

INSECT APPENDAGES

These are the outgrowths of the body wall which are movable and connected with it by a membrane. The appendages of head, thorax and abdomen in different insects are given below.

APPENDAGES OF HEAD

These comprise the antennae and mouthparts. It may be noted that according to the definition of appendages, the eyes are excluded from them.

A. **Antennae:** They are a pair of jointed, primarily sensory appendages which are located between or below the compound eyes on the head. They are also called feelers. They are absent in the insects of the order Protura.

(a) **Parts of antenna:** Each antenna consists of three parts, viz., scape, pedicel and flagellum (Fig. 18B). The scape is the first or basal segment of the antenna. It is usually longer and thicker than the following segment. The pedicel is the second segment which is generally small. All the remaining segments are usually similar and together called the flagellum. The latter is further divided into ring segments (very small and ring-like), funicle (ordinary segments) and club (swollen segments as in Fig. 18K) in most of the chalcids (parasitic wasps). As the shape of flagellum varies greatly in different insects, there are many types or modifications of antennae. It must be remembered that while describing different types of antennae, you have to consider only the shape of the flagellar segments.

(b) **Types of antennae:** The important types of antennae are as follows:

1. **Setaceous** (bristle-like)(18A): The segments of flagellum gradually taper or narrow towards apex like a hair, e.g., dragonflies, damsel flies, stoneflies, silverfish and cockroaches.

2. **Filiform** (thread-like)(18B): The segments of flagellum are almost cylindrical and of the same thickness like a thread, e.g., ak grasshopper, locust, red cotton bug, earwigs, psocids and shield bugs.

3. **Moniliform** (bead-like)(Fig. 18C): The segments of flagellum are more or less globular like a bead, e.g., termites, doubletails, beaded lacewings and wrinkled bark beetles.

4. **Serrate or dentate** (saw-like or tooth-like)(Fig. 18D): The segments of flagellum have short triangular or tooth-like projections on one side, e.g., pulse beetles (dhora) and most click beetles.

5. **Pectinate** (comb-like)(Fig. 18E): The segments of flagellum have long, slender and stiff projections on one side like the teeth of a comb, e.g., cardinal beetle. When these projections are on both sides, the antenna is called bipectinate, e.g., silkworm moth, saturniid moths, some noctuid moths and sphingid moths.

