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Morphology of trophotaeniae within the subfamily Goodeinae (Goodeidae: Cyprinodontiformes)

The Goodeinae are a viviparous group of freshwater fishes (Cyprinodontiformes: Goodeidae) found in the Mesa Central of Mexico. The group contains 17 genera and 38 extant species. The embryos of every species in the subfamily are characterized by epithelial processes termed 'trophotaeniae' that extend from the perianal lip into the ovarian lumen. Trophotaenial tissue is the site of nutrient uptake and gas exchange in larval goodeids, and attributed to a massive increase in embryonic dry weight. Historically, these structures have been used, in part, as a diagnostic character for goodeid taxonomy. Trophotaenial tissue has been examined for morphological descriptive purposes but only for a few species, and four general types have been recognized. This presentation will utilize gross examination, along with high resolution scanning electron microscopy to evaluate surface characteristics of the trophotaeniae. Our study included nearly all of the species in the subfamily, making it the most comprehensive study to date. Larval specimens were extracted from females using one ventral incision from below the pelvic fin to the dorso-ventral axis. The trophotaeniae were then run through a series of graded ethanol washes, critically point dried, mounted, and sputter coated. Various trophotaenial features were quantified and analyzed in a phylogenetic comparative framework to examine the evolution of this historically important taxonomic character.