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Morphological and Histological Study of Uropygial Gland in Moorhen (*G. gallinula C. choropus*)

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Abstract: Eighteen healthy moorhens obtained to describe the anatomical and histological structures of uropygial glands. The gland in moorhen composed of two lobes, each one has a single uropygial duct and they joined together by isthmus. Uropygial gland is embedded beneath the skin in a mass of fatty tissue, they surrounded by a connective tissue capsule apparently devoid of muscle fibers and receives its blood supply from the caudal artery, and drained by the caudal vein. The gland parenchyma consist of a highly developed trabeculae packed with tiny parallel secretory tubules, smooth muscle fibers are founds around these trabeculae and also forms a sphincter at the nipple of excretory ducts.

Key words: Papillae wide, trabeculae, isthmus

Introduction

The name moorhen is misleading and is, in fact, a corruption of mirehen or marshhen, which gives a much truer picture of its natural habitat. Since, however, it is essentially a wild bird of an independent nature, Easily separated from Coot by white under-tail feathers (which it raises frequently) and white flank stripe. Colorful red and yellow bill. Moorhens are one of the winter visitors of the Iraq marshes (Allous, 1961). Uropygial gland is specialized pair of oil sebaceous glands with raised portals of ducts (David, 1999). The gland may be considered as the only organized tegumentary structure of external secretion typical of birds, in some species it may be vestigial or absent such as in Rheidae, Psittacidae and Columbidae (Johnston, 1988). The bilobal gland is enclosed in a capsule of connective tissue and lies at the base of the tail, each lobe has a central cavity that collects the secretion from tubules arranged radially around the cavity (Jacob, 1976). The gland secretion is conveyed to the surface via ducts that, in most birds, opens at the top of papillae (Kolattukudy, 1981).

The uropygial gland excrete their secretion via the uropygial duct which project from the primary cavity and extends for the apex of the glands papillae which opens at the porus ductus uropygialis (Bhattacharyya, 1972; Lucas and Stettenheim, 1972; King and McLelland, 1984; Shawkey *et al.*, 2003). Each lobes shows the primary cavity which appears rounded crainally and narrow caudally at the uropygial canal enterance (Getty, 1975).

The glands in Geese consist of two lobes; each lobe has a single uropygial duct. Both lobes were joined together by extremely wide isthmus and there was a barrier separated between these lobes the interlobular septum. The lobes covered by a capsule of dense connective tissue intermediate by blood vessels and nerves (Hayder, 2005).

The histological organization of the gland is that of sebaceous gland, the trabecular epithelial cells are classified into germinative, intermediate, and secretory cells (Jacob and Ziswiler, 1982). The structure of the glands lobe is very peculiar in *Columba livia*, the epithelial cells are surrounded by a connective tissue septa and don't form tubules that joins in a central cavity. At the periphery of the cells bundles there was a small germinative layer in which the intermediate and secretory cells are arranged in mosaic-like pattern and the degenerative cells are rarely shows (Jacob and Zeman, 1972). In the present study due to the lack information on the morphological and histological structures of uropygial gland in moorhens this study was suggested.

Materials and Methods

Eighteen adult moorhens (*Gallinula c. choropus*), 700-900 grams weights of both sexes collected from the local market of Basrah city, Iraq. (Fig. 1). The birds were decapitated and vascular perfusion with 10% neutral formalin via the descending aorta was done before removal the gland. The gross anatomical features were verified and latex injection into aorta at the base of the heart were prepared for the purpose of nutrient blood supply study.

For histological study uropygial lobes were removed and immediately post-fixed in 10% neutral formalin for 24 hours. The specimens were washed in current water, dehydrated in aggraded series of alcohol, cleared in xylol and embedded in paraffin wax, serial sections of five micrometers thick were made, mounted on slides and stained with hematoxylin and eosin (Luna, 1968).

Results and Discussion

The uropygial gland in moorhen possessed two lobes lies on the base of the tail, over the pygostyle muscles.



