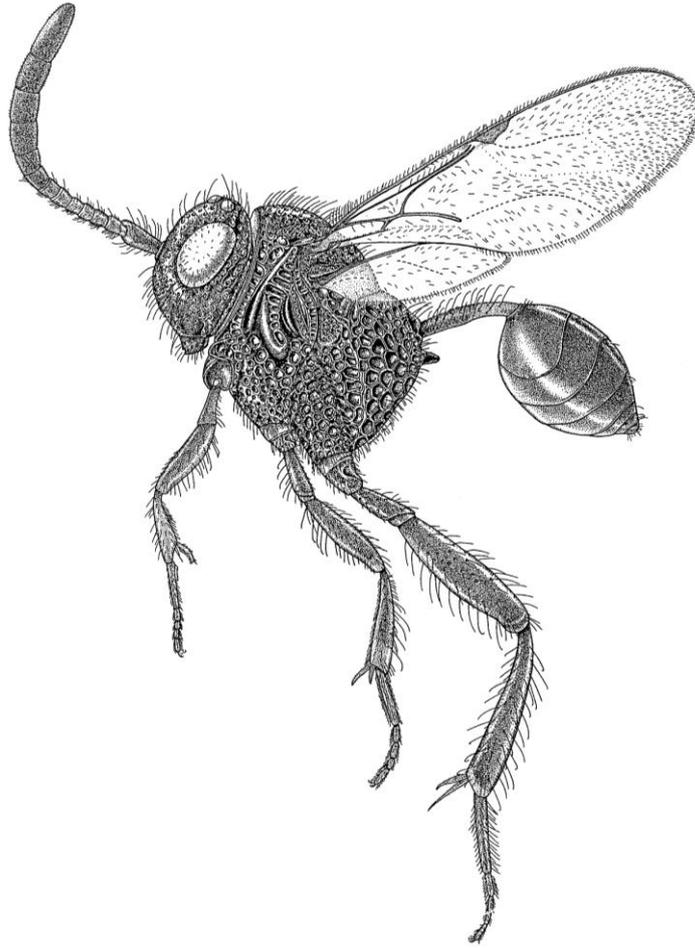


Order Hymenoptera



Common names: bees, wasps, ants, fig wasps, velvet ants, sawflies, ichneumons

Simple diagnosis. The Hymenoptera are very diverse in morphology. Adults are characterised by having mandibulate (= biting and chewing) mouthparts, although bees have tongue-like mouthparts; there are two pairs of wings that are membranous, and the tarsi are usually five segmented and the abdomen is often constricted into a one- or two-segmented petiole (= waist-like segment).

Technical diagnosis. Hymenoptera are diagnosed by two pairs of membranous wings with reduced venation, often with polygonal cells, and the anal vein of the forewing does not reach the posterior margin of the wings. The wings are often coupled with hooks (= hamuli). The hindwing is smaller than the forewing and is rarely reduced; sometimes the wings are absent. The mouthparts are mostly mandibulate (= biting and chewing), although in bees they are modified into a sucking tongue-like proboscis (= glossa). The mesothorax is well-developed, more so than the pro- and metathorax. Protibial spurs are present for cleaning the antennae. Tibial spines are usually present and the tarsi are often five-segmented. The female ovipositor is usually well-developed.



Bees (Hymenoptera: Apidae)

Larvae are mostly terrestrial, live on vegetation or in nests built by adults. They have a thick, eruciform (=caterpillar-like) body, have prolegs on segments II-VIII and X, which are sometimes absent; some larvae are apodous (= legless). The head capsule is usually thick and robust, without an adfrontal area, with mandibulate (= biting and chewing) mouthparts. The labium sometimes has a spinneret (= silk spinning organ).

What can they be confused with? The hymenopteran groups with reduced hindwings (family Mymarommatidae) can be confused with Diptera and male Coccoidea (Hemiptera); the two latter groups having two unconstricted basal abdominal segments, whereas in the family Mymarommatidae they are waist-like.

Wingless Hymenoptera can be confused with wingless Diptera, as they also have a similar body shape and the pronotum is reduced. However, wingless representatives of Hymenoptera have mandibulate (= biting and chewing) mouthparts. If their mouthparts are modified into a sucking proboscis, then they have a constricted abdomen. In contrast, representatives of Diptera that have a sucking proboscis never have constricted basal abdominal segments



Formicidae: *Aphaenogaster* sp.



Formicidae: *Polyrhachis* sp.



Formicidae (left to right): Ponerinae sp., *Camponotus* sp., *Dolichoderus* sp., *Odontognathus* sp.

Hymenopteran larvae are similar to those of Lepidoptera, and Coleoptera, as they are also usually thick, with mandibulate (= biting and chewing) mouthparts, and also can have prolegs and a 10-segmented abdomen. In Lepidoptera the prolegs are commonly placed on segments III-VI and X, having crochets, a spinneret is often present, and the head has an adfrontal area. Larvae of Coleoptera only rarely have prolegs. In other apodous larvae, the labium is segmented, whereas in apodous Hymenoptera it is usually unsegmented.

Biology. The Hymenoptera is one of the hyperdiverse orders of insects. They are ubiquitous in terrestrial habitats but do not occur in marine environments and are almost absent from water. Their feeding habits are diverse, but they are mostly herbivorous or parasitoids. Hymenoptera are known for their social systems and as pollinators, including bees and fig wasps.

Diversity in Papua New Guinea. This cosmopolitan order includes 150,000 species. Most groups are poorly known in New Guinea, but the ant fauna is well-described (Miller 2007).



Parasitic wasp (Hymenoptera: Gasteruptionidae)



Mud-dauber wasp (Hymenoptera: Sphecidae)



Vespid wasp (Hymenoptera: Vespidae)

Key references for Papua New Guinea.

Goulet, H. & Huber, JT. 1993. *Hymenoptera of the world: an identification guide to families*. Agriculture Canada, Ottawa.

Bolton, B. 1994. *Identification guide to ant genera of the world*. Harvard University Press, Massachusetts.



Bee (Hymenoptera: Apoidea)

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