

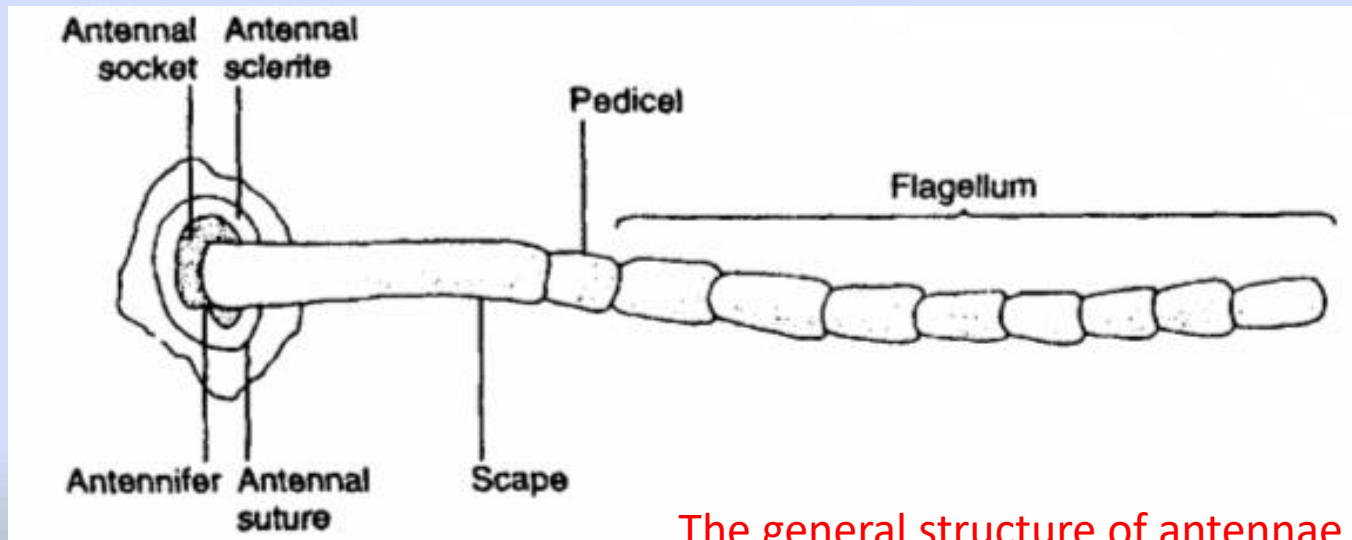
Lab. No. 5 Head appendages

Antennae

Is a pair of segmented appendages located on the head above the mouth parts .

- Antennae function almost exclusively in sensory perception.
- Some of the information that can be detected by insect antennae includes: **motion (movement)** and **orientation, odor, sound, humidity, and a variety of chemical cues.**
- Morphology of antenna which have three segments
 - 1- **Scape**: basic segment of antenna different size and shape with different group of insect.
 - 2- **Pedicel**: second segment of antenna different size and shape with different group of insect, middle between flagella and scape.
 - 3- **Flagellum**: Third or terminal segment of antenna different size and shape with different group of insect.

- **Antennal Socket:** It is a small pit in the front sclerite in the frontal view of the head it is separated from the frons sclerite by suture called **Antennal suture**.
- **Antennifer (Pivot):** It is small triangular which is connected with muscles from one side and with the scape in the other side function **control the movement of scape or antenna to different directions**.



The general structure of antennae

Types of Antennae

1- Geniculate

Geniculate :- This is the only type of antenna that has changes of morphology in scape, Pedicel and flagellum, the scape have right angle with the flagellum and pedicel connects between them

Examples: Bees and ants (Order: Hymenoptera).



