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Post-hatch ontogenetic changes and their functional significance in guppy fries (*Poecilia reticulata*) revealed by histology and osteology

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Poecilia reticulata (family: Poeciliidae) is an ovoviviparous fish whose fries live independently from birth. Records of ontogenic changes during early days of development in post-hatch guppy are rare. Present study shows developmental changes of post-hatch guppy fries from birth up to 10 days post-hatch (dph) stage in terms of osteology and histology. The functional significance of observed changes are discussed. Fry at birth (24 hour post-hatch), and 5 and 10 dph were studied (n=3-5), 1) for histology by staining with hematoxylin and eosin of both cross and transverse sections, 2) for osteology by staining with alizarin red. Newborn fry had ossified teeth. Jaw bones and axial skeleton were well ossified. Cranial bones were not completely ossified in newborns yet it seemed to occur with age. Gradual fusion of the second and third hypurals of the caudal element took place with changes in thickening of the caudal and pelvic fin rays suggesting an enhanced swimming capability. During early development, the photo-receptor cell layer in the eyes showed a marked increase in its thickness. Liver lipid vacuoles became distorted in shape and showed a decrease in their relative abundance. Cephalic kidney lumen seemed to be broadened and the swim bladder changed its shape with increased volume. In conclusion, the study revealed age-related gradual changes in bones and selected organs of functional significance during early development of guppy fries over 10 dph period. Notably, the newborn fry is already an active swimmer that resembles a miniscule adult.

Keywords: *guppy fry, ontogeny, osteological changes*

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