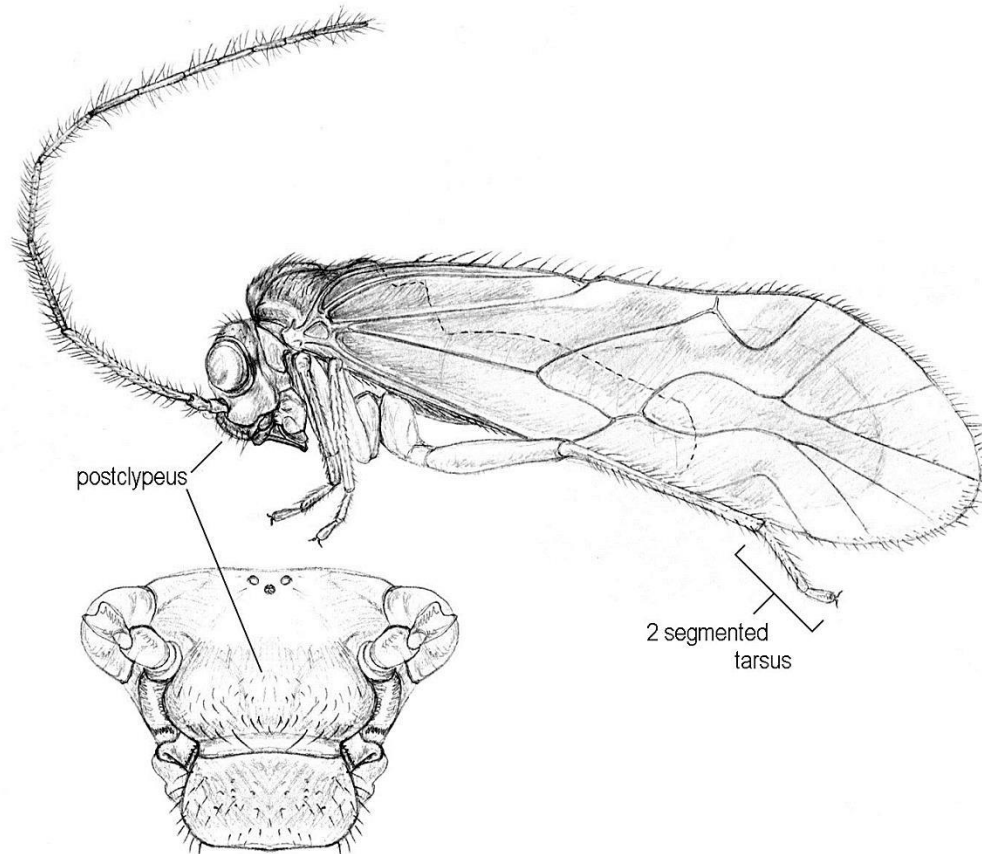


Order Psocodea

Modern classifications include the book lice (Psocoptera) and true lice (Phthiraptera) in the same order. We provide separate diagnoses for these two groups at the subordinal level.

Suborder Psocoptera

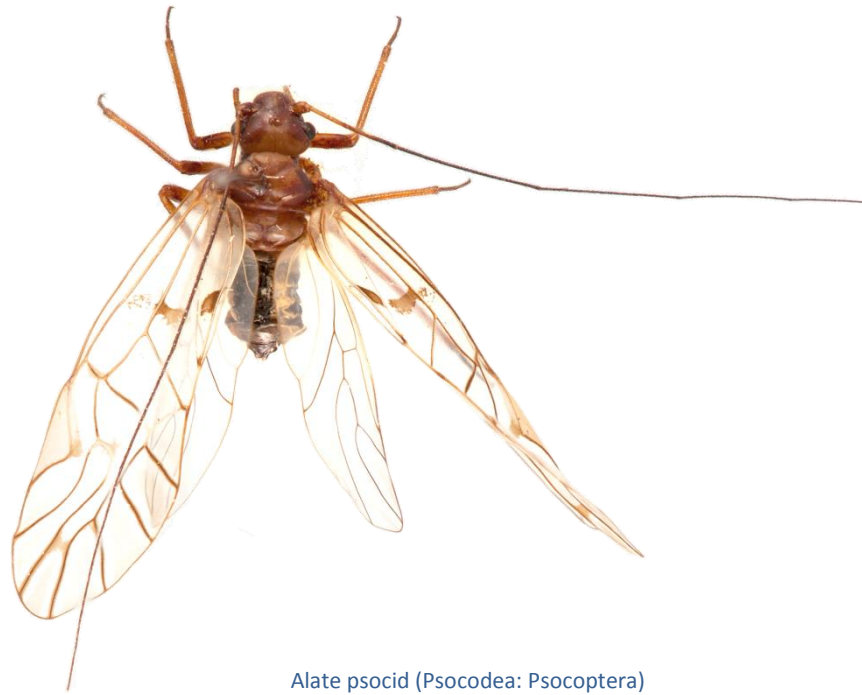


Common names: psocids, barklice, booklice

Psocids are found worldwide, with more than 3000 described species.

Simple diagnosis. The Psocoptera are defined by having a hypognathous (= directed vertically) head, mandibulate (= biting and chewing) mouthparts with elongate and pick-like lacinia (= inner lobe of the maxilla) and the wings are held tent-like over the body, hindwing short, and 2 or 3-segmented tarsi.

