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Organogenesis of the digestive system in Neotropical carnivorous freshwater catfish
Hemisorubim platyrhynchos (Siluriformes: Pimelodidae)

Claudemir Kuhn Faccioli^{a,b}, Renata Alari Chedid^a, Ricardo Hideo Mori^a, Antonio Carlos do Amaral^a, René Alberto Fuster Belmont^c, Irene Bastos Franceschini Vicentini^a, and Carlos Alberto Vicentini^{a,*}

^aDepartment of Biological Sciences, Faculty of Sciences and Aquaculture Center, São Paulo State University – UNESP, Bauru, SP, Brazil.

^bInstitute of Biosciences, Letter and Exact Sciences, São Paulo State University – UNESP, São José do Rio Preto, SP, Brazil.

^cHydrobiology and Aquaculture Station of Sao Paulo Energetic Company - CESP, Jupiá, SP, Brazil.

***Corresponding author:**

Dr. Carlos Alberto Vicentini

Department of Biological Sciences, Faculty of Sciences, UNESP, Av. Luiz Edmundo Carrijo Coube, 14-01, CEP: 17.033-360, Bauru, SP, Brazil. Phone: 55 14 31036078; fax: 55 14 31036092.

E-mail address: carlosav@fc.unesp.br.

Abstract

The morphological development of the digestive system of *Hemisorubim platyrhynchos* was studied from the day of hatching until 21 days post-hatching (DPH) using histology, histochemistry and scanning electron microscopy to augment the available knowledge regarding the organogenesis of the digestive system of carnivorous Neotropical fish. The development of the digestive system was divided into four major stages. Stage I (endotrophic period) starts with hatching and ends with mouth opening at 2 DPH. The digestive tract originated as a straight undifferentiated tube and ended as an esophagus with goblet cells, an incipient stomach, and an intestine divided in anterior, middle, posterior and rectum. Stage II (endo-exotrophic period) is from the onset of feeding to exhaustion of the yolk at 4 DPH. Stage III is the period in which the larvae rely exclusively on exogenous feeding but still have no functional stomach. Stage IV is an exotrophic period marked by the appearance of gastric glands at 15 DPH. At 20 DPH, the saccular stomach can be observed. Fish growth was largely variable over the time period studied, and the variability was predominant between the period in which the yolk was present and after its exhaustion. The mixed feeding period is short, and the larvae subsequently survive solely by exogenous feeding without a functional stomach for 15 days. During this period, the primary site of digestion is the anterior intestine, which presents with a saccular shape. The accessory glands, liver and pancreas, were differentiated at 2 DPH and thus contributed to

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