

**On Structure of Epidermis of an Amphibious
Mudskipper, *Boleophthalmus pectinirostris* (Pisces:
Gobiidae)**

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Introduction

Mudskippers, gobiid teleosts as *Boleophthalmus*, *Periophthalmus*, *Periophthalmodon*, and *Scartelaos* are amphibious, and mostly inhabit mangrove and mudflat areas of intertidal zone. They spend the greater part of their lives on land and are exposed to atmosphere during low tide. For their terrestrial locomotion, they have been known as air-breathing fishes, which use air directly through the skin, called cutaneous respiration. In *Boleophthalmus* and *Periophthalmus*, many physiological studies on aerial respiration have been carried out (Johanson, 1970; Tamura *et al.*, 1976; Niva *et al.*, 1981; Graham, 1997). In *Boleophthalmus pectinirostris* inhabiting intertidal zone of Korea, we observed the structure and histochemistry on the epidermis of the body and fin skin, and compared the thickness and the diffusion distance.

Materials and methods

The two specimens collected from Nampo-ri, Gangin-up, Gangin-gun, Jeollanam-do in the southern coast of Korea and were 133.0 and 138.9 mm in standard length. The specimens were fixed in 10 % neutral buffered formaldehyde. Skin fragments were taken from two different regions, the upper jaw and the dorsal fin. For histochemistry, we Ehrlich hematoxylin and counter-stained with eosin, and Masson trichrome stain, AB (pH 1.0 and 2.5), AB and PAS, toluidine blue.

Results and summary

The epidermis of the upper jaw and first dorsal fin of the amphibious mudskipper fish, *Bleophthalmus pectinirostris*, consists of three layers: the outermost

layer, middle layer and stratum germinativum. The outermost layer consists of polygonal cells and rather flattened cells arranged in one to eight layers. In between these cells, small ovoid cells and mucus cells are present. The small cells are ovoid to round with an inclusion of fine granules, which are weakly positive to acid chemical reaction. The mucus cell are acid mucopolysaccharide in nature. The middle layer consists of 1 to 50 layers of small or voluminous cells swollen by epidermal cells. Owing to various sizes and layers of the voluminous cell, the middle layer shows a web-like structure. The stratum germinativum consists of a single layer of cuboidal cells, or more or less columnar cells. A dermal bulge is located at each apical area of the upper jaw but does not exist in the first dorsal fin. In the jaw, the dermal bulge is sparsely occupied by dermal tissue and has dermal capillaries just beneath the stratum germinativum. The dermal bulge deeply penetrates into the epidermis where becomes greatly reduced in thickness.

References

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