

Distribution of CCK-IR cells in the digestive tract of the Gobiidae from Jeju Island, Korea

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Introduction

Cholecystokinin (CCK) is a major hormone controlling digestion. In teleosts, CCK has been shown to retard gastric emptying (Olsson *et al.*, 1999), regulate the secretion of pancreatic enzymes, stimulate gall bladder contractions *in vitro* and *in vivo*, and regulate intestinal peristalsis (Aldman and Holmgren, 1987; Einarsson *et al.*, 1997; Rajjo *et al.*, 1988; Andrew and Young, 1988; Aldman *et al.*, 1992). The digestive tract of most teleosts consist of an oral cavity, pharynx, stomach, intestine, rectum and anus. However, since the feeding habits of these fish differ by species and the environment that they inhabit, the morphologies and structures of their digestive tracts differ as well (Tanaka, 1969). In this study, we investigated the distributions and characteristics of CCK-producing cells with respect to the habitats and ingesta of individual species in order to provide a basis for understanding the digestive physiology and biology of the Gobiidae.

Materials and Methods

S. geneionema and *C. gulosus* were collected from the Hamdeok-ri coastal area of Jeju Island, Korea. *T. obscurus* and *R. giurinus* were collected from an estuary at Cheonjiyeon waterfall on Jeju Island. CCK-immunoreactive (IR) cells were visualized using the avidin-biotin complex (ABC) method. After the sections were deparaffinized and rehydrated, they were incubated in 0.5 mM periodic acid to block endogenous peroxides. After rinses, nonspecific binding was blocked with 10% normal goat serum. After rinses, primary CCK antiserum was added and the slides were incubated. After rinses, the sections were incubated in anti-rabbit goat serum. After rinses, the sections were incubated with strept avidin labeled peroxidase. After rinses the DAB substrate system was added for peroxidase reactions.

Results

1) *Sagamia geneionema*

CCK-IR cells were not detected in the esophagus. Thus, the highest frequency was observed in the anterior intestine portion, with decreasing frequencies toward the rectum.

2) *Chasmichthys gulosus*

CCK-IR cells were observed from the anterior to the mid intestine portion. Thus, from the anterior intestine portion to the mid intestine portion, the frequency of CCK-IR cells rapidly decreased.

3) *Tridentiger obscurus*

CCK-IR cells were observed in the anterior and mid intestine portion. Thus, CCK-IR cells were scattered throughout the anterior and mid intestine portion.

4) *Rhinogobius giurinus*

CCK-IR cells were observed only in the anterior and mid intestine portion. Thus, compared to the anterior intestine portion, the frequency of CCK-IR cells in the mid intestine portion was greatly decreased.

References

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