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Title: Anatomical and histological characteristics of the intestine of the Topmouth Culter (*Culter alburnus*)

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Abstract: Topmouth culter (*Culter alburnus*), a freshwater carnivorous fish of the Cyprinidae, is one of the most popular fish species in aquatic market in China. The anatomy and histology features of fish intestine are very useful for understanding digestive physiology, diagnosing some intestinal diseases and formulating suitable feeds. Thus, here we first characterize topmouth culter intestine via light microscope, transmission electron microscope and scan electron microscope. The 'Z' shaped intestine can be divided into three parts (e.g. the anterior intestine, middle intestine and posterior intestine), with an intestinal coefficient of 0.68. The anterior intestine possessed the longest mucosa folds and thickest muscularis among the three intestinal parts, and microvilli were very well-developed whilst many mitochondria, endoplasmic reticuli and lysosomes were found in which. This indicated the anterior intestine was a main region for digestion and absorption of food in the topmouth culter. While the vacuoles observed in the posterior intestine may be closely related to the intracellular digestion. Neutral and acid mucus were strongly present throughout the intestine. This detailed descriptive paper will be very helpful for studies of topmouth culter related to its digestive physiology, intestinal disease control and feed nutrient.

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