# Structure of skin of Aves:

1. The integument (Fig.1) is thin, loose, dry and devoid of glands except a uropygial gland at the base of the tail whose secreted oil is used for preening the feathers, especially in aquatic birds.
2. The stratified epidermis is delicate, except on shanks and feet where it is thick and forms epidermal scales.
3. The claws, spurs and horny sheaths of beaks are also the modifications of stratum corneum of epidermis.
4. Claws and beaks are variously modified in birds according to habitat.
5. The rest of the body has a protective covering of epidermal feathers which are evolved from epidermal scales.
6. Feathers protect and insulate the body, i.e, keep the body warm.
7. The dermis is thin and has interlacing connective tissue fibres, abundant muscle fibres for moving feathers, blood vessels and nerves.
8. The dermis forms an upper vascular and spongy layer and a lower compact layer.

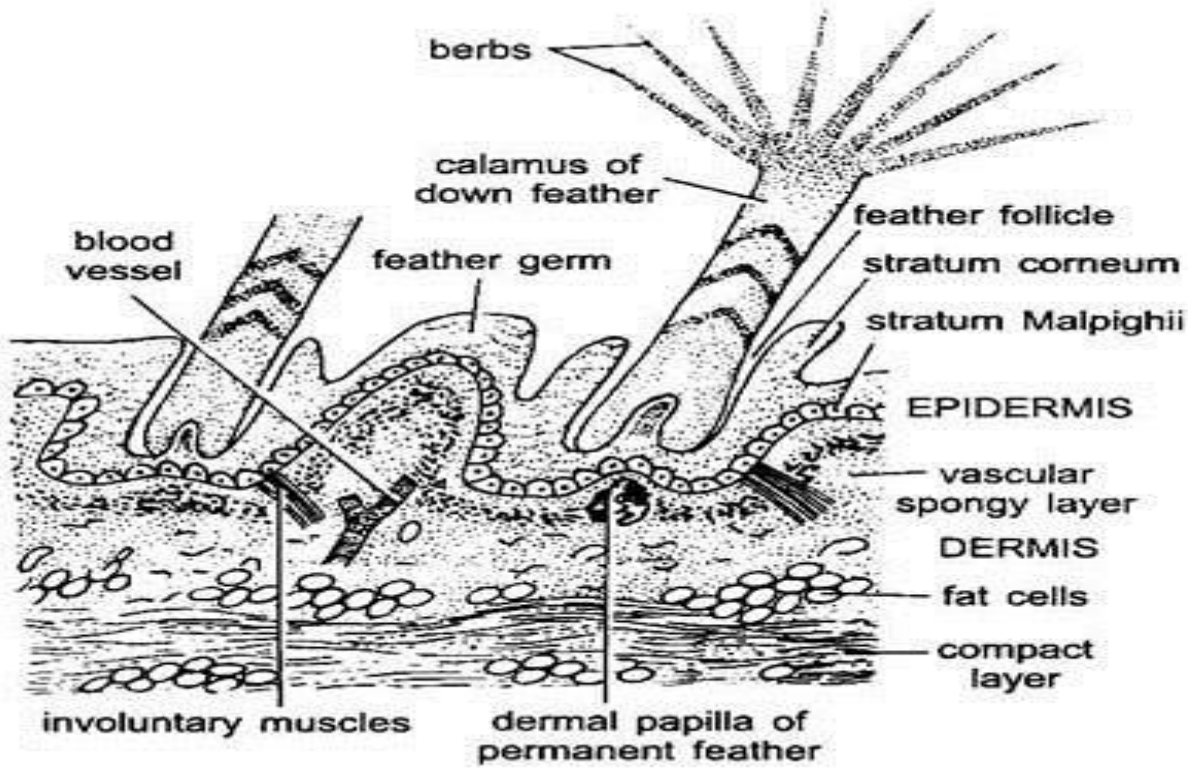
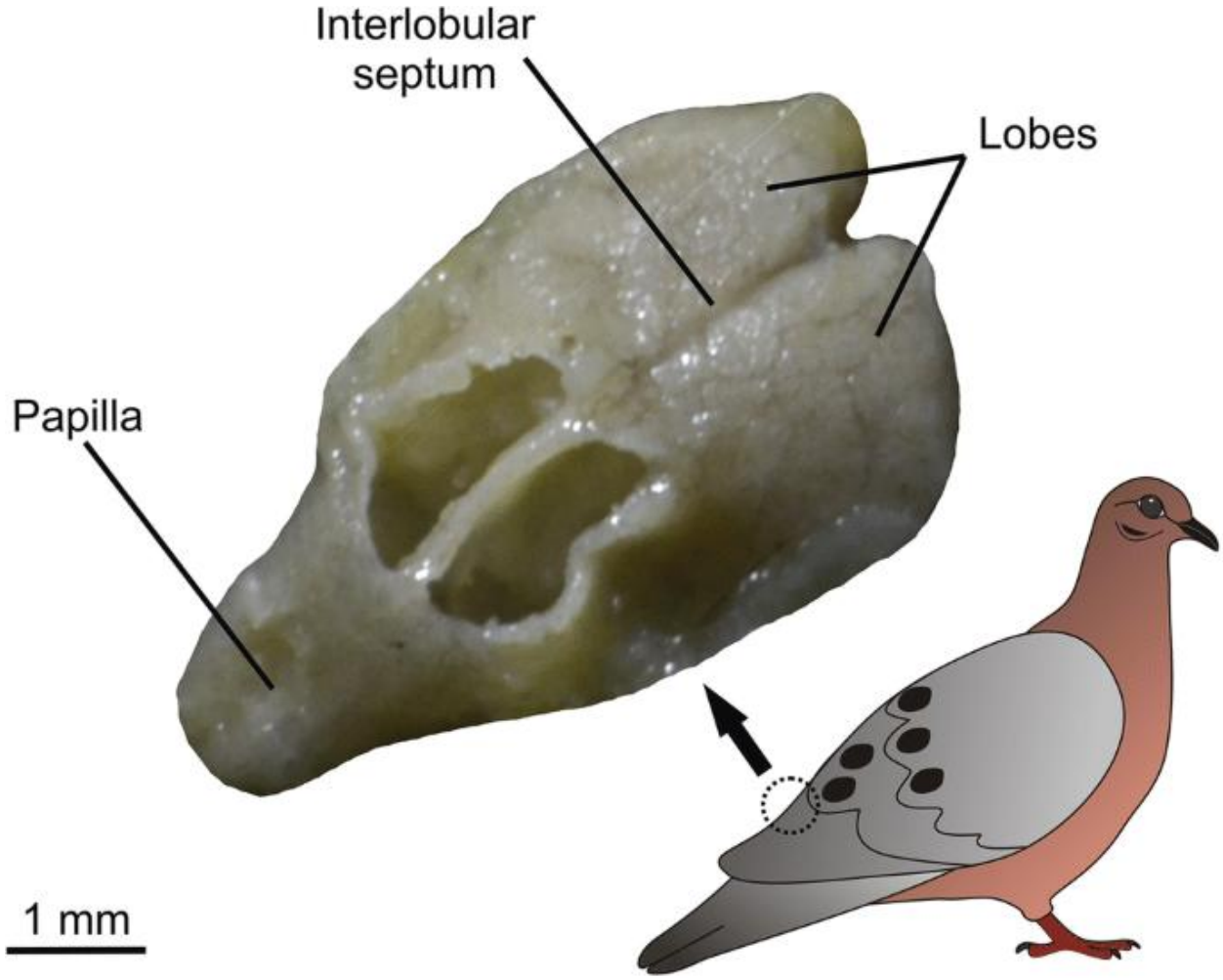



