

Fundamentals of Entomology

I year II Semester Credit hrs: 4 (3+1)

LECTURE

ON

Structure and Modifications of Insect Antennae



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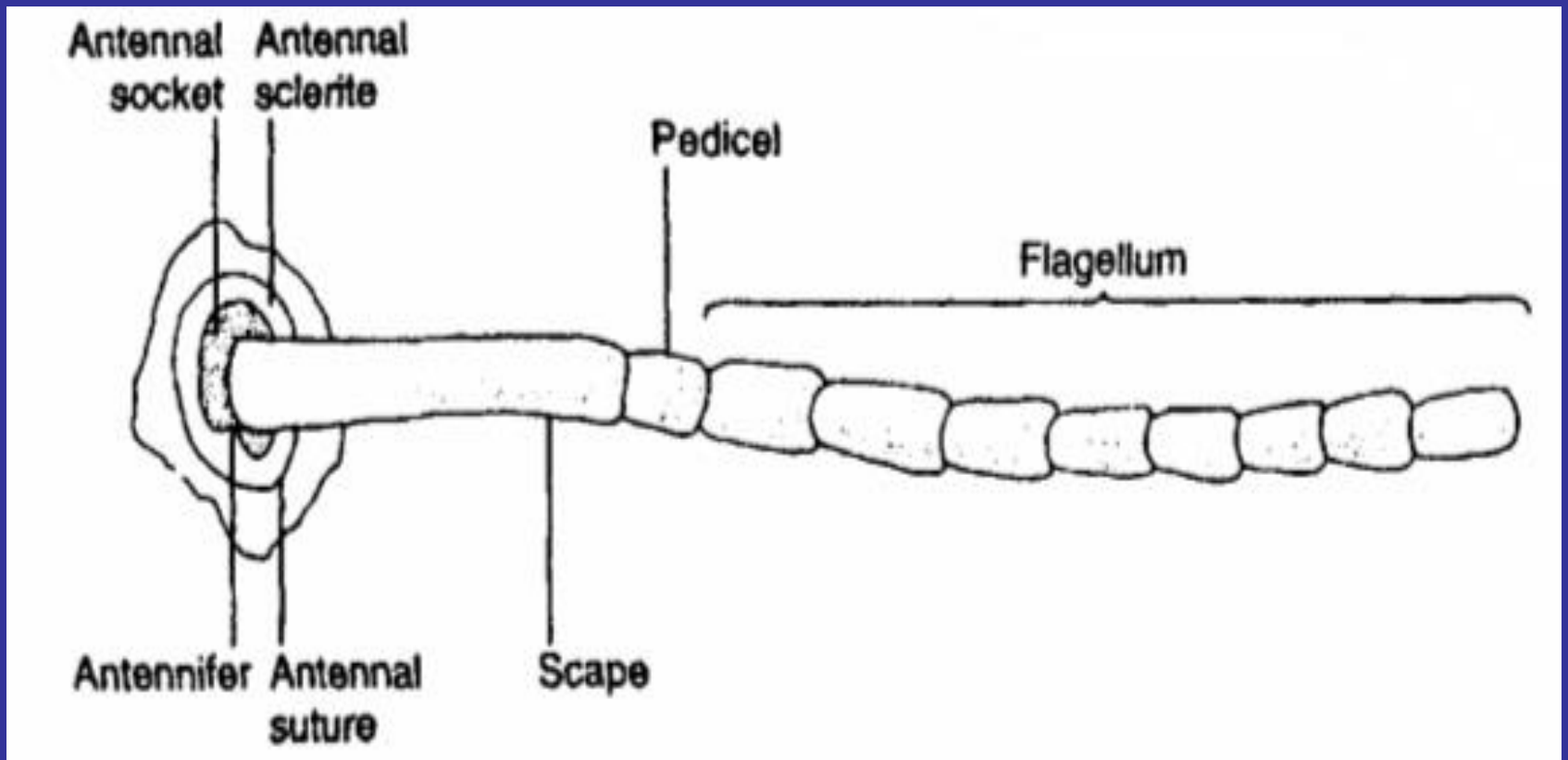
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Antennae of Insects: Olfactory organs