Carpenter ant



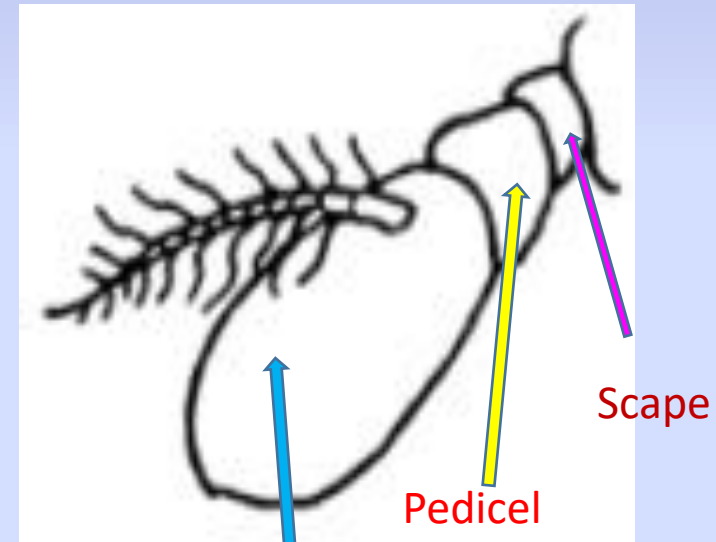
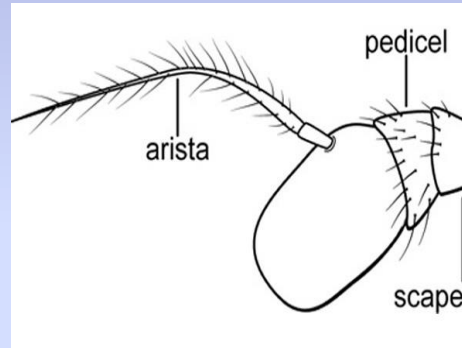
Honeybee worker



2-Aristate

- **Aristate** : the change morphology is in flagellum, the first segment usually enlarged and other segment very small, like hair or like arista

Examples: House fly and syrphid flies (Order: Diptera)



House fly
Aristate Antenna



Flagellum

3-Capitate

Capitate:

The change of morphology in the flagellum segment, the 1st group small but the three terminate segments are very large suddenly.

Examples: Rust red flour beetle. .



4-Clavate

Clavate: The change of morphology is in the flagellum segments, the segments of flagellum are gradually clubbed at the end.

Examples: Butterfly



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5-Filiform

Filiform: The change morphology in the flagellum segment same shape and size to the other segment. antennae have a thread-like shape.

Examples: Ground and long horned beetles (Order: Coleoptera), Grasshopper (Order: Orthoptera)).

- Soldier beetles



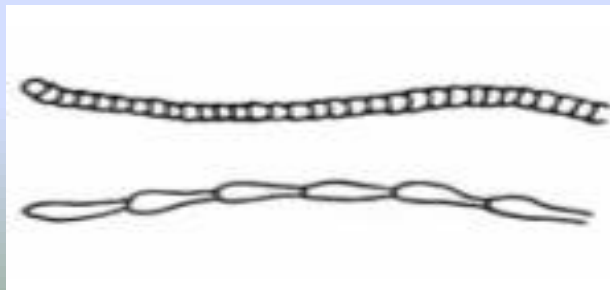
Soldier beetle



Ground beetle



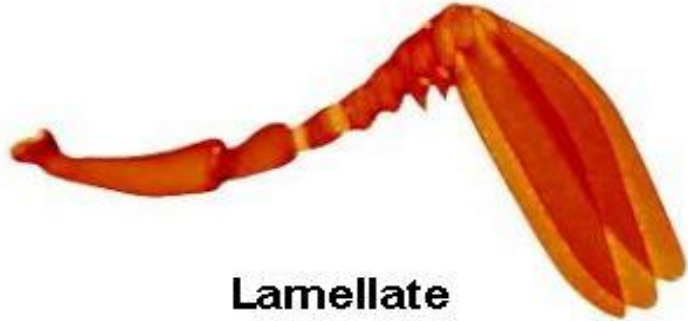
Asian longhorned beetle



6-Lamellate

Lamellate : The change of morphology in the flagellum segment, the 1st group small and have the same size and shape but the lateral group flattened like paper.

Examples: Stem borer of datepalm , Scarab beetles (Order: Coleoptera).



Japanese beetle



Conifer scarab

7-Moniliform

Moniliform: The change of morphology is in the flagellum segment circular in shape, beadlike shape and spherical in shape.)

Examples: Termites (Order: Isoptera)



Termite, *Reticulitermes* sp



Wrinkled bark beetles

8-Pectinate

Pectinate: The change of morphology is in the flagellum segment, each segment have one seta from one side (like comb).

Examples: female of silk worm butterfly
(Order: Coleoptera).

Fire-colored beetles and fireflies



Fire-colored beetle ⁹

9- Bipectinate

Bipectinate : The change of morphology is in the flagellum segment, each segment have 2 seta from both side (like Comb).

