

## **HISTOLOGICAL OBSERVATIONS ON THE PREEN GLAND OF INDIAN BLACK IBIS (*Pseudibis pappillosa Temminck*)**

**S.A. Sivakumar\*, S. Muthukrishnan, S. Paramasivan and S. Rajathi**

Department of Veterinary Anatomy

Veterinary College and Research Institute, Tirunelveli – 627 358

E-mail: sivavet1980@gmail.com (\*Corresponding author)

**Abstract:** Preen gland was a simple tubular gland with holocrine mode of secretion. The gland of Indian black Ibis is well developed. The gland as a whole was invested by a outer capsule. The capsule was rich in connective tissue fibres. From the capsule, the trabaculae enters the gland separating the Parenchyma into lobes and lobules. The Parenchyma of the Preen gland was composed of many tubules which converged from the periphery to the centre. The tubules were arranged centrally as well as peripherally. Each tubules contained central cavity where the secretions were poured. The secretions were secreted by the secretory cells of the tubules. Normally three types of secretory cells were identified histologically. They were basal cells, intermediate cells and secretory cells.

**Keywords:** Histology, Preen gland, Black Ibis.

### **Introduction**

Preen gland is an cutaneous oil gland. It is seen at the base of the tail and is not visible outside due to the covering of feathers. microorganism invading the plumage (Rajchard, 2010). The secretions, size and development. The preen oil secretions is rich in fatty acids which is applied to the feathers by the act of preening waterproofing substance. It also adds shining to the plumage and acts as a defense against of preen gland differed between the avian species (Chiale et al, 2014). In aquatic birds the gland is well developed (Solheim et al, 2016). In avian species such as Ostriches and pigeons the gland was absent (Reuda, 2017). Due to scarcity of literature in wild water birds regarding preen gland, the present histological observation of preen gland in Ibis is done to study the histological structure of preen gland immunologically.

### **Materials and methods**

The research study on the histology of preen gland of Black Indian Ibis was carried out in the Department of Veterinary Anatomy, Veterinary College and Research Institute, Tirunelveli. Two apparently healthy fresh predator killed adult birds were collected from the marshy areas of Tirunelveli. The topography of preen gland was located. The colour, size and shape of the

gland were recorded by naked eye. The preen gland was removed from the bird at the coccygeal region washed and then cut into small pieces. The small pieces is fixed in 10% neutral buffered formalin for 24 - 48 hours. Then the tissue pieces were washed in running tap water for overnight. The tissues were processed by Conventional paraffin processing. paraffin blocks were obtained. 5-6  $\mu\text{m}$  sections using leica microtome was taken for light microscopic study. Then the sections were stained by Haematoxylin and Eosin and Masson trichrome method for the connective tissue (Luna, 1968) were done for the study. The image was photographed and recorded by Image analysis software by digiscope.

### **Results and discussion**

The gland was invested by thick capsule. The capsule was thick, made up of dense connective tissue in two layers as per Chiaie et. al. (2014) in Skuas bird. Collagen fibres along with smooth muscles were tightly packed in the capsule (Fig.4). The capsule also contained blood vessels, adipocytes and nerve fibres. From the capsule the connective tissue septa enters the parenchyma of the gland dividing it into lobes. The lobes were arranged peripherally and in the middle of the gland. The connective tissue septa consisted of more collagen fibres and was distributed between the lobes as well as between the tubules (Fig.5). Adipose cells were also found in the connective tissue septa.

The parenchyma of the gland was composed of numerous secretory tubules (Fig.1) with blind end near the capsule. The epithelium lining the tubules is stratified epithelium according to Mohamed (2019) in Mule duck. The epithelium of the tubules were arranged from the basement membrane as basal cells, intermediate cells and secretory cells (Fig.3) as reported by Kozlu et. al (2011) in the urophagial gland of white stork.

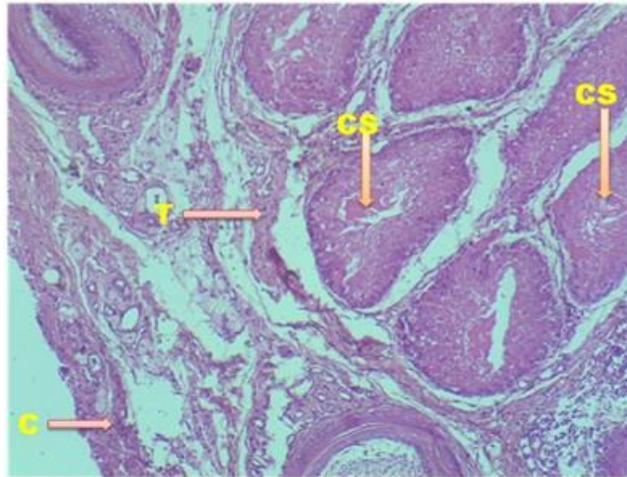
The basal cells were found near the basement membrane of the tubules. They are cuboidal in shape with prominent round, dark staining nucleus. The cytoplasm is pink in colour with less secretory material. The intermediate cells were polygonal in shape as per Sadoon (2011) in Starling with vacuolated nucleus in the centre. Both nucleus and nucleolus was prominent in these cells. The nucleus of these cells was larger than the basal cells. The moderate quantity of secretory material was distributed in the cytoplasm and appeared as a foamy. As the secretory substance in the intermediate cells increased in quantity the nucleus was pushed to the periphery of the cell and appeared like anucleate. These cells were secretory cells which contained more of secretory vacuoles. The secretory material were found in the central cavity as empty spaces (Fig.2).