- *Mobile sensory segmented appendages*
- *In certain larvae and in adults they arise from the base of mandibles.*
- *They are usually larger in males (sexual dimorphism)*
- *Absent in Protura and reduced in endopterygota larva while two pair of antennae are found in class **Crustacea***
- *Functionally they are almost exclusively in sensory perception.*



Structure of Insect Antennae

Parts of Insect Antennae

1. Scape

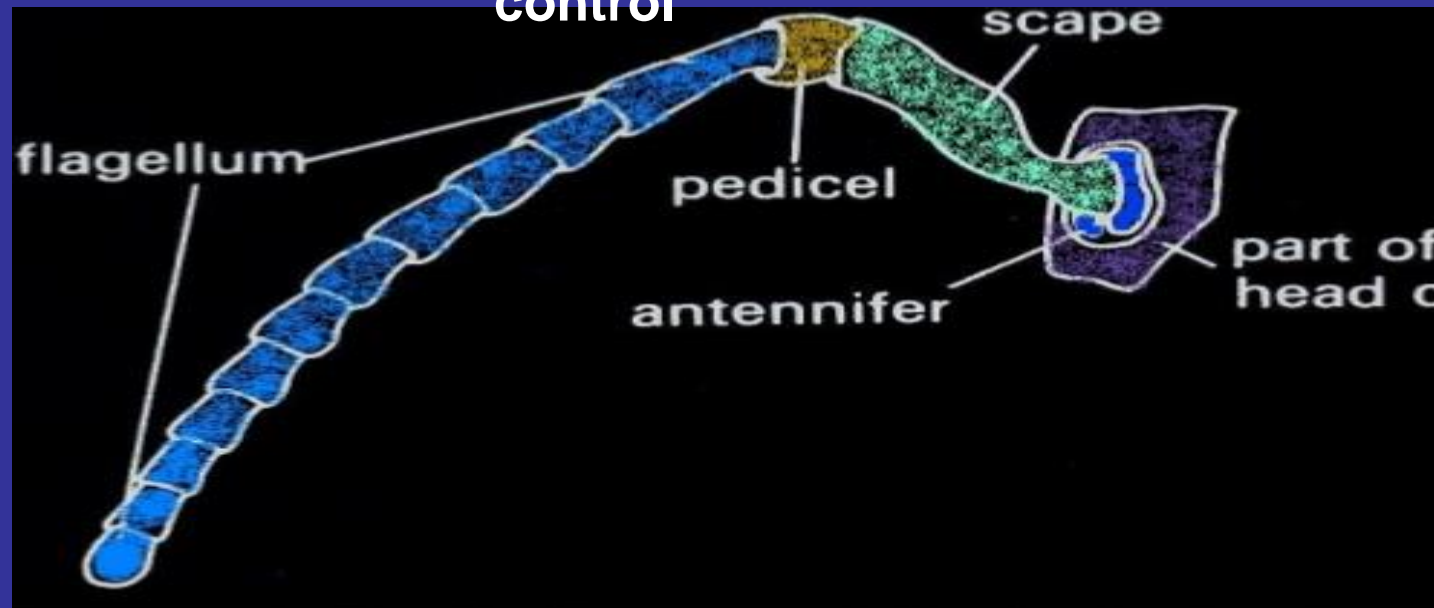
- First basal segment
- Larger than other Segments

2. Pedicel

- With Johnston's organ
- Absent in Diplura & Collembola
- With muscles for better control

3. Flagellum

- Known as clavola,
- Flagellomeres
- Divided into ring, funicle and club segments