Ex : Male of silk worm



Luna moth

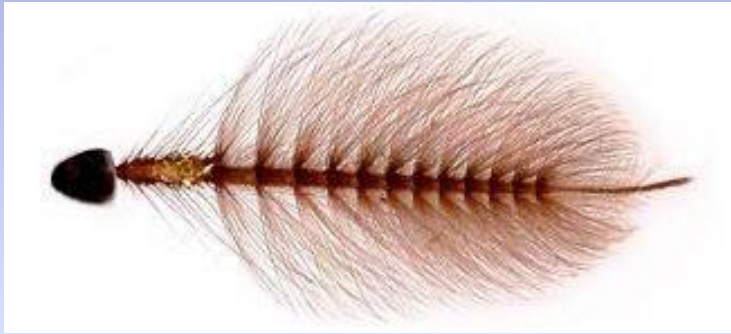


Hercules moth

10-Plumose

Plumose: The change morphology in flagellum each segment has group of (branch) from each side feather-like shape.

Examples: Male mosquitoes (Order: Diptera).



Mosquito male, *Culex*

11 – Pilose

Pilose: The change morphology in flagellum each segment have more than 2 hair from one side it simple hair.

Examples: Female mosquitoes (Order: Diptera).



12-Serrate

Serrate: The change of morphology is in the flagellum segment, each segment have extension or excess or one tooth from the top of each segment like saw-toothed shape .

Examples: Click beetles , stem borer beetles (Order: Coleoptera)

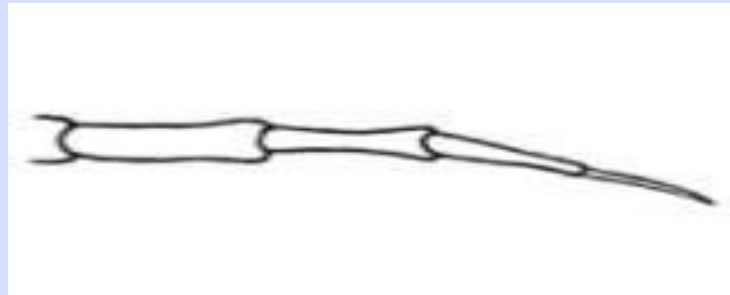


Click beetle, *Agriotes bicolor*
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13-Setaceous

Setaceous: The change morphology in the flagellum segment it is hair like the first segment is large followed by number of smaller and smaller segments (bristle-like shape).

Examples: Cockroach (Order: Dictyoptera)



14- Flat

Example:- Green grasshopper

Grasshopper



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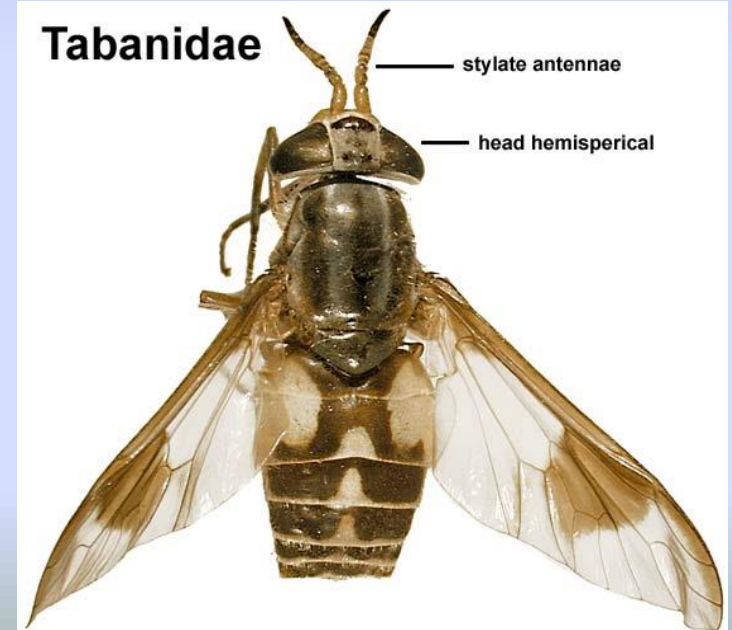


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15- Stylate :

Stylate: The change of morphology is in the flagellum segment, the 1st group small, middle group large, and the lateral group smaller than all group, the last segment bearing an elongate terminal **style** like or fingerlike .

Ex; Horsefly , robber fly .



16– Flabellate Antennae

Flabellate Antennae : antennae strongly flabellate in males, pectinate in females



Family: Callirhipidae and Rhipiceridae