

Morphology of adult beetles

The following publications on beetles in general and on particular species of ladybirds should be consulted for ladybird beetle morphology: Lawrence and Britton (1994; general beetle morphology); Verhoeff (1895; morphology of the abdomen); Dobzhansky (1924, 1926; morphology of the female genitalia); Hafez and El-Ziady (1952a, 1952b; adult and larva of *Hyperaspis*); Sasaji (1968a, 1971; comparative adult morphology); Priore (1963; adult and larva of *Rodolia cardinalis*); and Kovář 1996a (adult morphology and anatomy).

The body (Figs 31–42) of a ladybird beetle is usually oval or rounded in outline and quite convex. However, in some Coccidulinae it is elongate and almost flat. The ventral side is usually flat but in rare cases is weakly to distinctly convex. The dorsal surfaces may be polished and apparently glabrous or have only a slight sheen, covered with short to moderately long setae, stiff hairs or a combination of both. The head is small, partly withdrawn into the prothorax and, to varying extent, covered from above by the pronotum. The articulation between the prothorax and elytral bases is almost always broad and usually rigid. Appendages (antennae and legs) are often short and inconspicuous.

Head

Many important characters are situated on the head and its appendages. The head capsule (cranium) can vary from quadrate to distinctly transverse. Rarely it is elongate with the clypeal part somewhat rostrate (Microweiseini, Carinodulini). It is usually flattened and directed anteriorly (prognathous), but in some taxa it can be directed down obliquely (e.g. Serangiini, some Chilacorini) or, in repose, it can be strongly deflexed and fit closely underneath against the prosternum (Sukunahikonini and Microweiseini; Fig. 50).

The size of the eyes can vary considerably between genera and species but in most Coccinellidae the eyes are large and occupy a large portion of head. In some of the taxa that live in leaf litter, the eyes have been reduced to only a few coarse facets. The anterior margin of the eye can be variously indented by a cuticular process here called the ocular canthus (synonyms: genal canthus; genal shelf; clypeal shelf). In the extreme condition the eye is almost completely divided by the canthus (Telsimiini). The ocular canthus appears as a lateral extension of the clypeus in Telsimiini, Platynaspidini or Chilacorini (Figs 979, 982) but it is clearly above the clypeus in most other groups (Fig. 1122).

Eye facets are fine and flat in most groups but in many taxa classified in Coccidulinae they tend more towards coarse and convex; the eyes sometimes bear distinct interfacetal setae or stiff bristles (Fig. 1071). The interocular distance is the minimum distance between the inner orbits of the eyes. The width of the head is defined as the maximum width with the eyes included. A useful character is the relationship between these two measures. The ratio is usually about 0.5. In taxa with narrowly separated eyes (e.g. Telsimiini), this ratio is clearly below 0.5, while in many Epilachninae it is distinctly above.