Academic Voices
A Multidisciplinary Journal
Volume 7, No. 1, 2017
ISSN 2091-1106

HISTOLOGICAL STUDIES OF PREEN GLAND OF SOME PET BIRDS

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Abstract

Preen gland is also known as uropygial gland or oil gland. It is bilobate sebaceous gland possessed by the majority of birds. It is located dorsally at the base of tail between the fourth caudal vertebra and pygostyle and is greatly variable in both shape and size. Most birds preen by rubbing their bill and head over the preen gland pore and then rubbing the accumulated oil over the feathers of the body and wings and the skin of the legs and feet. Birds also distribute the oil over the plumage. During distribute the oil over the plumage. During preening, birds gather oily secretions that contain diester waxes from their oil glands. Preening is a bird's way of grooming it's feathers to keep them in the best condition.

Key words

Oil gland; oily secretion; vitamin D; diester waxes and bilobate

Introduction

Preen oil derived from the preen gland has previously been shown to differ in its composition between different ages, sex and diet. Among our pet birds, the oil gland is found on budgies, parrot (except amazon parrots), canaries, most finches, ostrich and some woodpeckers. Marshall (1960), Wallace (1955) and Welty (1964) have reported that this gland is lacking in adults of several species including some parrots, bustards, doves cassowaries etc. The parrot have a reduced uropygial gland and down feathers continually disintegrate at the tip into powder that to a certain degree serves as substitute for the secretion of preen gland with which other birds feather are oiled (Hanzak and Formanek, 1977). Present investigations revealed that some pet birds as *Corvus splendens, Acridotheres tristis, Psittacula krameri, Ploceus philippinus, Columba livia* and *Passer domesticus* have well developed preen gland. Its structure has been studied in detail. Its secretion is odorous during breeding and is compared with scent gland of reptile. Its oily secretion is used in dressing the feathers and other epidermal structures. According to Thomsan (1923) secretion of this gland stimulate the flow of saliva which causes indirect help in cleaning of feathers.

Materials and methods

Adult pet birds collected from their natural habitat, were purchased from bird catchers and were maintained in the laboratory in separate cages. The preen gland was isolated from each of narcotized bird species, opened by a median dorsal cut along it's entire length in two pieces, thoroughly eviscerated, cleaned of extra muscles. These were fixed in alcoholic Bounis fluid for 24 hours.

After washing the pieces in 70% alcohol, dehydrated in alcohol grades were embedded in paraffin wax. The secretions were cut at 6 m on a rotatory microtome and were stained in haematoxilin and eosin. The stained sections were used as such for studying the normal histology under a microscope.

Observation and results

Preen gland of pet birds are large, bilobed and of sebaceous type present at the base of the tail (fig1).

Fig 1. Shows that preen gland of a pet bird

The gland is in the form of a conical elevation with an opening and opens on the surface of skin. The glans as a whole is surrounded by a capsule of fibrous tissue from which radiate very thin septules separating the closely packed alveoli. A septum in the middle of gland divides into the lobes.

Each lobe of the gland consists of a central cavity for collecting the secretion, the oil and a duct through which discharges. The alveolus in each lobe is lined with several layers of cells. The superficial cells are large, polyhedral and cytoplasm in crowded with fatty globules. Some of the surface cells are under going complete destruction. The cells of the basement membrane are flattened and the cytoplasm in granular giving the periphery of the alveolus and darker appearance. It is contended that these cells replace the superficial cells. The superficial ducts are lined with stratified epithelium, the deeper ducts with flattened of cuboidal epithelium. The dressing of feathers in some birds during preening was observed by Waterson (1832). Hou (1928,1930) proved that its secretion is source of vitamin which is observed in body through mouth with feathers particles during preening. Rickets may be due to its removal from body in spite of sun shine treatment and normal feeding. Jacob and Poltz (1974) have analyzed the secretion of the uropygial gland of *Melopsittasus undulates*.

The secretion is a mixture of ester waxes is given in following table:

Secretin of mixture wax	Percentage
Unbranched alcohol	20.9
Monomethyl	62
Dimethyl substituted fatty acids	17.1
Monomethyl branched	Substituted compounds

Discussion

The only true cutaneous, Preen gland of different birds and their variations were studied in detail by Paris (1914). According to him its secretion is odorous during breeding and is compared with scent gland. Generally Preen gland in birds are large (if present) but *Osprey* has enormous uropygial or preen gland (Welty, 1964). It has been observed that common myna, *Acridotheres tristis* move in

pair, stopping each other to preen feathers, this gland is important, Murphy (1936), but some time in some birds e.g. Tufted duck, *Aythya fuligula*, water proofing of feathers do not require the presence of uropygial gland (Fabricius, 1959). Experiment of Gomot (1956), on duck embryos have shown the formation of gland is due to specific action of mesoderm on ectoderm. Carter and Lawrie (1950) have demonstrated two clear divisions, one outer sebaceous zone which is responsible for high esterage activity showing lipids rapid production and inner glycogen, acid phosphatase and osmic acid solution lipid. According to Thomson (1923) secretion of this gland stimulate the flow of saliva which causes indirect help in cleaning and feathers.

Experiments of Knowles *et al.* (1935), have shown that in presence of antirachitic factor this performs calcium metabolism in fowl. Removal of preen gland is not the cause of rickets in English sparrow and different species of birds use Vitamin D in different manner (Friedmann, 1935). He suggested that presence of preen gland in a bird is less rigidity bound environmentally by ecological presence or presence of antirachitic factor. According to Elder (1954), the uropygial gland of many waterfowl secrete a fluid contains fatty acid fat and wax and the action of preening automatically stimulates its flow from the gland. Birds collect the secreted oil of preen gland with their beak and apparently apply it to feathers. It is thought that gland secretion helps to conditions and water proof of feathers. According to other theory oil conditions the bill by polishing it and preventing brittleness. Probably this theory does not bear much weight because all birds do not possess this gland. Removal of preen gland causes ricket (Vitamin D deficiency) in some birds but not in English sparrow (Manter and Moller, 1959).

The exact function of this gland is still unknown, but the function can be concluded as water proofing or dressing of feathers, for important antirachitic function and lubrication of the covering of bill for its sharpness and brightness.

Acknowledgements

I am very much thankful to Prof. Dr. Prabhat Kumar, Department of Zoology, Lucknow University, Lucknow, India for his valuable guidance and suggestions during preparation of this manuscript.

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