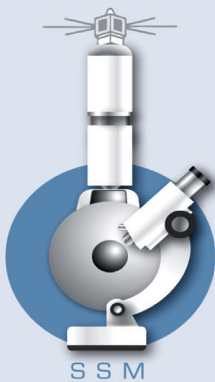


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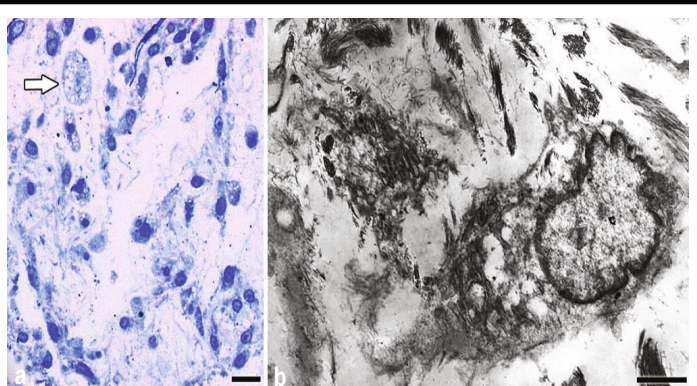


Image description: Representative micrographs of semi-thin (a, $\times 40$; bar, $12.5\ \mu\text{m}$) and ultra-thin (b, $\times 6000$; bar, $1\ \mu\text{m}$) sections obtained from the umbilical cord. Arrow, Hofbauer cells; a and b, Hofbauer cells at the light and electron microscopic levels, respectively

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The Olfactory Mucosa of Butter Catfish *Clupisoma garua* (*Siluriformes*, *Ailiidae*): An Ultrastructural Study

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Abstract

Objective: The olfactory system is one of the most important chemosensory systems for teleosts. The olfactory epithelium of freshwater catfish *Clupisoma garua* (*Siluriformes*, *Ailiidae*) was studied by the aid of light microscopy and transmission electron microscopy. **Materials and Methods:** Mature sex-independent fish species were collected from Hooghly River, a distributary channel of river Ganga. Following routine procedure of ultrastructural techniques, different sensory and nonsensory cells lining the olfactory epithelium were described. **Results:** The lamella contained two epithelia, with a central core sandwiched in between. Based on distribution pattern and structural characteristics of cell, each olfactory lamella was differentiated into sensory and nonsensory epithelium. The smaller sensory epithelium contained morphologically distinct ciliated, microvillous, and rod receptor cells, distinguished based on staining patterns, characteristic length, and architecture of their dendritic terminals. The nonsensory epithelium comprising the greater surface area was made up of labyrinth cells, mast cells, supporting cells, ciliated nonsensory cells, and basal cells. The cilia furnished a characteristic 9 + 2 microtubule arrangement. **Conclusion:** The functional significance of various cells on the olfactory epithelium was correlated with behavior of the fish concerned.

Keywords: Cellular structure, chemosensory system, *Clupisoma garua*, olfactory epithelium, transmission electron microscopy

INTRODUCTION

The olfactory organs of teleosts are of majestic biological concern as serve for crucial role in kin recognition, mate selection, food finding, predator avoidance, homing, and other behavioral activities.^[1] Survive in aquatic habitat, without light but abundant with dissolved compounds, the chemosensory organs of fish exhibit remarkable adaptations according to ecological habitats and taxonomic levels.^[2] The olfactory organ is apparently sheathed by epithelium which performs a momentous role in chemoreception.^[3] Olfaction of fish is concerned to study as the olfactory organ directly interacts with the surrounding aquatic environment and marks the external chemical stimuli in various ways. The olfactory system accords when odorants affix to molecular receptors located on olfactory receptor neurons within the olfactosensory epithelium.^[4] Many reports are available on the fine structure of the olfactory epithelium in a number of fish species.^[5-12] The gross morphology, topology, and cellular organization of olfactory organ variegate considerably among teleosts. The

number of olfactory lamellae and the distribution of receptor cells on the epithelial surface mediate the sensory distinctness of the fish.^[13] The disposition and texture of olfactory cells among different teleosts have been extensively characterized and reported diverse types of sensory receptor cells having precise sort of attentiveness for distinct chemical cues. The term olfaction implies the system devised by the bipolar sensory neurons of the olfactory mucosa.^[14]

Structural organization of the olfactory system is necessary to annotation of the olfactory execution. *Clupisoma garua* (Hamilton, 1822), a bottom dweller river catfish, feeds mostly on insects, mollusks, small fishes, decaying, and algal matter.^[15,16] Only a few studies are reported on surface morphology and histology of olfactory organ in schilbid catfish.^[17,18] Considering the dearth of information, the present

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