  .27642      .31135      .29742      .90146 -2 (.29433,.30052)
53.V53          35  .10482      .13043      .11529      .55132 -2 (.11339,.11718)
54.V54          35  .10796      .13217      .11513      .56928 -2 (.11317,.11708)
55.V55          35  .24876 -1  .36827 -1  .30571 -1  .32685 -2 (.29449 -1,.31694 -1)
56.V56          35  .95935 -1  .11194      .10264      .41788 -2 (.10121,.10408)
57.V57          35  .66210 -1  .89235 -1  .76770 -1  .50700 -2 (.75029 -1,.78512 -1)
58.V58          35  .66572 -1  .89552 -1  .76322 -1  .54370 -2 (.74454 -1,.78190 -1)
59.V59          35  .80201 -1  .11073      .94916 -1  .69985 -2 (.92512 -1,.97320 -1)
60.V60          35  .65068 -1  .85384 -1  .75397 -1  .47731 -2 (.73758 -1,.77037 -1)
61.V61          35  .17456      .23116      .20774      .14097 -1 (.20289,.21258)
62.V62          35  .26777      .34356      .30814      .17870 -1 (.30200,.31428)
63.V63          35  .62657 -1  .83707 -1  .72210 -1  .45503 -2 (.70647 -1,.73773 -1)
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64.V64               35  .13545      .16174      .14781      .68569 -2 (.14546,.15017)
65.V65               35  .18519      .21945      .20385      .88230 -2 (.20082,.20688)
66.V66               35  .16438      .19826      .18395      .79228 -2 (.18123,.18667)
67.V67               35  .13242      .16932      .15297      .90764 -2 (.14985,.15609)
68.V68               35  .36851 -1   .59625 -1   .48881 -1   .55423 -2 (.46977 -1,.50785 -1)
69.V69               35  .73260 -1   .95238 -1   .84767 -1   .49266 -2 (.83075 -1,.86459 -1)

DESCRIPTIVE MEASURES  <10> V16:10  CASES=CASE#:139-852
   VARIABLE          N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
    1.V1            10  14.000      17.000      15.400      .84327     (14.797,16.003)
    2.V2            10  11.000      13.000      12.000      .47140     (11.663,12.337)
    3.V3            10  29.000      32.000      30.000      .81650     (29.416,30.584)
    4.V4            10  12.000      12.000      12.000
    5.V5             7  20.000      23.000      21.143      1.0690     (20.154,22.132)
    6.V6            10  47.000      55.000      51.400      3.5653     (48.850,53.950)
    7.V7            10  21.000      23.000      22.100      .73786     (21.572,22.628)
    8.V8            10  41.000      46.000      43.200      1.4757     (42.144,44.256)
    9.V9            10  29.000      35.000      31.900      1.7920     (30.618,33.182)
   10.V10           10  23.000      26.000      24.400      1.1738     (23.560,25.240)
   11.V11           10  27.000      38.000      32.600      3.8355     (29.856,35.344)
   12.V12           10  36.000      39.000      37.400      .96609     (36.709,38.091)
   13.V13           10  5.0000      6.0000      5.9000      .31623     (5.6738,6.1262)
   14.V14           10  14.000      15.000      14.200      .42164     (13.898,14.502)
   15.V15           10  8.0000      8.0000      8.0000
   17.V17           10  307.00      661.00      429.60      118.12     (345.10,514.10)
   44.V44           10  .57319      .59280      .58026      .85055 -2 (.57417,.58634)
   45.V45           10  .46571      .50379      .48358      .11017 -1 (.47570,.49146)
   46.V46           10  .37192      .40798      .38590      .11943 -1 (.37736,.39445)
   47.V47           10  .26687      .33510      .29604      .20853 -1 (.28113,.31096)
   48.V48           10  .13296      .15909      .14432      .10264 -1 (.13698,.15166)
   49.V49           10  .23449      .25568      .24586      .67749 -2 (.24101,.25071)
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50.V50              10  .15280     .17045     .16369     .63770 -2 (.15913,.16825)
51.V51              10  .14773     .17989     .16543     .80382 -2 (.15968,.17118)
52.V52              10  .28409     .30711     .29756     .71287 -2 (.29246,.30266)
53.V53              10  .12577     .15168     .13473     .82967 -2 (.12879,.14066)
54.V54              10  .11364     .12808     .12048     .53792 -2 (.11663,.12432)
55.V55              10  .25714 -1  .39409 -1  .32663 -1  .46126 -2 (.29363 -1,.35963 -1)
56.V56              10  .98160 -1  .10749     .10311     .26539 -2 (.10121,.10500)
57.V57              10  .62857 -1  .81439 -1  .73161 -1  .61588 -2 (.68756 -1,.77567 -1)
58.V58              10  .63540 -1  .87[illegible] 1  .78036 -1  .71486 -2 (.72922 -1,.83150 -1)
59.V59              10  .80332 -1  .94697 -1  .85539 -1  .44861 -2 (.82330 -1,.88748 -1)
60.V60              10  .59113 -1  .73864 -1  .67306 -1  .50533 -2 (.63691 -1,.70921 -1)
61.V61              10  .16477     .20811     .18104     .14031 -1 (.17100,.19108)
62.V62              10  .23926     .30335     .26972     .17927 -1 (.25690,.28255)
63.V63              10  .74130 -1  .95092 -1  .86360 -1  .61516 -2 (.81959 -1,.90760 -1)
64.V64              10  .14675     .16477     .15555     .54121 -2 (.15168,.15942)
65.V65              10  .17992     .21472     .19967     .10016 -1 (.19250,.20683)
66.V66              10  .16857     .18695     .17671     .76571 -2 (.17123,.18219)
67.V67              10  .12883     .15697     .14040     .77231 -2 (.13487,.14592)
68.V68              10  .46899 -1  .52910 -1  .50034 -1  .22945 -2 (.48392 -1,.51675 -1)
69.V69              10  .79755 -1  .90909 -1  .83985 -1  .34907 -2 (.81488 -1,.86482 -1)


DESCRIPTIVE MEASURES  STRAT=V16  CASES=CASE#:371-395
    VARIABLE        N  MINIMUM     MAXIMUM     MEAN       STD DEV     .9500 CONFIDENCE INT
     1.V1           25  13.000      16.000      14.840      .62450     (14.582,15.098)
     2.V2           25  11.000      13.000      12.000      .28868     (11.881,12.119)
     3.V3           25  30.000      32.000      30.640      .86023     (30.285,30.995)
     4.V4           25  12.000      12.000      12.000
     5.V5           25  18.000      21.000      19.880      .83267     (19.536,20.224)
     6.V6           25  45.000      53.000      49.920      2.0599     (49.070,50.770)
     7.V7           25  20.000      24.000      21.320      1.1075     (20.863,21.777)
     8.V8           25  40.000      45.000      42.800      1.3540     (42.241,43.359)
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 9.V9               25  29.000     34.000     31.920     1.5253     (31.290,32.550)
10.V10              25  21.000     25.000     23.000     .95743     (22.605,23.395)
11.V11              25  28.000     34.000     30.760     2.1848     (29.858,31.662)
12.V12              25  36.000     38.000     37.200     .57735     (36.962,37.438)
13.V13              25  5.0000     6.0000     5.9600     .20000     (5.8774,6.0426)
14.V14              25  13.000     14.000     13.920     .27689     (13.806,14.034)
15.V15              25  7.0000     8.0000     7.8000     .40825     (7.6315,7.9685)
17.V17              25  333.00     498.00     412.44     51.174     (391.32,433.56)
44.V44              25  .57709     .61044     .59181     .93435 -2 (.58796,.59567)
45.V45              25  .46875     .51148     .48758     .11585 -1 (.48280,.49236)
46.V46              25  .34672     .37465     .36193     .72562 -2 (.35893,.36492)
47.V47              25  .26316     .31727     .29189     .12939 -1 (.28654,.29723)
48.V48              25  .13687     .15890     .14899     .60550 -2 (.14649,.15149)
49.V49              25  .24009     .26074     .25078     .54715 -2 (.24853,.25304)
50.V50              25  .14823     .17027     .15881     .61465 -2 (.15628,.16135)
51.V51              25  .16097     .17838     .16943     .44450 -2 (.16759,.17126)
52.V52              25  .25991     .28649     .27377     .71577 -2 (.27081,.27672)
53.V53              25  .11927     .13784     .12970     .37507 -2 (.12815,.13125)
54.V54              25  .11422     .12526     .12031     .31882 -2 (.11899,.12162)
55.V55              25  .25140 -1  .37578 -1  .30751 -1  .31021 -2 (.29471 -1,.32032 -1)
56.V56              25  .91691 -1  .11411     .10563     .43537 -2 (.10383,.10743)
57.V57              25  .65574 -1  .76110 -1  .70748 -1  .28409 -2 (.69576 -1,.71921 -1)
58.V58              25  .73903 -1  .90090 -1  .80052 -1  .43762 -2 (.78246 -1,.81859 -1)
59.V59              25  .78522 -1  .89189 -1  .84766 -1  .25945 -2 (.83695 -1,.85837 -1)
60.V60              25  .58350 -1  .72626 -1  .64361 -1  .29669 -2 (.63137 -1,.65586 -1)
61.V61              25  .16667     .20485     .18772     .10466 -1 (.18340,.19204)
62.V62              25  .25826     .31106     .28343     .16641 -1 (.27656,.29030)
63.V63              25  .69930 -1  .87156 -1  .78426 -1  .47126 -2 (.76481 -1,.80371 -1)
64.V64              25  .14550     .16284     .15309     .46621 -2 (.15117,.15502)
65.V65              25  .19114     .21922     .20752     .68557 -2 (.20469,.21035)
66.V66              25  .16783     .19415     .18359     .65800 -2 (.18088,.18631)
67.V67              25  .12613     .15031     .13965     .59233 -2 (.13721,.14210)
68.V68              25  .32967 -1  .56367 -1  .40029 -1  .61466 -2 (.37492 -1,.42567 -1)
69.V69              25  .82569 -1  .96096 -1  .89637 -1  .33521 -2 (.88253 -1,.91020 -1)
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DESCRIPTIVE MEASURES  <12> V16:12  CASES=CASE#:139-852

   VARIABLE          N  MINIMUM    MAXIMUM    MEAN      STD DEV     .9500 CONFIDENCE INT
  1.V1              25  14.000     16.000     15.120    .78102     (14.798,15.442)
  2.V2              25  10.000     12.000     11.120    .43970     (10.939,11.301)
  3.V3              25  30.000     32.000     30.840    .89815     (30.469,31.211)
  4.V4              25  11.000     12.000     11.920    .27689     (11.806,12.034)
  5.V5              25  18.000     21.000     19.480    .71414     (19.185,19.775)
  6.V6              25  43.000     51.000     47.560    1.9807     (46.742,48.378)
  7.V7              25  20.000     23.000     21.280    .73711     (20.976,21.584)
  8.V8              25  38.000     46.000     42.400    2.1985     (41.493,43.307)
  9.V9              25  28.000     34.000     30.640    1.5513     (30.000,31.280)
 10.V10             25  21.000     24.000     22.440    1.0033     (22.026,22.854)
 11.V11             25  30.000     37.000     33.680    1.8421     (32.920,34.440)
 12.V12             25  35.000     37.000     36.320    .55678     (36.090,36.550)
 13.V13             25  6.0000     6.0000     6.0000
 14.V14             25  13.000     14.000     13.960    .20000     (13.877,14.043)
 15.V15             25  7.0000     8.0000     7.9600    .20000     (7.8774,8.0426)
 17.V17             25  288.00     489.00     382.52    47.594     (362.87,402.17)
 44.V44             25  .56627     .61258     .58843    .13339 -1 (.58292,.59393)
 45.V45             25  .47712     .52857     .50398    .13465 -1 (.49842,.50953)
 46.V46             25  .33333     .36881     .34990    .10357 -1 (.34563,.35418)
 47.V47             25  .25564     .29231     .27160    .87629 -2 (.26798,.27521)
 48.V48             25  .13405     .16225     .14830    .72510 -2 (.14531,.15130)
 49.V49             25  .26790     .30857     .28513    .10101 -1 (.28096,.28930)
 50.V50             25  .17284     .19837     .18461    .77825 -2 (.18139,.18782)
 51.V51             25  .17962     .19792     .18955    .58287 -2 (.18714,.19196)
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52.V52              25  .26159      .29208      .27812      .79346 -2 (.27485,.28140)
53.V53              25  .11137      .12772      .12190      .39278 -2 (.12028,.12353)
54.V54              25  .12322      .14402      .13093      .47581 -2 (.12897,.13289)
55.V55              25  .27778 -1   .36952 -1   .31666 -1   .21537 -2 (.30777 -1,.32555 -1)
56.V56              25  .10025      .11429      .10875      .35150 -2 (.10730,.11020)
57.V57              25  .78522 -1   .10685      .91568 -1   .77465 -2 (.88371 -1,.94766 -1)
58.V58              25  .89041 -1   .10526      .97160 -1   .45914 -2 (.95264 -1,.99055 -1)
59.V59              25  .10188      .14402      .12100      .10001 -1 (.11687,.12513)
60.V60              25  .73964 -1   .10326      .87359 -1   .81888 -2 (.83979 -1,.90739 -1)
61.V61              25  .16964      .21564      .19752      .12361 -1 (.19242,.20262)
62.V62              25  .27083      .32530      .30647      .12265 -1 (.30140,.31153)
63.V63              25  .57534 -1   .81928 -1   .72313 -1   .59288 -2 (.69866 -1,.74760 -1)
64.V64              25  .13784      .15753      .14838      .55072 -2 (.14611,.15065)
65.V65              25  .18684      .21429      .20088      .82717 -2 (.19747,.20430)
66.V66              25  .17349      .19298      .18518      .53508 -2 (.18297,.18738)
67.V67              25  .12847      .14940      .14239      .50619 -2 (.14030,.14448)
68.V68              25  .45576 -1   .68421 -1   .58356 -1   .57845 -2 (.55968 -1,.60744 -1)
69.V69              25  .81699 -1   .97368 -1   .89453 -1   .40897 -2 (.87765 -1,.91142 -1)

DESCRIPTIVE MEASURES  <13> V16:13  CASES=CASE#:139-852
    VARIABLE         N  MINIMUM     MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
   1.V1             25   13.000      15.000     14.360     .63770     (14.097,14.623)
   2.V2             25   10.000      12.000     11.280     .61373     (11.027,11.533)
   3.V3             25   29.000      32.000     31.080     .99666     (30.669,31.491)
   4.V4             25   12.000      13.000     12.040     .20000     (11.957,12.123)
   5.V5             25   19.000      22.000     20.360     .75719     (20.047,20.673)
   6.V6             25   44.000      51.000     47.600     1.8484     (46.837,48.363)
   7.V7             25   19.000      23.000     21.480     1.1225     (21.017,21.943)
   8.V8             25   39.000      46.000     42.120     1.9858     (41.300,42.940)
   9.V9             25   29.000      34.000     31.120     1.3013     (30.583,31.657)
  10.V10            25   21.000      24.000     22.560     .76811     (22.243,22.877)
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11.V11            25  32.000     42.000     37.000     2.3979     (36.010,37.990)
12.V12            25  36.000     37.000     36.280     .45826     (36.091,36.469)
13.V13            25  5.0000     6.0000     5.9600     .20000     (5.8774,6.0425)
14.V14            25  14.000     15.000     14.040     .20000     (13.957,14.123)
15.V15            25  8.0000     8.0000     8.0000
17.V17            25  451.00     825.00     625.16     127.01     (572.73,677.59)
44.V44            25  .56637     .61123     .59137     .10641 -1 (.58698,.59577)
45.V45            25  .49810     .52555     .50981     .78574 -2 (.50657,.51305)
46.V46            25  .33498     .38432     .36262     .10442 -1 (.35831,.36693)
47.V47            25  .30501     .34430     .32536     .10810 -1 (.32090,.32982)
48.V48            25  .15927     .19202     .17569     .88712 -2 (.17203,.17936)
49.V49            25  .24728     .28238     .26406     .79372 -2 (.26078,.26733)
50.V50            25  .16567     .19351     .18145     .84481 -2 (.17797,.18494)
51.V51            25  .17339     .19745     .18450     .54849 -2 (.18223,.18676)
52.V52            25  .27750     .31858     .29513     .85907 -2 (.29159,.29868)
53.V53            25  .13098     .14650     .14006     .36827 -2 (.13854,.14158)
54.V54            25  .12228     .13588     .12934     .34960 -2 (.12789,.13078)
55.V55            25  .33264 -1  .41308 -1  .38169 -1  .18481 -2 (.37406 -1,.38932 -1)
56.V56            25  .10114     .11530     .10756     .38937 -2 (.10596,.10917)
57.V57            25  .77605 -1  .95618 -1  .88929 -1  .43143 -2 (.87149 -1,.90710 -1)
58.V58            25  .66234 -1  .86475 -1  .76534 -1  .57244 -2 (.74171 -1,.78897 -1)
59.V59            25  .95344 -1  .12151     .11228     .67358 -2 (.10950,.11506)
60.V60            25  .70953 -1  .87649 -1  .81081 -1  .42421 -2 (.79330 -1,.82832 -1)
61.V61            25  .17211     .22319     .19704     .13110 -1 (.19163,.20245)
62.V62            25  .26181     .32459     .29347     .18342 -1 (.28590,.30104)
63.V63            25  .60790 -1  .85828 -1  .70688 -1  .56418 -2 (.68360 -1,.73017 -1)
64.V64            25  .13780     .15570     .14621     .45110 -2 (.14435,.14808)
65.V65            25  .18750     .21622     .20141     .67133 -2 (.19864,.20418)
66.V66            25  .16465     .19507     .17933     .84045 -2 (.17586,.18280)
67.V67            25  .13963     .16298     .15207     .65432 -2 (.14937,.15477)
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  68.V68             25  .44848 -1  .60219 -1  .50481 -1  .44585 -2 (.48641 -1,.52321 -1)
  69.V69             25  .79179 -1  .92121 -1  .86150 -1  .32281 -2 (.84817 -1,.87482 -1)

DESCRIPTIVE MEASURES  <14> V16:14  CASES=CASE#:139-852
     VARIABLE        N  MINIMUM     MAXIMUM     MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1              25  14.000     17.000      15.360     .81035     (15.026,15.694)
   2.V2              25  11.000     13.000      12.000     .64550     (11.734,12.266)
   3.V3              25  30.000     34.000      32.000     .95743     (31.605,32.395)
   4.V4              25  11.000     13.000      12.000     .28868     (11.881,12.119)
   5.V5              25  19.000     23.000      21.400     1.1180     (20.938,21.862)
   6.V6              25  43.000     54.000      46.280     2.6064     (45.204,47.356)
   7.V7              25  18.000     22.000      20.000     .81650     (19.663,20.337)
   8.V8              25  38.000     44.000      40.760     1.8092     (40.013,41.507)
   9.V9              25  28.000     34.000      31.400     1.4142     (30.816,31.984)
  10.V10             25  20.000     23.000      21.120     .83267     (20.776,21.464)
  11.V11             25  36.000     51.000      42.080     4.1020     (40.387,43.773)
  12.V12             25  36.000     38.000      37.160     .62450     (36.902,37.418)
  13.V13             25  6.0000     6.0000      6.0000
  14.V14             25  14.000     14.000      14.000
  15.V15             25  8.0000     8.0000      8.0000
  17.V17             25  423.00     704.00      532.84     75.382     (501.72,563.96)
  44.V44             25  .57333     .61803      .58802     .10445 -1 (.58371,.59233)
  45.V45             25  .46099     .52951      .49792     .15289 -1 (.49161,.50423)
  46.V46             25  .28702     .37094      .35631     .16107 -1 (.34966,.36296)
  47.V47             25  .26950     .32295      .29641     .13968 -1 (.29064,.30217)
  48.V48             25  .13725     .17472      .15809     .83231 -2 (.15465,.16152)
  49.V49             25  .25505     .28884      .26949     .10814 -1 (.26502,.27395)
  50.V50             25  .15839     .19920      .17889     .12493 -1 (.17373,.18405)
  51.V51             25  .16863     .19309      .18007     .64216 -2 (.17742,.18272)
  52.V52             25  .27317     .29828      .28623     .75575 -2 (.28311,.28934)
  53.V53             25  .11786     .13655      .12574     .43002 -2 (.12397,.12752)
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 54.V54            25  .11765      .14058      .12811      .52684 -2 (.12593,.13028)
 55.V55            25  .30364 -1   .42614 -1   .36117 -1   .30915 -2 (.34841 -1,.37394 -1)
 56.V56            25  .10095      .11111      .10663      .28528 -2 (.10545,.10781)
 57.V57            25  .83607 -1   .10079      .92485 -1   .54054 -2 (.90254 -1,.94716 -1)
 58.V58            25  .72443 -1   .92199 -1   .81697 -1   .58762 -2 (.79272 -1,.84123 -1)
 59.V59            25  .99057 -1   .13944      .11882      .10694 -1 (.11440,.12323)
 60.V60            25  .73529 -1   .10079      .87011 -1   .75340 -2 (.83901 -1,.90121 -1)
 61.V61            25  .16173      .22602      .19476      .15023 -1 (.18856,.20096)
 62.V62            25  .26651      .34517      .29993      .18317 -1 (.29237,.30749)
 63.V63            25  .64706 -1   .84483 -1   .72315 -1   .52900 -2 (.70132 -1,.74499 -1)
 64.V64            25  .13576      .16397      .14953      .75822 -2 (.14640,.15265)
 65.V65            25  .16381      .20356      .18090      .10807 -1 (.17644,.18536)
 66.V66            25  .16078      .19323      .17645      .82283 -2 (.17305,.17984)
 67.V67            25  .13333      .15815      .14220      .57144 -2 (.13984,.14456)
 68.V68            25  .42017 -1   .73123 -1   .56742 -1   .79403 -2 (.53464 -1,.60020 -1)
 69.V69            25  .81761 -1   .10084      .90677 -1   .40435 -2 (.89008 -1,.92346 -1)

DESCRIPTIVE MEASURES  <15> V16:15  CASES=CASE#:139-852

    VARIABLE         N  MINIMUM     MAXIMUM       MEAN     STD DEV     .9500 CONFIDENCE INT
   1.V1             25   14.000      16.000      14.800     .57735     (14.562,15.038)
   2.V2             25   11.000      13.000      11.960     .53852     (11.738,12.182)
   3.V3             25   30.000      32.000      31.680     .62716     (31.421,31.939)
   4.V4             25   11.000      12.000      11.960     .20000     (11.877,12.043)
   5.V5             25   20.000      23.000      21.760     .83066     (21.417,22.103)
   6.V6             25   43.000      52.000      48.040     1.9253     (47.245,48.835)
   7.V7             25   19.000      23.000      20.880     1.0536     (20.445,21.315)
   8.V8             25   39.000      49.000      43.480     2.3295     (42.518,44.442)
   9.V9             25   29.000      34.000      31.720     1.4000     (31.142,32.298)
  10.V10            25   19.000      23.000      20.800     .86603     (20.443,21.157)
  11.V11            25   33.000      49.000      40.120     3.4919     (38.679,41.561)
  12.V12            25   37.000      39.000      37.720     .54160     (37.496,37.944)
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13.V13          25  6.0000      6.0000      6.0000
14.V14          25  14.000      15.000      14.040      .20000     (13.957,14.123)
15.V15          25  7.0000      8.0000      7.9200      .27689     (7.8057,8.0343)
17.V17          25  278.00      600.00      489.16      70.493     (460.06,518.26)
44.V44          25  .54839      .60138      .58119      .12122 -1 (.57618,.58619)
45.V45          25  .48036      .52826      .50261      .13101 -1 (.49720,.50802)
46.V46          25  .32813      .37770      .35231      .12850 -1 (.34701,.35762)
47.V47          25  .26419      .30483      .28200      .10111 -1 (.27783,.28617)
48.V48          25  .14130      .16786      .15674      .67753 -2 (.15395,.15954)
49.V49          25  .25801      .28478      .26929      .71210 -2 (.26635,.27223)
50.V50          25  .16553      .19079      .17829      .65047 -2 (.17561,.18098)
51.V51          25  .16929      .18696      .17673      .45370 -2 (.17486,.17860)
52.V52          25  .25446      .29348      .27807      .85710 -2 (.27453,.28161)
53.V53          25  .11324      .12590      .11943      .38443 -2 (.11784,.12102)
54.V54          25  .12018      .13686      .12903      .39108 -2 (.12742,.13065)
55.V55          25  .30702 -1  .38333 -1  .34159 -1  .17699 -2 (.33428 -1,.34889 -1)
56.V56          25  .95969 -1  .11151      .10416      .36654 -2 (.10264,.10567)
57.V57          25  .81784 -1  .10365      .90812 -1  .54262 -2 (.88572 -1,.93052 -1)
58.V58          25  .77187 -1  .10432      .85488 -1  .56776 -2 (.83144 -1,.87831 -1)
59.V59          25  .95238 -1  .11957      .10630      .68778 -2 (.10347,.10914)
60.V60          25  .69663 -1  .85714 -1  .78898 -1  .42237 -2 (.77155 -1,.80642 -1)
61.V61          25  .17176      .22470      .19887      .15119 -1 (.19263,.20511)
62.V62          25  .25180      .33105      .30106      .17487 -1 (.29384,.30828)
63.V63          25  .64748 -1  .79926 -1  .72857 -1  .43987 -2 (.71042 -1,.74673 -1)
64.V64          25  .13309      .15511      .14652      .65483 -2 (.14382,.14923)
65.V65          25  .15238      .18527      .16810      .76160 -2 (.16496,.17125)
66.V66          25  .15827      .19420      .17564      .10619 -1 (.17126,.18002)
67.V67          25  .12230      .14821      .13964      .56783 -2 (.13730,.14198)
68.V68          25  .34305 -1  .65502 -1  .55402 -1  .71617 -2 (.52446 -1,.58358 -1)
69.V69          25  .71429 -1  .91518 -1  .85267 -1  .59004 -2 (.82831 -1,.87702 -1)
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DESCRIPTIVE MEASURES  <16> V16:16  CASES=CASE#:139-852

   VARIABLE           N  MINIMUM     MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
  1.V1               12  14.000      17.000      15.250     .86603     (14.700,15.800)
  2.V2               12  12.000      12.000      12.000
  3.V3               12  29.000      34.000      31.250     1.3568     (30.388,32.112)
  4.V4               12  11.000      12.000      11.917     .28868     (11.733,12.100)
  5.V5               12  19.000      22.000      20.833     1.1146     (20.125,21.542)
  6.V6               12  42.000      50.000      44.750     2.5981     (43.099,46.401)
  7.V7               12  19.000      22.000      20.167     .83485     (19.636,20.697)
  8.V8               12  37.000      42.000      39.583     1.5643     (38.589,40.577)
  9.V9               12  28.000      33.000      29.917     1.6214     (28.887,30.947)
 10.V10              12  20.000      22.000      21.083     .79296     (20.580,21.587)
 11.V11              12  30.000      54.000      40.250     6.4544     (36.149,44.351)
 12.V12              12  36.000      38.000      37.167     .71774     (36.711,37.623)
 13.V13              12  4.0000      6.0000      5.8333     .57735     (5.4665,6.2002)
 14.V14              12  13.000      14.000      13.917     .28868     (13.733,14.100)
 15.V15              12  8.0000      8.0000      8.0000
 17.V17              12  301.00      785.00      435.58     142.96     (344.75,526.41)
 44.V44              12  .57783      .60797      .59217     .91656 -2 (.58635,.59800)
 45.V45              12  .49045      .53125      .50879     .13983 -1 (.49990,.51767)
 46.V46              12  .33887      .40094      .37114     .17487 -1 (.36003,.38225)
 47.V47              12  .27273      .33441      .30496     .20932 -1 (.29166,.31826)
 48.V48              12  .13770      .17042      .15129     .10309 -1 (.14474,.15784)
 49.V49              12  .24331      .30565      .27409     .17337 -1 (.26307,.28510)
 50.V50              12  .17045      .19948      .18199     .10005 -1 (.17563,.18834)
 51.V51              12  .16688      .19934      .18180     .82874 -2 (.17654,.18707)
 52.V52              12  .26910      .31465      .28844     .13733 -1 (.27972,.29717)
 53.V53              12  .13121      .14952      .14202     .55483 -2 (.13850,.14555)
 54.V54              12  .12484      .14618      .13664     .66819 -2 (.13240,.14089)
 55.V55              12  .34375 -1   .41943 -1   .38860 -1  .20014 -2 (.37588 -1,.40131 -1)
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56.V56              12  .10318     .12292     .11253     .58296 -2 (.10883,.11624)
57.V57              12  .80189 -1  .96346 -1  .87218 -1  .52838 -2 (.83861 -1,.90576 -1)
58.V58              12  .68790 -1  .99668 -1  .87354 -1  .93127 -2 (.81437 -1,.93271 -1)
59.V59              12  .90909 -1  .12957     .10804     .12347 -1 (.10020,.11589)
60.V60              12  .77689 -1  .94923 -1  .85950 -1  .59887 -2 (.82144 -1,.89755 -1)
61.V61              12  .17188     .21865     .19560     .12881 -1 (.18741,.20378)
62.V62              12  .26563     .33762     .29265     .19585 -1 (.28021,.30510)
63.V63              12  .66225 -1  .91981 -1  .76779 -1  .95170 -2 (.70732 -1,.82826 -1)
64.V64              12  .14670     .17660     .16171     .85942 -2 (.15625,.16717)
65.V65              12  .17705     .20579     .19264     .10127 -1 (.18621,.19908)
66.V66              12  .16381     .19614     .18033     .83155 -2 (.17505,.18561)
67.V67              12  .13115     .17219     .14750     .13046 -1 (.13922,.15579)
68.V68              12  .49682 -1  .73491 -1  .62255 -1  .74021 -2 (.57552 -1,.66958 -1)
69.V69              12  .87898 -1  .10820     .96553 -1  .61020 -2 (.92676 -1,.10043)

