

Research Article

Cellular organization of the olfactory epithelium during growth, maturation, spawning and post-spawning phases of freshwater catfish, *Eutropiichthys vacha* (Hamilton, 1822) (Teleostei: Siluriformes)

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Abstract: Cytological status of olfactory epithelium during different reproductive phases of *Eutropiichthys vacha* (Hamilton, 1822) were described by light microscopy. The olfactory organ was composed of various lamella contained two principal layer: olfactory mucosa and central core, radiated from midline raphe. A sharp divergence existed between the mucosa of the olfactory lamella and raphe. The olfactory mucosa was distinguished into sensory and non-sensory epithelium, which consisted of polymorphism of receptors, supporting, labyrinth, mucous and basal cells. The central core was made up of loosely disposed connective tissue, nerve fibres and blood capillaries. A well-developed basement membrane was clearly distinguishable in between the olfactory epithelium and central core. The seasonal changes of the olfactory mucosa during growth, maturation, spawning and post-spawning phases was characterized by considering the tallness and architecture of the receptor cells as main criteria along with commute cellular features and staining patterns of different cell types. The structural components of the olfactory epithelium were correlated with the olfaction in the life of fish concerned.

Keywords: Schilbeidae, Olfactory epithelium Histology, Annual cyclical changes, Receptor cells.

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Introduction

Teleosts utilize olfaction modalities to ascertain water soluble compounds to carry information about the surrounding aquatic environment. Olfaction plays an important role to mediate behaviour from feeding and predator detection (Valentinčič 2005) to social interaction and reproductive synchrony (Farbman 1994; Sorensen & Caprio 1998; Hamdani et al. 2008). In fish, water with chemical cues enters into the olfactory cavity through nares; resulting the receptor neurons lining the olfactory mucosa forthwith contact to water contaminants. The receptor cells of the olfacto-sensory epithelium are

stimulated when they are exposed to determinate chemicals carried in water and transmit signals to the nervous system (Lara 2008).

Relative anatomical and histological studies have reported a wide range of variation arises in the structure of olfactory organs (Mana & Kawamura 2002; Kasumyan 2004; Hansen & Zielinski 2005; Chakrabarti & Ghosh 2010; Kuciel et al. 2011; Waryani et al. 2013; Patle & Baile 2014; Kim & Park 2016; Ghosh et al. 2017) as result of differing environments where teleost fishes inhabit. The ecological niche hold by fish species has an august impression on its texture and level of specialization