

## Ultrastructural Study of Gills of the *Aphanius dispar* (Rüppell 1828) (Pisces: Cyprinodontidae)

T.A. Ba-Omar, R. Al-Ghanbousi and R. Victor

Department of Biology, College of Science, Sultan Qaboos University, P.O.Box 36, Muscat 123, Oman taher@squ.edu.om

The Killifish *Aphanius dispar* (Rüppell 1828) (Pisces: Cyprinodontidae) is found freshwater in brackish water of the Middle East. It has the ability to tolerate salinity and different temperatures.

Fish were collected from Wadi Tewi (Latitude: 22° 49' 42 N, Longitude: 59° 15' 30 E) Oman and brought into the laboratory where they were acclimatized for at least ten days in glass tank. The fish were fed on commercial feed Tetra Min® (Tetra GmbH, D-49304, Germany) contain 47% protein and Hikary Tropical (KYORIN CO., LTD, Japan) contain 59% protein. The fish were killed by placing them in ice for few minutes. Then they were dissected out for their gills. The gills were fixed in Karnovsky buffered with sodium cacodylate to a pH of 7.4 for four hours and then cut into small pieces. The tissue were washed in cacodylate buffer and then post-fixed in 1% aqueous solution of osmium tetroxide for 1 hour and dehydrated in a series of alcohol before embedding in Agar 100 resin. The semi-thin sections were stained with toluidine blue and the sections were examined under light microscope. The ultra-thin sections were stained with uranyl acetate and post-stained in lead citrate. They were examined under JEOL JEM -1230 TEM.

Each gill has primary and secondary lamellae. The primary lamellae possess four types of cells; basal cells, chloride cells, accessory cells and pavement cells (PVC) (Fig.1). The chloride cells (also called mitochondria-rich cells) were often distributed in the interlamellar region and were characterized by abundant mitochondria associated with system of regularly branching and anastomosing tubular (Fig. 2). Accessory cells (also called filament-rich cells) are flat and found between neighboring chloride cells and have denser cytoplasm than chloride cells and have few mitochondria (Fig. 1). Secondary lamellae epithelium consists of two epithelial cell layers separated from the pillar cell by a basement membrane (Fig. 3). In addition, secondary lamellae PVC are polygonal in shape, and display smooth surface with only long microridges running parallel to the cells (Fig. 3).

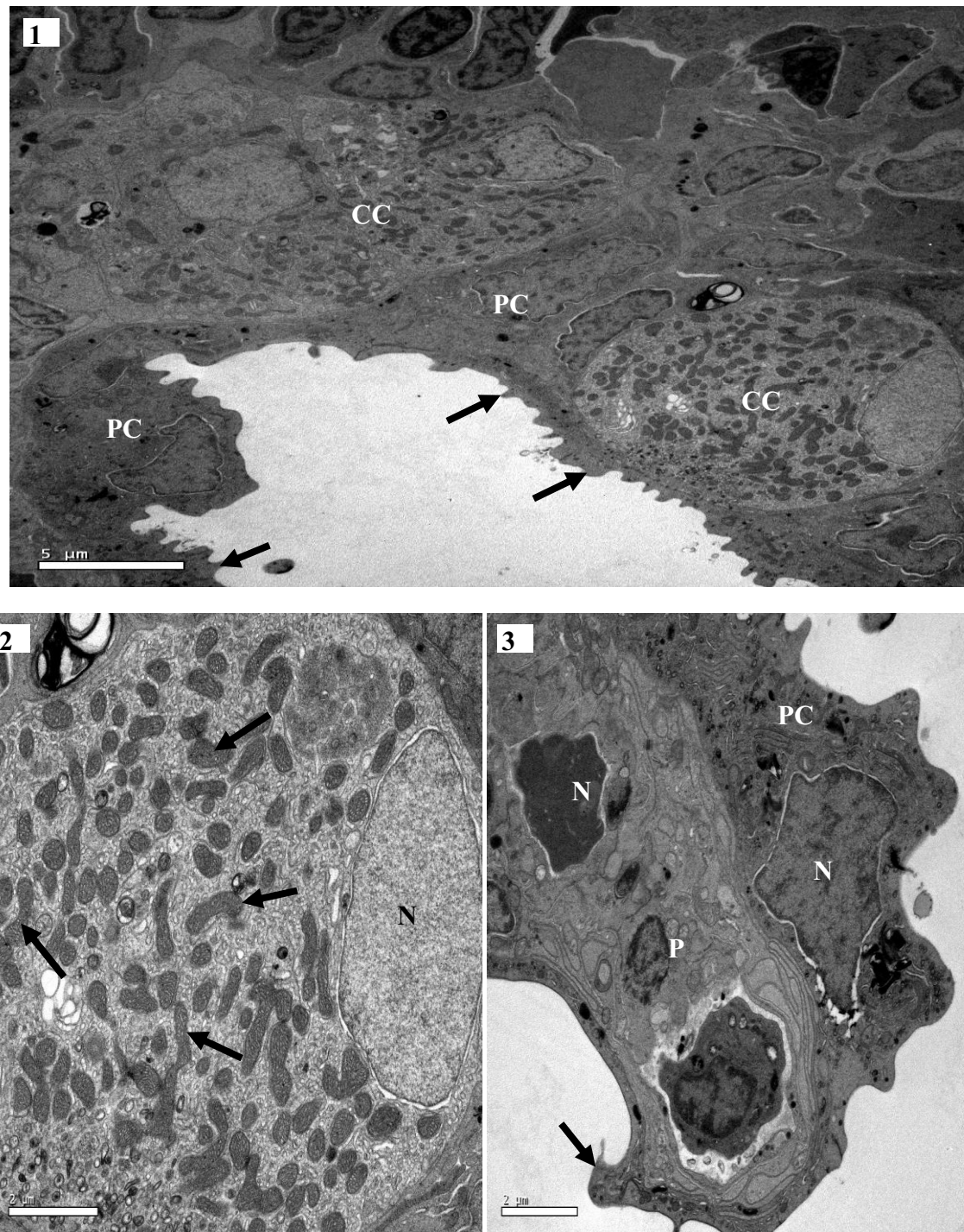


Fig. 1. Electron micrograph of the gill showing chloride cell (CC); pavement cells PC. Scale bar = 5μm

Fig. 2. Electron micrograph showing chloride cell with its nucleus (N); mitochondria (arrows). Scale bar = 2μm

Fig. 3. Electron micrograph showing pavement cell (PC); pillar cell (P) and microridge (arrow). Scale bar = 2μm