Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (Second Year)

Subject: Zoology

Paper Code: ZOC 103

Paper Title: Anatomy of Animal Body Systems

Unit: 01

Module Name: Epidermal soft derivatives- Part II

Module No: 07

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NOTES

Epidermal Soft Derivatives

- Based on their functions, they are classified into several types:

1) MUCOUS GLANDS

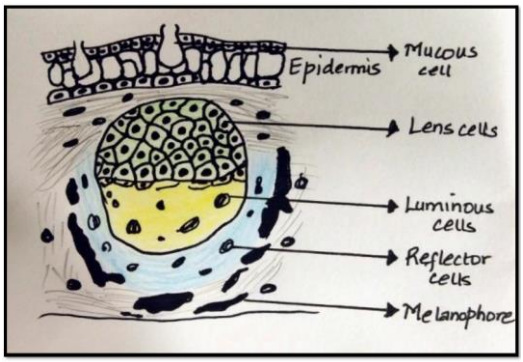
- These may be Unicellular or multicellular and secrete **mucin.**
- The secretion reacts with water to forms slimy mucous which keeps the skin moist, slippery and protects against harmful agents.
- Abundant in integument of chordates such as Cyclostomes, fishes and amphibians.
- Aids in protection, respiration, retaining moisture, etc.

2) POISON GLANDS

- Found in the integument of some fishes and amphibians.
- These are multicellular glands larger than the mucous glands.
- Also known as Parotoid glands behind the head of toads which produce bitter, irritating and repellant milky secretion containing alkaloid.
- This secretion makes the animal unpalatable. Example: Cane toad.

3) LUMINESCENT GLANDS/ PHOTOPHORES

- These luminescent glands are found in the deep-sea fishes wherein, they serve as low intensity light emitting organs.
- They serve the function of prey and mate attraction, predation, communication, etc.
- In the photophore, Mucous cell layer serves as magnifying lens, followed below by a layer of luminous cells surrounded below by the reflecting pigment cells, containing Guanine crystals.
- They are controlled by sympathetic nervous system.



PHOTOPHORE OF A LUMINOUS FISH

4) FEMORAL GLANDS

- These are the secretory glands found on the ventral side of thighs in male lizards.
- The femoral pores appear in series of 12-18 pores from knee to cloacal aperture producing, sticky secretions which harden later in air to form spines which serve as holdfast during copulation.

5) UROPYGIAL GLANDS/ PREEN GLANDS

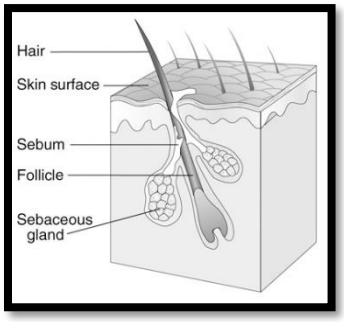
- Preen glands are exclusively found in Birds and appear as prominent swelling above the Uropygium or tail.
- It produces oily water repellent secretion containing **Pomatum**.
- It is used for lubricating beak, preening feathers, mate attraction due to its odoriferous nature.

6) SUDORIFEROUS GLANDS/ SWEAT GLANDS

- Sweat glands are simple coiled tubular glands which secrete sudor (=sweat), hence also known as Sudoriferous glands.
- The sweat glands' secretory unit is seated deeper into dermis in close proximity with the blood vessels, and its ducts open to the surface.
- Its functions include metabolic waste elimination through sweat and thermoregulation through evaporation of the same from the skin surface.

- Found abundantly in the skin of all mammals except, Pangolins, marine mammals (Sirenians and cetaceans) and monotremes.
- Ciliary glands (glands of Moll) are modified sweat glands found on the margin of eyelid next to the base of the eyelashes.

7) SEBACEOUS GLANDS



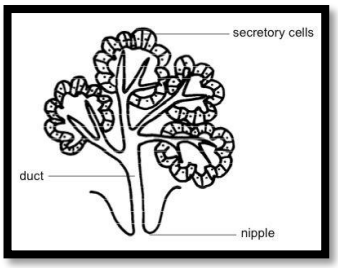
"**Normal Pilosebaceous Unit",** by National Institute of Arthritis and Musculoskeletal and Skin Dieseases, retrieved from https://www.flickr.com/photos/niams_nih/23948403171/in/photostream/ is licensed under PDM 1.0

- Sebaceous glands are alveolar, found in association with hair follicles.
- They produce an oily exudate known as **sebum (=grease)**.
- The duct opens directly on skin surface in areas such as around genitalia, on nose tips and lips edges.
- Absent in pangolins and marine mammals.
- **Ceruminous glands** and **Meibomian glands** are two modifications of sebaceous glands.
- Ceruminous glands produce a waxy, greasy secretion known as **Cerumen,** which traps insects and dirt and prevents its entry into the ear canal.
- Meibomian glands are present on the margin of eyelids and spread its oily secretion over the exposed eyeball so as to lubricate it. Also moistens the conjunctiva of eye.

8) SCENT GLANDS

- Modification of Sudoriferous or Sebaceous glands of mammals.
- These glands ac mostly pheromonal and functions as a repellent or attractant or for communication.
- Found between toes (goat, rhino, etc.), near eyes on head (deer), navel (musk deer) and around anus (skunk).

9) MAMMARY GLANDS



- Mammary glands are modification of Sebaceous glands.
- These are Compound tubular glands that are characteristic to mammals and produce milk during lactation to feed and nurture the young ones.
- Milk secreting only on females, except in monotremes wherein males' mammary glands also secrete milk.
- Nipple/teat bears the opening(s) of the mammary gland.
- **Mammary glands of Monotremes** resemble modified sweat glands and lack nipples/ teat. The ducts open directly onto the skin surface (like the sweat glands) in between the hair and the secreted milk is lapped by the young ones.
- **True teats** are the ones in which the ducts of mammary glands open separately on one nipple. Example: Man and apes.
- In **False teats**, all the ducts of a mammary gland empty into a cistern, and a single tube leads into the nipple. Example: Ungulates.

Mammary glands, ducts and nipples of (a) Monotreme, (b) Human and (c) Ungulate