DESCRIPTIVE MEASURES  <17> V16:17  CASES=CASE#:139-852
    VARIABLE         N  MINIMUM    MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
     1.V1           45   14.000     17.000     15.356      .71209    (15.142,15.569)
     2.V2           45   11.000     14.000     12.356      .60886    (12.173,12.538)
     3.V3           45   27.000     32.000     30.311     1.1643     (29.961,30.661)
     4.V4           45   11.000     12.000     11.978      .14907    (11.933,12.023)
     5.V5           45   18.000     23.000     20.622     1.2843     (20.236,21.008)
     6.V6           45   45.000     58.000     52.689     2.6528     (51.892,53.486)
     7.V7           45   20.000     25.000     22.756     1.2996     (22.365,23.146)
     8.V8           45   42.000     47.000     44.489     1.5612     (44.020,44.958)
     9.V9           45   31.000     37.000     33.800     1.4863     (33.353,34.247)
    10.V10          45   21.000     25.000     23.133     1.0574     (22.816,23.451)
    11.V11          45   30.000     46.000     36.244     3.3040     (35.252,37.237)
    12.V12          45   36.000     39.000     37.711      .72683    (37.493,37.929)
    13.V13          45   4.0000     7.0000     5.9778      .33635    (5.8767,6.0788)
    14.V14          45   12.000     15.000     14.022      .45171    (13.887,14.158)
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15.V15         45  7.0000     8.0000     7.9556     .20841     (7.8929,8.0182)
17.V17         45  452.00     797.00     570.82     77.903     (547.42,594.23)
44.V44         45  .56897     .61880     .58767     .10881 -1 (.58440,.59094)
45.V45         45  .46350     .51883     .48964     .11790 -1 (.48609,.49318)
46.V46         45  .34188     .38422     .36200     .10508 -1 (.35884,.36516)
47.V47         45  .27674     .33824     .31003     .13321 -1 (.30603,.31404)
48.V48         45  .13924     .18291     .16082     .94693 -2 (.15797,.16366)
49.V49         45  .22750     .25732     .24035     .73761 -2 (.23813,.24257)
50.V50         45  .14641     .17831     .16420     .68154 -2 (.16215,.16624)
51.V51         45  .15071     .17717     .16689     .58661 -2 (.16513,.16865)
52.V52         45  .26418     .31013     .28751     .10844 -1 (.28426,.29077)
53.V53         45  .10491     .13321     .12289     .52922 -2 (.12130,.12448)
54.V54         45  .99346 -1  .12178     .11230     .46184 -2 (.11092,.11369)
55.V55         45  .29503 -1  .39454 -1  .35002 -1  .25102 -2 (.34248 -1,.35756 -1)
56.V56         45  .88285 -1  .11088     .98890 -1  .42626 -2 (.97609 -1,.10017)
57.V57         45  .65134 -1  .81942 -1  .72601 -1  .40336 -2 (.71389 -1,.73813 -1)
58.V58         45  .61481 -1  .85774 -1  .76759 -1  .49549 -2 (.75271 -1,.78248 -1)
59.V59         45  .70330 -1  .10806     .84963 -1  .90095 -2 (.82257 -1,.87670 -1)
60.V60         45  .50167 -1  .75472 -1  .63958 -1  .56897 -2 (.62248 -1,.65667 -1)
61.V61         45  .17400     .22155     .20044     .10872 -1 (.19718,.20371)
62.V62         45  .24665     .32473     .28897     .16052 -1 (.28415,.29379)
63.V63         45  .59423 -1  .82988 -1  .71445 -1  .49624 -2 (.69955 -1,.72936 -1)
64.V64         45  .12644     .15708     .14334     .71497 -2 (.14119,.14548)
65.V65         45  .16330     .19914     .17756     .77005 -2 (.17525,.17987)
66.V66         45  .14914     .18209     .16592     .82221 -2 (.16345,.16839)
67.V67         45  .11927     .14931     .13680     .65883 -2 (.13482,.13878)
68.V68         45  .29872 -1  .48170 -1  .37793 -1  .46229 -2 (.36404 -1,.39181 -1)
69.V69         45  .71307 -1  .98901 -1  .81865 -1  .53508 -2 (.80257 -1,.83472 -1)

DESCRIPTIVE MEASURES  <18> V16:18  CASES=CASE#:139-852
    VARIABLE       N  MINIMUM    MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
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 1.V1              25  14.000     17.000     15.800     .81650     (15.463,16.137)
 2.V2              25  11.000     13.000     12.280     .54160     (12.056,12.504)
 3.V3              25  30.000     35.000     31.480     1.1590     (31.002,31.958)
 4.V4              25  11.000     12.000     11.960     .20000     (11.877,12.043)
 5.V5              25  19.000     21.000     19.400     .64550     (19.134,19.666)
 6.V6              25  45.000     53.000     47.800     2.2361     (46.877,48.723)
 7.V7              25  19.000     23.000     20.480     1.1225     (20.017,20.943)
 8.V8              25  38.000     46.000     41.600     2.0000     (40.774,42.426)
 9.V9              25  29.000     33.000     30.920     1.2220     (30.416,31.424)
10.V10             25  19.000     23.000     21.040     .97809     (20.636,21.444)
11.V11             25  30.000     41.000     34.280     3.1953     (32.961,35.599)
12.V12             25  36.000     38.000     37.120     .52599     (36.903,37.337)
13.V13             25  6.0000     6.0000     6.0000
14.V14             25  13.000     14.000     13.960     .20000     (13.877,14.043)
15.V15             25  7.0000     8.0000     7.9600     .20000     (7.8774,8.0426)
17.V17             25  315.00     590.00     433.64     78.364     (401.29,465.99)
44.V44             25  .57030     .61594     .58900     .11702 -1 (.58417,.59383)
45.V45             25  .49378     .54378     .51283     .12648 -1 (.50761,.51805)
46.V46             25  .32609     .37692     .35382     .11169 -1 (.34921,.35843)
47.V47             25  .28762     .34895     .31257     .16648 -1 (.30569,.31944)
48.V48             25  .14260     .18841     .16642     .10856 -1 (.16194,.17090)
49.V49             25  .25411     .28659     .27154     .93200 -2 (.26770,.27539)
50.V50             25  .16610     .20109     .18194     .74755 -2 (.17885,.18502)
51.V51             25  .17288     .19891     .18757     .75086 -2 (.18447,.19067)
52.V52             25  .25915     .29423     .27792     .91855 -2 (.27413,.28171)
53.V53             25  .11017     .13212     .12211     .53676 -2 (.11990,.12433)
54.V54             25  .11517     .13225     .12502     .38651 -2 (.12342,.12661)
55.V55             25  .25496 -1  .39855 -1  .34235 -1  .41823 -2 (.32509 -1,.35962 -1)
56.V56             25  .10070     .11746     .10735     .43019 -2 (.10557,.10912)
57.V57             25  .70822 -1  .97143 -1  .87426 -1  .65720 -2 (.84714 -1,.90139 -1)
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58.V58               25  .74954 -1  .94512 -1  .84448 -1  .55985 -2 (.82137 -1,.86759 -1)
59.V59               25  .80439 -1  .13524     .10861     .11452 -1 (.10388,.11333)
60.V60               25  .69841 -1  .99078 -1  .85719 -1  .83753 -2 (.82262 -1,.89176 -1)
61.V61               25  .17949     .22101     .19746     .11638 -1 (.19266,.20227)
62.V62               25  .26667     .32541     .28750     .14378 -1 (.28157,.29344)
63.V63               25  .56657 -1  .73171 -1  .65982 -1  .50681 -2 (.63890 -1,.68074 -1)
64.V64               25  .12077     .15541     .14051     .73171 -2 (.13749,.14353)
65.V65               25  .16159     .18821     .17564     .62963 -2 (.17305,.17824)
66.V66               25  .15232     .18416     .16886     .68318 -2 (.16604,.17168)
67.V67               25  .11890     .14523     .13211     .71185 -2 (.12917,.13504)
68.V68               25  .51522 -1  .68841 -1  .60804 -1  .46395 -2 (.58889 -1,.62719 -1)
69.V69               25  .77228 -1  .90674 -1  .84248 -1  .38561 -2 (.82657 -1,.85840 -1)

DESCRIPTIVE MEASURES  <19> V16:19  CASES=CASE#:139-852
   VARIABLE          N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT.
  1.V1               25  14.000     16.000     15.080     .57155    (14.844,15.316)
  2.V2               25  11.000     13.000     11.440     .58310    (11.199,11.681)
  3.V3               25  29.000     32.000     31.360     1.0360    (30.932,31.788)
  4.V4               25  11.000     12.000     11.960     .20000    (11.877,12.043)
  5.V5               25  18.000     21.000     19.520     .87178    (19.160,19.880)
  6.V6               25  54.000     63.000     58.200     2.2730    (57.262,59.138)
  7.V7               25  20.000     24.000     22.200     1.1180    (21.738,22.662)
  8.V8               25  40.000     47.000     43.400     1.7795    (42.665,44.135)
  9.V9               25  34.000     41.000     37.640     1.6803    (36.946,38.334)
 10.V10              25  22.000     25.000     23.800     1.0408    (23.370,24.230)
 11.V11              25  26.000     34.000     29.080     2.1000    (28.213,29.947)
 12.V12              25  36.000     39.000     37.920     .57155    (37.684,38.156)
 13.V13              25  5.0000     7.0000     6.0000     .28868    (5.8808,6.1192)
 14.V14              25  14.000     16.000     15.640     .63770    (15.377,15.903)
 15.V15              25  7.0000     9.0000     8.0000     .28868    (7.8808,8.1192)
 17.V17              25  373.00     643.00     477.16     65.563    (450.10,504.22)
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44.V44              25  .59144      .66719      .61512      .14363 -1 (.60919,.62105)
45.V45              25  .47289      .53499      .49520      .12953 -1 (.48986,.50055)
46.V46              25  .30171      .37527      .35329      .14544 -1 (.34728,.35929)
47.V47              25  .22912      .29705      .26024      .14654 -1 (.25419,.26629)
48.V48              25  .13605      .17729      .14796      .93791 -2 (.14409,.15183)
49.V49              25  .24274      .26594      .25241      .58476 -2 (.24999,.25482)
50.V50              25  .14074      .17574      .15817      .85160 -2 (.15466,.16169)
51.V51              25  .15809      .18040      .16904      .54153 -2 (.16680,.17127)
52.V52              25  .24417      .30290      .28419      .11654 -1 (.27938,.28900)
53.V53              25  .10110      .12131      .10836      .45160 -2 (.10649,.11022)
54.V54              25  .10629      .12131      .11243      .34192 -2 (.11102,.11384)
55.V55              25  .29491 -1  .38880 -1  .34242 -1  .25478 -2 (.33191 -1,.35294 -1)
56.V56              25  .98160 -1  .11664      .10477      .39215 -2 (.10315,.10639)
57.V57              25  .69705 -1  .86758 -1  .77799 -1  .47059 -2 (.75857 -1,.79742 -1)
58.V58              25  .69021 -1  .84475 -1  .76378 -1  .34680 -2 (.74946 -1,.77809 -1)
59.V59              25  .85062 -1  .10468      .94160 -1  .54151 -2 (.91924 -1,.96395 -1)
60.V60              25  .62361 -1  .85317 -1  .73861 -1  .55005 -2 (.71591 -1,.76132 -1)
61.V61              25  .17184      .21830      .19550      .10652 -1 (.19110,.19990)
62.V62              25  .27614      .33387      .31307      .14876 -1 (.30693,.31921)
63.V63              25  .64315 -1  .79767 -1  .72492 -1  .40508 -2 (.70820 -1,.74154 -1)
64.V64              25  .12863      .15397      .14480      .65315 -2 (.14210,.14749)
65.V65              25  .16111      .19129      .17447      .78435 -2 (.17124,.17771)
66.V66              25  .15768      .20062      .17501      .89489 -2 (.17132,.17870)
67.V67              25  .12332      .15552      .13896      .64354 -2 (.13631,.14162)
68.V68              25  .43384 -1  .61224 -1  .52205 -1  .50095 -2 (.50138 -1,.54273 -1)
69.V69              25  .74689 -1  .93313 -1  .81152 -1  .43452 -2 (.79358 -1,.82945 -1)

DESCRIPTIVE MEASURES  <20> V16:20  CASES=CASE#:139-852

   VARIABLE          N  MINIMUM     MAXIMUM       MEAN      STD DEV    .9500 CONFIDENCE INT

  1.V1              25   15.000      17.000      16.080      .64031     (15.816,16.344)

  2.V2              25   11.000      13.000      12.040      .53852     (11.818,12.262)
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3.V3            25  28.000    33.000    30.880    1.1662     (30.399,31.361)
4.V4            25  11.000    12.000    11.920    .27689     (11.806,12.034)
5.V5            25  19.000    21.000    19.720    .67823     (19.440,20.000)
6.V6            25  49.000    58.000    52.400    2.5658     (51.341,53.459)
7.V7            25  19.000    25.000    21.680    1.3760     (21.112,22.248)
8.V8            25  38.000    45.000    41.440    1.8276     (40.686,42.194)
9.V9            25  31.000    38.000    33.440    1.7340     (32.724,34.156)
10.V10          25  20.000    24.000    22.160    .94340     (21.771,22.549)
11.V11          25  27.000    34.000    30.320    1.9942     (29.497,31.143)
12.V12          25  37.000    38.000    37.320    .47610     (37.123,37.517)
13.V13          25  3.0000    6.0000    5.8400    .62450     (5.5822,6.0978)
14.V14          25  13.000    15.000    14.040    .45461     (13.852,14.228)
15.V15          25  7.0000    8.0000    7.9200    .27689     (7.8057,8.0343)
17.V17          25  314.00    575.00    455.20    64.894     (428.41,481.99)
44.V44          25  .56130    .60624    .57624    .98791 -2 (.57217,.58032)
45.V45          25  .48522    .52459    .50364    .10390 -1 (.49935,.50792)
46.V46          25  .33430    .36952    .35563    .90286 -2 (.35190,.35935)
47.V47          25  .27833    .30783    .29266    .86445 -2 (.28909,.29623)
48.V48          25  .13832    .17151    .15260    .71623 -2 (.14965,.15556)
49.V49          25  .25043    .29803    .26051    .98076 -2 (.25646,.26456)
50.V50          25  .16949    .18966    .17776    .49830 -2 (.17570,.17981)
51.V51          25  .16162    .19298    .17811    .75895 -2 (.17497,.18124)
52.V52          25  .26163    .30063    .28636    .88050 -2 (.28273,.29000)
53.V53          25  .10319    .12261    .11040    .45401 -2 (.10852,.11227)
54.V54          25  .10909    .12671    .11569    .45182 -2 (.11382,.11755)
55.V55          25  .28662 -1 .38986 -1 .35095 -1 .29043 -2 (.33896 -1,.36294 -1)
56.V56          25  .98765 -1 .12069    .10683    .46353 -2 (.10491,.10874)
57.V57          25  .66879 -1 .93596 -1 .78943 -1 .58961 -2 (.76509 -1,.81377 -1)
58.V58          25  .69583 -1 .91133 -1 .80117 -1 .57815 -2 (.77731 -1,.82504 -1)
59.V59          25  .81365 -1 .10117    .88387 -1 .55111 -2 (.86113 -1,.90662 -1)
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60.V60          25  .66087 -1  .83744 -1  .74862 -1  .45245 -2 (.72994 -1,.76730 -1)
61.V61          25  .18790     .23930     .21433     .13328 -1 (.20883,.21983)
62.V62          25  .27070     .33852     .30631     .15176 -1 (.30004,.31257)
63.V63          25  .59113 -1  .76289 -1  .68991 -1  .53086 -2 (.66800 -1,.71182 -1)
64.V64          25  .13060     .14980     .14335     .54901 -2 (.14108,.14561)
65.V65          25  .16708     .18519     .17702     .48991 -2 (.17500,.17904)
66.V66          25  .15193     .18314     .17080     .74929 -2 (.16771,.17389)
67.V67          25  .12209     .14074     .13301     .47433 -2 (.13105,.13497)
68.V68          25  .39312 -1  .55328 -1  .47995 -1  .37482 -2 (.46448 -1,.49543 -1)
69.V69          25  .79012 -1  .98837 -1  .87240 -1  .52098 -2 (.85089 -1,.89390 -1)

DESCRIPTIVE MEASURES  <21> V16:21  CASES=CASE#:139-852
   VARIABLE          N  MINIMUM    MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
  1.V1              25  13.000     16.000      14.360     .75719     (14.047,14.673)
  2.V2              25  10.000     12.000      10.960     .53852     (10.738,11.182)
  3.V3              25  30.000     33.000      31.280     .97980     (30.876,31.684)
  4.V4              25  11.000     12.000      11.960     .20000     (11.877,12.043)
  5.V5              25  17.000     21.000      18.880     .88129     (18.516,19.244)
  6.V6              25  42.000     51.000      47.280     2.1894     (46.376,48.184)
  7.V7              25  20.000     23.000      21.680     .80208     (21.349,22.011)
  8.V8              24  38.000     46.000      41.958     1.7315     (41.227,42.689)
  9.V9              24  26.000     31.000      29.292     1.3015     (28.742,29.841)
 10.V10             25  20.000     25.000      22.600     1.1902     (22.109,23.091)
 11.V11             25  26.000     34.000      31.280     1.9261     (30.485,32.075)
 12.V12             25  35.000     38.000      36.760     .59722     (36.513,37.007)
 13.V13             25  4.0000     6.0000      5.8000     .57735     (5.5617,6.0383)
 14.V14             25  13.000     15.000      13.960     .35119     (13.815,14.105)
 15.V15             25  7.0000     8.0000      7.9200     .27689     (7.8057,8.0343)
 17.V17             25  324.00     465.00      361.92     34.108     (347.84,376.00)
 44.V44             25  .55521     .59948      .57821     .13033 -1 (.57283,.58359)
 45.V45             25  .46626     .51932      .49227     .14641 -1 (.48623,.49832)
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  46.V46              25  .34031      .37963      .36178      .10728 -1 (.35736,.36621)
  47.V47              25  .25000      .28490      .26822      .79929 -2 (.26492,.27152)
  48.V48              25  .11585      .16425      .14025      .98919 -2 (.13617,.14433)
  49.V49              25  .25000      .27536      .26295      .66980 -2 (.26018,.26571)
  50.V50              25  .15854      .18660      .17308      .82326 -2 (.16968,.17648)
  51.V51              25  .16564      .19807      .17826      .66380 -2 (.17552,.18100)
  52.V52              25  .26570      .31065      .28922      .10484 -1 (.28489,.29354)
  53.V53              25  .10875      .12654      .11878      .41234 -2 (.11708,.12048)
  54.V54              25  .11765      .13105      .12442      .32047 -2 (.12309,.12574)
  55.V55              25  .27027 -1   .36232 -1   .32328 -1   .21956 -2 (.31422 -1,.33235 -1)
  56.V56              25  .89552 -1   .11183      .10675      .43921 -2 (.10493,.10856)
  57.V57              25  .69444 -1   .88172 -1   .75833 -1   .48758 -2 (.73821 -1,.77846 -1)
  58.V58              25  .78261 -1   .91176 -1   .84770 -1   .37437 -2 (.83225 -1,.86316 -1)
  59.V59              25  .83333 -1   .10538      .92093 -1   .53082 -2 (.89902 -1,.94284 -1)
  60.V60              25  .71225 -1   .86567 -1   .79641 -1   .42806 -2 (.77874 -1,.81408 -1)
  61.V61              25  .15805      .21393      .18510      .12893 -1 (.17978,.19042)
  62.V62              25  .25915      .30597      .28746      .11973 -1 (.28251,.29240)
  63.V63              25  .53254 -1   .71809 -1   .63498 -1   .49966 -2 (.61435 -1,.65560 -1)
  64.V64              25  .13611      .15957      .14733      .65797 -2 (.14461,.15004)
  65.V65              25  .17222      .20118      .18686      .64387 -2 (.18420,.18951)
  66.V66              25  .15337      .17634      .16354      .58868 -2 (.16111,.16597)
  67.V67              25  .12195      .14409      .13421      .51628 -2 (.13208,.13634)
  68.V68              25  .41667 -1   .60440 -1   .52186 -1   .51234 -2 (.50071 -1,.54301 -1)
  69.V69              25  .75075 -1   .90395 -1   .83677 -1   .42637 -2 (.81917 -1,.85437 -1)

DESCRIPTIVE MEASURES  <22> V16:22  CASES=CASE#:139-852

    VARIABLE          N  MINIMUM     MAXIMUM        MEAN      STD DEV     .9500 CONFIDENCE INT

   1.V1               5  15.000      17.000      16.000      1.0000     (14.758,17.242)
   2.V2               5  11.000      12.000      11.800      .44721     (11.245,12.355)
   3.V3               5  29.000      32.000      30.600      1.3416     (28.934,32.266)
   4.V4               5  12.000      12.000      12.000
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  5.V5                      5  18.000      20.000      19.400      .89443     (18.289,20.511)
  6.V6                      5  51.000      54.000      52.400      1.3416     (50.734,54.066)
  7.V7                      5  20.000      22.000      21.000      .70711     (20.122,21.878)
  8.V8                      5  37.000      40.000      38.400      1.1402     (36.984,39.816)
  9.V9                      5  29.000      34.000      31.200      1.9235     (28.812,33.588)
 10.V10                     5  21.000      22.000      21.200      .44721     (20.645,21.755)
 11.V11                     5  30.000      34.000      32.600      1.6733     (30.522,34.678)
 12.V12                     5  38.000      38.000      38.000
 13.V13                     5  6.0000      6.0000      6.0000
 14.V14                     5  14.000      14.000      14.000
 15.V15                     5  8.0000      8.0000      8.0000
 17.V17                     5  431.00      510.00      470.20      34.564     (427.28,513.12)
 44.V44                     5  .55098      .58206      .56678      .13089 -1 (.55053,.58303)
 45.V45                     5  .48667      .51491      .50299      .10441 -1 (.49002,.51595)
 46.V46                     5  .37333      .38627      .38059      .53306 -2 (.37398,.38721)
 47.V47                     5  .25686      .28306      .26938      .10728 -1 (.25606,.28270)
 48.V48                     5  .13137      .14849      .14142      .75110 -2 (.13209,.15074)
 49.V49                     5  .25447      .27378      .26199      .75897 -2 (.25257,.27142)
 50.V50                     5  .16630      .18097      .17169      .63555 -2 (.16380,.17958)
 51.V51                     5  .17059      .18887      .17867      .74363 -2 (.16943,.18790)
 52.V52                     5  .28667      .30020      .29356      .64708 -2 (.28552,.30159)
 53.V53                     5  .10503      .11601      .11115      .46237 -2 (.10541,.11689)
 54.V54                     5  .11379      .12065      .11738      .28244 -2 (.11387,.12089)
 55.V55                     5  .33333 -1  .41575 -1  .36953 -1  .35260 -2 (.32575 -1,.41332 -1)
 56.V56                     5  .10222      .11176      .10579      .38131 -2 (.10105,.11052)
 57.V57                     5  .83527 -1  .91111 -1  .87626 -1  .34519 -2 (.83340 -1,.91912 -1)
 58.V58                     5  .71571 -1  .80000 -1  .75383 -1  .31367 -2 (.71488 -1,.79277 -1)
 59.V59                     5  .96078 -1  .10667      .10272      .41729 -2 (.97534 -1,.10790)
 60.V60                     5  .68627 -1  .80000 -1  .75001 -1  .41531 -2 (.69845 -1,.80158 -1)
 61.V61                     5  .20350      .23898      .22295      .13461 -1 (.20624,.23967)
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62.V62             5  .29540     .31787     .30786     .98195 -2 (.29567,.32005)
63.V63             5  .74246 -1  .82353 -1  .76420 -1  .33736 -2 (.72231 -1,.80609 -1)
64.V64             5  .14314     .16078     .15182     .74053 -2 (.14263,.16102)
65.V65             5  .17694     .18627     .18246     .43578 -2 (.17705,.19787)
66.V66             5  .16078     .18222     .16915     .81354 -2 (.15905,.17925)
67.V67             5  .13129     .14444     .13774     .50197 -2 (.13150,.14397)
68.V68             5  .52941 -1  .62645 -1  .58113 -1  .46038 -2 (.52397 -1,.63830 -1)
69.V69             5  .83527 -1  .90196 -1  .87920 -1  .26437 -2 (.84638 -1,.91203 -1)

DESCRIPTIVE MEASURES  <23> V16:23  CASES=CASE#:139-852
     VARIABLE      N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
   1.V1            5  14.000     16.000     15.200     .83666    (14.161,16.239)
   2.V2            5  11.000     13.000     11.800     .83666    (10.761,12.839)
   3.V3            5  27.000     32.000     30.000     1.8708    (27.677,32.323)
   4.V4            5  11.000     12.000     11.800     .44721    (11.245,12.355)
   5.V5            5  19.000     21.000     19.400     .89443    (18.289,20.511)
   6.V6            5  42.000     51.000     47.800     3.5637    (43.375,52.225)
   7.V7            5  19.000     21.000     20.200     .83666    (19.161,21.239)
   8.V8            5  38.000     40.000     39.000     .70711    (38.122,39.878)
   9.V9            5  29.000     33.000     31.800     1.6432    (29.760,33.840)
  10.V10           5  21.000     22.000     21.400     .54772    (20.720,22.080)
  11.V11           5  28.000     32.000     30.200     1.4832    (28.358,32.042)
  12.V12           5  37.000     38.000     37.400     .54772    (36.720,38.080)
  13.V13           5  6.0000     6.0000     6.0000
  14.V14           5  14.000     14.000     14.000
  15.V15           5  8.0000     8.0000     8.0000
  17.V17           5  385.00     443.00     422.80     24.284    (392.65,452.95)
  44.V44           5  .56193     .59740     .58041     .12823 -1 (.56449,.59633)
  45.V45           5  .48081     .50000     .49292     .75618 -2 (.48353,.50231)
  46.V46           5  .36883     .39052     .37583     .87269 -2 (.36499,.38667)
  47.V47           5  .26494     .29369     .28120     .10319 -1 (.26839,.29401)
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48.V48                5  .15049     .15982     .15460     .35019 -2 (.15025,.15895)
49.V49                5  .25229     .26712     .25772     .56631 -2 (.25068,.26475)
50.V50                5  .16364     .18721     .17189     .94626 -2 (.16014,.18364)
51.V51                5  .16748     .18265     .17544     .59964 -2 (.16800,.18289)
52.V52                5  .28883     .30926     .30083     .87253 -2 (.29000,.31166)
53.V53                5  .11872     .12864     .12361     .45218 -2 (.11800,.12923)
54.V54                5  .11165     .12557     .11815     .50188 -2 (.11192,.12438)
55.V55                5  .31553 -1  .36364 -1  .34537 -1  .19260 -2 (.32145 -1,.36928 -1)
56.V56                5  .98624 -1  .10959     .10413     .42504 -2 (.98854 -1,.10941)
57.V57                5  .75688 -1  .82192 -1  .78947 -1  .27018 -2 (.75592 -1,.82302 -1)
58.V58                5  .74492 -1  .82569 -1  .79517 -1  .30024 -2 (.75789 -1,.83245 -1)
59.V59                5  .84951 -1  .93607 -1  .88420 -1  .34273 -2 (.84164 -1,.92675 -1)
60.V60                5  .62338 -1  .73394 -1  .68428 -1  .45107 -2 (.62827 -1,.74028 -1)
61.V61                5  .18284     .21233     .19613     .11881 -1 (.18138,.21088)
62.V62                5  .26862     .29909     .28120     .13225 -1 (.26478,.29762)
63.V63                5  .64935 -1  .75688 -1  .70867 -1  .45827 -2 (.65177 -1,.76557 -1)
64.V64                5  .14026     .15138     .14742     .42053 -2 (.14219,.15264)
65.V65                5  .16514     .19221     .18096     .11398 -1 (.16681,.19511)
66.V66                5  .16284     .17580     .16798     .54361 -2 (.16123,.17473)
67.V67                5  .12208     .13470     .12809     .51080 -2 (.12175,.13443)
68.V68                5  .42889 -1  .48544 -1  .46401 -1  .22199 -2 (.43644 -1,.49157 -1)
69.V69                5  .76749 -1  .91324 -1  .82305 -1  .59391 -2 (.74931 -1,.89680 -1)

