

Integumentary Structures : in Birds

(1)

[Feathers]

I. Introduction: Feathers are remarkably complicated cornified epidermal appendages of integument & are unique to the birds. That's why Salim Ali aptly defined birds the "Feathered Bipeds".

II. Location: On general body surface of birds except on feet & beak.

III. Various Types of feather : (1) Contour feather (2) Down feathers,
(3) Semi-plume, (4) Filoplume, (5) Barbules.

(1) Semi Plume: are feathers intermediate in structure between contour feathers & down feathers.

Structure: The rachis bears plumaceous vane. The rachis is longer than the longest barb.

Location: Mostly just hidden below the contour-feathers.

Function: It gives thermal insulation it can also air trap.

(2) Filoplume: are fine, hair-like feathers with long rachis and few barbs & barbules with large plumaceous vane. It has a connection with a special nerve.

Function: (1) Tactile Response.
(2) Work as a touch receptor.

In case of ~~Bird~~ Bulbul, Cormorant filoplumes ⁽²⁾ are exposed.



Fig: Filoplume



Fig: Down feather

(3) Down feather: of various types feathers, entirely plumaceous feathers in which the rachis is shorter in size than the longest barb/may be absent.

Newly hatched ~~chick~~ chick they appear the first feather is called down feather.

Location: generally present in apteria. — it has some other types feathers.

(A) Powdery down: It's covered by $CaCO_3$, deep imprinted in the skin. Best development in Herons.

(B) Natal down: Small feathers appears in newly hatched chick.

(C) Uropygial down: The gland located at the base of the anus for most birds.

□ Function: The papilla of the gland usually a tuft of modified, bristle-like down feathers that aid in

transferring the oily secretion from the gland to the bill to provide waterproof dressing to the plumage.

(3) Definitive: Present in the adult bird.

Location: Below the contour feathers.

Function: Mainly insulate the body.

~~(4) Pr bristles: present in the adult bird.~~

~~Location: Below the contour feathers.~~

~~Function: Mainly insulate the body.~~

(4) Bristles: Bristles are specialised feathers with a stiff rachis & a hook only on the proximal portion / none at all.

Location: Surrounding the beak, nastrils & as well as Toes.

Tip of the rachis contain Melanin.

Function: (i) Melanin ~~prevent~~ photochemical damage.

(ii) Helps them to catch the prey.

(iii) Protects their eyes & nastrils from the foreign particles.

(iv) Works as a tactile sense organs.

(v) Flight feathers / Towit : (i) Remiges → Located on wing.

(ii) Number: Many; (23) in Pigeon.

↳ Classified according to placement. (11)

(a) Primaries - are (11) feathers of which (6) metacarpals & (5) digitals.

(b) Secondaries - are (2) feathers attached to hind end of ulna.

(c) Rectrices → arranged in semi-circle or fan on the tail, numbers - many, as (12) in Columba.

Function: Remiges engaged in inactive flight & Rectrices act as a brake & steering during flight.

↳ Contour feathers = (i) Location: The conspicuous feathers that cover the whole body surface & thus give a bird its contour or general shape.

(ii) Structure: Similar to that of a typical feather, but soft & small & interlocking system is not very tight.

(iii) Function: Providing a smooth surface, of the body gives very little resistance during flight.

(11) Some Definitions: (i) Superior umbillicus & Inferior umbillicus, Loose feathers which is located at the broad tip of Calamus, Quills on Inferior umbillicus helps to keep the feather attached to skin.

(5)
Loose feathers/apertures which is situated at the base of the vane, known as Superior umbilicus.

(1) Calamus → The contour feathers include a short, tubular base, called the "Calamus".

(2) Rachis & Barbs → The distal portion of the "Calamus" is a long, tapered structure is called the "Rachis" by which bears closely spaced side branches, called the Barbs; the lowermost of which externally mark the division between "Calamus" & "Rachis".

(3) Vane → The barbs on either side of the rachis constitute a surface, is called a "Vane".

(4) Plumaceous feathers → The proximal portion of the vane bears some soft, fluffy, loose feathers, which are known as Plumaceous feathers. Function: Helps in thermal insulation.

(5) Pennaceous feathers → The distal portion of the vane bears some compact, firm & closely knit feathers, which are known as Pennaceous feathers. Function: Helps in fly in the sky.

(6) Apteria & Pterylosae:

Feathers develop from pits/follicles in the skin, generally arranged

in Anats / Pterylae which are separate by patches ^⑥ of unfeathered
skin, the "Apteria".