Fig.1 V.S. Skin of Birds.

9. The dermis also contains fat cells. The skin has no chromatophores.
10. Pigment found in melanocytes migrates into feathers and scales.
11. Colour patterns of birds are vivid; they are for concealment, recognition, and sexual stimulation.
12. The colours are mainly produced by reflection and refraction of light from surface of feathers.

# UROPYGIAL GLANDS:

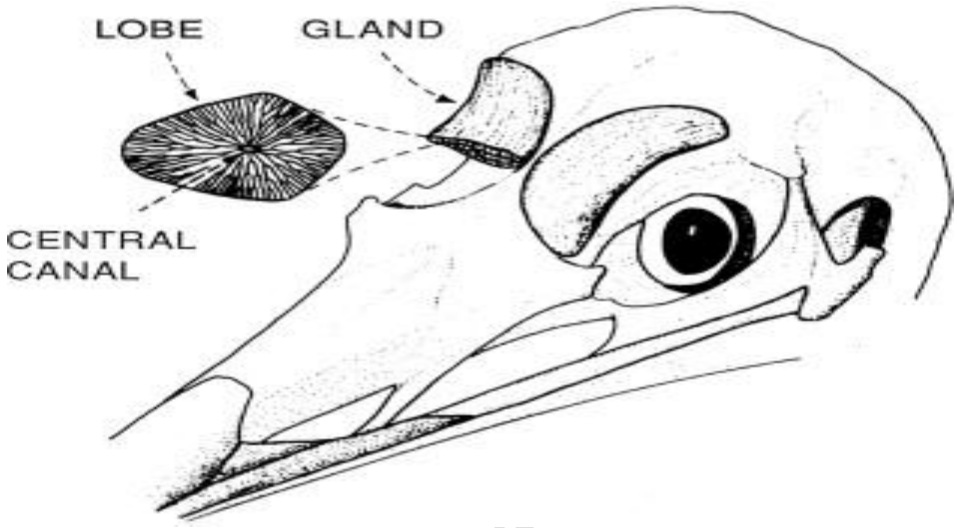
- These are the only glands in birds, and they are best developed in aquatic birds.
- Uropygial glands are branched alveolar glands located on the dorsal side at the base of the tail or uropygium in the form of swelling.
- They secrete an oil which is odoriferous and attracts the opposite sex.
- The oil contains pomatum (waxy substance) which is picked up with the beak and used for preening and waterproofing the feathers.

