Topography, Macroscopic and Microscopic Anatomy of Kidney of *Oreochromis niloticus*

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Tilapia nilotica (*Oreochromus niloticus*) is a very successfully established fresh water fish species in Sri Lanka and an understanding of its biology is very important in maintaining the species in optimum health and production. A study was undertaken on the morphology of its organ systems and this paper describes the topography and macroscopic and microscopic structure of the kidney.

Nine adults were dissected from the left flank. All organs were removed to observe the topography and gross anatomy of the kidney. For histology, whole fish were fixed in 10% formal saline and decalcified in EDTA. Selected samples were processed, sectioned and stained with Hematoxylin and Eosin for light microscopy. As with other fish, two sets of paired kidneys, the head kidney (HK) and posterior or trunk kidney (PK) were identified. The dark brown HK was located in the pharyngeal region and each had two lobes. One lobe was directed caudally along the body wall while the other extended cranially within the hypaxial muscles. The dark red PK was located retroperitoneally ventral to vertebral column and ran along the entire length of the body cavity. The two PKs although separate in the cranial half, were fused caudally. Microscopically, the HK showed a thin connective tissue capsule and mainly consisted of islands of red blood cells outside the sinusoidal spaces and epithelial-lined tubular structures similar to mesonephric tubules. Degenarating mesonephric tubules in the HK have been reported to be replaced by hemopoetic tissue in other species of fish. Numerous large irregular cells with yellow-brown cytoplasm with eccentric nuclei were identified as melano-macrophages. The parenchyma of the PK consisted mainly of renal corpuscles, renal tubules and collecting ducts. Four distinct regions based on epithelial structure are identified in other studies - neck segment, proximal segments 1 and 2 and a distal segment - were also identified in the present study. The neck segment had a non-ciliated low columnar epithelium. Proximal segment 1 showed a tall columnar epithelium with central nuclei and densely packed brush border. Proximal segment 2 showed basal nuclei and a low brush border of reduced density resulting in a larger lumen. The distal segment which opens to the collecting duct was characterized by low columnar cells with central nuclei without an apical brush border. The collecting duct had a taller epithelium surrounded by a thin layer of smooth muscle followed by connective tissue. A few melano-macrophage centers and corpuscles of Stannius comprising concentric basophilic cellular laminae surrounded by a fibrous capsule were also present. There were large irregular eosinophilic inter-renal cells with round central nuclei. From the present observations it may be concluded that the PK is the functional kidney in the adult.