

Abstract

Milkfish (*Chanos chanos*) is a euryhaline fish and is widely distributed around sub-tropic Indo-Pacific waters. It has an adipose eyelid in the cephalic region which covers the whole eye. A chamber exists in between eye and the eyelid, and the chamber is filled with liquid. The histological sections with different staining methods and SEM results showed that there were three distinctive layers in the adipose eyelid. The outer and inner layers were the epithelial tissues and the middle layer was the connective tissue. This connective was formed by type I collagen fibril.

The osmolarities of the fluid inside the chamber were always higher than those of ambient water and the variations were always higher than those of the plasma. The immunohistochemical and Western blotting results revealed one type of ion transporter proteins, Na^+/K^+ ATPase (NKA), which likely participated in osmoregulation on the outer epithelial layer of the eyelid. The type I collagen fibrils offered the adipose eyelids tensile strength to resist the impact. The higher osmolarities of chamber liquid provided the turgor pressure which made the fluid chambers to act as dampers to absorb the impacting force from ambient water molecular when in high speed cruising.

Light wavelength shorter than 300 nm was filtered out by the adipose eyelid, but the adipose eyelid didn't participate in eye focusing. Because of the different habitat and feeding modes between the larval and juvenile milkfish, the

microspectrophotometry (MSP) data showed that the juvenile milkfish had rod cells, red, blue, and green cone cells while the larval milkfish had additional violet cone cells.

Keyword: type I collagen fibril, osmoregulation, immunostaining, Western blotting, transmission, vision.