6. **Plumose** (feather-like or densely hairy)(Fig. 18F): The segments of

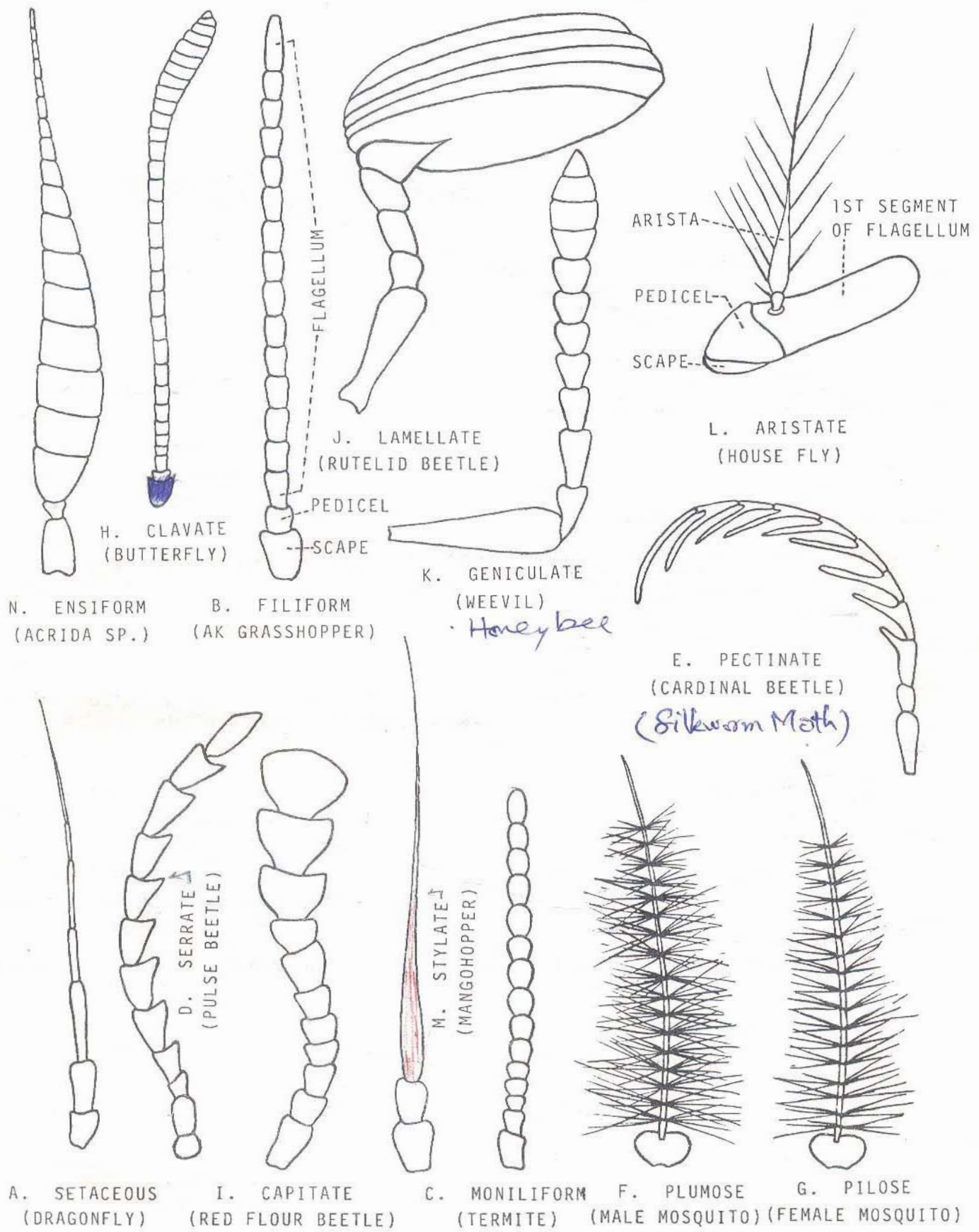


FIG. 18. ANTENNAE OF INSECTS

flagellum (except the distal ones) have thick whorls of long hair on them, e.g., male mosquitoes.

7. Pilose (sparsely hairy)(Fig. 18G): The segments of flagellum (except the distal ones) have very thin whorls of short hair on them, e.g., female mosquitoes.

8. Clavate (club-shaped)(Fig. 18H): The segments of flagellum gradually broaden towards apex, e.g., butterflies, antlions, trogossitid beetles and some darkling beetles.

9. Capitate (knob-like or head-like)(Fig. 18I): One or a few terminal segments of flagellum are suddenly thickened to form a head-like structure, e.g., red flour beetle, powderpost beetles, nitidulid beetles and amblyceran biting lice.

10. Lamellate (leaf-like)(Fig. 18J): The terminal segments of flagellum are expanded into long, broad leaf-like plates on one side, e.g., rutelid beetles, rhinoceros beetles and dungrollers.

11. Flabellate (tongue-like): It has some resemblance to the lamellate antenna. But in this type one or more segments of flagellum are produced into long, thick, tongue-like processes slightly broadening towards apices, e.g., male stylopids and sandalid beetles.

12. Geniculate (elbow-like)(Fig. 18K): In this antenna the scape is very long and forms a sharp bend with the remaining segments like a flexed arm, e.g., weevils, honeybees, chalcid wasps and stag beetles.

13. Aristate (arista-like)(Fig. 18L): The scape is very small while the pedicel is large and triangular. The first segment of flagellum is greatly enlarged, where as the remaining segments are modified into a large hairy bristle, the arista, which is attached to the first segment on the dorsum of its base, e.g., house flies, fruit flies, syrphid flies, etc.

14. Stylate (styliform or setiform)(Fig. 18M): The flagellum forms a long, unsegmented, terminal hair, e.g., mango hoppers (leafhoppers), planthoppers, cicadas, robber flies, delphacid bugs and mayflies.

15. Ensiform (sword-like)(Fig. 18N): The segments of flagellum are thin, flattened and gradually taper towards apex like a leaf-blade or a sword, e.g., green grasshoppers (*Acrida sp.*).

B. Mouthparts: These are the organs of feeding which typically consist of the following five parts:

1. Labrum (upper lip)
2. A pair of mandibles (upper jaws)
3. A pair of maxillae (lower jaws)
4. Labium (lower lip)
5. Hypopharynx (tongue or lingua)