

Microscopic structure of the intestine of beluga (*Huso huso*) from hatching until ranching to sea

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Abstract

Microscopic structure of intestine of beluga was studied from hatching until releasing to sea. Larvae were fixed in bouin's solution, dehydrated and embedded in paraffin wax. Sections of 5-7 μm thick were produced and stained according to standard histological techniques: Hematoxylin-Eosin (H&E) and Periodic Acid Schiff (PAS). One day old larvae possessed a primordial intestine, which is lined by a simple columnar ciliated epithelium. At 3 days after hatching, an oblique furrow of the digestive tube wall started to develop on the dorsal- posterior region of the yolk sac and divided the alimentary canal into two differentiated regions: the future stomach and intermediate intestine. At this time spiral valve started to differentiate. Granules of embryonic pigment accumulated in the spiral valve lumen forming the melanin plug. At 7 days after hatching intermediate gut and spiral gut were lined by a columnar ciliated epithelium. The terminal section of the digestive tract was differentiated into a short rectal duct lined with a cuboidal epithelium. The urinary bladder connected with rectum at this time. At 13 days after hatching the number of vacuoles filled with lipid increase in intermediate gut and spiral gut. Between 17-19 days post hatching beluga larvae have a period of mixed nutrition. At 25 days after hatching cells of intermediate gut showed long microvilli. At 36 days after hatching the number of goblet cells increased in spiral gut. At 43 days after hatching several intestine glands were visible in connective tissue of intermediate gut which was lined by a simple columnar ciliated epithelium. Between 57-75 days after hatching the number and size of mucosal folds increased in intestine. This information may be useful to improve rearing efficiency of beluga and the other sturgeons.

Keywords: Microscopic structure, Digestive tract, Intestine, Beluga (*Huso huso*), Larval stages

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