Types of Insect Antennae

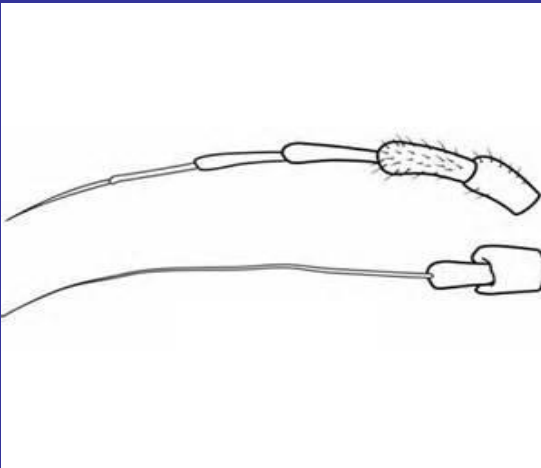
- Antennae are modified according to functions

1-Setaceous:- (Whip like or bristle like)

Bristle like

Noticeable decrease in the size of segments from the base to the apex, so that the antenna tapers from a rather thick base to a very slender tip.

Eg. *Cockroach, dragonflies and damselflies*



2- Filiform:- (Thread like)

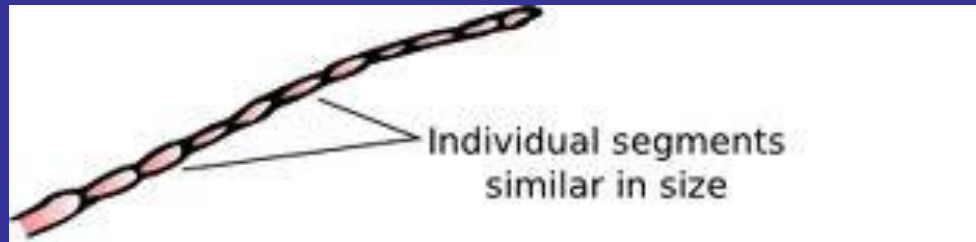
Thread like

Segments nearly uniform in size

Usually cylindrical and

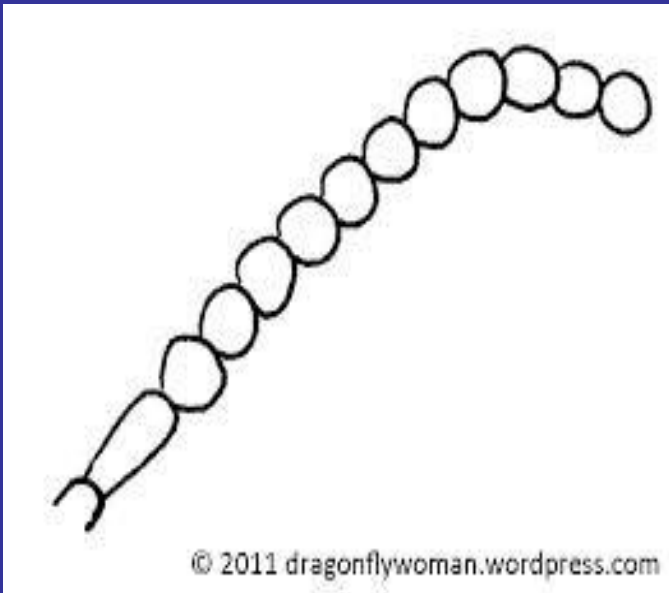
have no prominent constructions at the joints.

Eg. Grasshopper, Ground and long horned beetles



3- Moniliform:- (like string of beads)

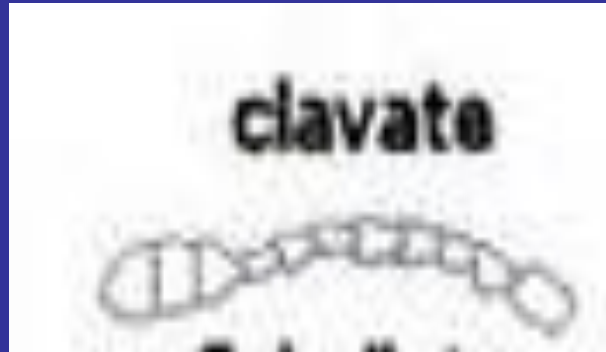
Like a string of beads,
Segments similar in size and more or less spherical or
globular in shape
With prominent constrictions between them
E.g. Termite.



