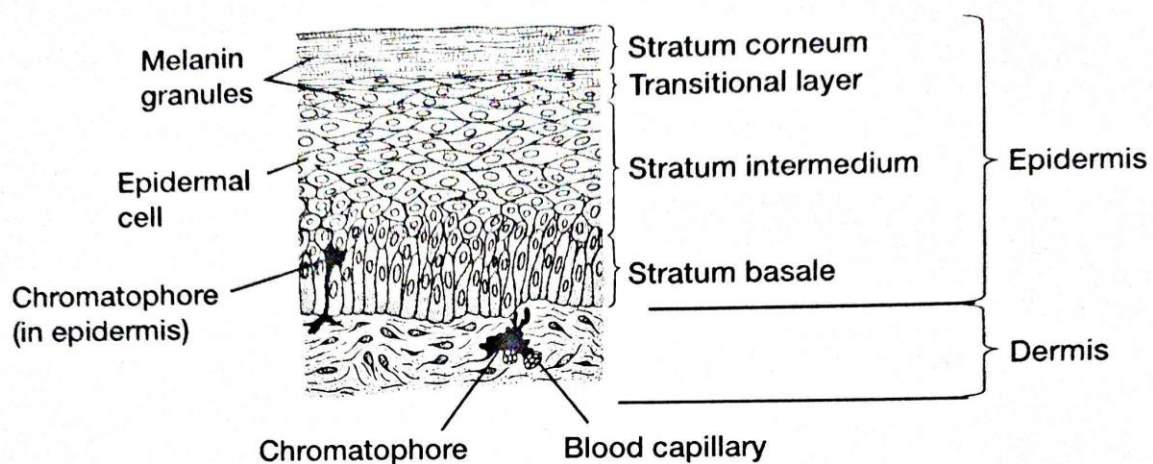


## ZOOG-CC2-2-TH (Comparative Anatomy and Developmental Biology)

### Derivatives of Integument with respect to glands in Birds

#### Integument of Birds

Integument of birds is thin and weakly keratinized. Epidermis is made with the layers stratum basale and stratum corneum. In between these two distinct layers there is a transitional layer of cells that are transforming and being keratinized into the cells of the corneum. The derivatives of the epidermis, the feathers, are highly keratinized. Dermis near the feather follicles becomes richly supplied with blood vessels, smooth muscles and nerves.



