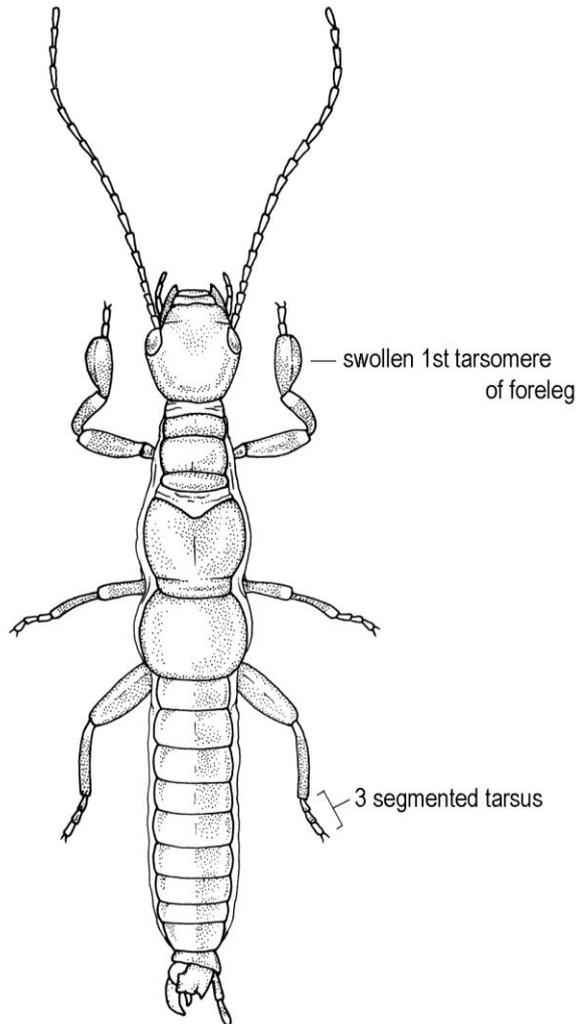


## Order Embioptera (= Embiidina)



**Common name: webspinners, footspinnners**

**Simple diagnosis.** Embioptera are small, elongate insects with biting and chewing mouthparts, 3-segmented tarsi with the first tarsal segment of the leg enlarged and used for silk-production, they have a pair of short two-segmented cerci at the end of the abdomen and short legs.

**Technical diagnosis.** The footspinnners are small winged or wingless insects. Their main diagnostic characters are three-segmented tarsi with the first tarsal segment enlarged. The head and mouthparts are prognathous (= directed anteriorly), they have mandibulate (= biting and chewing) mouthparts, with elongate mandibles, the antennae have 12-32 segments, the compound eyes are often very small, and ocelli are absent. If both pairs of wings are present, both are about equal in length with reduced venation, with only a few cross veins (= small veins connecting longitudinal veins) present. The abdominal cerci are two-segmented. The nymphs are similar in overall morphology to adults and wing buds are present in species that have winged adults.



Webspinner (Embioptera)

**What can they be confused with?** Footspinners share some similarities with termites; both live in groups, have winged and wingless forms, similar antennae, with 10-32 segments, mandibulate mouth (= biting and chewing) mouthparts, unmodified antennae, the thoracic terga (= dorsal sclerites) are well-defined, fore- and hindwings are roughly equal in shape and size, with reduced venation. Termites differ from footspinners by having a hypognathous (= directed vertically) head, mostly 4-segmented tarsi, the foretarsus is never enlarged, the cerci are two-segmented and the wings lack cross veins. Termites are also social insects with a caste system.

Embiopterans can be confused with Zoraptera, as both live gregariously, and have wingless and winged forms, mandibulate (= biting and chewing) mouthparts, the eyes are usually reduced or absent, possess a well-developed prothorax, and the wing venation is reduced. Zorapterans can be distinguished by the hypognathous (= directed vertically) head, two-segmented tarsi, without enlargement, unsegmented cerci, and the hindwing is smaller than the forewing, with reduced venation but without cross veins. Zorapterans never live in silk galleries.

Wingless footspinners are also similar to wingless thrips (= order Thysanoptera), with both having an elongate body and short gressorial legs. Thrips can be separated by a hypognathous (= directed vertically) head, minute and asymmetrical mouthparts (= triangular in anterior view and mandibles in shape of stylets), antennae 5- to 9-segmented, tarsi two segmented with no enlarged tarsomeres, the apex of the abdomen is conical, and they lack cerci.

Wingless footspinners are superficially similar to small earwigs (= Dermaptera) with short cerci, and both have a prognathous (= directed forwards) head, multisegmented antennae, no ocelli, simple mandibulate (= biting and chewing) mouthparts, and all thoracic terga are well-defined and possess three-segmented tarsi. Dermapterans can be separated by the absence of an enlarged foretarsus, and most species have enlarged forceps at the tip of the abdomen.

**Biology.** Embiopterans are gregarious insects that live in silk-galleries, mostly on bark or rocky surfaces. They do not have true eusociality and castes. They feed on mosses, lichens, outer bark and dead leaves.



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**Diversity in Papua New Guinea.** Footspinners are known from tropical and warm temperate regions. Only about 200 species are described. The New Guinea fauna includes only one recorded genus (Ross 1990; Miller 2007).

**Key references for Papua New Guinea.**

Ross, ES. 1990. Embioptera. *Insects of Australia*. CSIRO Publishing, Melbourne.