4. Clavate:- (clubbed)

Club shaped, the segments increasing in diameter gradually towards the tip.

E.g. Butterfly, Carrion beetles

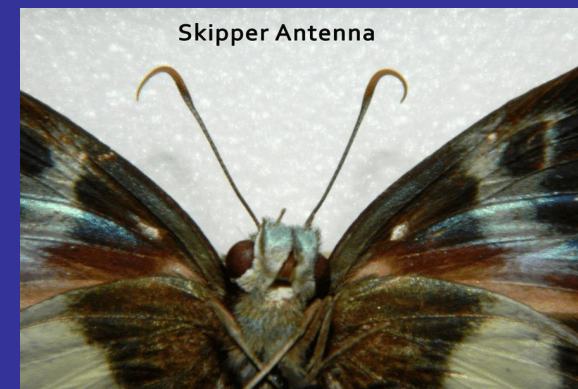


5. Clavate with hook :- (clubbed antennae with hook)

Gradually increase in diameter

Last one ends with a small hook like structure.

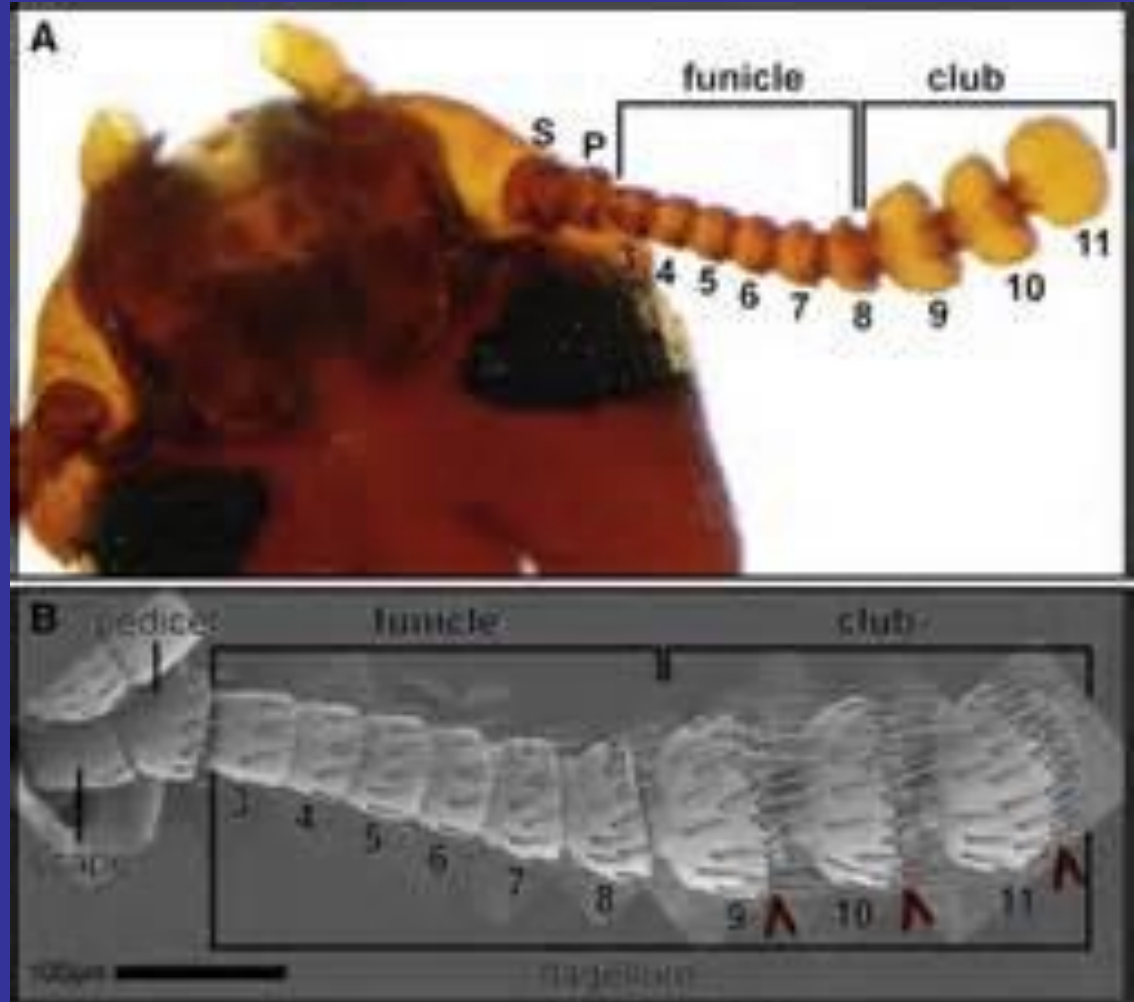
Eg. Rice Skipper



6. Capitite:- (clubbed with knob)

Knobbed, last three segments are suddenly enlarged.

e.g. Red flour beetle.



7- Pectinate:- (Comb like)

