

Ontogeny of proteolytic enzymes (pepsin, trypsin and chymotrypsin) of Stellate (*Acipenser stellatus*) from hatching up to day 50 post hatch

Ghasemi N.¹; Noori F.^{2*}; Imani A.¹; Shahrooz R.³

*f.noori@urmia.ac.ir

1- Dept. of Fisheries, Faculty of Natural Resources, Urmia University

2-Dept. of Biology and Aquaculture, Artemia and Aquaculture Research Institute, Urmia University

3-Dept. of Comparative Histology and Embryology, Faculty of Veterinary Medicine, Urmia University

Abstract:

The present study focused on ontogeny of digestive enzymes activity namely Pepsin, Trypsin and Chymotrypsin of *A. stellatus*. Stellate larvae, from the first day of hatch to day 50 of development, were randomly taken for enzyme assay. Specific enzyme activities of Pepsin, Trypsin and Chymotrypsin were determined. The Peptic activity was detected in one-day-old larvae with a sharp raise of enzymatic activity from day 8 post hatch forth, especially during the larval transition to exogenous feedings ($p < 0.05$). The activity of Trypsin in the first day of post hatch was 0.04 U.mg protein⁻¹ and with an increasing trend, the enzyme exhibited its highest activity on day 8 post hatch ($p < 0.05$). Generally, Tryptic activity was decreasing during the larval ontogeny of *A. stellatus*. The highest activity of Chymotrypsin was also recorded on the day right after hatching ($p < 0.05$ 0.03 U.mg protein⁻¹). With some rises in the activity of the enzyme on days 15 and 31, however, in general the fish showed a decreasing trend in specific Chymotryptic activity up to day 50-post hatch. Pearson correlation revealed that specific activity of Pepsin of samples were negatively related to alkaline proteolytic enzymes activity (Trypsin and Chymotrypsin) meaning that concomitant with maturation of digestive tract of the Stellate, the gastric digestion of proteins became dominant ($p < 0.05$). In conclusion, development of stomach in those fish with functional stomach might be indicative of onset of acid Protease digestion, precedence of extracellular digestion to intracellular one and efficient use of dietary protein through post-larval life.

Keywords: Digestive tract, Stellate larvae, proteolytic enzymes, Sturgeons, *Acipenser stellatus*

*Corresponding author