ABSTRACT

Sa-an, Analyn Castor S. University of the Philippines in the Visayas. 2004 Develoj ment of the Digestive System of Rabbitfish Siganus guttatus (Bloch): Histology and Histochemistry

Histology and histochemistry in the digestive tract were studied in rabbitfish Siganus guttatus from day 0 to day 50. The digestive tract of a newly-hatched rabbitfish larva started as a simple tube. Non-specific esterase activity was intensely demonstrated in the intestine at day 0 indicating the importance of the intestine in nutrient absorption. An enhancement of digestive capacity occurred with transition from endogenous to exogenous feeding. At the onset of exogenous feeding (day 2), differentiation of the digestive tract into buccal cavity, pharynx, esophagus, stomach. and intestine was observed. The primordial liver, gall bladder, and pancreas appeared at this age indicating the digestive functionality. At day 2, there was also a clear increase of aminopeptidase. alkaline phosphatase and non-specific esterase in the brush border of the intestine when the larvae started Brachionus feeding. The strong activity of aminopeptidase, alkaline phosphatase, and non-specific esterase enzymes is a clear confirmation of the importance of intestine for protein and nutrient absorption in early larvae. At day 4, the presence of lipid droplets and supranuclear vacuoles in the intestine concomitant with an increase in the activity of trypsin and maltase in the brush border suggests that protein, carbohydrate, and lipid digestion and ingestion had occurred. At day 8, the presence of spleen, mucus cells and pharyngeal teeth simultaneous with the differentiation of presumptive cardiac and pyloric stomach further shows the developed digestive capacity of the early larvae. At the onset of metamorphosis (day 20), the gastric gland and pyloric caeca were observed and coincided with the increased activities of non-specific esterase, trypsin, and maltase in the pyloric caeca. These findings strongly confirmed the significance of the pyloric caeca in protein digestion and nutrient absorption especially during transition from zooplankton to Artemia feeding. The presence of weak enzyme activities in the associated digestive organs suggests that they are secreted in these organs. These

histological and histochemical changes in the digestive tract indicate a correlation in dietary shifts throughout development.