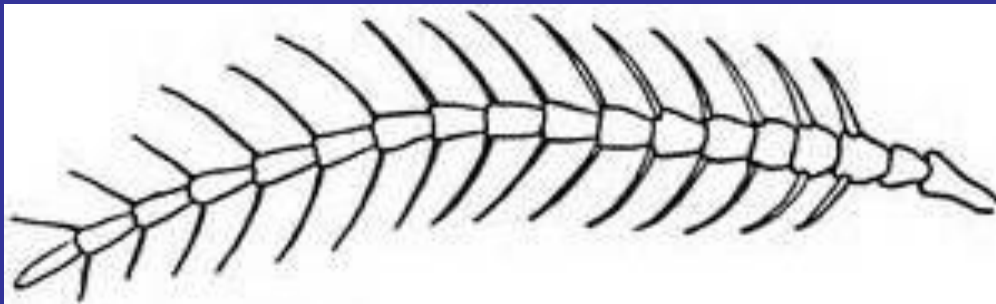
Comb like, most segments with longer slender lateral processes on one side

Eg. Female Arctid moths, Fire coloured beetles



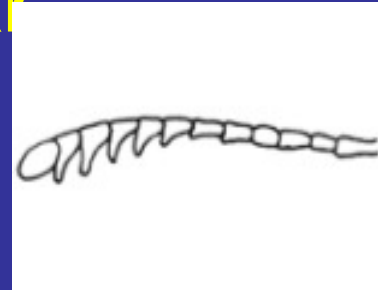
8- Bipectinate:- (Double comb like)

- Most segments have slender lateral processes on either side. e.g. Silk moth



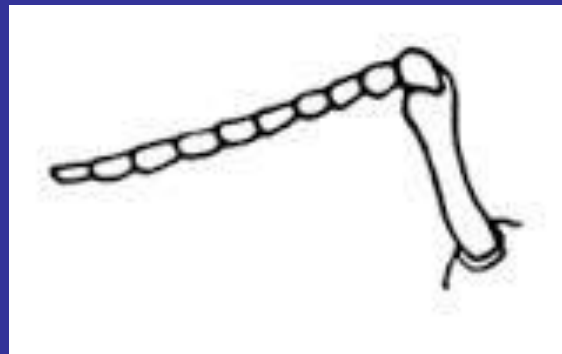
9. Serrate:- (Saw like)

- Saw like or saw-toothed,
- segments have short triangular
- projections to one side.
- E.g. Pulse Beetle.



