INSECT MORPHOLOGY
Lab 3 - A Study of the Insect Head

The Grasshopper Head

A. ANTERIOR ASPECT. The frontal region of frons is the large sclerite that occupies the anterior surface of the cranium and extends ventrally to the epistomal suture. This suture separates the clypeus and the frontal region. The dorsal limit of the frons is not clear. Note that there is a median suture extending over the vertex. This median suture forks into two sutures in the vicinity of the paired upper ocelli. The inverted v-shaped suture looks like the ecdysial line but is in reality nothing more than a secondary inflection of the cuticula. The terms coronal suture for the upper part, and for the lower fork frontal suture are applied in taxonomic literature.

The central area of the frons is elevated and bounded by a ridge, the frontal carina, on each side. The flap-like sclerite beneath the clypeus is the labrum. The labrum is separated from the clypeus by the clypeo-labral suture. The maxillary palps are usually visible under the labrum.

The anterior tentorial pits are located in the epistomal suture near the outer edges of the clypeus. Those pits represent the points of invagination of the integument to form the anterior arms of the tentorium. The upper part of the clypeus is called the postclypeus, and the lower part the anteclypeus.

The large compound eyes are on the dorsolateral region of the head. The subocular ridge extends below the eye from the ventral rim of the eye to the lateral margins of the epistomal suture. Beneath the compound eye and posterior to the subocular ridge is the cheek area or gena.

The antennae are on the upper limits of the frontal region mesad of the compound eyes. The upper paired ocelli are located above the antennae and the median ocellus is below the antennae on the median elevated region of the frons.

A short, transverse subantennal suture lies on each side of the median elevation of the frons just below the level of the median ocellus. These subantennal sutures form inner ridges upon which the labral muscles have their origin.

1) Prepare a drawing of the frontal aspect of the head of the grasshopper labeling the above underlined structures.

B. LATERAL ASPECT. The greater part of the lateral aspect of the head is made up of the parietal region; this is the broad lateral sclerite bounded dorsally by the midline of the vertex, anteriorly by the subocular ridge, posteriorly by the occipital suture, and ventrally by the subgenal suture. The occipital suture is the vertical cuticular inflection that separates the parietal region from the narrow occipital sclerite behind it. The subgenal suture is a continuation of the epistomal suture at the sides of the head extending above the bases of the mandibles.

The parietal region bears the compound eyes. The ocular suture surrounds the eye, while the subocular suture extends beneath the eye. That portion of the parietal region above the eyes and extending to the dorsal midline of the cranium is the vertex; the portion of the parietal region beneath the eyes is called the gena.

1) Prepare a drawing of the lateral aspect of the head of the grasshopper and label the above underlined structures.

C. POSTERIOR ASPECT. The posterior surface of the cranium is a narrow area surrounding the occipital foramen (or foramen magnum) on the dorsal and lateral sides. The ventral side of the foramen is completed by the basal sclerite of the labium and by the neck (cervical) membrane in which the labium is embedded.

The occipital suture is located where the dorsal and lateral areas of the cranium are reflected on the posterior surface of the head. The occipital suture runs along the posterior margin of the parietals. The occipital suture marks the anterior edge of the occiput which is a narrow, arching sclerite lying behind the vertex and extending ventrally on each side to the posterior articulation of the mandible. The portion of the occiput below the compound eyes is expanded on each side and is called the postgena.

The postoccipital suture marks the posterior margin of the occiput and separates it from the postocciput. The posterior tentorial pits are located in the lower end of the postoccipital suture. When the postoccipital suture is indistinct, the posterior tentorial pits serve as landmarks to locate it.

Posterior to the postoccipital suture is the postocciput. It is difficult to locate this narrow arching sclerite. The postoccipital suture internally forms the ridge upon which the muscles that move the head and thorax are inserted. It is regarded as being the true dividing line between the labial and maxillary segments.

1) Prepare a drawing of the posterior aspect of the head of the grasshopper and label all of the above underlined structures.

The Hemipteran Head

1) Prepare a drawing of the lateral aspect of the head of a stink bug (Hemiptera: Pentatomidae), and label the following structures: compound eye, ocellus, antenna, vertex, clypeus, jugum, tylus, lorum, xyphus, gena, labrum, buccula, and labium.

The Coleopteran Head

1) Prepare a drawing of the lateral aspect of the head of a ground beetle (Coleoptera: Carabidae), and label the following structures: mandible, maxilla, maxillary palpus, labium, labial palpus, gula, submentum, gena, and labrum.

The Dipteran Head

1) Prepare a drawing of the anterior aspect of the head of a flesh fly (Diptera: Sarcophagidae), and label the following structures: antenna, arista, bucca, gena, rostrum, oral vibrissae, compound eye, ocellar triangle, frontal suture, frontal lunule, ocellar bristle, inner vertical bristle, postvertical bristle, outer vertical bristle, frontal bristle, and fronto orbital bristle.