

LABORATORY EXERCISE 7: Head of Insects

General Structure -- External

The head structure of some of the stonefly nymphs, order Plecoptera, is more generalized than that of any other existing Pterygota. Make a drawing (**Drawing #9**) of the dorsal aspect of the head of the nymph of *Acroneuria* sp. (or other suitable large stonefly) as you see it under high magnification of the dissecting ‘scope, omitting all mouthparts except the labrum (upper “lip”) and mandibles. Label compound eyes, ocelli (i.e., dorsal ocelli), antennae, antennal socket, labrum, clypeus, mandibles, and the following ecdysial cleavage lines: coronal suture and frontal suture (together constituting the epicranial suture), subgenal and epistomal sutures, and the antennal, ocular and subocular sutures (refer to Gillott, fig. 3.3). Make note of the areas for attachment of the mouthpart muscles; these appear as slightly raised, lightly pigmented areas of the cuticle of the head. The points of attachment of the anterior arms (apophyses) of the **tentorium** should also be visible as dark heavily sclerotized regions immediately below the antennal sockets; these are the sites of the **tentorial pits** (difficult to see; refer to Gillott, fig. 3.5). Also indicate the general areas of the **vertex**, **frons** and **genae**. Compare this head with that of an adult stonefly of the same species as the nymph.

Examine the head of a roach (*Blaberus* sp., *Periplaneta americana*, or *Gromphadorhina portentosa*), noting the differences and similarities in the parts mentioned above. Then compare with the head of a grasshopper, *Romalea microptera* (or other Acrididae). Also examine the heads of other insects provided for this purpose and the demonstration specimens.

Antennae

Examine the antennae of a live *Blaberus* spp. cockroach or of a hissing cockroach (*Gromphadorhina portentosa*), noting particularly the movement at the articulation with the head capsule (Gillott, fig. 3.6). Is the flagellum of the roach’s antenna capable of actively bending? Make a drawing (**Drawing #10**) of the three proximal segments of the antenna of a preserved cockroach, short-horned grasshopper (Orthoptera, Acrididae), or stonefly (Plecoptera), showing the details of articulation at the antennal socket. Label the scape, pedicel, flagellum, membranous socket, antennifer and antennal suture. Study the slides of different types of antennae on demonstration, noting the sensory setae and other sense organs (e.g., **Johnston’s Organ** on the mosquito antenna; order Diptera, family Culicidae) which are especially well developed on certain types.

For help in labeling your drawings in this lab exercise, refer to figure 3 in Imms and figures 3.3, 3.4, and 3.6 in Gillott.