10. Geniculate:- (Elbowed)

- Elbowed, has a sharp bend like a flexed arm the first segment long and following segments small.
- E.g. Honey bee and Ants



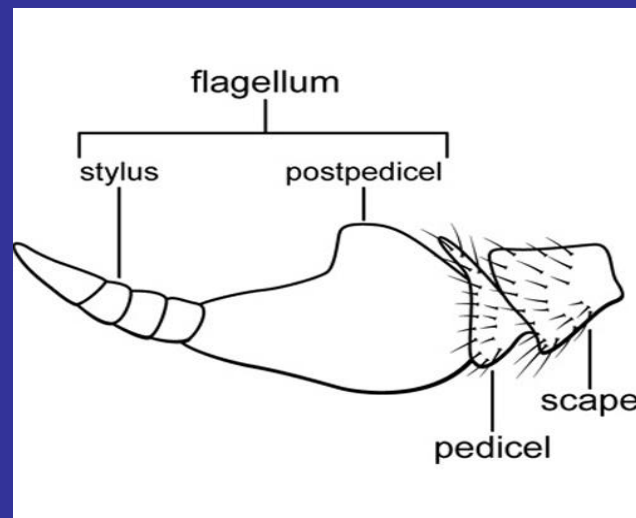
11- Lamellate:- (Leaf like).

The enlargement at the end is almost entirely towards one side from the axis of the antenna and forms broad, somewhat flattened plates.

E.g. Dung roller, Rhinoceros beetle



12- Stylate:- The last segment bearing an elongate terminal style like or finger like process, the style e.g. Robber fly.



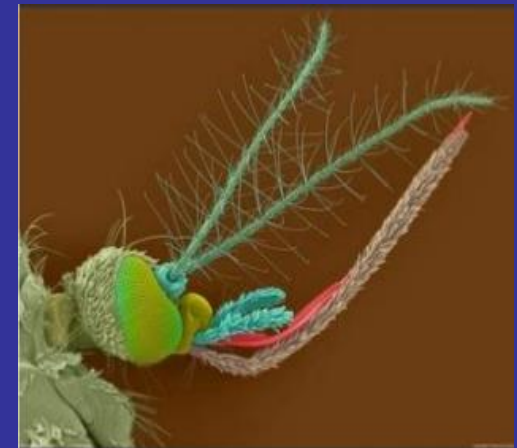
15- Plumose:- (Brush like

- with dense hairs)
- Whorls of hairs arise from each joint of the segment.
- Each whorl contains a number of hairs. *Plumose* antennae have a feather-like shape. Eg. Male mosquito



16. Pilose :- (Brush like with sparse hairs)

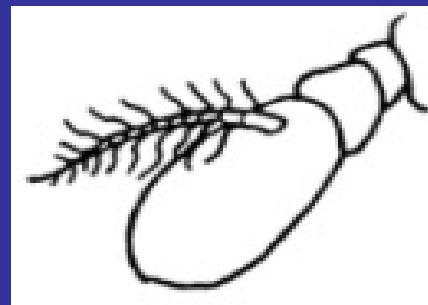
- Looks like plumose but each whorl contains less number hairs.
- E.g. Female mosquito



13- Flabellate:- The terminal segment gives the antenna a bifurcate appearance and the succeeding segments are seen to be enclosed in it.
E.g .Stylopids.



14- Aristate:- Small, microscopic
Third segment enlarged and bears a bristle called **arista** on its dorsal side



10- Aristate:- The last segment usually enlarged and bearing a conspicuous dorsal bristle known as arista. e.g. House fly.