DESCRIPTIVE MEASURES  <24> V16:24  CASES=CASE#:139-852
   VARIABLE           N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
  1.V1                5  14.000     16.000     15.400     .89443     (14.289,16.511)
  2.V2                5  11.000     12.000     11.800     .44721     (11.245,12.355)
  3.V3                5  29.000     32.000     30.400     1.1402     (28.984,31.816)
  4.V4                5  12.000     12.000     12.000
  5.V5                5  19.000     20.000     19.400     .54772     (18.720,20.080)
  6.V6                5  44.000     52.000     48.600     3.4351     (44.335,52.865)
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 7.V7             5  19.000     21.000     20.200     1.0954     (18.840,21.560)
 8.V8             5  37.000     42.000     40.400     2.3022     (37.541,43.259)
 9.V9             5  29.000     34.000     31.400     2.0736     (28.825,33.975)
10.V10            5  20.000     22.000     21.200     .83666     (20.161,22.239)
11.V11            5  35.000     46.000     42.000     4.3589     (36.588,47.412)
12.V12            5  37.000     38.000     37.200     .44721     (36.645,37.755)
13.V13            5  6.0000     6.0000     6.0000
14.V14            5  14.000     14.000     14.000
15.V15            5  8.0000     8.0000     8.0000
17.V17            5  435.00     695.00     520.00     104.40     (390.37,649.63)
44.V44            5  .55973     .57787     .57145     .70030 -2 (.56276,.58015)
45.V45            5  .50216     .51321     .50635     .45917 -2 (.50065,.51205)
46.V46            5  .36066     .37698     .36889     .79006 -2 (.35908,.37870)
47.V47            5  .26437     .29508     .28018     .11019 -1 (.26650,.29386)
48.V48            5  .14602     .18852     .16360     .18027 -1 (.14122,.18598)
49.V49            5  .25612     .26437     .26163     .33912 -2 (.25742,.26584)
50.V50            5  .16598     .18363     .17542     .86953 -2 (.16463,.18622)
51.V51            5  .17554     .19057     .18265     .67238 -2 (.17430,.19099)
52.V52            5  .29098     .29623     .29310     .21161 -2 (.29047,.29573)
53.V53            5  .11079     .12414     .12003     .53041 -2 (.11344,.12662)
54.V54            5  .12090     .12830     .12494     .27840 -2 (.12149,.12840)
55.V55            5  .33962 -1  .39823 -1  .36850 -1  .25117 -2 (.33732 -1,.39969 -1)
56.V56            5  .99281 -1  .10575     .10339     .28050 -2 (.99910 -1,.10688)
57.V57            5  .90566 -1  .94262 -1  .92530 -1  .18387 -2 (.90247 -1,.94813 -1)
58.V58            5  .69065 -1  .78161 -1  .75567 -1  .37338 -2 (.70931 -1,.80204 -1)
59.V59            5  .10841     .13208     .11729     .95518 -2 (.10543,.12915)
60.V60            5  .73009 -1  .90566 -1  .83580 -1  .67418 -2 (.75209 -1,.91951 -1)
61.V61            5  .19811     .21439     .20298     .66097 -2 (.19477,.21119)
62.V62            5  .28540     .33094     .30137     .18019 -1 (.27899,.32374)
63.V63            5  .67925 -1  .77698 -1  .72356 -1  .40242 -2 (.67359 -1,.77353 -1)
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  64.V64                 5  .14253      .15396      .14735      .48945 -2 (.14127,.15342)
  65.V65                 5  .17920      .19310      .18887      .56963 -2 (.18180,.19595)
  66.V66                 5  .17478      .18679      .18034      .45130 -2 (.17473,.18594)
  67.V67                 5  .12832      .14676      .13756      .66525 -2 (.12930,.14582)
  68.V68                 5  .63525 -1  .73585 -1  .67671 -1  .42658 -2 (.62374 -1,.72967 -1)
  69.V69                 5  .77869 -1  .90708 -1  .82526 -1  .49232 -2 (.76413 -1,.88639 -1)

DESCRIPTIVE MEASURES  <25> V16:25  CASES=CASE#:139-852
     VARIABLE           N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
    1.V1                5  15.000      17.000      16.000      .70711     (15.122,16.878)
    2.V2                5  12.000      13.000      12.400      .54772     (11.720,13.080)
    3.V3                5  29.000      30.000      29.800      .44721     (29.245,30.355)
    4.V4                5  12.000      12.000      12.000
    5.V5                5  18.000      20.000      19.400      .89443     (18.289,20.511)
    6.V6                5  50.000      53.000      52.000      1.4142     (50.244,53.756)
    7.V7                5  20.000      21.000      20.600      .54772     (19.920,21.280)
    8.V8                5  39.000      43.000      41.000      1.5811     (39.037,42.963)
    9.V9                5  29.000      33.000      31.200      1.7889     (28.979,33.421)
   10.V10               5  21.000      23.000      21.800      .83666     (20.761,22.839)
   11.V11               5  29.000      34.000      31.800      2.1679     (29.108,34.492)
   12.V12               5  36.000      38.000      37.200      .83666     (36.161,38.239)
   13.V13               5  6.0000      6.0000      6.0000
   14.V14               5  14.000      14.000      14.000
   15.V15               5  8.0000      8.0000      8.0000
   17.V17               5  432.00      674.00      560.00      106.03     (428.35,691.65)
   44.V44               5  .55324      .57567      .56274      .10751 -1 (.54939,.57609)
   45.V45               5  .49074      .51929      .50286      .12773 -1 (.48700,.51872)
   46.V46               5  .36241      .37963      .36814      .67833 -2 (.35972,.37657)
   47.V47               5  .24306      .27519      .25568      .13085 -1 (.23943,.27192)
   48.V48               5  .13400      .15489      .14333      .92944 -2 (.13179,.15487)
   49.V49               5  .24197      .25865      .25169      .70878 -2 (.24289,.26049)
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 50.V50            5  .15690    .17444    .16493    .83857 -2 (.15452,.17534)
 51.V51            5  .17000    .18647    .17654    .75228 -2 (.16720,.18588)
 52.V52            5  .28120    .30813    .29341    .13565 -1 (.27656,.31025)
 53.V53            5  .99537 -1 .11424    .10842    .63455 -2 (.10054,.11630)
 54.V54            5  .11111    .12481    .11719    .50561 -2 (.11091,.12346)
 55.V55            5  .34722 -1 .47478 -1 .42081 -1 .52063 -2 (.35616 -1,.48545 -1)
 56.V56            5  .10417    .11573    .10938    .43482 -2 (.10399,.11478)
 57.V57            5  .78704 -1 .89021 -1 .83546 -1 .49471 -2 (.77404 -1,.89689 -1)
 58.V58            5  .65282 -1 .74074 -1 .68638 -1 .35262 -2 (.64259 -1,.73016 -1)
 59.V59            5  .88847 -1 .96439 -1 .93224 -1 .31817 -2 (.89273 -1,.97174 -1)
 60.V60            5  .68000 -1 .78195 -1 .71953 -1 .41804 -2 (.66763 -1,.77144 -1)
 61.V61            5  .19213    .22707    .21648    .14022 -1 (.19907,.23389)
 62.V62            5  .29398    .31880    .30430    .12163 -1 (.28919,.31940)
 63.V63            5  .71834 -1 .78704 -1 .75186 -1 .28601 -2 (.71635 -1,.78737 -1)
 64.V64            5  .13233    .15188    .14412    .72607 -2 (.13511,.15314)
 65.V65            5  .17202    .18981    .18305    .72326 -2 (.17407,.19203)
 66.V66            5  .15690    .17594    .16978    .77045 -2 (.16021,.17935)
 67.V67            5  .13600    .14737    .13927    .46929 -2 (.13344,.14510)
 68.V68            5  .41588 -1 .53412 -1 .48472 -1 .50193 -2 (.42240 -1,.54705 -1)
 69.V69            5  .83176 -1 .97923 -1 .87329 -1 .62374 -2 (.79584 -1,.95073 -1)

DESCRIPTIVE MEASURES  <26> V16:26  CASES=CASE#:139-852
    VARIABLE         N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
   1.V1              5   15.000     17.000     15.800     .83666    (14.761,16.939)
   2.V2              5   11.000     12.000     11.400     .54772    (10.720,12.080)
   3.V3              5   30.000     32.000     30.400     .89443    (29.289,31.511)
   4.V4              5   12.000     12.000     12.000
   5.V5              5   19.000     20.000     19.200     .44721    (18.645,19.755)
   6.V6              5   49.000     54.000     52.200     2.0494    (49.655,54.745)
   7.V7              5   19.000     21.000     20.200     .83666    (19.161,21.239)
   8.V8              5   40.000     43.000     41.600     1.1402    (40.184,43.016)
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 9.V9                5  30.000       34.000       32.600       1.6733      (30.522,34.678)
10.V10               5  20.000       23.000       21.600       1.1402      (20.184,23.016)
11.V11               5  27.000       38.000       32.400       4.1593      (27.236,37.564)
12.V12               5  37.000       38.000       37.600       .54772      (36.920,38.280)
13.V13               5  6.0000       6.0000       6.0000
14.V14               5  14.000       14.000       14.000
15.V15               5  8.0000       8.0000       8.0000
17.V17               5  371.00       620.00       496.60       102.49      (369.35,623.85)
44.V44               5  .56887       .58795       .57773       .86931 -2 (.56694,.58852)
45.V45               5  .50674       .51325       .50915       .25145 -2 (.50603,.51227)
46.V46               5  .35323       .38072       .36425       .10510 -1 (.35120,.37730)
47.V47               5  .27581       .31325       .29220       .14711 -1 (.27394,.31047)
48.V48               5  .15323       .19277       .16822       .16343 -1 (.14793,.18852)
49.V49               5  .24578       .25403       .25044       .33648 -2 (.24626,.25462)
50.V50               5  .15968       .17520       .16760       .58321 -2 (.16036,.17485)
51.V51               5  .17419       .18605       .18030       .55173 -2 (.17345,.18715)
52.V52               5  .28571       .30309       .29117       .70288 -2 (.28244,.29990)
53.V53               5  .98387 -1  .11325       .10659       .53365 -2 (.99968 -1,.11322)
54.V54               5  .11566       .12165       .11905       .25856 -2 (.11584,.12226)
55.V55               5  .29650 -1  .41145 -1  .35757 -1  .41621 -2 (.30589 -1,.40925 -1)
56.V56               5  .98795 -1  .10555       .10300       .27009 -2 (.99647 -1,.10635)
57.V57               5  .75472 -1  .87657 -1  .83323 -1  .55168 -2 (.76473 -1,.90173 -1)
58.V58               5  .67742 -1  .81928 -1  .76191 -1  .56579 -2 (.69166 -1,.83216 -1)
59.V59               5  .86747 -1  .11390       .10304       .11358 -1 (.88941 -1,.11715)
60.V60               5  .67470 -1  .83871 -1  .77832 -1  .61810 -2 (.70157 -1,.85507 -1)
61.V61               5  .18868       .23256       .21206       .15893 -1 (.19233,.23180)
62.V62               5  .24259       .29517       .27824       .20959 -1 (.25222,.30427)
63.V63               5  .57915 -1  .69767 -1  .65358 -1  .47789 -2 (.59424 -1,.71291 -1)
64.V64               5  .12880       .14286       .13390       .59398 -2 (.12652,.14127)
65.V65               5  .16386       .17375       .16891       .45268 -2 (.16329,.17454)
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    66.V66                   5  .14669     .17581      .16144      .12362 -1 (.14609,.17679)
    67.V67                   5  .12668     .17097      .13747      .18888 -1 (.11402,.16093)
    68.V68                   5  .50602 -1  .59846 -1   .54749 -1   .39342 -2 (.49864 -1,.59634 -1)
    69.V69                   5  .77220 -1  .10161      .88934 -1   .10303 -1 (.76141 -1,.10173)

DESCRIPTIVE MEASURES   <27> V16:27   CASES=CASE#:139-852
     VARIABLE              N  MINIMUM     MAXIMUM       MEAN       STD DEV     .9500 CONFIDENCE INT
      1.V1                 2  16.000      17.000      16.500      .70711      (10.147,22.853)
      2.V2                 2  12.000      12.000      12.000
      3.V3                 2  28.000      30.000      29.000      1.4142      (16.294,41.706)
      4.V4                 2  12.000      12.000      12.000
      5.V5                 2  19.000      19.000      19.000
      6.V6                 2  51.000      54.000      52.500      2.1213      (33.441,71.559)
      7.V7                 2  21.000      21.000      21.000
      8.V8                 2  40.000      43.000      41.500      2.1213      (22.441,60.559)
      9.V9                 2  32.000      32.000      32.000
     10.V10                2  21.000      22.000      21.500      .70711      (15.147,27.853)
     11.V11                2  31.000      36.000      33.500      3.5355      (1.7345,65.266)
     12.V12                2  37.000      37.000      37.000
     13.V13                2  6.0000      6.0000      6.0000
     14.V14                2  14.000      15.000      14.500      .70711      (8.1469,20.853)
     15.V15                2  8.0000      8.0000      8.0000
     17.V17                2  674.00      728.00      701.00      38.184      (357.93,1044.1)
     44.V44                2  .56044      .57715      .56880      .11817 -1 (.46262,.67497)
     45.V45                2  .49313      .50890      .50102      .11151 -1 (.40083,.60121)
     46.V46                2  .35757      .36264      .36010      .35855 -2 (.32789,.39232)
     47.V47                2  .29674      .30220      .29947      .38621 -2 (.26477,.33417)
     48.V48                2  .17359      .17582      .17471      .15794 -2 (.16052,.18890)
     49.V49                2  .24588      .25074      .24831      .34385 -2 (.21742,.27920)
     50.V50                2  .17308      .17656      .17482      .24614 -2 (.15270,.19693)
     51.V51                2  .17953      .19368      .18660      .10010 -1 (.96668 -1,.27654)
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52.V52                 2  .27596      .28022      .27809      .30090 -2 (.25106,.30513)
53.V53                 2  .12088      .12166      .12127      .55338 -3 (.11630,.12624)
54.V54                 2  .11813      .12166      .11990      .24960 -2 (.97471 -1,.14232)
55.V55                 2  .37092 -1   .41209 -1   .39150 -1   .29110 -2 (.12996 -1,.65305 -1)
56.V56                 2  .10440      .10534      .10487      .66867 -3 (.98861 -1,.11088)
57.V57                 2  .83086 -1   .86538 -1   .84812 -1   .24412 -2 (.62879 -1,.10675)
58.V58                 2  .64560 -1   .74184 -1   .69372 -1   .68049 -2 (.82329 -2,.13051)
59.V59                 2  .10302      .11424      .10863      .79347 -2 (.37342 -1,.17992)
60.V60                 2  .74176 -1   .80119 -1   .77147 -1   .42022 -2 (.39392 -1,.11490)
61.V61                 2  .23442      .23901      .23672      .32454 -2 (.20756,.26587)
62.V62                 2  .32967      .33383      .33175      .29398 -2 (.30534,.35816)
63.V63                 2  .78297 -1   .78635 -1   .78466 -1   .23922 -3 (.76317 -1,.80615 -1)
64.V64                 2  .14973      .15282      .15127      .21876 -2 (.13162,.17093)
65.V65                 2  .17995      .18694      .18344      .49487 -2 (.13898,.22791)
66.V66                 2  .16758      .16914      .16836      .11010 -2 (.15847,.17825)
67.V67                 2  .14423      .14837      .14630      .29254 -2 (.12002,.17258)
68.V68                 2  .52198 -1   .56380 -1   .54289 -1   .29571 -2 (.27720 -1,.80858 -1)
69.V69                 2  .79670 -1   .83086 -1   .81378 -1   .24153 -2 (.59678 -1,.10308)

DESCRIPTIVE MEASURES  <28> V16:28  CASES=CASE#:139-852
    VARIABLE           N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1                5   15.000      17.000      16.200      .83666     (15.161,17.239)
   2.V2                5   11.000      13.000      11.800      .83666     (10.761,12.839)
   3.V3                5   29.000      32.000      30.200      1.0954     (28.840,31.560)
   4.V4                5   12.000      12.000      12.000
   5.V5                5   17.000      19.000      18.200      .83666     (17.161,19.239)
   6.V6                5   50.000      53.000      51.200      1.3038     (49.581,52.819)
   7.V7                5   20.000      21.000      20.800      .44721     (20.245,21.355)
   8.V8                5   39.000      42.000      40.600      1.3416     (38.934,42.266)
   9.V9                5   30.000      35.000      32.200      1.9235     (29.812,34.588)
  10.V10               5   21.000      22.000      21.400      .54772     (20.720,22.080)
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11.V11       5  29.000     32.000     30.400     1.3416     (28.734,32.066)
12.V12       5  36.000     38.000     37.200     .83666     (36.161,38.239)
13.V13       5  6.0000     6.0000     6.0000
14.V14       5  14.000     14.000     14.000
15.V15       5  8.0000     8.0000     8.0000
17.V17       5  386.00     571.00     482.40     81.097     (381.70,583.10)
44.V44       5  .54116     .58549     .56445     .18769 -1  (.54115,.58776)
45.V45       5  .49661     .51225     .50526     .62699 -2  (.49747,.51304)
46.V46       5  .34967     .37698     .36325     .12127 -1  (.34819,.37831)
47.V47       5  .26185     .28756     .27383     .10553 -1  (.26073,.28694)
48.V48       5  .13995     .16036     .14796     .80335 -2  (.13798,.15793)
49.V49       5  .25222     .27394     .26416     .85147 -2  (.25359,.27474)
50.V50       5  .17052     .18214     .17623     .44678 -2  (.17069,.18178)
51.V51       5  .17407     .18394     .17987     .38879 -2  (.17504,.18470)
52.V52       5  .28285     .30248     .29308     .70119 -2  (.28437,.30179)
53.V53       5  .97691 -1  .11734     .10917     .72850 -2  (.10012,.11821)
54.V54       5  .11512     .12472     .11994     .37926 -2  (.11523,.12464)
55.V55       5  .37300 -1  .38860 -1  .38185 -1  .61182 -3  (.37425 -1,.38945 -1)
56.V56       5  .10302     .10622     .10422     .12829 -2  (.10262,.10581)
57.V57       5  .87034 -1  .93541 -1  .89822 -1  .26289 -2  (.86557 -1,.93086 -1)
58.V58       5  .72824 -1  .82902 -1  .78043 -1  .39943 -2  (.73084 -1,.83003 -1)
59.V59       5  .99467 -1  .12259     .11437     .87426 -2  (.10351,.12522)
60.V60       5  .80311 -1  .91314 -1  .84883 -1  .45114 -2  (.79282 -1,.90485 -1)
61.V61       5  .19689     .24694     .22294     .18130 -1  (.20043,.24545)
62.V62       5  .15762     .31083     .26879     .63591 -1  (.18983,.34774)
63.V63       5  .56995 -1  .81705 -1  .69810 -1  .90657 -2  (.58553 -1,.81066 -1)
64.V64       5  .13140     .14447     .13804     .59392 -2  (.13067,.14541)
65.V65       5  .16163     .18486     .17811     .93512 -2  (.16650,.18972)
66.V66       5  .14565     .18962     .17542     .17661 -1  (.15349,.19735)
67.V67       5  .13212     .14221     .13972     .43146 -2  (.13436,.14508)
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  68.V68               5  .56838 -1  .73497 -1  .66662 -1  .66722 -2 (.58377 -1,.74946 -1)
  69.V69               5  .78153 -1  .91314 -1  .85594 -1  .51281 -2 (.79227 -1,.91961 -1)

DESCRIPTIVE MEASURES  <29> V16:29  CASES=CASE#:139-852
     VARIABLE         N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1                5  15.000     17.000     16.200      .83666     (15.161,17.239)
   2.V2                5  11.000     13.000     12.000      .70711     (11.122,12.878)
   3.V3                5  28.000     31.000     29.800     1.0954      (28.440,31.160)
   4.V4                5  11.000     12.000     11.800      .44721     (11.245,12.355)
   5.V5                5  20.000     22.000     20.600      .89443     (19.489,21.711)
   6.V6                5  49.000     53.000     51.000     1.5811      (49.037,52.963)
   7.V7                5  22.000     23.000     22.600      .54772     (21.920,23.280)
   8.V8                5  42.000     46.000     43.800     1.6432      (41.760,45.840)
   9.V9                5  29.000     34.000     31.800     2.1679      (29.108,34.492)
  10.V10               5  23.000     25.000     23.800      .83666     (22.761,24.839)
  11.V11               5  36.000     45.000     41.400     3.5071      (37.045,45.755)
  12.V12               5  37.000     38.000     37.200      .44721     (36.645,37.755)
  13.V13               5  6.0000     6.0000     6.0000
  14.V14               5  14.000     15.000     14.400      .54772     (13.720,15.080)
  15.V15               5  7.0000     8.0000     7.8000      .44721     (7.2447,8.3553)
  17.V17               5  472.00     733.00     615.80     93.903      (499.20,732.40)
  44.V44               5  .54711     .56568     .55288      .76097 -2 (.54343,.56233)
  45.V45               5  .45397     .50212     .46763      .19528 -1 (.44339,.49188)
  46.V46               5  .37460     .39124     .38174      .66174 -2 (.37353,.38996)
  47.V47               5  .29421     .31992     .30665      .10847 -1 (.29318,.32011)
  48.V48               5  .15079     .18623     .17140      .13853 -1 (.15420,.18861)
  49.V49               5  .22783     .25000     .23611      .91013 -2 (.22481,.24741)
  50.V50               5  .15873     .17161     .16528      .51919 -2 (.15884,.17173)
  51.V51               5  .16190     .18644     .17348      .12041 -1 (.15852,.18843)
  52.V52               5  .29025     .30413     .29831      .60115 -2 (.29085,.30578)
  53.V53               5  .12698     .13559     .13133      .34807 -2 (.12701,.13565)
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54.V54             5  .11270      .12076      .11652      .38161 -2 (.11178,.12126)
55.V55             5  .33898 -1   .35994 -1   .34726 -1   .82375 -3 (.33703 -1,.35749 -1)
56.V56             5  .92562 -1   .95462 -1   .94229 -1   .12118 -2 (.92725 -1,.95734 -1)
57.V57             5  .71429 -1   .82627 -1   .78119 -1   .45019 -2 (.72529 -1,.83708 -1)
58.V58             5  .65484 -1   .74153 -1   .68908 -1   .33168 -2 (.64789 -1,.73026 -1)
59.V59             5  .82645 -1   .95339 -1   .88078 -1   .54883 -2 (.81264 -1,.94893 -1)
60.V60             5  .65079 -1   .74153 -1   .69207 -1   .43677 -2 (.63784 -1,.74631 -1)
61.V61             5  .20165      .22510      .20999      .93559 -2 (.19838,.22161)
62.V62             5  .27966      .32196      .29382      .17583 -1 (.27199,.31565)
63.V63             5  .74603 -1   .87637 -1   .81729 -1   .56660 -2 (.74694 -1,.88764 -1)
64.V64             5  .14215      .15678      .14815      .55856 -2 (.14121,.15508)
65.V65             5  .18512      .19562      .18991      .50286 -2 (.18367,.19616)
66.V66             5  .17058      .18827      .17657      .68229 -2 (.16810,.18504)
67.V67             5  .13884      .15143      .14412      .47340 -2 (.13825,.15000)
68.V68             5  .42857 -1   .50847 -1   .47034 -1   .31241 -2 (.43155 -1,.50914 -1)
69.V69             5  .72727 -1   .82627 -1   .76563 -1   .40473 -2 (.71538 -1,.81588 -1)

DESCRIPTIVE MEASURES  <30> V16:30  CASES=CASE#:139-852
    VARIABLE       N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
  1.V1             5  15.000      15.000      15.000
  2.V2             5  11.000      12.000      11.400      .54772      (10.720,12.080)
  3.V3             5  30.000      30.000      30.000
  4.V4             5  12.000      12.000      12.000
  5.V5             5  19.000      20.000      19.400      .54772      (18.720,20.080)
  6.V6             5  57.000      62.000      60.000      1.8708      (57.677,62.323)
  7.V7             5  21.000      23.000      22.000      1.0000      (20.758,23.242)
  8.V8             5  43.000      46.000      44.400      1.1402      (42.984,45.816)
  9.V9             5  35.000      40.000      37.000      1.8708      (34.677,39.323)
 10.V10            5  23.000      25.000      24.200      .83666      (23.161,25.239)
 11.V11            5  32.000      33.000      32.600      .54772      (31.920,33.280)
 12.V12            5  37.000      38.000      37.600      .54772      (36.920,38.280)
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13.V13             5  6.0000      6.0000      6.0000
14.V14             5  16.000      17.000      16.200      .44721     (15.645,16.755)
15.V15             5  8.0000      8.0000      8.0000
17.V17             5  460.00      655.00      559.60      74.198     (467.47,651.73)
44.V44             5  .60811      .62391      .61568      .69786 -2 (.60701,.62434)
45.V45             5  .48601      .51739      .50163      .11440 -1 (.48743,.51583)
46.V46             5  .32819      .37863      .35517      .18954 -1 (.33163,.37870)
47.V47             5  .24565      .27319      .26046      .12324 -1 (.24516,.27576)
48.V48             5  .14672      .16526      .15457      .73608 -2 (.14543,.16371)
49.V49             5  .24301      .26522      .25267      .84272 -2 (.24220,.26313)
50.V50             5  .15444      .16336      .15802      .36813 -2 (.15345,.16259)
51.V51             5  .16434      .17609      .17016      .50322 -2 (.16391,.17641)
52.V52             5  .27027      .29771      .28745      .11699 -1 (.27292,.30197)
53.V53             5  .10039      .12142      .10723      .82645 -2 (.96972 -1,.11750)
54.V54             5  .11004      .11957      .11478      .38011 -2 (.11006,.11950)
55.V55             5  .32040 -1   .35115 -1   .33981 -1   .13102 -2 (.32354 -1,.35608 -1)
56.V56             5  .10232      .10652      .10506      .16704 -2 (.10299,.10714)
57.V57             5  .73427 -1   .90734 -1   .81953 -1   .68678 -2 (.73425 -1,.90480 -1)
58.V58             5  .73282 -1   .80435 -1   .75713 -1   .30820 -2 (.71886 -1,.79539 -1)
59.V59             5  .87413 -1   .10039      .93094 -1   .47363 -2 (.87213 -1,.98975 -1)
60.V60             5  .64122 -1   .81081 -1   .70926 -1   .70231 -2 (.62205 -1,.79646 -1)
61.V61             5  .19498      .21329      .20607      .84556 -2 (.19557,.21657)
62.V62             5  .30309      .32977      .31360      .10558 -1 (.30049,.32671)
63.V63             5  .65767 -1   .78261 -1   .72811 -1   .49434 -2 (.66673 -1,.78949 -1)
64.V64             5  .14161      .16031      .15177      .68217 -2 (.14330,.16024)
65.V65             5  .17133      .19130      .17989      .88128 -2 (.16895,.19083)
66.V66             5  .16409      .18696      .17374      .87129 -2 (.16292,.18456)
67.V67             5  .13811      .15008      .14462      .56163 -2 (.13765,.15160)
68.V68             5  .47203 -1   .55985 -1   .51877 -1   .32746 -2 (.47811 -1,.55943 -1)
69.V69             5  .81081 -1   .86003 -1   .82861 -1   .18548 -2 (.80558 -1,.85164 -1)
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DESCRIPTIVE MEASURES  <31> V16:31   CASES=CASE#:139-852

