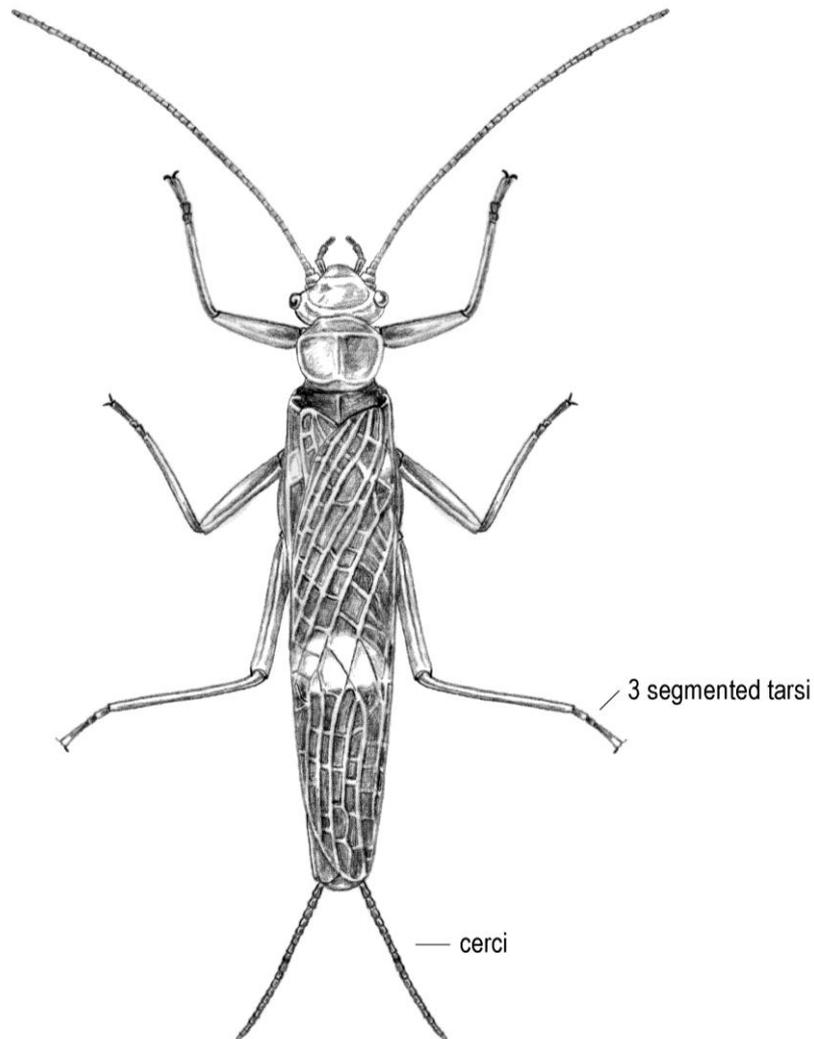


Order Plecoptera



Common name: stoneflies

Simple diagnosis. Plecoptera can be recognised by having two pairs of membranous wings with dense venation, the hindwings are wider than the forewings, the head is vertically directed, with biting and chewing mouthparts, the antennae are long and multi-segmented, there are 2 or 3 ocelli, the cerci are multisegmented, and the tarsi are 3-segmented.

Technical diagnosis. Adults have a roughly cylindrical body, hypognathous (= directed vertically) head with mandibulate (= biting and chewing) mouthparts, well-developed eyes, two or three ocelli, long and multi-segmented antennae, separated thoracic segments, with pronotum not enlarged or shield-like, two pairs of membranous wings with dense venation, held flat over the body when at rest, and the hindwings are wider than the forewings (note, wings can be reduced), slender, well-developed legs, 3-segmented tarsi and usually elongate and multi-segmented cerci.

What can they be confused with? Adults of Plecoptera are similar to those of Neuroptera in terms of general body plan, multi-segmented antennae, simple mandibulate (= biting and chewing) mouthparts, and dense venation of wings. However, the Neuroptera differ in that the wings are



Sterniperla australis

usually held tent-like over the body when at rest, abdominal cerci are absent, and tarsi are 5-segmented. Some stonefly nymphs or wingless adults can be confused with Dermaptera (= earwigs), as they both have unmodified mandibulate (= biting and chewing) mouthparts, free thoracic segments, long cerci, and 3-segmented tarsi, but earwigs generally have a prognathous (= directed forwards) head, sclerotised and shortened (sometimes absent) forewings, no ocelli, forcep-like and unsegmented (rarely multi-segmented) cerci, and a flattened body.

The nymphs of Plecoptera are aquatic and can be confused with those of Ephemeroptera or Odonata. However, Ephemeroptera nymphs differ because the metanotum (= last thoracic dorsal segment) is small and usually not visible from above, and there are three (rarely two) caudal segmented filaments and rows of gills on the abdomen. Ephemeropteran nymphs also move their abdomen up and down when swimming. Odonata nymphs can be readily distinguished by mouthparts in the shape of an elongate mask and the presence of caudal lamellae instead of filaments (= cerci).

Biology. Adults are commonly found near water, but may hide under bark during the day. Adults live for a few days only. They are not good flyers but can run fast. They feed on plants tissues, including algae, lichen and rotten wood.

Nymphs are aquatic and usually inhabit cool, aerated water. When swimming, their abdomen moves from side to side. Some nymphs are terrestrial, but require wet conditions. Nymphs are generally similar to adults, but have wing buds instead of wings. Gills may also be present on different parts of the body. Plecoptera nymphs largely feed on detritus and plants, but some of them carnivorous or polyphagous.

Diversity in Papua New Guinea. Plecoptera is a small order of freshwater associated insects, with about 2000 species worldwide, mostly in temperate regions. Only a single species of Plecoptera is known from New Guinea (Miller 2007).



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Key references for Papua New Guinea.

The single recorded species is only known from its aquatic nymphs and is undescribed.