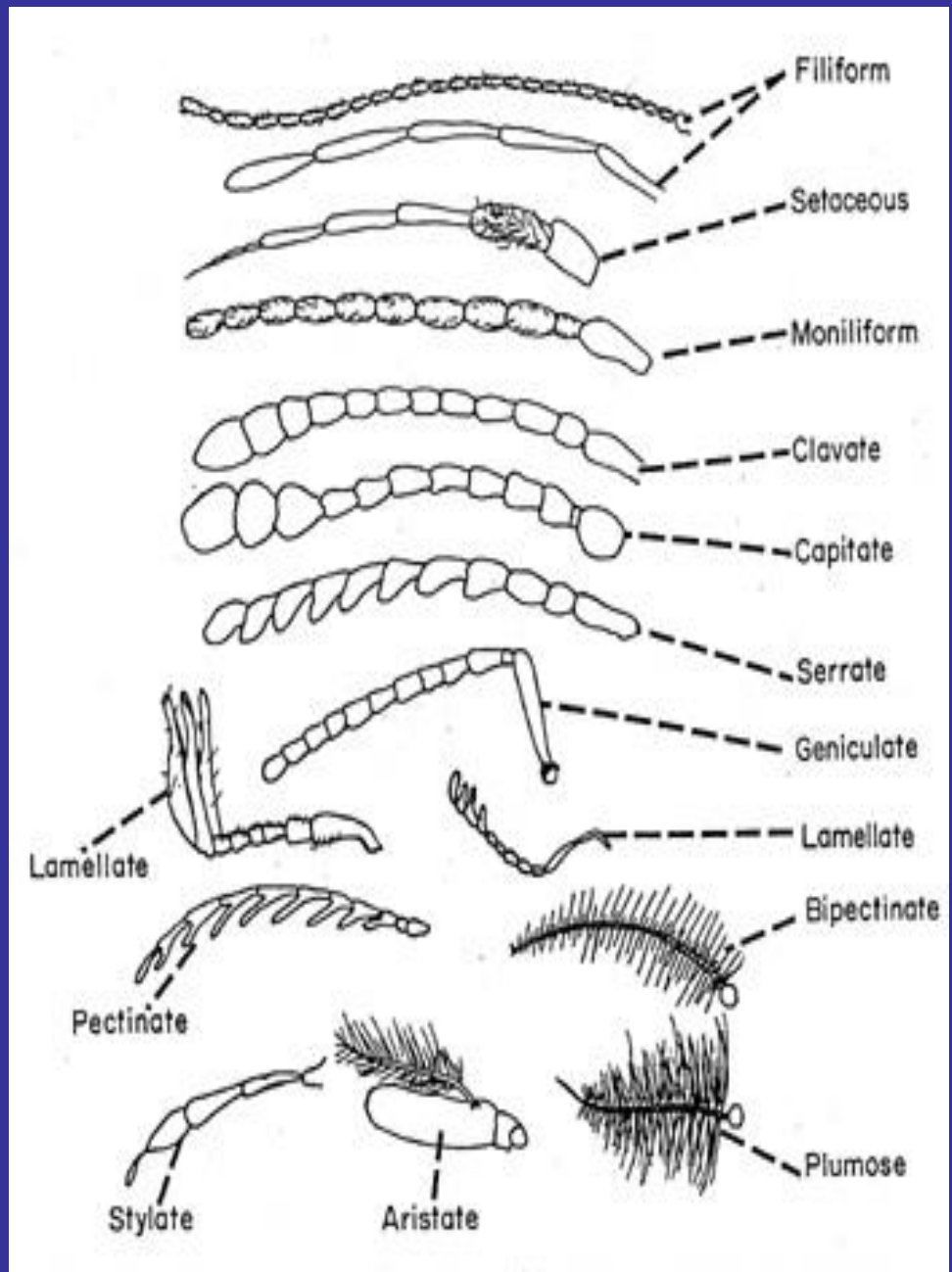
11- Plumose:- Feathery, most segments with whorls of long hairs. e.g. Mosquito.

12- Stylate:- The last segment bearing an elongate terminal style like or finger like process, the style e.g. Robber fly.

13- Serrate:- Saw like or saw-toothed, the segments have short triangular projections to one side. e.g. Pulse Beetle.

14- Whorled:- All the segments carry hairs all around the joints. e.g. Mango Mealy bug.

15- Flabellate:- The third segment gives the antenna a bifurcate appearance and the succeeding segments are seen to be enclosed it. e.g. Stylopids.





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