

DIAGNOSTIC CHARACTERS FOR THE IDENTIFICATION OF ADULT COLEOPTERA (Polyphaga)

Hind coxae are not fused to the metasternum and do not divide the first abdominal sternum; pronotum without notopleural sutures.

Tarsal formula is the number of segments of the tarsi, which has 3 numbers a-b-c, starting with the fore leg (a), then the middle leg (b), then the hind leg (c). For example, a tarsal formula of "5-5-4" means there are 5 segments in the fore leg's tarsi, 5 segments in the middle leg's tarsi, and 4 segments in the hind leg's tarsi. This character is especially useful at family rank and higher.

Families:

Lycidae. (Net-winged beetles): Length 5-18mm. some species have fan-shaped (widened posteriorly) elytra, **net-veined elytra (network of raised lines, longitudinal ridges); soft bodied; large antennae with broad flat segments;** often red or yellow with black markings, or black with sides of pronotum reddish.



Lampyridae. (lightning bugs, fireflies) ; Length 5-20mm. **Elongate soft bodied beetles.** Color brownish, olive or black sometime marked with yellow or red. **Head more or less covered by the prothorax;** middle coxae meet at the base; elytra reticulate ; many of the larger species have **light organ on the ventral abdomen.**



Cantharidae. (Soldier beetles): L. 1-15mm (usually 7-12mm). Elongate soft bodied beetles; head is not covered by the pronotum (head visible from above) ; no light producing organs; color usually black or dark brown, some species are bright yellow, orange or red with black markings.



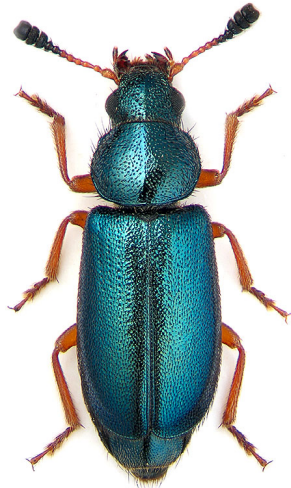
Dermestidae. (Dermestid, skin, larder beetles): L. 1-12mm. Body is usually oval or slightly elongate oval covered with scales or dense hair like setae; antennae are short, clubbed and fit in an antennal groove beneath the head; hind coxae are dug for reception of the femora; color is usually dark with white, yellow, brown or reddish scales. All adults except genus *Dermestes* have a median ocellus (can be very small).



Bostrichidae. (Horned branch and twig borers): L. 2-50mm (usually 2-20mm). Many species are **elongate cylindrical** and are black in color (a few species have red elytra). **Most species have a rasp-like pronotum with horns or tubercles present; antennae are not elbowed but have a 3-4 segmented clubs**; the head is not visible from above in many species includes ‘‘powderpost beetles’’ which born into dry and seasoned wood reducing it to powder.



Cleridae. (Checkered beetles): L. 3-24mm (usually 5-12mm). Elongate narrow shape; **pronotum is usually narrower than the base of the elytra; head is large, often as wide or wider than the pronotum; densely hairy body, usually marked with bright contrasting colors**; all tarsomeres are lobed except for the fifth tarsomere on each leg. Some specialist has placed some clerids which have the fourth tarsomere very small and difficult to see into a separate family. Corynetidae (include the genus *Necrobia*).



Nitidulidae. (sap beetles): L. 1.5-12mm. Usually oval, nearly quadrate body shape; body often flattened; pronotum with usually as wide or wider than base of the elytra; color pale to black, may have red or yellowish spots on the elytra; the elytra are sometime shortened exposing the apex of the abdomen; **antennae with a distinct 3-segmented club**; some species have tibiae spinose or denticulate on external margin; **dilated tarsomeres with pads of setae beneath, fourth tarsomere minute, fifth long.**



Cucujidae. (Flat bark beetles): L. 2-14mm. **usually very flat beetles, body is elongate with a broad prominent head,** often expanded laterally behind eyes; **antennae are 11 segmented** (filiform or miniliform without distinct club); mandible large robust; color is red to black.



Coccinellidae. (ladybird beetles, ladybugs); L. 0.8-10mm. **Body round or oblong, strongly convex dorsally; head concealed** from above in many species by expanded pronotum; **tarsal formula apparently 3-3-3, actually 4-4-4** in most species (3rd tarsomere often small and tucked within broad triangular 2nd tarsomere); often brightly colored, usually red, orange, brown or shiny black with various markings including white spots; antennae clubbed and inserted at the inner margin of the eyes.



Mordellidae. (Tumbling flower beetles): L. 1.5-15mm (usually < 8mm). **Wedge-shaped, humpbacked beetles; head bent down, not visible from above, end of abdomen (pygidium) pointed and extend beyond the elytra:** short antennae; hind legs long, often with enlarge femora; usually black or brown, often with white, red or yellow coarse hair-like setae or scales.



Tenebrionidae. (darkling beetles); L. 2-35mm. **Body hard; pronotum margined; tarsal formula is almost always 5-5-4;** tarsomeres usually without large pads; claws often simple; frontal coxal cavities closed behind; eyes usually notched; 11 segmented antennae (rarely 10 segmented) inserted under lateral expansion of frons; five visible abdominal sterna; most species are black, some with white or red markings, rarely reddish or brownish.



Meloidae. (Blister beetles); L. 3-30mm (usually 10-15mm). Elytra are soft, the body is usually narrow or elongate, some species globular shaped; head is deflexed with narrow neck; **the pronotum is narrower than the head or elytra; tarsomeres not lobed but slender, tarsal formula 5-5-4 ; tarsal claws cleft or toothed;** six visible abdominal sterna is often black or brown, sometimes orange or marked with red, yellow or white.



Cerambycidae. (Long-horned beetles) L. 3-150mm. **Elongate-cylindrical shape; antennae usually at least half as long as the body, often much longer;** antennae are usually inserted on the prominence and their base is partially surrounded by eyes; tarsi appear four segmented but are actually 5-5-5 (4th segment is concealed in the notch of the 3rd segment); can be brightly colored.



Chrysomelidae. (leaf beetles): L. 1-20mm. **Body is elongate-sylindrical to oval and flat; the head is generally visible from above;** same tarsal formula as cerambycidae (**apparently 4-4-4 but is actually 5-5-5**) but beetles are often similar (6-12mm) and **antennae are short (less than half length of body), antennal insertions not on prominences and not partially encircled by eyes;** hind femora of some species enlarged for jumping; many species brightly colored.



Curculionidae. (snout beetles and weevils): L. 1-35mm. **Head is drawn out into an elongate nostrum or snout; antennae are usually elbowed** and clubbed (geniculate) and inserted on the snout; tarsal formula is 5-5-5, with the 4th segment minute and usually concealed within a depression in the 3rd segment (description fits ca. 95% of species in the family); recent revision now includes beetles that formerly were included in the family Scolytidae which is currently considered a subfamily within Curculionidae.



Scolytidae. (Bark beetles, engravers, ambrosia beetles): L. 1-9mm (usually under 4mm). Rostrum or snout is greatly reduced; body is punctuate and striate, very stout to moderately elongate/cylindrical; similar to bostrichidae except **the antennae are elbowed with a distinct club and no horns or tubercles are present on the pronotum**; tarsal formula is 5-5-5 with the 4th tarsomere minute and the 3rd slender or broad.