### Derivatives of Integument with respect to Glands in Birds

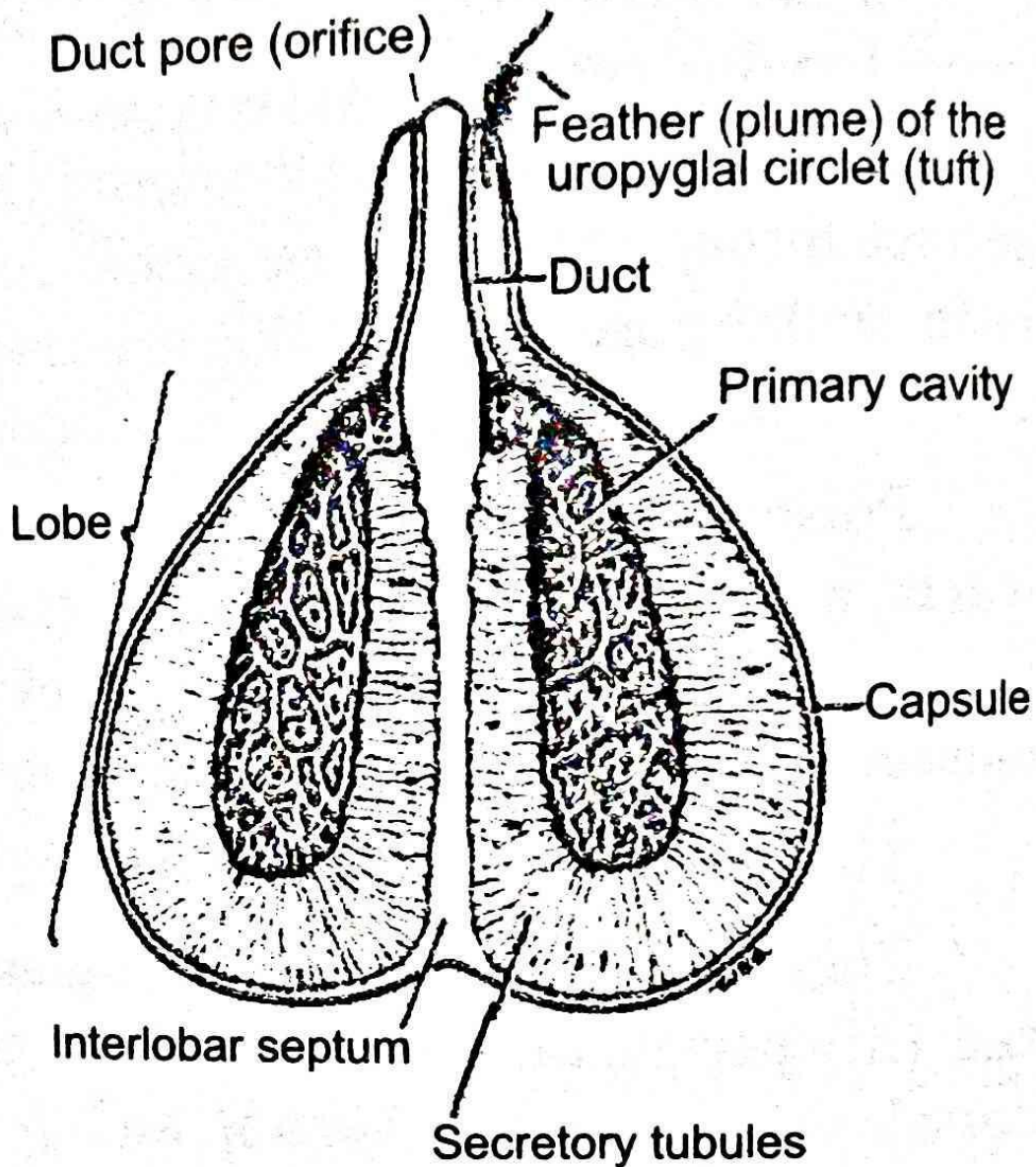
Bird skin has few glands.

Uropygial gland present above the tail of the birds secretes oil like substance by which the birds preen their feathers. So this gland is also known as preen gland. The secretion of the gland comes to the skin surface through one or more nipple - like pores. The oil-like secretion contains lipid and protein that the birds collect on their

beaks and apply on the feathers to make them water proof. The preen gland is alveolar and a paired structure.

The two lobes of the glands are separated by an interlobular septum. It is covered by an external capsule. The gland contains one or many ducts and a tuft of feathers at the openings.

The gland is best developed in aquatic birds like ducks and pelicans and absent in running birds like emu, ostrich and cassowary.



**Fig. 1.9 : Uropygial gland of birds**

Preen glands perform many functions:

- (i) The oily secretion has hydrophobic property due to which the preening coat above the feathers makes them water proof.
- (ii) The secretion has anti abrasive effects that protect the fine structures of the feather (barbules) from physical damage.
- (iii) The waxy secretion has antimicrobial property, thus protects the feathers from bacteria and fungi. In some birds the preen gland harbours

symbiotic bacteria. Secretion of these bacteria reduces the damage caused by feather-degrading bacteria.

(iv) Preen oil in some species maintains the integrity of the horny beak and the scaly skin of the birds legs.

(v) In some species preen gland secretion contains a precursor of vitamin D. In presence of sunlight this compound gets converted into vitamin D which is then absorbed through the skin.

(vi) Preen gland in female birds secretes lipids which have female pheromone activity.

Besides the preen glands some birds, specially the marine birds, have salt gland located in the head region. This gland helps in removal of excess salt from the body that accumulates in these birds due to feeding upon marine food.