The cells from the basal cells to the secretory cells were found in various stages of degeneration. So this proved that the preen gland was holocrine in type.

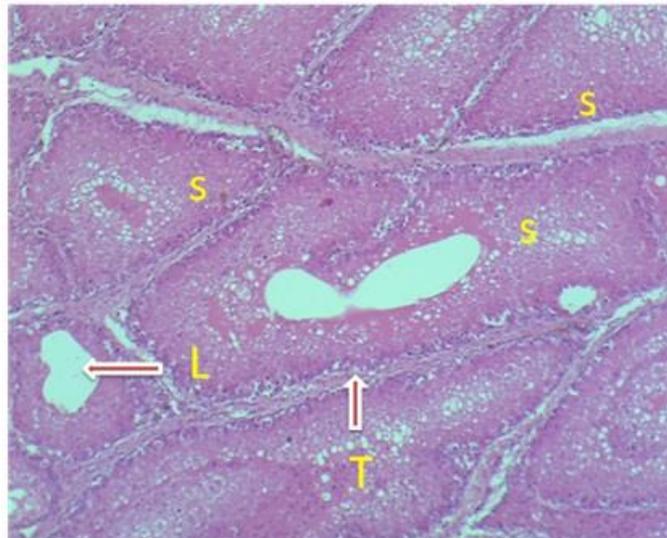
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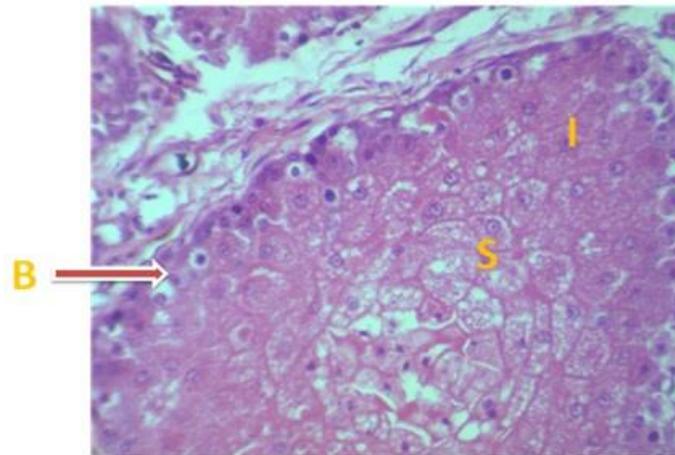
**Figure 1.** Photomicrograph of the Preen gland showing capsule and cross section of the lobe containing tubules. CS – Central cavity of tubule containing secretion, T – Trabaculae, C- Capsule (H& E X 100)



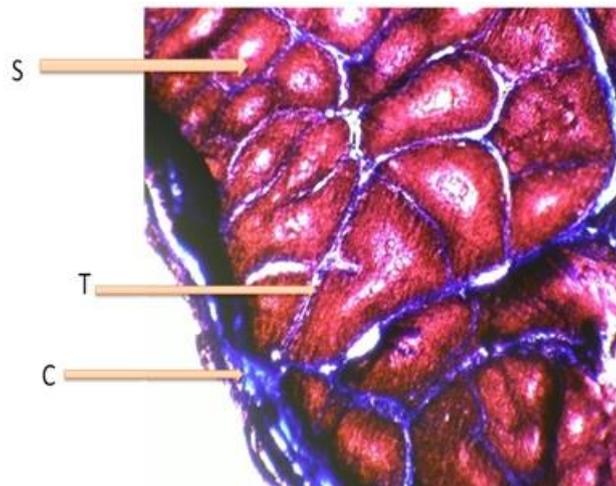
**Figure 2.** Photomicrograph of tubular structure of preen gland. The tubules are divided by trabaculae. S – tubule, T – Trabaculae, L- Central cavity of the tubules (H& E X 100)



**Figure 3.** Photomicrograph of Tubule of preen gland. B –Basal cells, I – Intermediate Cells, S- Secretory cells (H& E X 400)



**Figure 4.** Photomicrograph showing lobes of the Preen Gland, S – Tubule, T – Trabaculae, C – Muscle fibres and Collagen fibres of Capsule (Masson Trichrome X 100)



**Figure 5.** Photomicrograph of Tubule of Preen gland, CC- Central Cavity, T – Trabaculae with collagen fibres (Masson Trichrome X 400)