Technical diagnosis. Psocids are relatively small insects, 1-10 mm in length, and are either fully winged, short wings or apterous (= wings lost). They have a relatively large and mobile head, usually with large eyes, sometimes the eyes are reduced, ocelli are usually present, but are sometimes absent. Their antennae are filiform (thread-like), usually have 13 segments, but sometimes more. They have mandibulate (= biting and chewing) mouthparts with a lacinia pick-like (= inner lobe of the



Alate psocid (Psocodea: Psocoptera)

maxilla). The pronotum is usually reduced, especially in winged representatives, and the pterothorax (middle and hind thoracic segments) is enlarged. The legs are usually gressorial, the tarsi are 2 or 3-segmented which are not enlarged. The abdominal cerci are always absent. Wings, if present, are held tent-like over the body when at rest, the hindwings are shorter than the forewing, and both have reduced venation, and the forewing usually contain an open cell in the forewing (= areola postica). The nymphs resemble adults.

What can they be confused with? Winged representatives of Psocoptera are similar to some Hemiptera with tent-like wings at rest (some Auchenorrhyncha and Sternorrhyncha). The Hemiptera can be separated from psocids by having elongate tube-like mouthparts, encased by the labium and the pronotum is usually enlarged.

Winged psocids can be confused with some Neuroptera (= lacewings), as they also have tent-like wings at rest, but the latter order differs in possessing dense venation, unmodified mouthparts and five-segmented tarsi.

Wingless psocids are similar to wingless some Zoraptera, in being small, having a hypognathous (= directed vertically) head, eyes reduced and tarsi 2-segmented. However, Zoraptera differ by having 9-segmented antennae, unsegmented cerci, and the pronotum is not reduced, and is as large as the other thoracic terga.

Wingless psocids also can be confused with termite workers, as they both have a large head with a swollen clypeus, moniliform (= bead-like) antennae, and reduced eyes. Termites differ by having unmodified mouthparts, pronotum well-developed, tarsi usually 4- or rarely 5-segmented, and unsegmented cerci.

Biology. Psocids have a worldwide distribution, and most species live in cryptic (= concealed places), such as leaf litter, and under bark and stones, in caves, and nests of termites, hymenopterans or



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mammals. They can make silk galleries. Psocids feed on lichens, algae, fungi, dead organic matter or insect eggs. They have incomplete metamorphosis and the nymphs are like the adults.

Diversity in Papua New Guinea. The New Guinea fauna is poorly known (Miller 2007).



Photograph: © Perry Babin; used under the Creative Commons Attribution-NonCommercial-NoDerivs License - Version 1.0. Specimen size: ~1.25 mm

Key references for Papua New Guinea.

New, TR & Lienhard, C. 2007. *The Psocoptera of tropical South-east Asia*, Brill, Leiden.

Smithers, CN & Thornton, IWB. 1981. The role of New Guinea in the evolution and biogeography of Psocopteran insects. In: Gressitt (ed) *Biogeography and Ecology of New Guinea*, Junk, The Hague.

Suborder Phthiraptera

Common names: lice

Simple diagnosis. The suborder Phthiraptera or lice comprise apterous (= wingless), dorsoventrally flattened ectoparasites (= external parasites). Their eyes are reduced or absent and the antennae are short, 3-5 segmented, the thoracic segments are partly or completely fused, the legs are short, the tarsi are 1-2 segmented, with claws forming hooks, and the abdominal cerci are absent.

Taxonomic diagnosis. Lice are obligate ectoparasites (= external parasites) living on mammals, including humans, and birds. Morphologically they can be recognised by a flattened wingless body, reduced or absent compound eyes, antennae reduced to 3-5 segments. The mouthparts are usually piercing or sucking, sometimes mandibulate (= biting and chewing), the thoracic segments can be partly or completely fused, the legs are well-developed and short, mostly used for climbing on hair or feathers, the tarsi are 1- or 2-segmented, bearing single or two claws forming a large hook, and the cerci are absent. Lice have incomplete metamorphosis and nymphs are smaller and less pigmented than adults.

What can they be confused with? Lice have highly specialised morphology associated with their parasitic life. They are sometimes confused with other unrelated ectoparasites, which can also be wingless, have a compressed body, reduced eyes and antennae, and sucking and piercing mouthparts.

Siphonaptera (fleas) differ from lice in that the body is bilaterally compressed, but never dorsoventrally compressed, and the tarsi are five-segmented. Unlike lice, they are excellent jumpers, and do not spend all their lifecycle on the same host individual.



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Adult fly parasites of mammals and birds (families Hippoboscidae, Nycteribiidae, Streblidae) are also obligate ectoparasites, and spend most of their life cycle on the body of their host. However, they differ by having longer legs, usually more than two tarsal segments, typically five, and the claws are not in the shape of a large hook.

Hemipteran ectoparasitic bugs of the families Cimicidae and Polyctenidae are also dorsoventrally compressed, but differ in having long thin legs and their claws do have large hooks. Polyctenidae are permanent ectoparasites (= external parasites), living exclusively on bats. Cimicidae are temporary parasites and generally are only on their hosts to feed.

Biology. Lice are permanent ectoparasites on hosts and feed on different tissues of their hosts, including their skin, feathers or blood.

Diversity in Papua New Guinea. Lice are found worldwide, with about 3000 species described. The New Guinea fauna is poorly known (Miller 2007).

Key references for Papua New Guinea.

There are no reviews of the New Guinea fauna.