Fig. 1: The moorhen *Gallinula c. choropus*

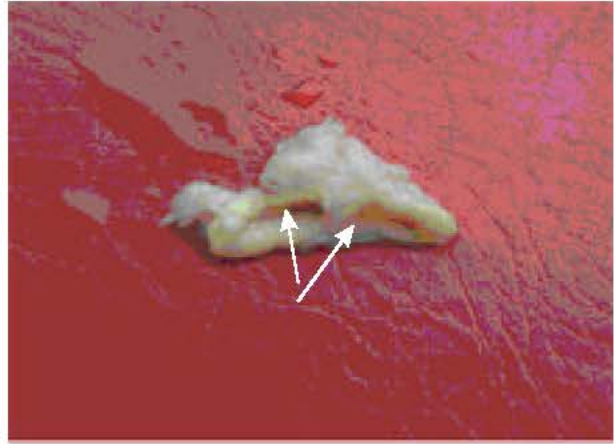


Fig. 4: Internal opening of uropygial ducts

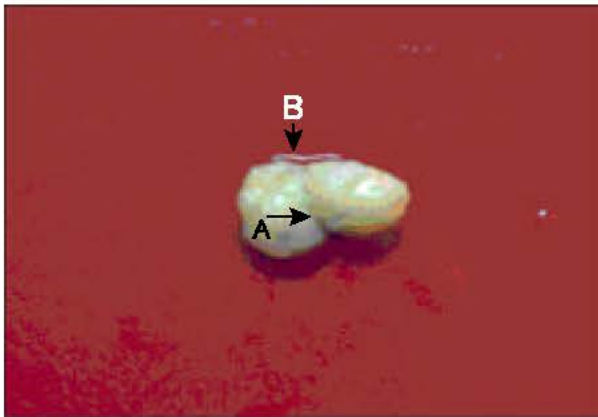


Fig. 2: Dorsal surface of uropygial lobes
A-Interlobar septum B-Isthmus

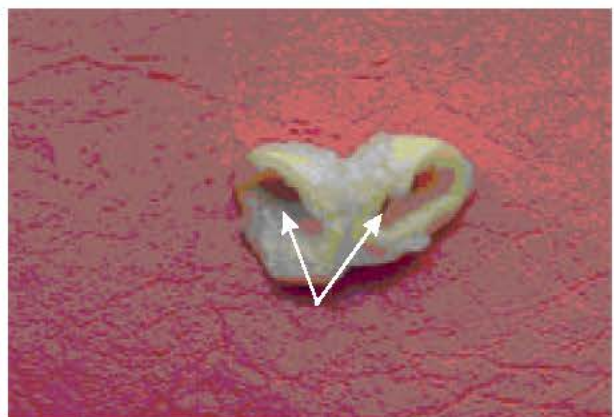


Fig. 5: The cavity of uropygial lobes which filled by sebaceous substance

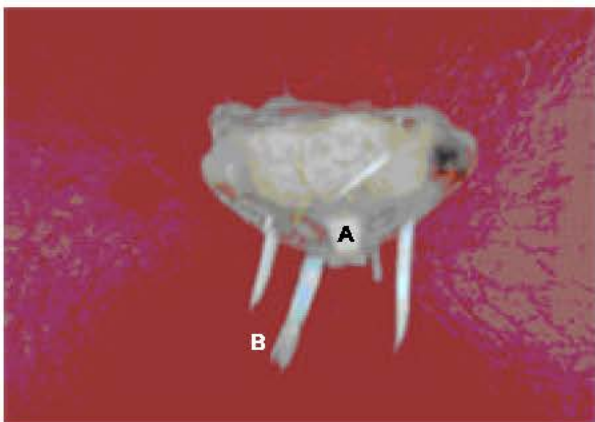


Fig. 3: External structure of uropygial gland in moorhen
A-Uropygial papillae B-Uropygial wike

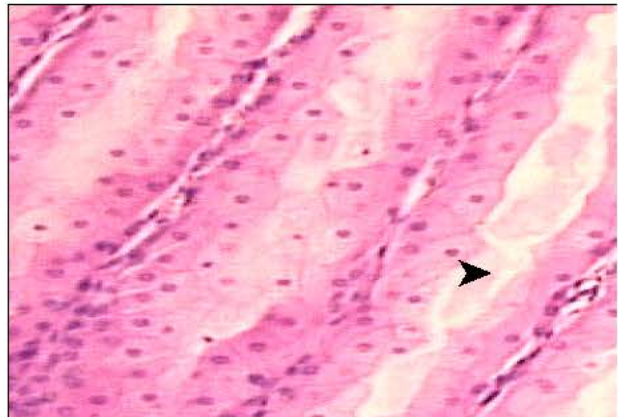


Fig. 6: Secretory tubules of the gland filled with fat droplets ↗. H&E stain 400X