   VARIABLE          N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT

    1.V1             5  16.000      17.000      16.200     .44721     (15.645,16.755)
    2.V2             5  11.000      13.000      11.800     .83666     (10.761,12.839)
    3.V3             5  30.000      32.000      30.600     .89443     (29.489,31.711)
    4.V4             5  12.000      12.000      12.000
    5.V5             5  20.000      20.000      20.000
    6.V6             5  52.000      57.000      54.000     1.8708     (51.677,56.323)
    7.V7             5  21.000      23.000      21.600     .89443     (20.489,22.711)
    8.V8             5  39.000      44.000      41.000     2.0000     (38.517,43.483)
    9.V9             5  30.000      32.000      31.000     .70711     (30.122,31.878)
   10.V10            5  21.000      23.000      22.000     .70711     (21.122,22.878)
   11.V11            5  28.000      36.000      33.200     3.1145     (29.333,37.067)
   12.V12            5  37.000      38.000      37.200     .44721     (36.645,37.755)
   13.V13            5  6.0000      6.0000      6.0000
   14.V14            5  14.000      14.000      14.000
   15.V15            5  8.0000      8.0000      8.0000
   17.V17            5  504.00      739.00      590.40     96.051     (471.14,709.66)
   44.V44            5  .55608      .58748      .57213     .11967 -1 (.55727,.58699)
   45.V45            5  .49405      .50744      .50056     .50832 -2 (.49425,.50688)
   46.V46            5  .35317      .36585      .35706     .51740 -2 (.35064,.36349)
   47.V47            5  .27804      .28705      .28258     .35885 -2 (.27813,.28704)
   48.V48            5  .14484      .16135      .15476     .64865 -2 (.14671,.16281)
   49.V49            5  .25000      .26519      .25625     .78800 -2 (.24647,.26604)
   50.V50            5  .16468      .18199      .17364     .72678 -2 (.16461,.18266)
   51.V51            5  .17321      .18762      .18073     .54971 -2 (.17390,.18756)
   52.V52            5  .27381      .29542      .28711     .80760 -2 (.27708,.29714)
   53.V53            5  .10317      .12179      .11061     .69751 -2 (.10195,.11927)
   54.V54            5  .11257      .12314      .11685     .42473 -2 (.11158,.12213)
   55.V55            5  .31596 -1   .37889 -1   .35117 -1  .31695 -2 (.31182 -1,.39053 -1)
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56.V56           5  .10119     .10690     .10516     .23454 -2 (.10225,.10808)
57.V57           5  .78989 -1  .88398 -1  .84455 -1  .35613 -2 (.80033 -1,.88877 -1)
58.V58           5  .70365 -1  .79190 -1  .75600 -1  .36190 -2 (.71107 -1,.80094 -1)
59.V59           5  .98782 -1  .10585     .10319     .27229 -2 (.99812 -1,.10657)
60.V60           5  .71090 -1  .93923 -1  .81624 -1  .81910 -2 (.71454 -1,.91795 -1)
61.V61           5  .21764     .24645     .23059     .12001 -1 (.21569,.24549)
62.V62           5  .30206     .33491     .31581     .12295 -1 (.30054,.33107)
63.V63           5  .71090 -1  .85317 -1  .75645 -1  .58559 -2 (.68374 -1,.82916 -1)
64.V64           5  .12954     .14822     .14058     .74668 -2 (.13131,.14985)
65.V65           5  .17262     .18416     .18068     .47851 -2 (.17474,.18663)
66.V66           5  .16468     .17997     .17416     .62403 -2 (.16641,.18191)
67.V67           5  .13586     .14087     .13871     .19269 -2 (.13632,.14110)
68.V68           5  .51587 -1  .55292 -1  .53494 -1  .14346 -2 (.51713 -1,.55275 -1)
69.V69           5  .81349 -1  .95685 -1  .88160 -1  .58751 -2 (.80865 -1,.95455 -1)

DESCRIPTIVE MEASURES   <32> V16:32   CASES=CASE#:139-852
    VARIABLE          N  MINIMUM    MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
    1.V1              5   15.000     16.000     15.800     .44721     (15.245,16.355)
    2.V2              5   11.000     12.000     11.600     .54772     (10.920,12.280)
    3.V3              5   29.000     32.000     30.200     1.0954     (28.840,31.560)
    4.V4              5   12.000     12.000     12.000
    5.V5              5   19.000     21.000     19.400     .89443     (18.289,20.511)
    6.V6              5   50.000     54.000     51.800     1.4832     (49.958,53.642)
    7.V7              5   20.000     22.000     21.200     .83666     (20.161,22.239)
    8.V8              5   41.000     43.000     41.800     1.0954     (40.440,43.160)
    9.V9              5   31.000     35.000     32.600     1.5166     (30.717,34.483)
   10.V10             5   22.000     24.000     22.800     .83666     (21.761,23.839)
   11.V11             5   29.000     35.000     32.200     2.1679     (29.508,34.892)
   12.V12             5   37.000     39.000     37.600     .89443     (36.489,38.711)
   13.V13             5   6.0000     6.0000     6.0000
   14.V14             5   14.000     14.000     14.000
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 15.V15              5  8.0000      8.0000      8.0000
 17.V17              5  371.00      604.00      462.20      91.911     (348.08,576.32)
 44.V44              5  .56785      .59079      .58322      .92155 -2 (.57178,.59466)
 45.V45              5  .48927      .53453      .50988      .19669 -1 (.48545,.53430)
 46.V46              5  .35849      .38363      .36658      .10425 -1 (.35363,.37952)
 47.V47              5  .29636      .30901      .30358      .57153 -2 (.29648,.31067)
 48.V48              5  .17251      .18046      .17564      .30103 -2 (.17191,.17938)
 49.V49              5  .24893      .26343      .25753      .57569 -2 (.25038,.26468)
 50.V50              5  .17053      .18026      .17649      .38323 -2 (.17174,.18125)
 51.V51              5  .17219      .19099      .18160      .76918 -2 (.17205,.19115)
 52.V52              5  .28032      .30946      .29275      .10908 -1 (.27921,.30630)
 53.V53              5  .10596      .12109      .11435      .54565 -2 (.10758,.12113)
 54.V54              5  .11373      .12735      .11882      .55128 -2 (.11198,.12567)
 55.V55              5  .28133 -1   .37578 -1   .33224 -1   .41571 -2 (.28062 -1,.38386 -1)
 56.V56              5  .98712 -1   .11253      .10543      .49500 -2 (.99282 -1,.11157)
 57.V57              5  .74169 -1   .87748 -1   .80830 -1   .53108 -2 (.74235 -1,.87424 -1)
 58.V58              5  .74503 -1   .86253 -1   .80184 -1   .42572 -2 (.74897 -1,.85470 -1)
 59.V59              5  .96567 -1   .11900      .10570      .91482 -2 (.94346 -1,.11706)
 60.V60              5  .77253 -1   .91858 -1   .82616 -1   .56654 -2 (.75581 -1,.89650 -1)
 61.V61              5  .20755      .24172      .22582      .15623 -1 (.20642,.24522)
 62.V62              5  .25575      .31524      .29271      .28985 -1 (.25672,.32870)
 63.V63              5  .62630 -1   .75107 -1   .68467 -1   .54217 -2 (.61735 -1,.75199 -1)
 64.V64              5  .12661      .13811      .13374      .49071 -2 (.12764,.13983)
 65.V65              5  .16524      .19833      .18344      .14029 -1 (.16602,.20086)
 66.V66              5  .15633      .18580      .17325      .10663 -1 (.16001,.18649)
 67.V67              5  .13208      .14823      .13759      .65292 -2 (.12949,.14570)
 68.V68              5  .53648 -1   .61995 -1   .59347 -1   .34668 -2 (.55043 -1,.63652 -1)
 69.V69              5  .86093 -1   .94629 -1   .89485 -1   .31857 -2 (.85529 -1,.93440 -1)

DESCRIPTIVE MEASURES  <33> V16:33  CASES=CASE#:139-852

    VARIABLE        N  MINIMUM     MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
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1.V1                   5  15.000      16.000      15.800      .44721      (15.245,16.355)
2.V2                   5  11.000      13.000      11.600      .89443      (10.489,12.711)
3.V3                   5  29.000      32.000      30.200      1.0954      (28.840,31.560)
4.V4                   5  12.000      12.000      12.000
5.V5                   5  18.000      21.000      19.600      1.1402      (18.184,21.016)
6.V6                   5  49.000      56.000      52.800      2.4900      (49.708,55.892)
7.V7                   5  19.000      22.000      20.400      1.1402      (18.984,21.816)
8.V8                   5  39.000      42.000      40.400      1.1402      (38.984,41.816)
9.V9                   5  29.000      32.000      31.200      1.3038      (29.581,32.819)
10.V10                 5  21.000      22.000      21.800      .44721      (21.245,22.355)
11.V11                 5  31.000      37.000      32.800      2.3875      (29.836,35.764)
12.V12                 5  37.000      38.000      37.200      .44721      (36.645,37.755)
13.V13                 5  6.0000      6.0000      6.0000
14.V14                 5  14.000      14.000      14.000
15.V15                 5  8.0000      8.0000      8.0000
17.V17                 5  538.00      715.00      610.00      74.199      (517.87,702.13)
44.V44                 5  .56503      .58550      .57779      .79799 -2 (.56788,.58770)
45.V45                 5  .48794      .49685      .49066      .36238 -2 (.48617,.49516)
46.V46                 5  .36245      .38182      .37267      .83315 -2 (.36233,.38302)
47.V47                 5  .27087      .31041      .28807      .15741 -1 (.26853,.30762)
48.V48                 5  .15224      .17286      .16355      .87094 -2 (.15274,.17437)
49.V49                 5  .24164      .26183      .24919      .81606 -2 (.23905,.25932)
50.V50                 5  .16543      .18612      .17550      .83533 -2 (.16513,.18587)
51.V51                 5  .17286      .19243      .17954      .76649 -2 (.17003,.18906)
52.V52                 5  .27458      .30769      .29222      .14498 -1 (.27422,.31022)
53.V53                 5  .11218      .12245      .11711      .43426 -2 (.11172,.12251)
54.V54                 5  .11152      .12461      .11565      .51645 -2 (.10923,.12206)
55.V55                 5  .37175 -1   .41009 -1   .38954 -1   .13853 -2 (.37233 -1,.40674 -1)
56.V56                 5  .10595      .11987      .11072      .54951 -2 (.10390,.11754)
57.V57                 5  .78526 -1   .83488 -1   .80736 -1   .19870 -2 (.78268 -1,.83203 -1)
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58.V58             5  .65734 -1  .72555 -1  .69295 -1  .25091 -2 (.66179 -1,.72410 -1)
59.V59             5  .84936 -1  .10095     .92588 -1  .67492 -2 (.84208 -1,.10097)
60.V60             5  .61538 -1  .76208 -1  .70955 -1  .55258 -2 (.64094 -1,.77816 -1)
61.V61             5  .21399     .24448     .22533     .11593 -1 (.21094,.23973)
62.V62             5  .28253     .31546     .29777     .12644 -1 (.28207,.31347)
63.V63             5  .67133 -1  .83488 -1  .72651 -1  .67477 -2 (.64273 -1,.81030 -1)
64.V64             5  .13383     .15028     .14022     .71187 -2 (.13138,.14906)
65.V65             5  .15804     .18182     .17224     .89359 -2 (.16115,.18334)
66.V66             5  .16643     .17981     .17348     .59108 -2 (.16615,.18082)
67.V67             5  .13011     .13622     .13309     .23709 -2 (.13015,.13603)
68.V68             5  .41958 -1  .55659 -1  .48630 -1  .53352 -2 (.42005 -1,.55254 -1)
69.V69             5  .84936 -1  .96215 -1  .89598 -1  .43502 -2 (.84197 -1,.95000 -1)

DESCRIPTIVE MEASURES  <34> V16:34  CASES=CASE#:139-852
    VARIABLE       N  MINIMUM    MAXIMUM     MEAN      STD DEV    .9500 CONFIDENCE INT
   1.V1            5  15.000     17.000     16.000     .70711    (15.122,16.878)
   2.V2            5  11.000     12.000     11.600     .54772    (10.920,12.280)
   3.V3            5  28.000     32.000     30.000     1.4142    (28.244,31.756)
   4.V4            5  12.000     12.000     12.000
   5.V5            5  18.000     20.000     19.400     .89443    (18.289,20.511)
   6.V6            5  48.000     56.000     53.800     3.3466    (49.645,57.955)
   7.V7            5  20.000     22.000     20.600     .89443    (19.489,21.711)
   8.V8            5  40.000     43.000     41.400     1.1402    (39.984,42.816)
   9.V9            5  30.000     35.000     32.800     1.9235    (30.412,35.188)
  10.V10           5  21.000     23.000     22.000     .70711    (21.122,22.878)
  11.V11           5  30.000     35.000     32.600     1.8166    (30.344,34.856)
  12.V12           5  37.000     38.000     37.800     .44721    (37.245,38.355)
  13.V13           5  3.0000     7.0000     5.4000     1.5166    (3.5169,7.2831)
  14.V14           5  14.000     14.000     14.000
  15.V15           5  8.0000     8.0000     8.0000
  17.V17           5  445.00     675.00     526.20     89.122    (415.54,636.86)
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44.V44                5  .56303      .59524      .57836      .13303 -1 (.56184,.59488)
45.V45                5  .48989      .50471      .49694      .70190 -2 (.48822,.50565)
46.V46                5  .35028      .36296      .35824      .54027 -2 (.35153,.36495)
47.V47                5  .27731      .32937      .30762      .20726 -1 (.28188,.33335)
48.V48                5  .16593      .18056      .17382      .64187 -2 (.16585,.18179)
49.V49                5  .23704      .26517      .25136      .10977 -1 (.23773,.26499)
50.V50                5  .16741      .18427      .17518      .69801 -2 (.16651,.18384)
51.V51                5  .16444      .19551      .18271      .12023 -1 (.16778,.19764)
52.V52                5  .27704      .29567      .28588      .67582 -2 (.27749,.29427)
53.V53                5  .10923      .12135      .11365      .46264 -2 (.10790,.11939)
54.V54                5  .11704      .12360      .11917      .28607 -2 (.11562,.12273)
55.V55                5  .27778 -1   .42963 -1   .35536 -1   .59516 -2 (.28146 -1,.42926 -1)
56.V56                5  .10370      .11236      .10761      .39493 -2 (.10270,.11251)
57.V57                5  .69444 -1   .85393 -1   .79754 -1   .65850 -2 (.71578 -1,.87931 -1)
58.V58                5  .69630 -1   .83146 -1   .77087 -1   .55171 -2 (.70237 -1,.83937 -1)
59.V59                5  .88889 -1   .10787      .97755 -1   .72566 -2 (.88745 -1,.10677)
60.V60                5  .62222 -1   .78652 -1   .70685 -1   .62118 -2 (.62972 -1,.78398 -1)
61.V61                5  .20040      .22370      .21446      .99724 -2 (.20207,.22684)
62.V62                5  .28764      .31073      .29564      .10380 -1 (.28275,.30853)
63.V63                5  .60264 -1   .69328 -1   .65830 -1   .34117 -2 (.61594 -1,.70066 -1)
64.V64                5  .12809      .15126      .13693      .95290 -2 (.12510,.14876)
65.V65                5  .17063      .18652      .17843      .65427 -2 (.17031,.18656)
66.V66                5  .16889      .19551      .18528      .98805 -2 (.17302,.19755)
67.V67                5  .13235      .13936      .13695      .31978 -2 (.13298,.14092)
68.V68                5  .42963 -1   .60674 -1   .52162 -1   .68219 -2 (.43692 -1,.60633 -1)
69.V69                5  .81933 -1   .10516      .92835 -1   .94244 -2 (.81133 -1,.10454)

DESCRIPTIVE MEASURES  <35> V16:35  CASES=CASE#:139-852

    VARIABLE          N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT

   1.V1               1  15.000      15.000      15.000
   2.V2               1  13.000      13.000      13.000
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  3.V3              1  30.000     30.000     30.000
  4.V4              1  12.000     12.000     12.000
  5.V5              1  18.000     18.000     18.000
  6.V6              1  51.000     51.000     51.000
  7.V7              1  22.000     22.000     22.000
  8.V8              1  38.000     38.000     38.000
  9.V9              1  33.000     33.000     33.000
 10.V10             1  21.000     21.000     21.000
 11.V11             1  26.000     26.000     26.000
 12.V12             1  37.000     37.000     37.000
 13.V13             1  6.0000     6.0000     6.0000
 14.V14             1  14.000     14.000     14.000
 15.V15             1  8.0000     8.0000     8.0000
 17.V17             1  340.00     340.00     340.00
 44.V44             1  .57353     .57353     .57353
 45.V45             1  .49118     .49118     .49118
 46.V46             1  .38529     .38529     .38529
 47.V47             1  .22941     .22941     .22941
 48.V48             1  .14118     .14118     .14118
 49.V49             1  .24706     .24706     .24706
 50.V50             1  .15294     .15294     .15294
 51.V51             1  .16176     .16176     .16176
 52.V52             1  .29706     .29706     .29706
 53.V53             1  .11176     .11176     .11176
 54.V54             1  .11471     .11471     .11471
 55.V55             1  .26471 -1  .26471 -1  .26471 -1
 56.V56             1  .88235 -1  .88235 -1  .88235 -1
 57.V57             1  .67647 -1  .67647 -1  .67647 -1
 58.V58             1  .88235 -1  .88235 -1  .88235 -1
 59.V59             1  .82353 -1  .82353 -1  .82353 -1
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  60.V60               1  .67647 -1  .67647 -1  .67647 -1
  61.V61               1  .16471     .16471     .16471
  62.V62               1  .25000     .25000     .25000
  63.V63               1  .79412 -1  .79412 -1  .79412 -1
  64.V64               1  .15294     .15294     .15294
  65.V65               1  .21765     .21765     .21765
  66.V66               1  .18235     .18235     .18235
  67.V67               1  .13235     .13235     .13235
  68.V68               1  .41176 -1  .41176 -1  .41176 -1
  69.V69               1  .88235 -1  .88235 -1  .88235 -1

DESCRIPTIVE MEASURES  <36> V16:36  CASES=CASE#:139-852
    VARIABLE           N  MINIMUM    MAXIMUM     MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1                3  13.000     15.000     14.333     1.1547     (11.465,17.202)
   2.V2                3  11.000     12.000     11.667     .57735     (10.232,13.101)
   3.V3                3  29.000     31.000     30.000     1.0000     (27.516,32.484)
   4.V4                3  12.000     12.000     12.000
   5.V5                3  17.000     20.000     18.000     1.7321     (13.697,22.303)
   6.V6                3  57.000     62.000     59.667     2.5166     (53.415,65.918)
   7.V7                3  24.000     24.000     24.000
   8.V8                3  47.000     48.000     47.667     .57735     (46.232,49.101)
   9.V9                3  40.000     42.000     40.667     1.1547     (37.798,43.535)
  10.V10               3  24.000     24.000     24.000
  11.V11               3  25.000     34.000     30.667     4.9329     (18.413,42.921)
  12.V12               3  36.000     38.000     37.000     1.0000     (34.516,39.484)
  13.V13               3  3.0000     6.0000     5.0000     1.7321     (.69735,9.3027)
  14.V14               3  14.000     14.000     14.000
  15.V15               3  8.0000     8.0000     8.0000
  17.V17               3  333.00     614.00     517.33     159.70     (120.61,914.05)
  44.V44               3  .60661     .61401     .61008     .37195 -2 (.60084,.61932)
  45.V45               3  .48534     .51351     .49494     .16092 -1 (.45496,.53491)
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 46.V46              3  .33884      .35016      .34578      .60798 -2 (.33068,.36089)
 47.V47              3  .25526      .28827      .26768      .17963 -1 (.22306,.31230)
 48.V48              3  .12312      .15309      .14001      .15342 -1 (.10190,.17812)
 49.V49              3  .24132      .24925      .24496      .40041 -2 (.23501,.25490)
 50.V50              3  .15207      .15961      .15694      .42310 -2 (.14643,.16746)
 51.V51              3  .16198      .17752      .16722      .89214 -2 (.14506,.18939)
 52.V52              3  .26446      .29479      .27951      .15164 -1 (.24184,.31718)
 53.V53              3  .10511      .11726      .11104      .60847 -2 (.95922 -1,.12615)
 54.V54              3  .11570      .12378      .11887      .43127 -2 (.10815,.12958)
 55.V55              3  .30030 -1   .37459 -1   .33516 -1   .37357 -2 (.24236 -1,.42796 -1)
 56.V56              3  .10744      .10912      .10822      .84704 -3 (.10612,.11033)
 57.V57              3  .71661 -1   .72727 -1   .72154 -1   .53767 -3 (.70818 -1,.73489 -1)
 58.V58              3  .71074 -1   .84084 -1   .77235 -1   .65321 -2 (.61009 -1,.93462 -1)
 59.V59              3  .78078 -1   .92834 -1   .85621 -1   .73834 -2 (.67279 -1,.10396)
 60.V60              3  .61157 -1   .66066 -1   .63037 -1   .26483 -2 (.56459 -1,.69616 -1)
 61.V61              3  .16216      .21987      .19897      .31974 -1 (.11954,.27840)
 62.V62              3  .25526      .32248      .29946      .38297 -1 (.20433,.39460)
 63.V63              3  .72072 -1   .80992 -1   .77080 -1   .45597 -2 (.65753 -1,.88407 -1)
 64.V64              3  .14545      .15315      .14948      .38616 -2 (.13989,.15907)
 65.V65              3  .17686      .18730      .18044      .59362 -2 (.16570,.19519)
 66.V66              3  .15616      .18404      .17235      .14478 -1 (.13639,.20832)
 67.V67              3  .12913      .14658      .13818      .87440 -2 (.11646,.15991)
 68.V68              3  .39039 -1   .48860 -1   .43074 -1   .51394 -2 (.30307 -1,.55841 -1)
 69.V69              3  .82645 -1   .84084 -1   .83264 -1   .74061 -3 (.81424 -1,.85103 -1)

DESCRIPTIVE MEASURES  <37> V16:37  CASES=CASE#:139-852
    VARIABLE         N  MINIMUM     MAXIMUM      MEAN       STD DEV    .9500 CONFIDENCE INT
      1.V1           1  14.000      14.000      14.000
      2.V2           1  12.000      12.000      12.000
      3.V3           1  29.000      29.000      29.000
      4.V4           1  12.000      12.000      12.000
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  5.V5            1  21.000     21.000     21.000
  6.V6            1  60.000     60.000     60.000
  7.V7            1  22.000     22.000     22.000
  8.V8            1  46.000     46.000     46.000
  9.V9            1  37.000     37.000     37.000
 10.V10           1  23.000     23.000     23.000
 11.V11           1  31.000     31.000     31.000
 12.V12           1  38.000     38.000     38.000
 13.V13           1  5.0000     5.0000     5.0000
 14.V14           1  16.000     16.000     16.000
 15.V15           1  8.0000     8.0000     8.0000
 17.V17           1  546.00     546.00     546.00
 44.V44           1  .61722     .61722     .61722
 45.V45           1  .47985     .47985     .47985
 46.V46           1  .37179     .37179     .37179
 47.V47           1  .26557     .26557     .26557
 48.V48           1  .14286     .14286     .14286
 49.V49           1  .25092     .25092     .25092
 50.V50           1  .15201     .15201     .15201
 51.V51           1  .16300     .16300     .16300
 52.V52           1  .29853     .29853     .29853
 53.V53           1  .10623     .10623     .10623
 54.V54           1  .10806     .10806     .10806
 55.V55           1  .32967 -1  .32967 -1  .32967 -1
 56.V56           1  .10256     .10256     .10256
 57.V57           1  .75092 -1  .75092 -1  .75092 -1
 58.V58           1  .75092 -1  .75092 -1  .75092 -1
 59.V59           1  .86081 -1  .86081 -1  .86081 -1
 60.V60           1  .71429 -1  .71429 -1  .71429 -1
 61.V61           1  .19780     .19780     .19780
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 62.V62              1  .31868       .31868      .31868
 63.V63              1  .62271 -1   .62271 -1   .62271 -1
 64.V64              1  .13553       .13553      .13553
 65.V65              1  .18498       .18498      .18498
 66.V66              1  .17949       .17949      .17949
 67.V67              1  .14835       .14835      .14835
 68.V68              1  .42125 -1   .42125 -1   .42125 -1
 69.V69              1  .82418 -1   .82418 -1   .82418 -1

DESCRIPTIVE MEASURES  <38> V16:38  CASES=CASE#:139-852
     VARIABLE        N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1              1  15.000      15.000       15.000
   2.V2              1  12.000      12.000       12.000
   3.V3              1  29.000      29.000       29.000
   4.V4              1  12.000      12.000       12.000
   5.V5              1  19.000      19.000       19.000
   6.V6              1  56.000      56.000       56.000
   7.V7              1  22.000      22.000       22.000
   8.V8              1  43.000      43.000       43.000
   9.V9              1  33.000      33.000       33.000
  10.V10             1  24.000      24.000       24.000
  11.V11             1  32.000      32.000       32.000
  12.V12             1  37.000      37.000       37.000
  13.V13             1  6.0000      6.0000       6.0000
  14.V14             1  14.000      14.000       14.000
  15.V15             1  8.0000      8.0000       8.0000
  17.V17             1  385.00      385.00       385.00
  44.V44             1  .56883      .56883       .56883
  45.V45             1  .50390      .50390       .50390
  46.V46             1  .36883      .36883       .36883
  47.V47             1  .23896      .23896       .23896
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48.V48                1  .13247     .13247     .13247
49.V49                1  .27273     .27273     .27273
50.V50                1  .17662     .17662     .17662
51.V51                1  .19221     .19221     .19221
52.V52                1  .28571     .28571     .28571
53.V53                1  .11429     .11429     .11429
54.V54                1  .12727     .12727     .12727
55.V55                1  .33766 -1  .33766 -1  .33766 -1
56.V56                1  .11169     .11169     .11169
57.V57                1  .77922 -1  .77922 -1  .77922 -1
58.V58                1  .96104 -1  .96104 -1  .96104 -1
59.V59                1  .88312 -1  .88312 -1  .88312 -1
60.V60                1  .70130 -1  .70130 -1  .70130 -1
61.V61                1  .17662     .17662     .17662
62.V62                1  .29091     .29091     .29091
63.V63                1  .72727 -1  .72727 -1  .72727 -1
64.V64                1  .14805     .14805     .14805
65.V65                1  .22338     .22338     .22338
66.V66                1  .17403     .17403     .17403
67.V67                1  .14545     .14545     .14545
68.V68                1  .46753 -1  .46753 -1  .46753 -1
69.V69                1  .90909 -1  .90909 -1  .90909 -1

DESCRIPTIVE MEASURES  <39> V16:39  CASES=CASE#:139-852
     VARIABLE         N  MINIMUM    MAXIMUM    MEAN       STD DEV    .9500 CONFIDENCE INT
   1.V1               1  16.000     16.000     16.000
   2.V2               1  11.000     11.000     11.000
   3.V3               1  30.000     30.000     30.000
   4.V4               1  12.000     12.000     12.000
   5.V5               1  20.000     20.000     20.000
   6.V6               1  47.000     47.000     47.000
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 7.V7             1  21.000    21.000    21.000
 8.V8             1  37.000    37.000    37.000
 9.V9             1  30.000    30.000    30.000
10.V10            1  20.000    20.000    20.000
11.V11            1  29.000    29.000    29.000
12.V12            1  37.000    37.000    37.000
13.V13            1  6.0000    6.0000    6.0000
14.V14            1  14.000    14.000    14.000
15.V15            1  8.0000    8.0000    8.0000
17.V17            1  492.00    492.00    492.00
44.V44            1  .57724    .57724    .57724
45.V45            1  .48577    .48577    .48577
46.V46            1  .37805    .37805    .37805
47.V47            1  .26423    .26423    .26423
48.V48            1  .13008    .13008    .13008
49.V49            1  .25203    .25203    .25203
50.V50            1  .15650    .15650    .15650
51.V51            1  .16463    .16463    .16463
52.V52            1  .30488    .30488    .30488
53.V53            1  .11992    .11992    .11992
54.V54            1  .11585    .11585    .11585
55.V55            1  .34553 -1 .34553 -1 .34553 -1
56.V56            1  .10366    .10366    .10366
57.V57            1  .81301 -1 .81301 -1 .81301 -1
58.V58            1  .77236 -1 .77236 -1 .77236 -1
59.V59            1  .89431 -1 .89431 -1 .89431 -1
60.V60            1  .75203 -1 .75203 -1 .75203 -1
61.V61            1  .20732    .20732    .20732
62.V62            1  .30488    .30488    .30488
63.V63            1  .71138 -1 .71138 -1 .71138 -1
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  64.V64             1  .13415        .13415        .13415
  65.V65             1  .17480        .17480        .17480
  66.V66             1  .17480        .17480        .17480
  67.V67             1  .13618        .13618        .13618
  68.V68             1  .46748 -1   .46748 -1   .46748 -1
  69.V69             1  .87398 -1   .87398 -1   .87398 -1