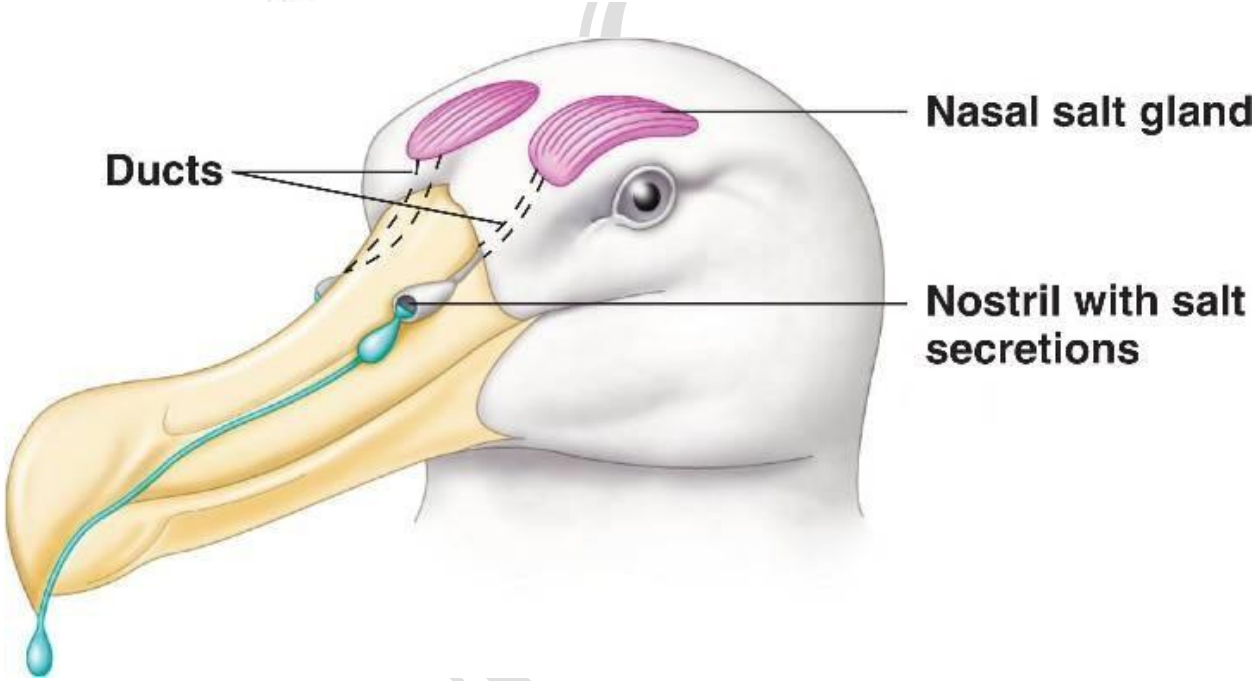

Interlobular
septum
Lobes
Papilla
1 mm

## Salt gland:

- Nasal gland/salt gland, in marine birds that drink saltwater, gland that extracts the salt and removes it from the animal's body.
- Its function was unknown until 1957, when K. Schmidt-Nielsen and coworkers solved the long-standing problem of how oceanic birds can live without fresh water.

- They found that a gland, located above each eye, removes sodium chloride from the blood far more efficiently than does the avian kidney and excretes it as brine through a duct into the nasal cavity.
- It is discharged from the nostrils (sometimes the mouth) in headshaking movements characteristic of cormorants, penguins, and other marine species.
- Marine birds can drink seawater because their cephalic 'salt' glands secrete a sodium chloride (NaCl) solution more concentrated than seawater.
- Salt gland secretion generates osmotically free water that sustains their other physiological processes.
- When the bird drinks seawater, Na enters the plasma from the gut and plasma osmolality (Osm(pl)) increases.
- This induces water to move out cells expanding the extracellular fluid volume (ECFV).
- Both increases in Osm(pl) and ECFV stimulate salt gland secretion.


LOBE
GLAND
CENTRAL
CANAL


Nasal salt gland
Ducts
Nostril with salt
secretions