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ARTICLE

Bactericidal activity of skin mucus and skin extracts of *Catla catla* and *Channa striatus*

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ABSTRACT Fishes counteract certain microbial attacks in water by producing antimicrobial proteins/peptides in their skin surface. The present study focused on screening the bactericidal activity of skin and skin mucus extracts of *Catla catla* and *Channa striatus*. The bactericidal activity was assessed against *Escherichia coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Proteus vulgaris*, *Aeromonas hydrophila*, *Staphylococcus aureus* and *Bacillus coagulans* by disc diffusion method. The minimal inhibitory concentration was also determined. Protein profiles in skin and skin mucus extracts were analyzed by SDS-PAGE. Samples from both fishes showed antibacterial activity. Detailed analysis of individual protein and peptide would throw light on their medicinal importance to be used against pathogenic microbes. **Acta Biol Szeged 64(1):11-16 (2020)**

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Introduction

Fishes have great economic value due to their taste and rich protein content. In an aquatic environment, a myriad of pathogenic and non-pathogenic organisms is present. Occasionally, fish cultivation results in enormous loss because of infectious diseases caused by the pathogenic microorganisms. Antibiotics are being utilized to manage these diseases; however, pathogens develop resistance against several antibiotics (Lalumera et al. 2004). At the same time, fishes possess excellent defense system against the pathogens by producing biochemically diverse secretions which mainly act on bacterial membranes and induce cell lysis.

The mucus layer on the surface of the fish is constantly replaced, which possibly prevents stable colonization by parasites, bacteria and fungi. Skin secretions have a broad range of polypeptides with antimicrobial properties (Uthayakumar et al. 2012). The bioactive substances like lysozyme, lectins, proteolytic enzymes, flavoenzymes, immunoglobins, C-reactive proteins, apolipoprotein A-1 and antimicrobial peptides are constitutively expressed in the mucus to provide immediate protection to fish against potential pathogens (Kitani et al. 2008).

Further, the mucus layer of the fish skin is presumed to perform several other functions, viz., acts as a lubricant, serves as a barrier for microbial entry, maintains osmoregulation, plays a role in locomotion and pheromone communication (Hellio et al. 2002). By nature, antimicrobial peptides (AMPs) are secreted by the fish skin and function as a first line defense against the microbial attacks. They protect the fish against a wide variety of bacterial, fungal, viral, and other pathogenic infections by disruptive "lytic" or pore-forming "ionophoric" actions (Smith et al. 2010). Fish epidermal mucus AMPs have demonstrated a broad spectrum of activity that is 10-100 times more potent than that of their amphibian counterparts against various fish and human pathogens (Park et al. 1998).

Proteins or peptides present in the fish skin mucus form pores on the bacterial membrane that cause oozing out of cellular contents. This alters the regular ionic gradients of membrane and eventually leads to the death