DESCRIPTIVE MEASURES  <40> V16:40  CASES=CASE#:139-852
     VARIABLE           N  MINIMUM     MAXIMUM      MEAN       STD DEV      .9500 CONFIDENCE INT
   1.V1              5  14.000      15.000      14.200      .44721      (13.645,14.755)
   2.V2              5  11.000      12.000      11.800      .44721      (11.245,12.355)
   3.V3              5  28.000      30.000      29.600      .89443      (28.489,30.711)
   4.V4              5  12.000      12.000      12.000
   5.V5              5  19.000      21.000      20.200      .83666      (19.161,21.239)
   6.V6              5  48.000      51.000      49.200      1.3038      (47.581,50.819)
   7.V7              5  22.000      24.000      22.600      .89443      (21.489,23.711)
   8.V8              5  40.000      43.000      41.600      1.1402      (40.184,43.016)
   9.V9              5  31.000      35.000      32.600      1.5166      (30.717,34.483)
  10.V10             5  21.000      24.000      22.000      1.2247      (20.479,23.521)
  11.V11             5  27.000      31.000      28.600      1.6733      (26.522,30.678)
  12.V12             5  37.000      38.000      37.400      .54772      (36.720,38.080)
  13.V13             5  5.0000      6.0000      5.8000      .44721      (5.2447,6.3553)
  14.V14             5  14.000      14.000      14.000
  15.V15             5  7.0000      8.0000      7.4000      .54772      (6.7199,8.0801)
  17.V17             5  372.00      465.00      414.40      34.268      (371.85,456.95)
  44.V44             5  .56183      .58925      .57660      .12948 -1 (.56053,.59268)
  45.V45             5  .46774      .48780      .47714      .95864 -2 (.46524,.48905)
  46.V46             5  .35529      .37634      .36462      .78778 -2 (.35484,.37440)
  47.V47             5  .25538      .29247      .26975      .15955 -1 (.24994,.28956)
  48.V48             5  .12688      .13500      .13190      .31579 -2 (.12798,.13582)
  49.V49             5  .25500      .26829      .26005      .57301 -2 (.25294,.26717)
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50.V50            5  .17000      .18118      .17800      .46241 -2 (.17225,.18374)
51.V51            5  .16250      .17419      .16677      .46015 -2 (.16105,.17248)
52.V52            5  .28000      .30376      .29333      .88921 -2 (.28229,.30437)
53.V53            5  .11951      .12903      .12453      .37125 -2 (.11992,.12914)
54.V54            5  .11294      .11828      .11578      .20386 -2 (.11325,.11831)
55.V55            5  .29268 -1   .32500 -1   .30944 -1   .13948 -2 (.29213--1,.32676 -1)
56.V56            5  .10750      .11951      .11092      .51251 -2 (.10456,.11728)
57.V57            5  .67204 -1   .77647 -1   .72786 -1   .40665 -2 (.67737 -1,.77835 -1)
58.V58            5  .80488 -1   .86022 -1   .83087 -1   .22472 -2 (.80297 -1,.85877 -1)
59.V59            5  .91765 -1   .95122 -1   .93689 -1   .15092 -2 (.91815 -1,.95563 -1)
60.V60            5  .61828 -1   .75610 -1   .71199 -1   .53778 -2 (.64522 -1,.77877 -1)
61.V61            5  .17073      .19570      .18814      .10105 -1 (.17560,.20069)
62.V62            5  .29512      .30753      .30149      .50558 -2 (.29521,.30777)
63.V63            5  .70000 -1   .83871 -1   .76967 -1   .50180 -2 (.70736 -1,.83198 -1)
64.V64            5  .15250      .16129      .15719      .38198 -2 (.15245,.16194)
65.V65            5  .20000      .22581      .21397      .10582 -1 (.20083,.22711)
66.V66            5  .17250      .20430      .18736      .12046 -1 (.17240,.20232)
67.V67            5  .14118      .14785      .14298      .27652 -2 (.13955,.14642)
68.V68            5  .46341 -1   .54118 -1   .50269 -1   .33395 -2 (.46123 -1,.54416 -1)
69.V69            5  .88172 -1   .95122 -1   .90283 -1   .27922 -2 (.86816 -1,.93750 -1)

DESCRIPTIVE MEASURES  <41> V16:41  CASES=CASE#:139-852
     VARIABLE       N  MINIMUM     MAXIMUM     MEAN        STD DEV     .9500 CONFIDENCE INT
   1.V1             2  14.000      15.000      14.500      .70711      (8.1469,20.853)
   2.V2             2  11.000      11.000      11.000
   3.V3             2  30.000      30.000      30.000
   4.V4             2  12.000      12.000      12.000
   5.V5             2  19.000      20.000      19.500      .70711      (13.147,25.853)
   6.V6             2  47.000      48.000      47.500      .70711      (41.147,53.853)
   7.V7             2  20.000      22.000      21.000      1.4142      (8.2938,33.706)
   8.V8             2  39.000      41.000      40.000      1.4142      (27.294,52.706)
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 9.V9             2  28.000     33.000     30.500     3.5355     (-1.2655,62.266)
10.V10            2  21.000     22.000     21.500     .70711     (15.147,27.853)
11.V11            2  30.000     32.000     31.000     1.4142     (18.294,43.706)
12.V12            2  37.000     37.000     37.000
13.V13            2  6.0000     6.0000     6.0000
14.V14            2  14.000     14.000     14.000
15.V15            2  8.0000     8.0000     8.0000
17.V17            2  393.00     608.00     500.50     152.03     (-865.42,1866.4)
44.V44            2  .57072     .58270     .57671     .84666 -2 (.50064,.65278)
45.V45            2  .44901     .47074     .45988     .15362 -1 (.32186,.59790)
46.V46            2  .36678     .37659     .37168     .69396 -2 (.30933,.43403)
47.V47            2  .24682     .31086     .27884     .45280 -1 (-.12799,.68566)
48.V48            2  .12723     .15954     .14338     .22849 -1 (-.61905 -1,.34867)
49.V49            2  .24671     .25191     .24931     .36754 -2 (.21629,.28233)
50.V50            2  .15776     .16612     .16194     .59097 -2 (.10884,.21504)
51.V51            2  .16539     .16776     .16658     .16750 -2 (.15153,.18163)
52.V52            2  .29276     .29517     .29396     .16986 -2 (.27870,.30923)
53.V53            2  .12214     .12336     .12275     .86116 -3 (.11501,.13048)
54.V54            2  .11349     .11450     .11400     .71911 -3 (.10753,.12046)
55.V55            2  .30534 -1  .36184 -1  .33359 -1  .39951 -2 (-.25349 -2,.69253 -1)
56.V56            2  .10526     .11450     .10988     .65341 -2 (.51177 -1,.16859)
57.V57            2  .73791 -1  .77303 -1  .75547 -1  .24829 -2 (.53239 -1,.97855 -1)
58.V58            2  .75658 -1  .78880 -1  .77269 -1  .22787 -2 (.56796 -1,.97742 -1)
59.V59            2  .81425 -1  .98684 -1  .90055 -1  .12204 -1 (-.19595 -1,.19970)
60.V60            2  .68702 -1  .75658 -1  .72180 -1  .49184 -2 (.27990 -1,.11637)
61.V61            2  .18830     .21711     .20270     .20372 -1 (.19667 -1,.38573)
62.V62            2  .28244     .32237     .30241     .28232 -1 (.48754 -1,.55606)
63.V63            2  .75658 -1  .78880 -1  .77269 -1  .22787 -2 (.56796 -1,.97742 -1)
64.V64            2  .15267     .15789     .15528     .36932 -2 (.12210,.18847)
65.V65            2  .20395     .20865     .20630     .33263 -2 (.17641,.23618)
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 66.V66          2  .17812     .18914     .18363     .77978 -2 (.11357,.25369)
 67.V67          2  .13740     .15132     .14436     .98367 -2 (.55981 -1,.23274)
 68.V68          2  .50891 -1  .52632 -1  .51761 -1  .12311 -2 (.40700 -1,.62822 -1)
 69.V69          2  .87171 -1  .91603 -1  .89387 -1  .31339 -2 (.61230 -1,.11754)

DESCRIPTIVE MEASURES  <42> V16:42  CASES=CASE#:139-852
   VARIABLE      N  MINIMUM    MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
    1.V1         5  15.000     16.000     15.200     .44721     (14.645,15.755)
    2.V2         5  11.000     13.000     11.800     .83666     (10.761,12.839)
    3.V3         5  30.000     32.000     30.400     .89443     (29.289,31.511)
    4.V4         5  12.000     12.000     12.000
    5.V5         5  19.000     20.000     19.200     .44721     (18.645,19.755)
    6.V6         5  53.000     57.000     55.400     1.8166     (53.144,57.656)
    7.V7         5  20.000     23.000     20.600     1.3416     (18.934,22.266)
    8.V8         5  40.000     45.000     43.600     2.0736     (41.025,46.175)
    9.V9         5  35.000     38.000     37.000     1.2247     (35.479,38.521)
   10.V10        5  21.000     25.000     22.600     1.5166     (20.717,24.483)
   11.V11        5  28.000     32.000     30.400     1.5166     (28.517,32.283)
   12.V12        5  37.000     38.000     37.600     .54772     (36.920,38.280)
   13.V13        5  6.0000     6.0000     6.0000
   14.V14        5  14.000     16.000     15.600     .89443     (14.489,16.711)
   15.V15        5  8.0000     8.0000     8.0000
   17.V17        5  506.00     637.00     547.80     54.724     (479.85,615.75)
   44.V44        5  .59486     .63108     .61825     .14696 -1 (.60000,.63650)
   45.V45        5  .47036     .50000     .49116     .12065 -1 (.47618,.50614)
   46.V46        5  .35573     .36673     .36002     .44363 -2 (.35452,.36553)
   47.V47        5  .24953     .26845     .25948     .80815 -2 (.24945,.26952)
   48.V48        5  .13800     .16601     .14965     .11157 -1 (.13580,.16351)
   49.V49        5  .24704     .25692     .25156     .37376 -2 (.24691,.25620)
   50.V50        5  .14556     .16043     .15371     .54699 -2 (.14692,.16050)
   51.V51        5  .15508     .17194     .16432     .63224 -2 (.15647,.17217)
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52.V52               5  .28164      .30237      .29175      .78091 -2 (.28206,.30145)
53.V53               5  .10019      .10518      .10290      .21002 -2 (.10029,.10550)
54.V54               5  .10775      .11303      .10974      .20956 -2 (.10714,.11234)
55.V55               5  .34026 -1   .36107 -1   .35386 -1   .79181 -3 (.34403 -1,.36369 -1)
56.V56               5  .10208      .10989      .10572      .28679 -2 (.10216,.10928)
57.V57               5  .73123 -1   .83176 -1   .78459 -1   .41083 -2 (.73357 -1,.83560 -1)
58.V58               5  .71301 -1   .77075 -1   .74197 -1   .21141 -2 (.71572 -1,.76821 -1)
59.V59               5  .88847 -1   .92885 -1   .89855 -1   .17117 -2 (.87729 -1,.91980 -1)
60.V60               5  .67194 -1   .77075 -1   .71673 -1   .48574 -2 (.65642 -1,.77704 -1)
61.V61               5  .20408      .21146      .20868      .34023 -2 (.20445,.21290)
62.V62               5  .31569      .33597      .32771      .77686 -2 (.31806,.33735)
63.V63               5  .68053 -1   .81028 -1   .75240 -1   .53967 -2 (.68539 -1,.81941 -1)
64.V64               5  .13800      .15415      .14730      .62461 -2 (.13955,.15506)
65.V65               5  .17580      .19170      .18166      .64778 -2 (.17362,.18970)
66.V66               5  .17013      .18524      .17902      .61512 -2 (.17138,.18666)
67.V67               5  .13611      .15071      .14248      .58952 -2 (.13516,.14980)
68.V68               5  .43956 -1   .49911 -1   .47576 -1   .26872 -2 (.44239 -1,.50912 -1)
69.V69               5  .80214 -1   .86342 -1   .82770 -1   .27120 -2 (.79403 -1,.86137 -1)

DESCRIPTIVE MEASURES  <43> V16:43  CASES=CASE#:139-852

     VARIABLE        N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1              5   12.000      15.000      13.600      1.1402     (12.184,15.016)
   2.V2              5   12.000      13.000      12.400      .54772     (11.720,13.080)
   3.V3              5   29.000      30.000      29.800      .44721     (29.245,30.355)
   4.V4              5   12.000      12.000      12.000
   5.V5              5   18.000      21.000      19.600      1.1402     (18.184,21.016)
   6.V6              5   47.000      51.000      48.800      1.4832     (46.958,50.642)
   7.V7              5   22.000      24.000      23.000      .70711     (22.122,23.878)
   8.V8              5   40.000      43.000      41.600      1.3416     (39.934,43.266)
   9.V9              5   30.000      35.000      32.600      2.4083     (29.610,35.590)
  10.V10             5   21.000      24.000      22.000      1.2247     (20.479,23.521)
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11.V11          5  28.000    37.000    32.200    3.2711    (28.138,36.262)
12.V12          5  36.000    37.000    36.800    .44721    (36.245,37.355)
13.V13          5  6.0000    6.0000    6.0000
14.V14          5  14.000    14.000    14.000
15.V15          5  8.0000    8.0000    8.0000
17.V17          5  399.00    670.00    505.60    118.36    (358.64,652.56)
44.V44          5  .56567    .59856    .57810    .13435 -1 (.56142,.59478)
45.V45          5  .46366    .50721    .47778    .17840 -1 (.45563,.49993)
46.V46          5  .37012    .38346    .37641    .50101 -2 (.37019,.38263)
47.V47          5  .25297    .29851    .27623    .18525 -1 (.25323,.29923)
48.V48          5  .13877    .16346    .14971    .11345 -1 (.13562,.16379)
49.V49          5  .24179    .26211    .25274    .82084 -2 (.24255,.26294)
50.V50          5  .15789    .17621    .16844    .70245 -2 (.15972,.17717)
51.V51          5  .16040    .16808    .16416    .33926 -2 (.15995,.16837)
52.V52          5  .28183    .30529    .29518    .10501 -1 (.28214,.30822)
53.V53          5  .11642    .12981    .12347    .54141 -2 (.11674,.13019)
54.V54          5  .11205    .11674    .11420    .22064 -2 (.11146,.11693)
55.V55          5  .28846 -1 .34328 -1 .31269 -1 .21107 -2 (.28648 -1,.33890 -1)
56.V56          5  .10299    .11674    .11063    .61607 -2 (.10298,.11828)
57.V57          5  .67669 -1 .76401 -1 .72660 -1 .37562 -2 (.67996 -1,.77324 -1)
58.V58          5  .68657 -1 .81731 -1 .75296 -1 .52530 -2 (.68774 -1,.81819 -1)
59.V59          5  .77694 -1 .98472 -1 .90967 -1 .82105 -2 (.80773 -1,.10116)
60.V60          5  .60150 -1 .79327 -1 .72000 -1 .71267 -2 (.63151 -1,.80849 -1)
61.V61          5  .17548    .22090    .19332    .18493 -1 (.17036,.21628)
62.V62          5  .25721    .31045    .29025    .21683 -1 (.26333,.31717)
63.V63          5  .64904 -1 .85075 -1 .76771 -1 .86932 -2 (.65977 -1,.87565 -1)
64.V64          5  .13731    .16129    .15080    .97800 -2 (.13866,.16294)
65.V65          5  .19694    .22356    .20561    .10687 -1 (.19234,.21888)
66.V66          5  .16792    .19604    .18690    .11010 -1 (.17322,.20057)
67.V67          5  .12030    .14663    .13930    .10841 -1 (.12584,.15276)
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68.V68              5  .47619 -1  .56027 -1  .49588 -1  .36137 -2 (.45101 -1,.54076 -1)
69.V69              5  .86587 -1  .98558 -1  .92226 -1  .45681 -2 (.86554 -1,.97898 -1)

DESCRIPTIVE MEASURES  <44> V16:44  CASES=CASE#:139-852
    VARIABLE        N  MINIMUM    MAXIMUM     MEAN      STD DEV    .9500 CONFIDENCE INT
   1.V1             3  15.000     16.000     15.333     .57735     (13.899,16.768)
   2.V2             3  12.000     12.000     12.000
   3.V3             3  29.000     30.000     29.667     .57735     (28.232,31.101)
   4.V4             3  12.000     12.000     12.000
   5.V5             3  18.000     20.000     19.000     1.0000     (16.516,21.484)
   6.V6             3  52.000     61.000     55.667     4.7258     (43.927,67.406)
   7.V7             3  22.000     24.000     23.000     1.0000     (20.516,25.484)
   8.V8             3  46.000     47.000     46.333     .57735     (44.899,47.768)
   9.V9             3  37.000     40.000     38.667     1.5275     (34.872,42.461)
  10.V10            3  26.000     27.000     26.333     .57735     (24.899,27.768)
  11.V11            3  25.000     28.000     27.000     1.7321     (22.697,31.303)
  12.V12            3  37.000     38.000     37.333     .57735     (35.899,38.768)
  13.V13            3  6.0000     6.0000     6.0000
  14.V14            3  16.000     17.000     16.333     .57735     (14.899,17.768)
  15.V15            3  8.0000     8.0000     8.0000
  17.V17            3  353.00     472.00     430.00     66.776     (264.12,595.88)
  44.V44            3  .60623     .62500     .61471     .95137 -2 (.59108,.63835)
  45.V45            3  .49575     .50636     .50034     .54432 -2 (.48682,.51387)
  46.V46            3  .35169     .37394     .36087     .11619 -1 (.33201,.38974)
  47.V47            3  .24929     .28178     .26448     .16347 -1 (.22387,.30509)
  48.V48            3  .14164     .15914     .15181     .90890 -2 (.12924,.17439)
  49.V49            3  .24946     .25847     .25430     .45421 -2 (.24301,.26558)
  50.V50            3  .16431     .16737     .16576     .15401 -2 (.16193,.16958)
  51.V51            3  .16525     .17280     .17003     .41568 -2 (.15971,.18036)
  52.V52            3  .27966     .29745     .28771     .90142 -2 (.26532,.31010)
  53.V53            3  .10805     .11331     .11035     .26950 -2 (.10365,.11704)
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54.V54               3  .10765      .11398      .11060      .31867 -2 (.10268,.11852)
55.V55               3  .28329 -1   .32258 -1   .30083 -1   .19984 -2 (.25118 -1,.35047 -1)
56.V56               3  .10538      .11331      .10821      .44313 -2 (.97200 -1,.11922)
57.V57               3  .67989 -1   .74153 -1   .71036 -1   .30825 -2 (.63379 -1,.78694 -1)
58.V58               3  .80508 -1   .87819 -1   .84066 -1   .36590 -2 (.74977 -1,.93156 -1)
59.V59               3  .87819 -1   .90323 -1   .89041 -1   .12530 -2 (.85929 -1,.92154 -1)
60.V60               3  .68817 -1   .70822 -1   .69851 -1   .10037 -2 (.67358 -1,.72345 -1)
61.V61               3  .16714      .19703      .18519      .15885 -1 (.14573,.22465)
62.V62               3  .28329      .30085      .29005      .94489 -2 (.26658,.31352)
63.V63               3  .66667 -1   .76271 -1   .71253 -1   .48168 -2 (.59288 -1,.83219 -1)
64.V64               3  .13559      .14624      .14021      .54586 -2 (.12665,.15377)
65.V65               3  .17849      .18697      .18326      .43354 -2 (.17249,.19403)
66.V66               3  .16102      .17419      .16839      .67285 -2 (.15168,.18511)
67.V67               3  .13598      .15269      .14424      .83568 -2 (.12348,.16500)
68.V68               3  .47312 -1   .55085 -1   .50185 -1   .42643 -2 (.39592 -1,.60778 -1)
69.V69               3  .84986 -1   .88172 -1   .86674 -1   .16016 -2 (.82695 -1,.90653 -1)

DESCRIPTIVE MEASURES  <45> V16:45  CASES=CASE#:139-852

   VARIABLE          N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
    1.V1             2  16.000      16.000      16.000
    2.V2             2  12.000      12.000      12.000
    3.V3             2  29.000      34.000      31.500     3.5355      (-.26553,63.266)
    4.V4             2  12.000      12.000      12.000
    5.V5             2  20.000      21.000      20.500     .70711      (14.147,26.853)
    6.V6             2  46.000      49.000      47.500     2.1213      (28.441,66.559)
    7.V7             2  21.000      22.000      21.500     .70711      (15.147,27.853)
    8.V8             2  39.000      41.000      40.000     1.4142      (27.294,52.706)
    9.V9             2  31.000      32.000      31.500     .70711      (25.147,37.853)
   10.V10            2  21.000      21.000      21.000
   11.V11            2  32.000      36.000      34.000     2.8284      (8.5876,59.412)
   12.V12            2  37.000      37.000      37.000
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13.V13               2  6.0000     6.0000     6.0000
14.V14               2  14.000     14.000     14.000
15.V15               2  8.0000     8.0000     8.0000
17.V17               2  397.00     410.00     403.50     9.1924    (320.91,486.09)
44.V44               2  .57317     .57935     .57626     .43659 -2 (.53703,.61548)
45.V45               2  .50126     .50244     .50185     .83409 -3 (.49436,.50934)
46.V46               2  .35366     .36020     .35693     .46266 -2 (.31536,.39850)
47.V47               2  .26341     .27960     .27151     .11443 -1 (.16870,.37431)
48.V48               2  .14861     .14878     .14870     .11729 -3 (.14764,.14975)
49.V49               2  .26196     .27317     .26757     .79238 -2 (.19637,.33876)
50.V50               2  .16877     .17561     .17219     .48394 -2 (.12871,.21567)
51.V51               2  .18640     .19512     .19076     .61688 -2 (.13534,.24618)
52.V52               2  .29268     .29471     .29370     .14336 -2 (.28082,.30658)
53.V53               2  .11707     .12343     .12025     .44919 -2 (.79891 -1,.16061)
54.V54               2  .12594     .12683     .12639     .62557 -3 (.12077,.13201)
55.V55               2  .34146 -1  .35264 -1  .34705 -1  .79065 -3 (.27602 -1,.41809 -1)
56.V56               2  .10579     .11220     .10899     .45267 -2 (.68324 -1,.14966)
57.V57               2  .85366 -1  .85642 -1  .85504 -1  .19549 -3 (.83748 -1,.87260 -1)
58.V58               2  .78086 -1  .85366 -1  .81726 -1  .51479 -2 (.35474 -1,.12798)
59.V59               2  .97561 -1  .11335     .10546     .11165 -1 (.51454 -2,.20577)
60.V60               2  .75610 -1  .83123 -1  .79367 -1  .53130 -2 (.31631 -1,.12710)
61.V61               2  .19144     .20488     .19816     .95051 -2 (.11276,.28356)
62.V62               2  .29219     .30732     .29975     .10695 -1 (.20366,.39585)
63.V63               2  .68010 -1  .73171 -1  .70590 -1  .36491 -2 (.37804 -1,.10338)
64.V64               2  .14106     .15366     .14736     .89100 -2 (.67305 -1,.22741)
65.V65               2  .16829     .17884     .17357     .74590 -2 (.10655,.24058)
66.V66               2  .18537     .18640     .18588     .72983 -3 (.17932,.19244)
67.V67               2  .13602     .13902     .13752     .21243 -2 (.11844,.15661)
68.V68               2  .46341 -1  .52897 -1  .49619 -1  .46353 -2 (.79728 -2,.91265 -1)
69.V69               2  .88161 -1  .92683 -1  .90422 -1  .31973 -2 (.61695 -1,.11915)
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DESCRIPTIVE MEASURES  <46> V16:46   CASES=CASE#:139-852

    VARIABLE              N  MINIMUM      MAXIMUM       MEAN       STD DEV      .9500 CONFIDENCE INT

   1.V1                   3   16.000       17.000       16.667      .57735      (15.232,18.101)

   2.V2                   3   12.000       12.000       12.000

   3.V3                   3   30.000       32.000       31.000     1.0000       (28.516,33.484)

   4.V4                   3   12.000       12.000       12.000

   5.V5                   3   20.000       21.000       20.333      .57735      (18.899,21.768)

   6.V6                   3   56.000       58.000       56.667     1.1547       (53.798,59.535)

   7.V7                   3   22.000       24.000       22.667     1.1547       (19.798,25.535)

   8.V8                   3   46.000       48.000       47.000     1.0000       (44.516,49.484)

   9.V9                   3   35.000       39.000       37.333     2.0817       (32.162,42.504)

  10.V10                  3   24.000       27.000       25.333     1.5275       (21.539,29.128)

  11.V11                  3   28.000       35.000       31.333     3.5119       (22.609,40.057)

  12.V12                  3   37.000       38.000       37.667      .57735      (36.232,39.101)

  13.V13                  3   6.0000       6.0000       6.0000

  14.V14                  3   14.000       14.000       14.000

  15.V15                  3   8.0000       8.0000       8.0000

  17.V17                  3   335.00       499.00       412.67     82.343       (208.12,617.22)

  44.V44                  3   .55446       .58806       .56855     .17446 -1 (.52521,.61188)

  45.V45                  3   .49257       .49900       .49669     .35756 -2 (.48781,.50558)

  46.V46                  3   .35872       .37376       .36655     .75414 -2 (.34781,.38528)

  47.V47                  3   .24449       .25075       .24759     .31291 -2 (.23981,.25536)

  48.V48                  3   .11343       .13828       .12516     .12480 -1 (.94154 -1,.15616)

  49.V49                  3   .22687       .25451       .23802     .14576 -1 (.20181,.27422)

  50.V50                  3   .14851       .15631       .15236     .39002 -2 (.14267,.16204)

  51.V51                  3   .15594       .16633       .16116     .51961 -2 (.14825,.17406)

  52.V52                  3   .28657       .29950       .29355     .65307 -2 (.27733,.30978)

  53.V53                  3   .10220       .11881       .11148     .84737 -2 (.90433 -1,.13253)

  54.V54                  3   .11386       .11642       .11484     .13823 -2 (.11140,.11827)

  55.V55                  3   .26866 -1   .30060 -1   .28876 -1   .17503 -2 (.24528 -1,.33224 -1)
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56.V56             3  .98507 -1  .10220     .10073     .19601 -2 (.95863 -1,.10560)
57.V57             3  .69307 -1  .78156 -1  .73035 -1  .45862 -2 (.61642 -1,.84428 -1)
58.V58             3  .76152 -1  .83582 -1  .80473 -1  .38600 -2 (.70884 -1,.90061 -1)
59.V59             3  .81683 -1  .10220     .92142 -1  .10266 -1 (.66639 -1,.11764)
60.V60             3  .59406 -1  .82164 -1  .73061 -1  .12042 -1 (.43146 -1,.10298)
61.V61             3  .16716     .21242     .19336     .23458 -1 (.13509,.25164)
62.V62             3  .25373     .29058     .27797     .20999 -1 (.22581,.33014)
63.V63             3  .56716 -1  .69307 -1  .63384 -1  .63282 -2 (.47664 -1,.79104 -1)
64.V64             3  .11623     .14356     .13138     .13903 -1 (.96838 -1,.16591)
65.V65             3  .16834     .18507     .17803     .86798 -2 (.15647,.19960)
66.V66             3  .15821     .17635     .16928     .97080 -2 (.14516,.19339)
67.V67             3  .12537     .13427     .13110     .49703 -2 (.11875,.14345)
68.V68             3  .42079 -1  .53731 -1  .46633 -1  .62289 -2 (.31159 -1,.62106 -1)
69.V69             3  .82164 -1  .89552 -1  .85292 -1  .38221 -2 (.75797 -1,.94786 -1)

