

## LABORATORY EXERCISE 12:

### Legs of insects

Examine the legs of the silverfish or firebrat, *Lepisma* or *Thermobia*, respectively -- both of the primitively apterous order Zygentoma (thysanurans). Note the free (unfused) articulation of the coxae with the thorax. Is there any differentiation of the legs? (i.e., homonomous or heteronomous?) Try to see the median claw of the insect's pretarsus, situated between the two primary unguis; this condition is thought to be phylogenetically ancient, although many higher insects have secondarily lost one of the unguis in certain life stages and in response to specific (but unknown) evolutionary pressures.

Study the legs of a perlid or pteronarcid stonefly (Plecoptera) or other generalized insect (*Corydalus*, etc.). Is there any differentiation here, from segment to segment? Are the coxae 'free'? Examine carefully the articulation of the trochanter with the coxa and with the femur. Remove the metathoracic leg by cutting around the base of the coxa, or, better yet, pin the leg (still attached to the body) into such a position that all its parts are visible. Make a drawing (**Drawing #19**), lateral view, labeling the parts of the leg (see Gillott, figures 3.21 and 3.22).

Next, study the legs of a living *Periplaneta*, *Blaberus*, *Gromphadorhina*, or other cockroach (suitably restrained). Note the movements of all the joints, and compare the coxae in particular to those of a stonefly.

Study the tarsus and pretarsus of *Periplaneta*, *Gromphadorhina*, or *Blaberus* (preserved) under the high power of the dissecting scope. Draw (**Drawing #20-a** and **20-b**) both dorsal and ventral views. Label arolium, aroliar pads, auxilia, unguis, unguis tractor plate, plantulae, and tarsomeres (Gillott, fig. 3.23). Note that although the first three tarsomeres are partially fused, the plantulae are separate.

Carefully examine the demonstrations of leg adaptations and modifications, such as the hindleg of *Romalea* (Orthoptera); the foreleg of *Ranatra* and *Lethocerus* (Hemiptera, s.o. Heteroptera); foreleg of *Mantis* (Dictyoptera, s.o. Mantodea); hindleg of *Notonecta* (Hemiptera, s.o. Heteroptera); foreleg of *Cantheon* (Coleoptera) and *Gryllotalpa* (Orthoptera); foreleg of *Dytiscus* (Coleoptera); any leg of *Phthirus pubis*, *Pediculus* sp., or a representative of Phthiraptera (clades Mallophaga or Anoplura); and so on (Gillott, fig. 3.24). Determine in each case the homology of the leg segments and indicate (to yourselves -- no drawing necessary) the nature of the adaptation (cursorial, saltatorial, raptorial, fossorial, natatorial, grappling-parasitic, etc.).

You may use any time left at the conclusion of the above exercise to finish off work on the thorax of *Tipula* (Exercise 11).