Each lobes have a single duct and joined together by an extremely wide isthmus (Fig. 2). These finding were

in agreement with that of (Kolattukudy, 1981; King and McLelland, 1984; Wexo, 1990; Wissman and Parsons,

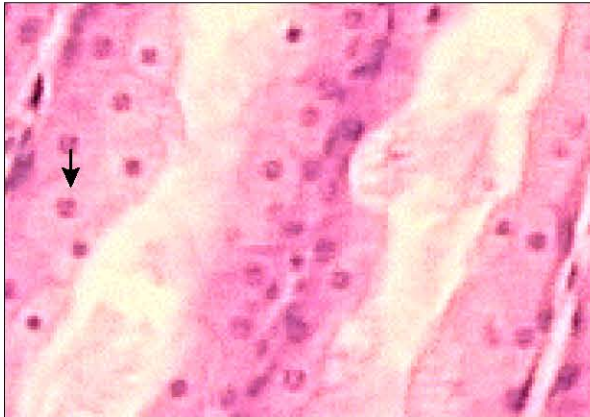


Fig. 7: Epithelial cells in secretory layer shows polygonal cells with secretory granules
H&E stain 1000X

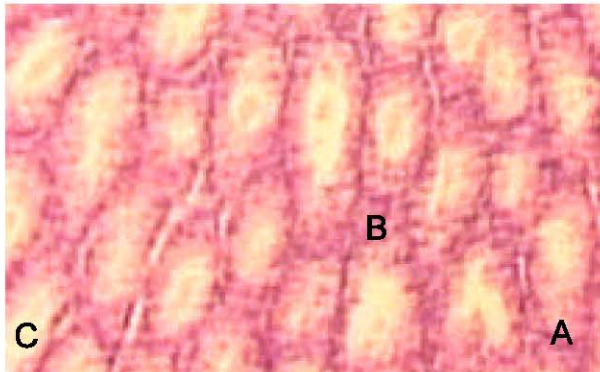


Fig. 8: Tubular epithelial cells layers, A-Germinative layer, B-Intermediate layer, C-secretory layer

2004) who stated that they have the same sites in chickens and marine birds.

The gland has an uropygial papillae lies dorso-caudally from the gland and have the uropygial wike (Fig. 3), the uropygial canal have a single opening at each lobe and posses a pair of canals (Fig. 4, 5) , While in geese the uropygial papillae was short, wide and held two openings for their canals, in chickens the papillae is long and thin while in turkey the base of papillae is wide on the other hands some birds such as Musk duck lack the uropygial wike. (David, 1999; Erin, 2001; Shawkey *et al.*, 2003).

The gland vascularized by the caudal artery that arising from the internal iliac artery and gave the following rami; the muscular ramus to the levator coccygeal and lateral caudal muscles, the lateral ramus which gave a small branches to the caudal component of the gland and the medial rami to the dorsal surface of the gland whereas (Hayder, 2005) shows that the gland in Geese received the blood from lateral caudal artery which divided into

three branches, external branch, internal branch and small median branch. The nerve supply is from the first pair of caudo-spinal nerves plus sympathetic fibers, these results are coincident with those reported by (King and McLelland, 1984). And pointed out with (Lucas and Stettenheim, 1972) who reported that the gland innervates from the caudal plexus.

The gland surrounded by a connective tissue capsule apparently devoid of muscle fibers, the glands parenchyma composed of secretory tubules and ducts in addition to the primary and secondary trabecula separated by a connective tissue (Fig. 6, 7). (Montalti, 1999) shows that similar observation in hens and pigeon, while (Al-Mehdawi, 2003) explain that each lobes composed of secretory lobules and the tubules terminates by alveoli.

The tubular epithelial cells are classified into four well defined layers, a germinative layer which consist of one or two rows of flat or cuboidal cells with a basophilic cytoplasm and dark nucleus, an intermediate layer composed of 1-3 rows of polygonal cells with a basophilic cytoplasm, secretory layer formed of 1-6 rows of polygonal cells with secretory granules and the degenerative layer characterized by cells with pyknotic nuclei (Fig. 8), these results were similar with (Hayder, 2005; Bacha and wood, 1990) who stated that the tubular epithelial classified into three zones.

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