DESCRIPTIVE MEASURES  <47> V16:47  CASES=CASE#:139-852
    VARIABLE         N  MINIMUM    MAXIMUM     MEAN     STD DEV    .9500 CONFIDENCE INT
   1.V1              5  15.000     17.000     15.600     .89443    (14.489,16.711)
   2.V2              5  12.000     13.000     12.400     .54772    (11.720,13.080)
   3.V3              5  30.000     34.000     32.000     1.5811    (30.037,33.963)
   4.V4              5  10.000     12.000     11.600     .89443    (10.489,12.711)
   5.V5              5  20.000     21.000     20.600     .54772    (19.920,21.280)
   6.V6              5  54.000     58.000     55.800     1.4832    (53.958,57.642)
   7.V7              5  22.000     24.000     23.400     .89443    (22.289,24.511)
   8.V8              5  43.000     49.000     45.600     2.4083    (42.610,48.590)
   9.V9              5  35.000     38.000     36.600     1.1402    (35.184,38.016)
  10.V10             5  23.000     25.000     23.800     .83666    (22.761,24.839)
  11.V11             5  31.000     44.000     37.600     5.4589    (30.822,44.378)
  12.V12             5  36.000     38.000     37.400     .89443    (36.289,38.511)
  13.V13             5  5.0000     6.0000     5.8000     .44721    (5.2447,6.3553)
  14.V14             5  14.000     14.000     14.000
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15.V15              5  7.0000     8.0000     7.6000     .54772     (6.9199,8.2801)
17.V17              5  380.00     572.00     472.00     85.542     (365.79,578.21)
44.V44              5  .57447     .59861     .58634     .11276 -1 (.57234,.60034)
45.V45              5  .48227     .51508     .49810     .12547 -1 (.48252,.51368)
46.V46              5  .34657     .37116     .35804     .94953 -2 (.34625,.36983)
47.V47              5  .25768     .30144     .27696     .18292 -1 (.25425,.29967)
48.V48              5  .13948     .15523     .14708     .64295 -2 (.13910,.15506)
49.V49              5  .25296     .26715     .26078     .69601 -2 (.25214,.26942)
50.V50              5  .15263     .16608     .15853     .55450 -2 (.15165,.16542)
51.V51              5  .16937     .18412     .17549     .61655 -2 (.16784,.18315)
52.V52              5  .26450     .29211     .27733     .10517 -1 (.26427,.29039)
53.V53              5  .10905     .11888     .11446     .46195 -2 (.10872,.12020)
54.V54              5  .11579     .12816     .12115     .47467 -2 (.11526,.12704)
55.V55              5  .30162 -1  .37906 -1  .34364 -1  .33421 -2 (.30215 -1,.38514 -1)
56.V56              5  .10209     .11011     .10610     .28826 -2 (.10252,.10968)
57.V57              5  .76923 -1  .84838 -1  .81502 -1  .37314 -2 (.76869 -1,.86136 -1)
58.V58              5  .78671 -1  .89474 -1  .82664 -1  .40776 -2 (.77601 -1,.87727 -1)
59.V59              5  .85106 -1  .11372     .97824 -1  .12968 -1 (.81723 -1,.11393)
60.V60              5  .61189 -1  .79422 -1  .69368 -1  .73257 -2 (.60272 -1,.78464 -1)
61.V61              5  .18097     .21329     .19529     .12381 -1 (.17991,.21066)
62.V62              5  .27895     .30944     .29398     .13637 -1 (.27705,.31091)
63.V63              5  .67285 -1  .75650 -1  .71386 -1  .38445 -2 (.66612 -1,.76159 -1)
64.V64              5  .13718     .15366     .14485     .65086 -2 (.13677,.15293)
65.V65              5  .18158     .20095     .19111     .86801 -2 (.18033,.20188)
66.V66              5  .16579     .18592     .17555     .82606 -2 (.16529,.18581)
67.V67              5  .12895     .14894     .14227     .80291 -2 (.13230,.15224)
68.V68              5  .42105 -1  .51044 -1  .45990 -1  .44266 -2 (.40494 -1,.51486 -1)
69.V69              5  .84211 -1  .95668 -1  .89637 -1  .47878 -2 (.83692 -1,.95582 -1)

DESCRIPTIVE MEASURES   <48> V16:48   CASES=CASE#:139-852

    VARIABLE          N  MINIMUM    MAXIMUM     MEAN      STD DEV    .9500 CONFIDENCE INT
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```
1.V1               5  15.000     17.000     15.800     .83666     (14.761,16.839)
2.V2               5  11.000     13.000     11.800     .83666     (10.761,12.839)
3.V3               5  30.000     32.000     31.200     1.0954     (29.840,32.560)
4.V4               5  12.000     12.000     12.000
5.V5               5  22.000     23.000     22.600     .54772     (21.920,23.280)
6.V6               5  42.000     48.000     44.600     2.4083     (41.610,47.590)
7.V7               5  21.000     24.000     21.800     1.3038     (20.181,23.419)
8.V8               5  39.000     45.000     42.800     2.6833     (39.468,46.132)
9.V9               5  27.000     32.000     29.600     1.9494     (27.180,32.020)
10.V10             5  20.000     23.000     21.600     1.1402     (20.184,23.016)
11.V11             5  43.000     49.000     46.400     2.4083     (43.410,49.390)
12.V12             5  36.000     38.000     37.000     .70711     (36.122,37.878)
13.V13             5  2.0000     6.0000     5.2000     1.7889     (2.9788,7.4212)
14.V14             5  14.000     14.000     14.000
15.V15             5  7.0000     8.0000     7.8000     .44721     (7.2447,8.3553)
17.V17             5  479.00     721.00     591.00     87.929     (481.82,700.18)
44.V44             5  .56401     .58792     .57514     .10021 -1 (.56269,.58758)
45.V45             5  .48405     .50622     .49710     .91203 -2 (.48578,.50843)
46.V46             5  .34948     .37448     .35854     .95079 -2 (.34674,.37035)
47.V47             5  .28392     .32178     .30336     .13484 -1 (.28662,.32010)
48.V48             5  .14614     .16227     .15639     .62200 -2 (.14867,.16412)
49.V49             5  .26214     .27766     .26868     .58255 -2 (.26145,.27592)
50.V50             5  .17762     .18512     .18174     .31936 -2 (.17777,.18570)
51.V51             5  .17752     .18789     .18344     .43126 -2 (.17809,.18880)
52.V52             5  .27766     .29404     .28287     .65161 -2 (.27477,.29096)
53.V53             5  .13361     .14424     .13794     .41121 -2 (.13283,.14304)
54.V54             5  .13315     .13844     .13587     .25252 -2 (.13274,.13901)
55.V55             5  .35831 -1  .39666 -1  .38017 -1  .14956 -2 (.36160 -1,.39874 -1)
56.V56             5  .10381     .10856     .10536     .18867 -2 (.10302,.10770)
57.V57             5  .90586 -1  .92926 -1  .91980 -1  .95703 -3 (.90792 -1,.93168 -1)
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    58.V58              5  .73509 -1  .87683 -1  .80122 -1  .51513 -2 (.73726 -1,.86518 -1)
    59.V59              5  .12611     .13176     .12847     .22130 -2 (.12573,.13122)
    60.V60              5  .81705 -1  .89965 -1  .87402 -1  .35830 -2 (.82953 -1,.91851 -1)
    61.V61              5  .20195     .22746     .21293     .98772 -2 (.20067,.22520)
    62.V62              5  .30195     .35506     .32800     .19534 -1 (.30375,.35225)
    63.V63              5  .69272 -1  .81831 -1  .77293 -1  .47483 -2 (.71397 -1,.83189 -1)
    64.V64              5  .14387     .17198     .16148     .11467 -1 (.14724,.17572)
    65.V65              5  .18650     .21086     .19869     .87084 -2 (.18788,.20950)
    66.V66              5  .18472     .20069     .19486     .67909 -2 (.18643,.20329)
    67.V67              5  .14210     .16505     .15263     .82145 -2 (.14243,.16283)
    68.V68              5  .58615 -1  .68404 -1  .63907 -1  .40254 -2 (.58909 -1,.68906 -1)
    69.V69              5  .83218 -1  .91858 -1  .87254 -1  .41199 -2 (.82138 -1,.92369 -1)

DESCRIPTIVE MEASURES  <49> V16:49  CASES=CASE#:139-852
     VARIABLE           N  MINIMUM    MAXIMUM       MEAN     STD DEV    .9500 CONFIDENCE INT
      1.V1              4  15.000     16.000     15.750     .50000     (14.954,16.546)
      2.V2              4  12.000     13.000     12.500     .57735     (11.581,13.419)
      3.V3              4  32.000     34.000     33.000     .81650     (31.701,34.299)
      4.V4              4  12.000     12.000     12.000
      5.V5              4  24.000     25.000     24.250     .50000     (23.454,25.046)
      6.V6              4  45.000     50.000     46.500     2.3805     (42.712,50.288)
      7.V7              4  19.000     22.000     20.750     1.2583     (18.748,22.752)
      8.V8              4  42.000     44.000     42.750     .95743     (41.227,44.273)
      9.V9              4  31.000     34.000     32.000     1.4142     (29.750,34.250)
     10.V10             4  22.000     23.000     22.750     .50000     (21.954,23.546)
     11.V11             4  40.000     48.000     42.500     3.6968     (36.617,48.383)
     12.V12             4  36.000     38.000     36.750     .95743     (35.227,38.273)
     13.V13             4  6.0000     6.0000     6.0000
     14.V14             4  14.000     14.000     14.000
     15.V15             4  8.0000     8.0000     8.0000
     17.V17             4  537.00     625.00     595.25     39.534     (532.34,658.16)
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44.V44            4  .57447      .59680      .58544      .91867 -2 (.57082,.60005)
45.V45            4  .47697      .49440      .48855      .80254 -2 (.47578,.50132)
46.V46            4  .37807      .38720      .38086      .43027 -2 (.37402,.38771)
47.V47            4  .32242      .36320      .33511      .18913 -1 (.30502,.36521)
48.V48            4  .14711      .17760      .15871      .14059 -1 (.13634,.18108)
49.V49            4  .22697      .25120      .23904      .10685 -1 (.22204,.25604)
50.V50            4  .16480      .17318      .17022      .37199 -2 (.16430,.17614)
51.V51            4  .16015      .17120      .16570      .62685 -2 (.15572,.17567)
52.V52            4  .29296      .30880      .30286      .68728 -2 (.29192,.31380)
53.V53            4  .14474      .15520      .14812      .48468 -2 (.14041,.15583)
54.V54            4  .12171      .12602      .12393      .18744 -2 (.12094,.12691)
55.V55            4  .34539 -1   .39106 -1   .37022 -1   .19098 -2 (.33983 -1,.40061 -1)
56.V56            4  .92105 -1   .10428      .99247 -1   .53977 -2 (.90658 -1,.10784)
57.V57            4  .72368 -1   .78560 -1   .76420 -1   .28821 -2 (.71834 -1,.81006 -1)
58.V58            4  .70724 -1   .75200 -1   .72641 -1   .18814 -2 (.69647 -1,.75634 -1)
59.V59            4  .69079 -1   .81833 -1   .76016 -1   .52500 -2 (.67662 -1,.84369 -1)
60.V60            4  .57566 -1   .67200 -1   .60819 -1   .43366 -2 (.53919 -1,.67719 -1)
61.V61            4  .18250      .19360      .18918      .48151 -2 (.18152,.19684)
62.V62            4  .28478      .30428      .29642      .89032 -2 (.28225,.31059)
63.V63            4  .75200 -1   .80196 -1   .77782 -1   .27242 -2 (.73447 -1,.82117 -1)
64.V64            4  .14730      .16480      .15630      .77293 -2 (.14400,.16860)
65.V65            4  .18092      .20298      .19507      .98120 -2 (.17946,.21069)
66.V66            4  .16776      .18880      .18076      .98786 -2 (.16504,.19648)
67.V67            4  .14239      .16201      .15435      .85287 -2 (.14078,.16792)
68.V68            4  .31250 -1   .32733 -1   .31910 -1   .62855 -3 (.30910 -1,.32910 -1)
69.V69            4  .78947 -1   .87523 -1   .83294 -1   .37830 -2 (.77275 -1,.89314 -1)

DESCRIPTIVE MEASURES  <50> V16:50  CASES=CASE#:139-852

    VARIABLE       N  MINIMUM     MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT

      1.V1         1  15.000      15.000      15.000
      2.V2         1  12.000      12.000      12.000
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3.V3             1  32.000     32.000     32.000
4.V4             1  12.000     12.000     12.000
5.V5             1  23.000     23.000     23.000
6.V6             1  47.000     47.000     47.000
7.V7             1  22.000     22.000     22.000
8.V8             1  40.000     40.000     40.000
9.V9             1  28.000     28.000     28.000
10.V10           1  22.000     22.000     22.000
11.V11           1  38.000     38.000     38.000
12.V12           1  38.000     38.000     38.000
13.V13           1  6.0000     6.0000     6.0000
14.V14           1  14.000     14.000     14.000
15.V15           1  8.0000     8.0000     8.0000
17.V17           1  491.00     491.00     491.00
44.V44           1  .59470     .59470     .59470
45.V45           1  .50509     .50509     .50509
46.V46           1  .36864     .36864     .36864
47.V47           1  .30754     .30754     .30754
48.V48           1  .15275     .15275     .15275
49.V49           1  .25458     .25458     .25458
50.V50           1  .16090     .16090     .16090
51.V51           1  .17312     .17312     .17312
52.V52           1  .28513     .28513     .28513
53.V53           1  .14868     .14868     .14868
54.V54           1  .12831     .12831     .12831
55.V55           1  .38697 -1  .38697 -1  .38697 -1
56.V56           1  .99796 -1  .99796 -1  .99796 -1
57.V57           1  .81466 -1  .81466 -1  .81466 -1
58.V58           1  .81466 -1  .81466 -1  .81466 -1
59.V59           1  .93686 -1  .93686 -1  .93686 -1
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60.V60              1  .67210 -1  .67210 -1  .67210 -1
61.V61              1  .19756     .19756     .19756
62.V62              1  .31568     .31568     .31568
63.V63              1  .93686 -1  .93686 -1  .93686 -1
64.V64              1  .16701     .16701     .16701
65.V65              1  .20570     .20570     .20570
66.V66              1  .19552     .19552     .19552
67.V67              1  .15682     .15682     .15682
68.V68              1  .42770 -1  .42770 -1  .42770 -1
69.V69              1  .83503 -1  .83503 -1  .83503 -1

DESCRIPTIVE MEASURES  <51> V16:51  CASES=CASE#:139-852
   VARIABLE         N  MINIMUM    MAXIMUM    MEAN      STD DEV     .9500 CONFIDENCE INT
    1.V1            5  15.000     16.000     15.600    .54772      (14.920,16.280)
    2.V2            5  12.000     13.000     12.400    .54772      (11.720,13.080)
    3.V3            5  29.000     32.000     31.000    1.4142      (29.244,32.756)
    4.V4            5  12.000     12.000     12.000
    5.V5            5  22.000     25.000     23.200    1.0954      (21.840,24.560)
    6.V6            5  44.000     49.000     46.800    2.1679      (44.108,49.492)
    7.V7            5  21.000     22.000     21.200    .44721      (20.645,21.755)
    8.V8            5  40.000     44.000     42.200    1.6432      (40.160,44.240)
    9.V9            5  29.000     33.000     30.400    1.6733      (28.322,32.478)
   10.V10           5  22.000     24.000     22.800    .83666      (21.761,23.839)
   11.V11           5  47.000     51.000     49.000    1.4142      (47.244,50.756)
   12.V12           5  37.000     38.000     37.600    .54772      (36.920,38.280)
   13.V13           5  6.0000     6.0000     6.0000
   14.V14           5  13.000     14.000     13.800    .44721      (13.245,14.355)
   15.V15           5  8.0000     8.0000     8.0000
   17.V17           5  520.00     1018.0     699.60    189.96      (463.73,935.47)
   44.V44           5  .56543     .59231     .58294    .10441 -1 (.56998,.59591)
   45.V45           5  .46562     .49921     .48340    .12195 -1 (.46826,.49854)
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    46.V46                  5  .34844      .39096      .37131      .15488 -1 (.35208,.39054)
    47.V47                  5  .28462      .33792      .31603      .26762 -1 (.28280,.34926)
    48.V48                  5  .15509      .18075      .16469      .11480 -1 (.15044,.17895)
    49.V49                  5  .23183      .24252      .23662      .40374 -2 (.23161,.24163)
    50.V50                  5  .15192      .17795      .16856      .98151 -2 (.15637,.18075)
    51.V51                  5  .16535      .17485      .16888      .36910 -2 (.16430,.17346)
    52.V52                  5  .28918      .31631      .29628      .11348 -1 (.28219,.31037)
    53.V53                  5  .13654      .14931      .14468      .49654 -2 (.13851,.15084)
    54.V54                  5  .12115      .13163      .12705      .38889 -2 (.12222,.13188)
    55.V55                  5  .34615 -1  .38310 -1  .36335 -1  .16183 -2 (.34325 -1,.38344 -1)
    56.V56                  5  .93700 -1  .99213 -1  .96715 -1  .20943 -2 (.94114 -1,.99315 -1)
    57.V57                  5  .73077 -1  .85462 -1  .80372 -1  .52210 -2 (.73889 -1,.86855 -1)
    58.V58                  5  .64833 -1  .78846 -1  .70895 -1  .54639 -2 (.64111 -1,.77680 -1)
    59.V59                  5  .92308 -1  .10707      .98895 -1  .56120 -2 (.91927 -1,.10586)
    60.V60                  5  .66142 -1  .70822 -1  .68373 -1  .18883 -2 (.66029 -1,.70718 -1)
    61.V61                  5  .18269      .20334      .19351      .79194 -2 (.18368,.20335)
    62.V62                  5  .28462      .34479      .31299      .22800 -1 (.28468,.34129)
    63.V63                  5  .72238 -1  .85039 -1  .78058 -1  .46250 -2 (.72315 -1,.83800 -1)
    64.V64                  5  .13893      .15433      .14684      .58441 -2 (.13958,.15409)
    65.V65                  5  .18664      .19843      .19111      .45690 -2 (.18544,.19679)
    66.V66                  5  .17447      .19213      .17979      .74896 -2 (.17049,.18909)
    67.V67                  5  .13893      .16110      .14848      .87771 -2 (.13758,.15938)
    68.V68                  5  .48077 -1  .55118 -1  .51572 -1  .32719 -2 (.47510 -1,.55635 -1)
    69.V69                  5  .76487 -1  .81532 -1  .78560 -1  .22317 -2 (.75789 -1,.81331 -1)

DESCRIPTIVE MEASURES   <52> V16:52   CASES=CASE#:139-852

     VARIABLE             N  MINIMUM     MAXIMUM      MEAN       STD DEV    .9500 CONFIDENCE INT
      1.V1                1  14.000      14.000      14.000
      2.V2                1  12.000      12.000      12.000
      3.V3                1  30.000      30.000      30.000
      4.V4                1  12.000      12.000      12.000
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 5.V5          1  21.000    21.000    21.000
 6.V6          1  45.000    45.000    45.000
 7.V7          1  21.000    21.000    21.000
 8.V8          1  40.000    40.000    40.000
 9.V9          1  28.000    28.000    28.000
10.V10         1  22.000    22.000    22.000
11.V11         1  34.000    34.000    34.000
12.V12         1  37.000    37.000    37.000
13.V13         1  6.0000    6.0000    6.0000
14.V14         1  14.000    14.000    14.000
15.V15         1  8.0000    8.0000    8.0000
17.V17         1  357.00    357.00    357.00
44.V44         1  .58263    .58263    .58263
45.V45         1  .52381    .52381    .52381
46.V46         1  .36415    .36415    .36415
47.V47         1  .28011    .28011    .28011
48.V48         1  .13445    .13445    .13445
49.V49         1  .28011    .28011    .28011
50.V50         1  .17367    .17367    .17367
51.V51         1  .18487    .18487    .18487
52.V52         1  .27171    .27171    .27171
53.V53         1  .14006    .14006    .14006
54.V54         1  .13445    .13445    .13445
55.V55         1  .33613 -1 .33613 -1 .33613 -1
56.V56         1  .11485    .11485    .11485
57.V57         1  .81232 -1 .81232 -1 .81232 -1
58.V58         1  .95238 -1 .95238 -1 .95238 -1
59.V59         1  .98039 -1 .98039 -1 .98039 -1
60.V60         1  .72829 -1 .72829 -1 .72829 -1
61.V61         1  .19048    .19048    .19048
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62.V62               1  .30252      .30252      .30252
63.V63               1  .86835 -1   .86835 -1   .86835 -1
64.V64               1  .15966      .15966      .15966
65.V65               1  .20168      .20168      .20168
66.V66               1  .18487      .18487      .18487
67.V67               1  .14286      .14286      .14286
68.V68               1  .50420 -1   .50420 -1   .50420 -1
69.V69               1  .98039 -1   .98039 -1   .98039 -1

DESCRIPTIVE MEASURES  <53> V16:53  CASES=CASE#:139-852
   VARIABLE         N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
  1.V1              3  14.000      15.000      14.667     .57735     (13.232,16.101)
  2.V2              3  12.000      12.000      12.000
  3.V3              3  29.000      30.000      29.667     .57735     (28.232,31.101)
  4.V4              3  12.000      12.000      12.000
  5.V5              3  19.000      21.000      20.000     1.0000     (17.516,22.484)
  6.V6              3  47.000      51.000      49.667     2.3094     (43.930,55.404)
  7.V7              3  20.000      20.000      20.000
  8.V8              3  39.000      41.000      40.333     1.1547     (37.465,43.202)
  9.V9              3  30.000      31.000      30.333     .57735     (28.899,31.768)
 10.V10             3  21.000      22.000      21.333     .57735     (19.899,22.768)
 11.V11             3  35.000      45.000      40.667     5.1316     (27.919,53.414)
 12.V12             3  37.000      39.000      38.000     1.0000     (35.516,40.484)
 13.V13             3  6.0000      6.0000      6.0000
 14.V14             3  14.000      14.000      14.000
 15.V15             3  8.0000      8.0000      8.0000
 17.V17             3  740.00      820.00      777.33     40.266     (677.31,877.36)
 44.V44             3  .57805      .58108      .57938     .15490 -2 (.57553,.58323)
 45.V45             3  .48919      .49512      .49175     .30493 -2 (.48417,.49932)
 46.V46             3  .36463      .37568      .36940     .56754 -2 (.35530,.38349)
 47.V47             3  .32568      .34390      .33243     .99855 -2 (.30763,.35724)
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48.V48              3 .16839      .17703      .17327      .44242 -2 (.16228,.18426)
49.V49              3 .24024      .25000      .24459      .49646 -2 (.23226,.25692)
50.V50              3 .17487      .18784      .18066      .65946 -2 (.16428,.19704)
51.V51              3 .17358      .18784      .18185      .74027 -2 (.16346,.20024)
52.V52              3 .28415      .29793      .29267      .74507 -2 (.27416,.31118)
53.V53              3 .13212      .14390      .13750      .59547 -2 (.12271,.15230)
54.V54              3 .11658      .12027      .11879      .19488 -2 (.11395,.12363)
55.V55              3 .36585 -1  .40155 -1  .38643 -1  .18466 -2 (.34056 -1,.43230 -1)
56.V56              3 .96341 -1  .10541      .10136      .46095 -2 (.89909 -1,.11281)
57.V57              3 .76425 -1  .83784 -1  .80639 -1  .37941 -2 (.71214 -1,.90064 -1)
58.V58              3 .67358 -1  .71622 -1  .69904 -1  .22494 -2 (.64316 -1,.75492 -1)
59.V59              3 .80488 -1  .85135 -1  .82841 -1  .23242 -2 (.77068 -1,.88615 -1)
60.V60              3 .56995 -1  .64865 -1  .60945 -1  .39351 -2 (.51170 -1,.70720 -1)
61.V61              3 .21341      .21622      .21489      .14061 -2 (.21139,.21838)
62.V62              3 .32297      .32561      .32414      .13446 -2 (.32080,.32748)
63.V63              3 .79016 -1  .83784 -1  .81502 -1  .23907 -2 (.75563 -1,.87441 -1)
64.V64              3 .13919      .14512      .14313      .34126 -2 (.13465,.15161)
65.V65              3 .16969      .19324      .18195      .11807 -1 (.15262,.21128)
66.V66              3 .16710      .18537      .17875      .10121 -1 (.15361,.20389)
67.V67              3 .14249      .15405      .15007      .65670 -2 (.13375,.16638)
68.V68              3 .41463 -1  .44595 -1  .42935 -1  .15741 -2 (.39024 -1,.46845 -1)
69.V69              3 .82902 -1  .90541 -1  .86269 -1  .38988 -2 (.76584 -1,.95954 -1)

DESCRIPTIVE MEASURES  <54> V16:54  CASES=CASE#:139-852

    VARIABLE          N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1               5  15.000      16.000      15.200     .44721      (14.645,15.755)
   2.V2               5  12.000      13.000      12.600     .54772      (11.920,13.280)
   3.V3               5  29.000      32.000      30.000     1.2247      (28.479,31.521)
   4.V4               5  12.000      12.000      12.000
   5.V5               5  19.000      21.000      20.200     .83666      (19.161,21.239)
   6.V6               5  48.000      52.000      50.000     1.8708      (47.677,52.323)
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 7.V7                5  19.000     22.000     20.400     1.1402     (18.984,21.816)
 8.V8                5  40.000     43.000     41.400     1.5166     (39.517,43.283)
 9.V9                5  28.000     34.000     31.600     3.2863     (27.519,35.681)
10.V10               5  21.000     24.000     22.800     1.3038     (21.181,24.419)
11.V11               5  35.000     39.000     37.800     1.7889     (35.579,40.021)
12.V12               5  36.000     38.000     36.800     .83666     (35.761,37.839)
13.V13               5  6.0000     6.0000     6.0000
14.V14               5  14.000     14.000     14.000
15.V15               5  8.0000     8.0000     8.0000
17.V17               5  542.00     656.00     593.20     45.334     (536.91,649.49)
44.V44               5  .56383     .58856     .57523     .96915 -2 (.56320,.58727)
45.V45               5  .49113     .51524     .49958     .91598 -2 (.48820,.51095)
46.V46               5  .36774     .38415     .37720     .62928 -2 (.36939,.38501)
47.V47               5  .28226     .30183     .28905     .79657 -2 (.27916,.29894)
48.V48               5  .13710     .15068     .14368     .60892 -2 (.13612,.15124)
49.V49               5  .25806     .26982     .26287     .44886 -2 (.25729,.26844)
50.V50               5  .17258     .18493     .17960     .60915 -2 (.17204,.18717)
51.V51               5  .17097     .18794     .17771     .69361 -2 (.16909,.18632)
52.V52               5  .28710     .29151     .29002     .17789 -2 (.28782,.29223)
53.V53               5  .12195     .13121     .12630     .37827 -2 (.12160,.13100)
54.V54               5  .12158     .13262     .12738     .46359 -2 (.12162,.13314)
55.V55               5  .40323 -1  .44207 -1  .41768 -1  .15742 -2 (.39814 -1,.43723 -1)
56.V56               5  .10445     .11433     .10916     .39616 -2 (.10424,.11408)
57.V57               5  .79032 -1  .91463 -1  .83771 -1  .49151 -2 (.77668 -1,.89873 -1)
58.V58               5  .75806 -1  .83333 -1  .79746 -1  .34952 -2 (.75407 -1,.84086 -1)
59.V59               5  .90323 -1  .10366     .97720 -1  .48109 -2 (.91747 -1,.10369)
60.V60               5  .64516 -1  .73801 -1  .69459 -1  .42570 -2 (.64173 -1,.74745 -1)
61.V61               5  .20849     .22561     .21915     .66368 -2 (.21091,.22740)
62.V62               5  .25461     .34220     .30416     .33475 -1 (.26259,.34572)
63.V63               5  .80479 -1  .88652 -1  .84982 -1  .41031 -2 (.79887 -1,.90076 -1)
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64.V64              5  .15000      .16489      .15957      .70158 -2 (.15086,.16828)
65.V65              5  .16605      .19665      .18397      .11936 -1 (.16915,.19879)
66.V66              5  .16452      .19817      .18017      .16340 -1 (.15989,.20046)
67.V67              5  .13871      .16052      .14926      .78300 -2 (.13953,.15898)
68.V68              5  .46099 -1  .51829 -1  .48789 -1  .21251 -2 (.46150 -1,.51427 -1)
69.V69              5  .83904 -1  .95745 -1  .91013 -1  .44700 -2 (.85463 -1,.96564 -1)

