

Ultrastructure and enzymology of the pancreas of bullfrog (*Lithobates Castebeianus*) tadpoles during development and metamorphosis

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During metamorphosis the pancreas of the tadpoles suffer changes in its cell structure followed by enzymatic alteration, caused by food habit changes from omnivorous to carnivorous. The present work aimed to describe the histological changes of the pancreas and the activity profile of the enzymes amylase and trypsin of bullfrog (*Lithobates castebeianus*) tadpoles during development and metamorphosis. Analysis were performed at the “Centro de Aqüicultura CAUNESP”, FCAV-UNESP and FMRP-USP. Tadpoles were classified by Etkin (1968). The pancreas samples were fixed in Karnovsky and conserved in sodium cacodylate solution (pH 7.4). The histological procedures were performed according to the “Laboratório de Microscopia Eletrônica da FMRP-USP” protocols. For enzymology, the pancreas was homogenized in Tris-HCl buffer (pH 7.4) and aliquoted for posterior analysis of its activity according to the “Laboratório de Enzimologia Aplicada (FCAV/UNESP)” protocols. Changes in the pancreas ultrastructure were not observed during pre and prometamorphosis. Acinar cells showed a pyramidal shape, spherical nuclei at the basal region and zymogen granules at the apical region. Endocrine cells were identified by the shape, size and electrodensity of its secreting granules. A cells showed round and large granules, B cells showed small granules and C cells showed bacillus-like shaped granules. During the metamorphic climax, both endocrine and exocrine cells showed apoptotic features i.e. picnotic nuclei, cytoplasmic shrinking and an enlargement of the intercellular space. At the end of the metamorphosis, the pancreatic parenchyma was restructured. Amylase and trypsin activity was significantly higher ($p < 0.05$) during pre and pro-metamorphosis, with a peak occurring at the pro-metamorphosis (amylase = 14.13 U.mg^{-1} and trypsin = 120.23 U.mg^{-1}). However, during the metamorphic climax, there was a decline of this activity (amylase = 0.96 U.mg^{-1} e trypsin = 34.26 U.mg^{-1}), caused by the histological restructuring of the pancreas during metamorphosis. Histological and enzymatic changes of the pancreas of bullfrog tadpoles may be directly linked to adaptation changes caused by a new food habit, once that after metamorphosis tadpoles change its food habits from omnivorous to adults carnivorous.