DESCRIPTIVE MEASURES   <55> V16:55   CASES=CASE#:139-852
    VARIABLE         N  MINIMUM     MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
     1.V1            5  15.000      16.000      15.200      .44721     (14.645,15.755)
     2.V2            5  12.000      13.000      12.400      .54772     (11.720,13.080)
     3.V3            5  30.000      32.000      31.600      .89443     (30.489,32.711)
     4.V4            5  12.000      12.000      12.000
     5.V5            5  17.000      24.000      21.400      2.7019     (18.045,24.755)
     6.V6            5  46.000      48.000      47.200      1.0954     (45.840,48.560)
     7.V7            5  20.000      22.000      20.400      .89443     (19.289,21.511)
     8.V8            5  37.000      43.000      40.000      2.2361     (37.224,42.776)
     9.V9            5  28.000      32.000      29.400      1.5166     (27.517,31.283)
    10.V10           5  21.000      22.000      21.200      .44721     (20.645,21.755)
    11.V11           5  41.000      52.000      47.600      4.5607     (41.937,53.263)
    12.V12           5  36.000      38.000      37.000      .70711     (36.122,37.878)
    13.V13           5  6.0000      6.0000      6.0000
    14.V14           5  13.000      14.000      13.800      .44721     (13.245,14.355)
    15.V15           5  6.0000      8.0000      7.4000      .89443     (6.2894,8.5106)
    17.V17           5  392.00      667.00      549.20      118.48     (402.09,696.31)
    44.V44           5  .55627      .59430      .57730      .14665 -1 (.55909,.59551)
    45.V45           5  .49625      .52296      .50555      .10852 -1 (.49208,.51903)
    46.V46           5  .34811      .38081      .36617      .13241 -1 (.34973,.38262)
    47.V47           5  .26531      .28289      .27289      .84319 -2 (.26242,.28336)
    48.V48           5  .14243      .15789      .14982      .58765 -2 (.14252,.15711)
    49.V49           5  .25563      .27806      .26686      .92110 -2 (.25542,.27829)
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50.V50              5  .17203      .18719      .17907      .54455 -2 (.17230,.18583)
51.V51              5  .17241      .18489      .17974      .54122 -2 (.17302,.18646)
52.V52              5  .26316      .31190      .28190      .17989 -1 (.25956,.30423)
53.V53              5  .12219      .13520      .12911      .60280 -2 (.12163,.13660)
54.V54              5  .13158      .14031      .13563      .31439 -2 (.13173,.13953)
55.V55              5  .38265 -1  .44335 -1  .40571 -1  .24864 -2 (.37484 -1,.43658 -1)
56.V56              5  .94855 -1  .10795      .10282      .53113 -2 (.96226 -1,.10942)
57.V57              5  .82459 -1  .10181      .89939 -1  .71490 -2 (.81062 -1,.98816 -1)
58.V58              5  .73463 -1  .91837 -1  .80267 -1  .74422 -2 (.71027 -1,.89508 -1)
59.V59              5  .10965      .12808      .11951      .78761 -2 (.10973,.12928)
60.V60              5  .74963 -1  .95238 -1  .84309 -1  .75986 -2 (.74874 -1,.93744 -1)
61.V61              5  .17857      .22496      .20916      .19314 -1 (.18518,.23315)
62.V62              5  .28061      .32677      .30624      .17738 -1 (.28421,.32826)
63.V63              5  .72347 -1  .97451 -1  .82680 -1  .10156 -1 (.70070 -1,.95290 -1)
64.V64              5  .15271      .17105      .16162      .91455 -2 (.15027,.17298)
65.V65              5  .18141      .19376      .18884      .49418 -2 (.18271,.19498)
66.V66              5  .15292      .18883      .17426      .13896 -1 (.15700,.19151)
67.V67              5  .14286      .16585      .15306      .88476 -2 (.14208,.16405)
68.V68              5  .52474 -1  .67323 -1  .60454 -1  .55765 -2 (.53530 -1,.67378 -1)
69.V69              5  .78778 -1  .89912 -1  .83752 -1  .48804 -2 (.77692 -1,.89811 -1)

DESCRIPTIVE MEASURES  <56> V16:56  CASES=CASE#:139-852
    VARIABLE          N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
      1.V1            5   15.000      17.000      16.400      .89443     (15.289,17.511)
      2.V2            5   12.000      12.000      12.000
      3.V3            5   29.000      30.000      29.600      .54772     (28.920,30.280)
      4.V4            5   12.000      12.000      12.000
      5.V5            5   19.000      21.000      20.000      .70711     (19.122,20.878)
      6.V6            5   50.000      58.000      53.400      3.8471     (48.623,58.177)
      7.V7            5   19.000      22.000      20.400      1.1402     (18.984,21.816)
      8.V8            5   37.000      42.000      40.400      1.9494     (37.980,42.820)
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 9.V9                5  31.000     36.000     33.800     2.1679    (31.108,36.492)
10.V10               5  20.000     23.000     21.400     1.1402    (19.984,22.816)
11.V11               5  31.000     34.000     32.000     1.2247    (30.479,33.521)
12.V12               5  37.000     38.000     37.800     .44721    (37.245,38.355)
13.V13               5  6.0000     6.0000     6.0000
14.V14               5  14.000     14.000     14.000
15.V15               5  8.0000     8.0000     8.0000
17.V17               5  425.00     721.00     544.80     108.30    (410.33,679.27)
44.V44               5  .53814     .57765     .56125     .15821 -1 (.54161,.58089)
45.V45               5  .47573     .49259     .48338     .76867 -2 (.47383,.49292)
46.V46               5  .35529     .40777     .37957     .19111 -1 (.35584,.40330)
47.V47               5  .25568     .26863     .26399     .55264 -2 (.25713,.27085)
48.V48               5  .14118     .17451     .15569     .13033 -1 (.13950,.17187)
49.V49               5  .24621     .26118     .25454     .59005 -2 (.24721,.26187)
50.V50               5  .15530     .17060     .16232     .55613 -2 (.15542,.16923)
51.V51               5  .15909     .18333     .17407     .10060 -1 (.16158,.18656)
52.V52               5  .28941     .32316     .30347     .12447 -1 (.28802,.31893)
53.V53               5  .10000     .11294     .10834     .53502 -2 (.10170,.11499)
54.V54               5  .10957     .11765     .11391     .40025 -2 (.10894,.11888)
55.V55               5  .35185 -1  .37647 -1  .36427 -1  .10057 -2 (.35178 -1,.37675 -1)
56.V56               5  .10118     .11234     .10580     .42714 -2 (.10050,.11111)
57.V57               5  .79057 -1  .87037 -1  .82383 -1  .39242 -2 (.77510 -1,.87255 -1)
58.V58               5  .66288 -1  .75294 -1  .71255 -1  .39801 -2 (.66313 -1,.76197 -1)
59.V59               5  .87121 -1  .11111     .98896 -1  .98842 -2 (.86623 -1,.11117)
60.V60               5  .67961 -1  .88235 -1  .79049 -1  .82579 -2 (.68795 -1,.89303 -1)
61.V61               5  .19294     .24272     .22094     .18868 -1 (.19751,.24436)
62.V62               5  .29882     .34119     .31318     .16867 -1 (.29223,.33412)
63.V63               5  .74510 -1  .87059 -1  .80246 -1  .46603 -2 (.74459 -1,.86032 -1)
64.V64               5  .13725     .15059     .14551     .52912 -2 (.13894,.15208)
65.V65               5  .17593     .18588     .18038     .37867 -2 (.17568,.18509)
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   66.V66                5  .16288      .17407      .17054      .44916 -2 (.16496,.17611)
   67.V67                5  .13447      .14702      .13960      .48511 -2 (.13358,.14563)
   68.V68                5  .47059 -1  .66667 -1  .55454 -1  .78444 -2 (.45714 -1,.65194 -1)
   69.V69                5  .82353 -1  .92926 -1  .88280 -1  .50857 -2 (.81966 -1,.94595 -1)

DESCRIPTIVE MEASURES  <57> V16:57  CASES=CASE#:139-852
     VARIABLE           N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
    1.V1                5  15.000     16.000     15.400     .54772     (14.720,16.080)
    2.V2                5  12.000     12.000     12.000
    3.V3                5  30.000     32.000     31.200     1.0954     (29.840,32.560)
    4.V4                5  12.000     12.000     12.000
    5.V5                5  20.000     23.000     20.600     1.3416     (18.934,22.266)
    6.V6                5  51.000     57.000     53.800     2.3875     (50.836,56.764)
    7.V7                5  22.000     23.000     22.400     .54772     (21.720,23.080)
    8.V8                5  43.000     47.000     45.000     1.5811     (43.037,46.963)
    9.V9                5  33.000     36.000     34.400     1.1402     (32.984,35.816)
   10.V10               5  22.000     24.000     22.800     .83666     (21.761,23.839)
   11.V11               5  28.000     39.000     33.800     4.0866     (28.726,38.874)
   12.V12               5  37.000     39.000     38.200     .83666     (37.161,39.239)
   13.V13               5  6.0000     6.0000     6.0000
   14.V14               5  14.000     14.000     14.000
   15.V15               5  8.0000     8.0000     8.0000
   17.V17               5  453.00     532.00     486.80     32.737     (446.15,527.45)
   44.V44               5  .57391     .60714     .59215     .13856 -1 (.57495,.60936)
   45.V45               5  .48221     .49890     .49116     .67664 -2 (.48276,.49956)
   46.V46               5  .35099     .38043     .36293     .12158 -1 (.34783,.37802)
   47.V47               5  .30464     .33126     .32259     .10995 -1 (.30894,.33625)
   48.V48               5  .15894     .18985     .17490     .11514 -1 (.16060,.18920)
   49.V49               5  .23320     .25607     .24303     .99579 -2 (.23067,.25540)
   50.V50               5  .16165     .16998     .16659     .36220 -2 (.16209,.17108)
   51.V51               5  .17391     .18797     .17897     .53989 -2 (.17226,.18567)
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52.V52            5  .28256      .30000      .28973      .73798 -2 (.28057,.29889)
53.V53            5  .12836      .13696      .13240      .34162 -2 (.12816,.13664)
54.V54            5  .11466      .12141      .11718      .26990 -2 (.11383,.12053)
55.V55            5  .32609 -1  .37594 -1  .36114 -1  .21271 -2 (.33473 -1,.38755 -1)
56.V56            5  .94862 -1  .10817      .10035      .49971 -2 (.94143 -1,.10655)
57.V57            5  .63043 -1  .76605 -1  .70704 -1  .55190 -2 (.63851 -1,.77557 -1)
58.V58            5  .75099 -1  .82609 -1  .79026 -1  .31324 -2 (.75136 -1,.82915 -1)
59.V59            5  .73913 -1  .84980 -1  .80429 -1  .40308 -2 (.75424 -1,.85434 -1)
60.V60            5  .54348 -1  .64018 -1  .58027 -1  .39806 -2 (.53085 -1,.62970 -1)
61.V61            5  .19048      .21344      .20061      .95031 -2 (.18881,.21241)
62.V62            5  .26708      .29051      .28030      .10361 -1 (.26743,.29316)
63.V63            5  .67669 -1  .75099 -1  .72012 -1  .37038 -2 (.67413 -1,.76611 -1)
64.V64            5  .14286      .15435      .14835      .43267 -2 (.14297,.15372)
65.V65            5  .16601      .18478      .17410      .72485 -2 (.16510,.18310)
66.V66            5  .16798      .17609      .17179      .31016 -2 (.16794,.17564)
67.V67            5  .12629      .14128      .13365      .53663 -2 (.12698,.14031)
68.V68            5  .34783 -1  .39526 -1  .37753 -1  .19074 -2 (.35385 -1,.40122 -1)
69.V69            5  .73123 -1  .82707 -1  .78060 -1  .42288 -2 (.72810 -1,.83311 -1)

DESCRIPTIVE MEASURES  <58> V16:58  CASES=CASE#:139-852
    VARIABLE          N  MINIMUM     MAXIMUM      MEAN       STD DEV     .9500 CONFIDENCE INT
     1.V1             5  15.000      16.000      15.600      .54772      (14.920,16.280)
     2.V2             5  12.000      13.000      12.200      .44721      (11.645,12.755)
     3.V3             5  30.000      32.000      30.800      .83666      (29.761,31.839)
     4.V4             5  12.000      12.000      12.000
     5.V5             5  20.000      22.000      20.800      .83666      (19.761,21.839)
     6.V6             5  51.000      55.000      53.400      1.6733      (51.322,55.478)
     7.V7             5  21.000      24.000      22.600      1.1402      (21.184,24.016)
     8.V8             5  40.000      47.000      44.200      2.5884      (40.986,47.414)
     9.V9             5  31.000      35.000      33.600      1.6733      (31.522,35.678)
    10.V10            5  22.000      25.000      23.000      1.2247      (21.479,24.521)
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11.V11          5  31.000     44.000     36.400     4.9295     (30.279,42.521)
12.V12          5  36.000     38.000     37.400     .89443     (36.289,38.511)
13.V13          5  6.0000     6.0000     6.0000
14.V14          5  14.000     14.000     14.000
15.V15          5  8.0000     8.0000     8.0000
17.V17          5  464.00     757.00     589.40     111.33     (451.16,727.64)
44.V44          5  .58108     .59359     .58861     .52388 -2 (.58211,.59512)
45.V45          5  .48456     .51940     .49804     .13254 -1 (.48159,.51450)
46.V46          5  .35667     .37452     .36503     .69436 -2 (.35641,.37366)
47.V47          5  .30185     .34267     .32393     .16987 -1 (.30283,.34502)
48.V48          5  .15514     .18534     .17506     .11555 -1 (.16071,.18941)
49.V49          5  .23359     .25431     .24190     .78302 -2 (.23218,.25162)
50.V50          5  .15346     .17026     .16122     .59791 -2 (.15379,.16964)
51.V51          5  .15935     .18750     .17217     .10726 -1 (.15885,.18549)
52.V52          5  .28162     .29537     .29035     .52334 -2 (.28386,.29685)
53.V53          5  .12479     .14440     .13180     .81177 -2 (.12172,.14188)
54.V54          5  .11096     .12500     .11706     .51304 -2 (.11069,.12343)
55.V55          5  .32040 -1  .38793 -1  .35730 -1  .25858 -2 (.32519 -1,.38940 -1)
56.V56          5  .96433 -1  .10776     .99554 -1  .47488 -2 (.93658 -1,.10545)
57.V57          5  .67568 -1  .79741 -1  .75186 -1  .46640 -2 (.69395 -1,.80977 -1)
58.V58          5  .70013 -1  .79741 -1  .73808 -1  .39082 -2 (.68956 -1,.78661 -1)
59.V59          5  .81897 -1  .94435 -1  .89590 -1  .49430 -2 (.83452 -1,.95727 -1)
60.V60          5  .60163 -1  .77572 -1  .66165 -1  .66432 -2 (.57916 -1,.74414 -1)
61.V61          5  .20325     .21268     .20731     .37378 -2 (.20267,.21196)
62.V62          5  .27150     .31836     .29009     .17455 -1 (.26842,.31177)
63.V63          5  .68293 -1  .84052 -1  .75377 -1  .56959 -2 (.68305 -1,.82450 -1)
64.V64          5  .13496     .15733     .14524     .85328 -2 (.13465,.15584)
65.V65          5  .16189     .18098     .17405     .76025 -2 (.16461,.18349)
66.V66          5  .15447     .18319     .17430     .11925 -1 (.15949,.18911)
67.V67          5  .13322     .15456     .14100     .83906 -2 (.13058,.15142)
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68.V68               5  .40541 -1  .46235 -1  .43956 -1  .21548 -2 (.41281 -1,.46632 -1)
69.V69               5  .77572 -1  .88362 -1  .81657 -1  .41267 -2 (.76534 -1,.86781 -1)

DESCRIPTIVE MEASURES  <59> V16:59  CASES=CASE#:139-852
  VARIABLE           N  MINIMUM    MAXIMUM      MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1              5   14.000     16.000     15.200      .83666     (14.161,16.239)
   2.V2              5   11.000     13.000     11.800      .83666     (10.761,12.839)
   3.V3              5   30.000     32.000     31.200      .83666     (30.161,32.239)
   4.V4              5   12.000     12.000     12.000
   5.V5              5   18.000     23.000     20.800      1.9235     (18.412,23.188)
   6.V6              5   52.000     57.000     55.000      2.0000     (52.517,57.483)
   7.V7              5   23.000     25.000     23.800      .83666     (22.761,24.839)
   8.V8              5   43.000     50.000     46.000      2.9155     (42.380,49.620)
   9.V9              5   37.000     39.000     37.800      1.0954     (36.440,39.160)
  10.V10             5   24.000     26.000     25.000      1.0000     (23.758,26.242)
  11.V11             5   30.000     36.000     34.400      2.6077     (31.162,37.638)
  12.V12             5   37.000     38.000     37.400      .54772     (36.720,38.080)
  13.V13             5   6.0000     6.0000     6.0000
  14.V14             5   14.000     16.000     14.800      .83666     (13.761,15.839)
  15.V15             5   8.0000     8.0000     8.0000
  17.V17             5   406.00     669.00     551.80      101.33     (425.98,677.62)
  44.V44             5   .58039     .59360     .58817      .55524 -2 (.58128,.59507)
  45.V45             5   .45672     .49015     .47482      .13483 -1 (.45808,.49156)
  46.V46             5   .35543     .38177     .37101      .13431 -1 (.35433,.38769)
  47.V47             5   .25262     .28939     .27073      .13509 -1 (.25396,.28751)
  48.V48             5   .11823     .15113     .13782      .12767 -1 (.12197,.15367)
  49.V49             5   .23020     .24514     .23778      .55542 -2 (.23088,.24467)
  50.V50             5   .14952     .15838     .15374      .31869 -2 (.14978,.15770)
  51.V51             5   .14286     .16293     .15347      .87684 -2 (.14258,.16435)
  52.V52             5   .29064     .31407     .29715      .98410 -2 (.28493,.30937)
  53.V53             5   .10932     .12069     .11496      .41040 -2 (.10987,.12006)
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54.V54              5  .10405     .11659     .11021     .45291 -2 (.10459,.11584)
55.V55              5  .27094 -1  .36977 -1  .32888 -1  .38158 -2 (.28150 -1,.37626 -1)
56.V56              5  .10212     .10762     .10434     .23310 -2 (.10144,.10723)
57.V57              5  .60773 -1  .74738 -1  .68360 -1  .54415 -2 (.61603 -1,.75116 -1)
58.V58              5  .70254 -1  .81281 -1  .73399 -1  .44734 -2 (.67845 -1,.78954 -1)
59.V59              5  .80386 -1  .90239 -1  .85468 -1  .38555 -2 (.80681 -1,.90255 -1)
60.V60              5  .59486 -1  .71429 -1  .65439 -1  .56531 -2 (.58420 -1,.72459 -1)
61.V61              5  .17734     .20927     .19754     .12914 -1 (.18151,.21357)
62.V62              5  .26108     .30939     .29021     .18762 -1 (.26691,.31350)
63.V63              5  .61657 -1  .81031 -1  .74811 -1  .76135 -2 (.65357 -1,.84264 -1)
64.V64              5  .13873     .16256     .14550     .10174 -1 (.13287,.15813)
65.V65              5  .16749     .17864     .17391     .41843 -2 (.16871,.17911)
66.V66              5  .16238     .18600     .17119     .90721 -2 (.15992,.18245)
67.V67              5  .13054     .13752     .13371     .29195 -2 (.13009,.13734)
68.V68              5  .36609 -1  .41854 -1  .38705 -1  .21088 -2 (.36086 -1,.41323 -1)
69.V69              5  .79190 -1  .88191 -1  .82872 -1  .34927 -2 (.78536 -1,.87209 -1)

DESCRIPTIVE MEASURES  <60> V16:60  CASES=CASE#:139-852
    VARIABLE        N  MINIMUM     MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
   1.V1             5  15.000      17.000      15.800     .83666    (14.761,16.839)
   2.V2             5  11.000      14.000      12.000     1.2247    (10.479,13.521)
   3.V3             5  30.000      32.000      31.200     .83666    (30.161,32.239)
   4.V4             5  12.000      12.000      12.000
   5.V5             5  19.000      20.000      19.600     .54772    (18.920,20.280)
   6.V6             5  54.000      64.000      58.200     3.6332    (53.689,62.711)
   7.V7             5  21.000      25.000      22.800     1.4832    (20.958,24.642)
   8.V8             5  42.000      47.000      45.000     2.3452    (42.088,47.912)
   9.V9             5  37.000      41.000      38.800     1.4832    (36.958,40.642)
  10.V10            5  22.000      27.000      24.200     1.9235    (21.812,26.588)
  11.V11            5  29.000      37.000      32.400     2.9665    (28.717,36.083)
  12.V12            5  36.000      38.000      37.000     .70711    (36.122,37.878)
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13.V13                 5  5.0000     6.0000     5.8000     .44721     (5.2447,6.3553)
14.V14                 5  13.000     14.000     13.800     .44721     (13.245,14.355)
15.V15                 5  8.0000     8.0000     8.0000
17.V17                 5  480.00     704.00     623.60     85.196     (517.82,729.38)
44.V44                 5  .59792     .61689     .60670     .75219 -2 (.59737,.61604)
45.V45                 5  .46875     .49922     .48979     .12175 -1 (.47468,.50491)
46.V46                 5  .34236     .36458     .35419     .85148 -2 (.34362,.36476)
47.V47                 5  .24728     .26989     .25634     .91869 -2 (.24493,.26775)
48.V48                 5  .14375     .15686     .15193     .52515 -2 (.14541,.15845)
49.V49                 5  .22585     .24583     .23986     .81344 -2 (.22976,.24996)
50.V50                 5  .13958     .15764     .14879     .75807 -2 (.13938,.15820)
51.V51                 5  .15417     .17197     .16071     .68978 -2 (.15215,.16928)
52.V52                 5  .27415     .29583     .28393     .92440 -2 (.27245,.29541)
53.V53                 5  .97978 -1  .10828     .10404     .39667 -2 (.99112 -1,.10896)
54.V54                 5  .10938     .11198     .11097     .10630 -2 (.10965,.11229)
55.V55                 5  .29830 -1  .33439 -1  .32489 -1  .15165 -2 (.30606 -1,.34372 -1)
56.V56                 5  .95170 -1  .10350     .10017     .32650 -2 (.96119 -1,.10423)
57.V57                 5  .71023 -1  .83333 -1  .78346 -1  .49315 -2 (.72223 -1,.84469 -1)
58.V58                 5  .69602 -1  .75000 -1  .72676 -1  .22860 -2 (.69838 -1,.75515 -1)
59.V59                 5  .79940 -1  .91667 -1  .86854 -1  .47355 -2 (.80974 -1,.92734 -1)
60.V60                 5  .58824 -1  .68429 -1  .63925 -1  .35578 -2 (.59507 -1,.68342 -1)
61.V61                 5  .19583     .21462     .20559     .80721 -2 (.19557,.21561)
62.V62                 5  .27917     .31108     .29212     .12823 -1 (.27620,.30805)
63.V63                 5  .67873 -1  .85227 -1  .72804 -1  .71237 -2 (.63959 -1,.81649 -1)
64.V64                 5  .13219     .14915     .14043     .71368 -2 (.13157,.14929)
65.V65                 5  .16405     .17798     .17027     .54447 -2 (.16351,.17703)
66.V66                 5  .16250     .17798     .17042     .57916 -2 (.16323,.17762)
67.V67                 5  .12597     .15833     .13666     .12960 -1 (.12057,.15276)
68.V68                 5  .31250 -1  .45833 -1  .37465 -1  .58422 -2 (.30211 -1,.44719 -1)
69.V69                 5  .77083 -1  .85973 -1  .81262 -1  .37484 -2 (.76608 -1,.85917 -1)
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DESCRIPTIVE MEASURES   <61> V16:61   CASES=CASE#:139-852
   VARIABLE          N  MINIMUM     MAXIMUM       MEAN       STD DEV      .9500 CONFIDENCE INT.
  1.V1               5  14.000      17.000       15.400      1.1402      (13.984,16.816)
  2.V2               5  12.000      13.000       12.400      .54772      (11.720,13.080)
  3.V3               5  30.000      33.000       31.800      1.0954      (30.440,33.160)
  4.V4               5  12.000      12.000       12.000
  5.V5               5  19.000      23.000       20.800      1.6432      (18.760,22.840)
  6.V6               5  45.000      48.000       45.800      1.3038      (44.181,47.419)
  7.V7               5  19.000      21.000       19.800      1.0954      (18.440,21.160)
  8.V8               5  36.000      42.000       39.400      2.3022      (36.541,42.259)
  9.V9               5  28.000      31.000       29.400      1.1402      (27.984,30.816)
 10.V10              5  19.000      22.000       20.800      1.3038      (19.181,22.419)
 11.V11              5  47.000      54.000       50.600      2.7019      (47.245,53.955)
 12.V12              5  36.000      37.000       36.800      .44721      (36.245,37.355)
 13.V13              5  6.0000      6.0000       6.0000
 14.V14              5  14.000      14.000       14.000
 15.V15              5  7.0000      8.0000       7.8000      .44721      (7.2447,8.3553)
 17.V17              5  680.00      829.00       747.60      57.821      (675.81,819.39)
 44.V44              5  .57275      .58987       .58106      .66741 -2 (.57277,.58934)
 45.V45              5  .48545      .51108       .49435      .10056 -1 (.48186,.50684)
 46.V46              5  .34788      .37941       .36417      .12348 -1 (.34883,.37950)
 47.V47              5  .32436      .34921       .33615      .97746 -2 (.32401,.34828)
 48.V48              5  .17196      .17732       .17431      .23756 -2 (.17136,.17726)
 49.V49              5  .24646      .25926       .25369      .51946 -2 (.24724,.26014)
 50.V50              5  .18088      .19035       .18377      .39151 -2 (.17891,.18863)
 51.V51              5  .17206      .17989       .17598      .32771 -2 (.17191,.18005)
 52.V52              5  .28162      .29265       .28664      .41412 -2 (.28150,.29178)
 53.V53              5  .13631      .14550       .14075      .36835 -2 (.13618,.14532)
 54.V54              5  .12890      .13631       .13237      .32449 -2 (.12834,.13639)
 55.V55              5  .35202 -1   .36827 -1    .35845 -1   .67386 -3 (.35008 -1,.36682 -1)
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56.V56              5  .89706 -1  .11098     .10416     .86648 -2 (.93405 -1,.11492)
57.V57              5  .79412 -1  .84656 -1  .82276 -1  .22878 -2 (.79436 -1,.85117 -1)
58.V58              5  .69100 -1  .74074 -1  .71162 -1  .20385 -2 (.68631 -1,.73693 -1)
59.V59              5  .10294     .12666     .11316     .88865 -2 (.10213,.12420)
60.V60              5  .72751 -1  .80882 -1  .75761 -1  .33124 -2 (.71648 -1,.79874 -1)
61.V61              5  .20588     .22555     .21729     .94863 -2 (.20552,.22907)
62.V62              5  .31161     .34550     .33012     .16330 -1 (.30984,.35039)
63.V63              5  .80834 -1  .88058 -1  .84717 -1  .29594 -2 (.81043 -1,.88392 -1)
64.V64              5  .14863     .16534     .15853     .65098 -2 (.15045,.16662)
65.V65              5  .18519     .19559     .18926     .38642 -2 (.18446,.19406)
66.V66              5  .18253     .19263     .18693     .47584 -2 (.18102,.19284)
67.V67              5  .14448     .16043     .15143     .65148 -2 (.14334,.15952)
68.V68              5  .54233 -1  .58670 -1  .56385 -1  .18516 -2 (.54086 -1,.58685 -1)
69.V69              5  .75071 -1  .94089 -1  .87596 -1  .85277 -2 (.77007 -1,.98184 -1)

DESCRIPTIVE MEASURES  <62> V16:62  CASES=CASE#:139-852
    VARIABLE         N  MINIMUM    MAXIMUM    MEAN     STD DEV    .9500 CONFIDENCE INT
  1.V1               5  15.000     16.000     15.800   .44721     (15.245,16.355)
  2.V2               5  12.000     12.000     12.000
  3.V3               5  28.000     31.000     30.200   1.3038     (28.581,31.819)
  4.V4               5  12.000     12.000     12.000
  5.V5               5  20.000     21.000     20.400   .54772     (19.720,21.080)
  6.V6               5  47.000     53.000     50.400   2.4083     (47.410,53.390)
  7.V7               5  20.000     23.000     21.800   1.0954     (20.440,23.160)
  8.V8               5  45.000     51.000     46.400   2.6077     (43.162,49.638)
  9.V9               5  32.000     35.000     33.200   1.3038     (31.581,34.819)
 10.V10              5  22.000     24.000     23.200   1.0954     (21.840,24.560)
 11.V11              5  32.000     40.000     36.400   3.3615     (32.226,40.574)
 12.V12              5  36.000     38.000     37.000   .70711     (36.122,37.878)
 13.V13              5  6.0000     6.0000     6.0000
 14.V14              5  14.000     14.000     14.000
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15.V15                5  8.0000       8.0000       8.0000
17.V17                5  374.00       640.00       518.00       97.895     (396.45,639.55)
44.V44                5  .57143       .58824       .57883       .64289 -2 (.57085,.58682)
45.V45                5  .47835       .50535       .48904       .11407 -1 (.47488,.50320)
46.V46                5  .35130       .37071       .36199       .72199 -2 (.35303,.37096)
47.V47                5  .29485       .32888       .31342       .12984 -1 (.29730,.32954)
48.V48                5  .16094       .17938       .16701       .75184 -2 (.15767,.17634)
49.V49                5  .26022       .27486       .26745       .56081 -2 (.26049,.27441)
50.V50                5  .16875       .18717       .18082       .75563 -2 (.17144,.19021)
51.V51                5  .17732       .19251       .18312       .57046 -2 (.17603,.19020)
52.V52                5  .27138       .29679       .28756       .97159 -2 (.27549,.29962)
53.V53                5  .12639       .14706       .13466       .81810 -2 (.12450,.14481)
54.V54                5  .11753       .12834       .12330       .39420 -2 (.11841,.12820)
55.V55                5  .37113 -1   .43750 -1   .40146 -1   .32159 -2 (.36153 -1,.44139 -1)
56.V56                5  .10595       .11340       .11027       .28901 -2 (.10668,.11385)
57.V57                5  .78351 -1   .92224 -1   .84921 -1   .52184 -2 (.78442 -1,.91401 -1)
58.V58                5  .76562 -1   .90909 -1   .82188 -1   .58244 -2 (.74956 -1,.89420 -1)
59.V59                5  .88660 -1   .10127       .94664 -1   .47084 -2 (.88818 -1,.10051)
60.V60                5  .68041 -1   .79687 -1   .73682 -1   .42059 -2 (.68460 -1,.78905 -1)
61.V61                5  .18449       .21881       .20404       .15929 -1 (.18426,.22382)
62.V62                5  .26203       .30199       .28851       .16303 -1 (.26827,.30875)
63.V63                5  .61497 -1   .79926 -1   .72647 -1   .70816 -2 (.63854 -1,.81440 -1)
64.V64                5  .12834       .13569       .13123       .34073 -2 (.12699,.13546)
65.V65                5  .15985       .17360       .16468       .57254 -2 (.15757,.17179)
66.V66                5  .14687       .17722       .16310       .11408 -1 (.14893,.17726)
67.V67                5  .12371       .13750       .13123       .50947 -2 (.12490,.13756)
68.V68                5  .42187 -1   .48128 -1   .45048 -1   .24898 -2 (.41957 -1,.48140 -1)
69.V69                5  .85502 -1   .97649 -1   .92463 -1   .48180 -2 (.86481 -1,.98446 -1)

DESCRIPTIVE MEASURES  <63> V16:63  CASES=CASE#:139-852
    VARIABLE          N  MINIMUM     MAXIMUM       MEAN     STD DEV    .9500 CONFIDENCE INT
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1.V1            5  15.000     16.000     15.400     .54772      (14.720,16.080)
2.V2            5  12.000     13.000     12.600     .54772      (11.920,13.280)
3.V3            5  30.000     32.000     30.800     .83666      (29.761,31.839)
4.V4            5  12.000     12.000     12.000
5.V5            5  19.000     21.000     20.200     1.0954      (18.840,21.560)
6.V6            5  45.000     52.000     47.600     2.9665      (43.917,51.283)
7.V7            5  19.000     21.000     20.000     .70711      (19.122,20.878)
8.V8            5  37.000     43.000     41.000     2.5495      (37.834,44.166)
9.V9            5  29.000     32.000     30.000     1.2247      (28.479,31.521)
10.V10          5  21.000     23.000     21.600     .89443      (20.489,22.711)
11.V11          5  34.000     52.000     39.800     7.7266      (30.206,49.394)
12.V12          5  37.000     38.000     37.200     .44721      (36.645,37.755)
13.V13          5  4.0000     6.0000     5.6000     .89443      (4.4894,6.7106)
14.V14          5  14.000     14.000     14.000
15.V15          5  8.0000     8.0000     8.0000
17.V17          5  317.00     540.00     396.40     88.934      (285.97,506.83)
44.V44          5  .57963     .60345     .59157     .91254 -2 (.58024,.60290)
45.V45          5  .49014     .51104     .50145     .82274 -2 (.49124,.51167)
46.V46          5  .35211     .35647     .35481     .18668 -2 (.35249,.35713)
47.V47          5  .27445     .30926     .29251     .13404 -1 (.27587,.30915)
48.V48          5  .14085     .16092     .14913     .76825 -2 (.13959,.15867)
49.V49          5  .26667     .28391     .27643     .66516 -2 (.26818,.28469)
50.V50          5  .17241     .19155     .18176     .86991 -2 (.17096,.19257)
51.V51          5  .16620     .18966     .18187     .91929 -2 (.17046,.19329)
52.V52          5  .25915     .29023     .27240     .12487 -1 (.25690,.28791)
53.V53          5  .12394     .13565     .12924     .51391 -2 (.12285,.13562)
54.V54          5  .12958     .13744     .13401     .31150 -2 (.13014,.13787)
55.V55          5  .25352 -1  .35185 -1  .29851 -1  .37018 -2 (.25255 -1,.34447 -1)
56.V56          5  .10370     .11268     .10947     .34682 -2 (.10517,.11378)
57.V57          5  .78873 -1  .90741 -1  .84686 -1  .42691 -2 (.79385 -1,.89987 -1)
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58.V58           5  .85185 -1  .94637 -1  .89255 -1  .35327 -2 (.84868 -1,.93641 -1)
59.V59           5  .10141     .12796     .11307     .10069 -1 (.10057,.12557)
60.V60           5  .73239 -1  .89080 -1  .82649 -1  .60629 -2 (.75121 -1,.90178 -1)
61.V61           5  .16092     .21667     .18261     .21161 -1 (.15634,.20888)
62.V62           5  .24138     .30185     .26640     .23717 -1 (.23695,.29585)
63.V63           5  .74713 -1  .87324 -1  .80273 -1  .51207 -2 (.73915 -1,.86632 -1)
64.V64           5  .13519     .15211     .14260     .63792 -2 (.13468,.15053)
65.V65           5  .16620     .18678     .17797     .86572 -2 (.16722,.18872)
66.V66           5  .15457     .18009     .16610     .92042 -2 (.15467,.17753)
67.V67           5  .12934     .13519     .13132     .24305 -2 (.12831,.13434)
68.V68           5  .53521 -1  .63091 -1  .57880 -1  .44071 -2 (.52408 -1,.63352 -1)
69.V69           5  .94787 -1  .10141     .97597 -1  .24579 -2 (.94545 -1,.10065)

DESCRIPTIVE MEASURES  <64> V16:64  CASES=CASE#:139-852
   VARIABLE      N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
    1.V1         5   14.000     17.000     15.400     1.1402    (13.984,16.816)
    2.V2         5   11.000     13.000     12.200     .83666    (11.161,13.239)
    3.V3         5   28.000     32.000     30.200     1.4832    (28.358,32.042)
    4.V4         5   12.000     12.000     12.000
    5.V5         5   20.000     22.000     20.800     1.0954    (19.440,22.160)
    6.V6         5   51.000     57.000     54.400     2.4083    (51.410,57.390)
    7.V7         5   22.000     23.000     22.400     .54772    (21.720,23.080)
    8.V8         5   43.000     46.000     44.000     1.2247    (42.479,45.521)
    9.V9         5   32.000     35.000     33.200     1.0954    (31.840,34.560)
   10.V10        5   21.000     24.000     22.200     1.0954    (20.840,23.560)
   11.V11        5   30.000     37.000     34.800     2.7749    (31.355,38.245)
   12.V12        5   38.000     39.000     38.200     .44721    (37.645,38.755)
   13.V13        5   6.0000     6.0000     6.0000
   14.V14        5   14.000     14.000     14.000
   15.V15        5   8.0000     8.0000     8.0000
   17.V17        5   573.00     686.00     622.80     54.815    (554.74,690.86)
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44.V44                 5  .56785      .58988      .57887      .10202 -1 (.56621,.59154)
45.V45                 5  .46313      .50084      .48341      .13564 -1 (.46657,.50025)
46.V46                 5  .36998      .39067      .38007      .76891 -2 (.37052,.38961)
47.V47                 5  .28103      .30716      .29237      .11058 -1 (.27864,.30610)
48.V48                 5  .14140      .15487      .14801      .62054 -2 (.14030,.15571)
49.V49                 5  .23156      .24456      .23757      .51403 -2 (.23119,.24395)
50.V50                 5  .14828      .16583      .15887      .74567 -2 (.14962,.16813)
51.V51                 5  .16248      .17586      .16810      .51150 -2 (.16175,.17445)
52.V52                 5  .29146      .31711      .30300      .10540 -1 (.28991,.31609)
53.V53                 5  .11799      .13089      .12546      .55110 -2 (.11862,.13231)
54.V54                 5  .10995      .11357      .11133      .15278 -2 (.10943,.11323)
55.V55                 5  .36207 -1  .40140 -1  .38181 -1  .16520 -2 (.36130 -1,.40232 -1)
56.V56                 5  .84483 -1  .97731 -1  .93069 -1  .53330 -2 (.86448 -1,.99691 -1)
57.V57                 5  .67241 -1  .77052 -1  .74126 -1  .40621 -2 (.69082 -1,.79170 -1)
58.V58                 5  .68966 -1  .73702 -1  .71527 -1  .20401 -2 (.68994 -1,.74060 -1)
59.V59                 5  .72414 -1  .82077 -1  .76990 -1  .36633 -2 (.72441 -1,.81538 -1)
60.V60                 5  .55394 -1  .60345 -1  .58191 -1  .18482 -2 (.55896 -1,.60486 -1)
61.V61                 5  .20942      .23451      .22181      .10815 -1 (.20838,.23524)
62.V62                 5  .30366      .34840      .33130      .18286 -1 (.30859,.35400)
63.V63                 5  .69808 -1  .86006 -1  .78020 -1  .77433 -2 (.68406 -1,.87635 -1)
64.V64                 5  .13966      .16415      .15202      .89839 -2 (.14086,.16317)
65.V65                 5  .18621      .19933      .19017      .53648 -2 (.18351,.19684)
66.V66                 5  .18276      .18928      .18565      .27933 -2 (.18218,.18912)
67.V67                 5  .14483      .16415      .15487      .78233 -2 (.14516,.16458)
68.V68                 5  .32759 -1  .43551 -1  .39180 -1  .41346 -2 (.34046 -1,.44314 -1)
69.V69                 5  .72271 -1  .83090 -1  .78727 -1  .44923 -2 (.73149 -1,.84305 -1)

DESCRIPTIVE MEASURES   <65> V16:65   CASES=CASE#:139-852

    VARIABLE           N  MINIMUM     MAXIMUM       MEAN       STD DEV     .9500 CONFIDENCE INT
   1.V1                5  13.000      14.000      13.800      .44721      (13.245,14.355)
   2.V2                5  11.000      12.000      11.200      .44721      (10.645,11.755)
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3.V3            5 29.000      30.000      29.800      .44721      (29.245,30.355)
4.V4            5 12.000      12.000      12.000
5.V5            5 17.000      20.000      18.400      1.1402      (16.984,19.816)
6.V6            5 58.000      63.000      60.600      2.4083      (57.610,63.590)
7.V7            5 21.000      23.000      22.000      .70711      (21.122,22.878)
8.V8            5 43.000      45.000      44.600      .89443      (43.489,45.711)
9.V9            5 37.000      43.000      39.800      2.5884      (36.586,43.014)
10.V10          5 23.000      25.000      24.200      .83666      (23.161,25.239)
11.V11          5 29.000      35.000      31.000      2.3452      (28.088,33.912)
12.V12          5 37.000      38.000      37.600      .54772      (36.920,38.280)
13.V13          5 6.0000      6.0000      6.0000
14.V14          5 14.000      15.000      14.200      .44721      (13.645,14.755)
15.V15          5 8.0000      9.0000      8.2000      .44721      (7.6447,8.7553)
17.V17          5 534.00      654.00      586.60      46.344      (529.06,644.14)
44.V44          5 .60067      .62232      .61386      .96099 -2 (.60193,.62580)
45.V45          5 .49813      .52708      .51260      .11766 -1 (.49799,.52721)
46.V46          5 .34296      .37309      .35462      .11946 -1 (.33979,.36945)
47.V47          5 .25468      .27288      .26562      .74606 -2 (.25636,.27488)
48.V48          5 .15356      .16780      .15982      .51775 -2 (.15339,.16625)
49.V49          5 .24719      .26173      .25426      .55171 -2 (.24741,.26111)
50.V50          5 .16292      .17304      .16854      .43663 -2 (.16312,.17397)
51.V51          5 .17041      .18231      .17750      .45673 -2 (.17183,.18317)
52.V52          5 .27617      .30122      .29141      .94305 -2 (.27970,.30312)
53.V53          5 .10112      .10856      .10315      .30952 -2 (.99310 -1,.10700)
54.V54          5 .11864      .12691      .12187      .37392 -2 (.11722,.12651)
55.V55          5 .28881 -1   .34942 -1   .30975 -1   .23194 -2 (.28095 -1,.33855 -1)
56.V56          5 .10300      .11814      .10889      .62906 -2 (.10108,.11670)
57.V57          5 .73034 -1   .77982 -1   .76628 -1   .20934 -2 (.74028 -1,.79227 -1)
58.V58          5 .81356 -1   .86142 -1   .83259 -1   .17654 -2 (.81067 -1,.85451 -1)
59.V59          5 .96506 -1   .10703      .10078      .47536 -2 (.94881 -1,.10669)
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60.V60              5  .66556 -1  .77982 -1  .70390 -1  .47747 -2 (.64462 -1,.76319 -1)
61.V61              5  .19492     .22296     .20544     .10476 -1 (.19243,.21844)
62.V62              5  .28644     .33278     .31327     .18010 -1 (.29091,.33564)
63.V63              5  .68592 -1  .79867 -1  .74234 -1  .40718 -2 (.69178 -1,.79290 -1)
64.V64              5  .14067     .15169     .14539     .50933 -2 (.13907,.15172)
65.V65              5  .16949     .19113     .17895     .83353 -2 (.16860,.18930)
66.V66              5  .16606     .19800     .17726     .13081 -1 (.16102,.19350)
67.V67              5  .13220     .13858     .13574     .28751 -2 (.13217,.13931)
68.V68              5  .48253 -1  .54237 -1  .50755 -1  .24504 -2 (.47713 -1,.53798 -1)
69.V69              5  .77966 -1  .93178 -1  .85344 -1  .63837 -2 (.77418 -1,.93270 -1)

DESCRIPTIVE MEASURES  <66> V16:66  CASES=CASE#:139-852
    VARIABLE        N  MINIMUM    MAXIMUM      MEAN      STD DEV    .9500 CONFIDENCE INT
   1.V1             5  13.000      15.000     14.000     .70711     (13.122,14.878)
   2.V2             5  12.000      13.000     12.200     .44721     (11.645,12.755)
   3.V3             5  29.000      30.000     29.600     .54772     (28.920,30.280)
   4.V4             5  11.000      12.000     11.800     .44721     (11.245,12.355)
   5.V5             5  21.000      24.000     22.200     1.3038     (20.581,23.819)
   6.V6             5  45.000      48.000     46.600     1.1402     (45.184,48.016)
   7.V7             5  20.000      22.000     20.800     .83666     (19.761,21.839)
   8.V8             5  38.000      42.000     40.200     1.4832     (38.358,42.042)
   9.V9             5  28.000      31.000     29.400     1.1402     (27.984,30.816)
  10.V10            5  20.000      24.000     21.400     1.6733     (19.322,23.478)
  11.V11            5  41.000      53.000     48.400     4.7749     (42.471,54.329)
  12.V12            5  37.000      38.000     37.600     .54772     (36.920,38.280)
  13.V13            5  6.0000      6.0000     6.0000
  14.V14            5  14.000      14.000     14.000
  15.V15            5  8.0000      8.0000     8.0000
  17.V17            5  352.00      951.00     667.80     259.17     (346.00,989.60)
  44.V44            5  .58044      .59659     .58642     .62326 -2 (.57868,.59416)
  45.V45            5  .46899      .50368     .48780     .14543 -1 (.46975,.50586)
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46.V46              5  .35331      .37755      .37008      .96284 -2 (.35813,.38204)
47.V47              5  .29112      .36383      .32206      .28657 -1 (.28648,.35764)
48.V48              5  .14205      .19138      .16464      .19535 -1 (.14038,.18889)
49.V49              5  .23286      .26705      .24640      .12770 -1 (.23054,.26225)
50.V50              5  .15986      .19033      .16996      .12658 -1 (.15424,.18568)
51.V51              5  .16477      .18612      .17292      .82805 -2 (.16263,.18320)
52.V52              5  .29022      .30141      .29585      .44894 -2 (.29027,.30142)
53.V53              5  .14556      .15625      .15142      .51492 -2 (.14503,.15782)
54.V54              5  .12840      .14090      .13432      .54801 -2 (.12751,.14112)
55.V55              5  .28409 -1  .39116 -1  .36247 -1  .44646 -2 (.30703 -1,.41791 -1)
56.V56              5  .97933 -1  .11080      .10132      .54248 -2 (.94587 -1,.10806)
57.V57              5  .71023 -1  .80967 -1  .75400 -1  .42391 -2 (.70136 -1,.80663 -1)
58.V58              5  .64200 -1  .99432 -1  .77073 -1  .13507 -1 (.60303 -1,.93844 -1)
59.V59              5  .91404 -1  .10208      .96684 -1  .46330 -2 (.90931 -1,.10244)
60.V60              5  .62024 -1  .68349 -1  .65491 -1  .27232 -2 (.62109 -1,.68872 -1)
61.V61              5  .14205      .22608      .18634      .30480 -1 (.14849,.22418)
62.V62              5  .27557      .37119      .31527      .38832 -1 (.26706,.36349)
63.V63              5  .68182 -1  .83333 -1  .74197 -1  .56727 -2 (.67154 -1,.81241 -1)
64.V64              5  .14796      .16761      .16046      .75351 -2 (.15110,.16981)
65.V65              5  .18878      .24432      .20560      .22215 -1 (.17802,.23319)
66.V66              5  .18934      .19849      .19443      .34139 -2 (.19019,.19867)
67.V67              5  .14489      .16824      .15625      .91977 -2 (.14483,.16767)
68.V68              5  .39698 -1  .48370 -1  .45246 -1  .32949 -2 (.41155 -1,.49337 -1)
69.V69              5  .85034 -1  .99432 -1  .89823 -1  .61831 -2 (.82146 -1,.97501 -1)

DESCRIPTIVE MEASURES   <67> V16:67   CASES=CASE#:139-852

    VARIABLE        N  MINIMUM     MAXIMUM       MEAN      STD DEV     .9500 CONFIDENCE INT
   1.V1             2  14.000      16.000      15.000      1.4142      (2.2938,27.706)
   2.V2             2  11.000      12.000      11.500      .70711      (5.1469,17.853)
   3.V3             2  31.000      31.000      31.000
   4.V4             2  12.000      12.000      12.000
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 5.V5          2  22.000     23.000     22.500     .70711     (16.147,28.853)
 6.V6          2  45.000     45.000     45.000
 7.V7          2  21.000     22.000     21.500     .70711     (15.147,27.853)
 8.V8          2  43.000     44.000     43.500     .70711     (37.147,49.853)
 9.V9          2  32.000     33.000     32.500     .70711     (26.147,38.853)
10.V10         2  21.000     22.000     21.500     .70711     (15.147,27.853)
11.V11         2  35.000     36.000     35.500     .70711     (29.147,41.853)
12.V12         2  37.000     37.000     37.000
13.V13         2  6.0000     6.0000     6.0000
14.V14         2  14.000     14.000     14.000
15.V15         2  8.0000     8.0000     8.0000
17.V17         2  352.00     409.00     380.50     40.305     (18.373,742.63)
44.V44         2  .59658     .59659     .59658     .98231 -5 (.59650,.59667)
45.V45         2  .50568     .51100     .50834     .37623 -2 (.47454,.54214)
46.V46         2  .35511     .36430     .35971     .64980 -2 (.30133,.41809)
47.V47         2  .29584     .29830     .29707     .17338 -2 (.28149,.31265)
48.V48         2  .15159     .15625     .15392     .32957 -2 (.12431,.18353)
49.V49         2  .25428     .27273     .26350     .13045 -1 (.14630,.38071)
50.V50         2  .17045     .17359     .17202     .22200 -2 (.15208,.19197)
51.V51         2  .18337     .19318     .18828     .69351 -2 (.12597,.25059)
52.V52         2  .28362     .28409     .28385     .33399 -3 (.28085,.28686)
53.V53         2  .13920     .14670     .14295     .52996 -2 (.95337 -1,.19057)
54.V54         2  .13203     .13352     .13278     .10560 -2 (.12329,.14226)
55.V55         2  .36675 -1  .36932 -1  .36803 -1  .18173 -3 (.35171 -1,.38436 -1)
56.V56         2  .10513     .11364     .10939     .60117 -2 (.55372 -1,.16340)
57.V57         2  .78240 -1  .85227 -1  .81733 -1  .49410 -2 (.37340 -1,.12613)
58.V58         2  .83130 -1  .93750 -1  .88440 -1  .75098 -2 (.20967 -1,.15591)
59.V59         2  .95355 -1  .99432 -1  .97393 -1  .28831 -2 (.71490 -1,.12330)
60.V60         2  .62500 -1  .68460 -1  .65480 -1  .42141 -2 (.27617 -1,.10334)
61.V61         2  .17848     .18182     .18015     .23575 -2 (.15897,.20133)
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 62.V62               2  .27841     .30073     .28957     .15786 -1 (.14774,.43140)
 63.V63               2  .73350 -1  .79545 -1  .76448 -1  .43811 -2 (.37085 -1,.11581)
 64.V64               2  .15648     .15909     .15779     .18467 -2 (.14119,.17438)
 65.V65               2  .19318     .19804     .19561     .34381 -2 (.16472,.22650)
 66.V66               2  .18750     .20293     .19522     .10913 -1 (.97163 -1,.29327)
 67.V67               2  .14670     .15057     .14863     .27357 -2 (.12405,.17321)
 68.V68               2  .36675 -1  .36932 -1  .36803 -1  .18173 -3 (.35171 -1,.38436 -1)
 69.V69               2  .78240 -1  .88068 -1  .83154 -1  .69499 -2 (.20712 -1,.14560)

DESCRIPTIVE MEASURES  <68> V16:68  CASES=CASE#:139-852
    VARIABLE          N  MINIMUM    MAXIMUM      MEAN     STD DEV    .9500 CONFIDENCE INT
     1.V1             4  14.000      15.000     14.750     .50000    (13.954,15.546)
     2.V2             4  12.000      13.000     12.250     .50000    (11.454,13.046)
     3.V3             4  32.000      33.000     32.250     .50000    (31.454,33.046)
     4.V4             4  12.000      12.000     12.000
     5.V5             4  20.000      23.000     21.000     1.4142    (18.750,23.250)
     6.V6             4  44.000      48.000     45.250     1.8930    (42.238,48.262)
     7.V7             4  20.000      24.000     21.750     1.7078    (19.032,24.468)
     8.V8             4  38.000      43.000     40.250     2.2174    (36.722,43.778)
     9.V9             4  28.000      32.000     30.000     1.8257    (27.095,32.905)
    10.V10            4  21.000      23.000     21.500     1.0000    (19.909,23.091)
    11.V11            4  35.000      42.000     39.750     3.2016    (34.656,44.844)
    12.V12            4  37.000      38.000     37.250     .50000    (36.454,38.046)
    13.V13            4  3.0000      6.0000     5.2500     1.5000    (2.8632,7.6368)
    14.V14            4  14.000      14.000     14.000
    15.V15            4  8.0000      8.0000     8.0000
    17.V17            4  383.00      488.00     422.50     46.220    (348.95,496.05)
    44.V44            4  .56762      .59530     .57770     .12278 -1 (.55816,.59723)
    45.V45            4  .47781      .50410     .49087     .10866 -1 (.47358,.50816)
    46.V46            4  .35248      .37343     .36109     .90866 -2 (.34664,.37555)
    47.V47            4  .28822      .31352     .30115     .10402 -1 (.28460,.31771)
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48.V48              4  .14787     .16710     .15628     .82729 -2 (.14312,.16945)
49.V49              4  .26110     .27569     .26781     .74028 -2 (.25603,.27959)
50.V50              4  .16449     .18546     .17678     .90211 -2 (.16243,.19114)
51.V51              4  .17857     .18852     .18381     .51744 -2 (.17557,.19204)
52.V52              4  .27937     .29508     .28403     .74022 -2 (.27225,.29581)
53.V53              4  .13577     .15369     .14198     .80290 -2 (.12920,.15475)
54.V54              4  .12857     .14035     .13484     .51159 -2 (.12670,.14298)
55.V55              4  .28721 -1  .35714 -1  .33077 -1  .31655 -2 (.28040 -1,.38114 -1)
56.V56              4  .10444     .11066     .10691     .29150 -2 (.10227,.11154)
57.V57              4  .73107 -1  .90164 -1  .83550 -1  .73087 -2 (.71920 -1,.95179 -1)
58.V58              4  .83333 -1  .91384 -1  .87638 -1  .33063 -2 (.82377 -1,.92899 -1)
59.V59              4  .10444     .12030     .11225     .68199 -2 (.10140,.12311)
60.V60              4  .73910 -1  .85213 -1  .78152 -1  .49906 -2 (.70211 -1,.86094 -1)
61.V61              4  .18277     .22951     .20072     .20170 -1 (.16862,.23281)
62.V62              4  .30548     .34836     .32104     .19331 -1 (.29028,.35180)
63.V63              4  .76190 -1  .81967 -1  .79196 -1  .27086 -2 (.74888 -1,.83508 -1)
64.V64              4  .15144     .16189     .15706     .46107 -2 (.14972,.16440)
65.V65              4  .19298     .20888     .20127     .65317 -2 (.19087,.21166)
66.V66              4  .17857     .19843     .18815     .90271 -2 (.17378,.20251)
67.V67              4  .13784     .15779     .14927     .83327 -2 (.13601,.16253)
68.V68              4  .52219 -1  .57644 -1  .55501 -1  .25448 -2 (.51451 -1,.59550 -1)
69.V69              4  .85714 -1  .92213 -1  .88579 -1  .31605 -2 (.83550 -1,.93608 -1)

DESCRIPTIVE MEASURES  <69> V16:69  CASES=CASE#:139-852
     VARIABLE         N  MINIMUM    MAXIMUM     MEAN     STD DEV    .9500 CONFIDENCE INT
   1.V1               1  13.000     13.000     13.000
   2.V2               1  11.000     11.000     11.000
   3.V3               1  28.000     28.000     28.000
   4.V4               1  12.000     12.000     12.000
   5.V5               1  22.000     22.000     22.000
   6.V6               1  40.000     40.000     40.000
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  7.V7              1  21.000       21.000       21.000
  8.V8              1  36.000       36.000       36.000
  9.V9              1  28.000       28.000       28.000
 10.V10             1  19.000       19.000       19.000
 11.V11             1  37.000       37.000       37.000
 12.V12             1  36.000       36.000       36.000
 13.V13             1  6.0000       6.0000       6.0000
 14.V14             1  14.000       14.000       14.000
 15.V15             1  8.0000       8.0000       8.0000
 17.V17             1  735.00       735.00       735.00
 44.V44             1  .59728       .59728       .59728
 45.V45             1  .47075       .47075       .47075
 46.V46             1  .38776       .38776       .38776
 47.V47             1  .31565       .31565       .31565
 48.V48             1  .16599       .16599       .16599
 49.V49             1  .25306       .25306       .25306
 50.V50             1  .17551       .17551       .17551
 51.V51             1  .17687       .17687       .17687
 52.V52             1  .31973       .31973       .31973
 53.V53             1  .14286       .14286       .14286
 54.V54             1  .12245       .12245       .12245
 55.V55             1  .39456 -1    .39456 -1    .39456 -1
 56.V56             1  .88435 -1    .88435 -1    .88435 -1
 57.V57             1  .73469 -1    .73469 -1    .73469 -1
 58.V58             1  .78912 -1    .78912 -1    .78912 -1
 59.V59             1  .69388 -1    .69388 -1    .69388 -1
 60.V60             1  .54422 -1    .54422 -1    .54422 -1
 61.V61             1  .20272       .20272       .20272
 62.V62             1  .35510       .35510       .35510
 63.V63             1  .77551 -1    .77551 -1    .77551 -1
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64.V64              1  .15918      .15918      .15918
65.V65              1  .20680      .20680      .20680
66.V66              1  .20544      .20544      .20544
67.V67              1  .17279      .17279      .17279
68.V68              1  .31293 -1  .31293 -1  .31293 -1
69.V69              1  .84354 -1  .84354 -1  .84354 -1
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