

EMBIOPTERA



Webspinners / Embiids

The name Embioptera, derived from the Greek "*embio*" meaning lively and "*ptera*" meaning wings refers to the fluttery movement of wings that was observed in the first male Embioptera described.

Classification	Life History & Ecology	Distribution
Physical Features	Economic Importance	
Major Families	Fact File	Hot Links

Life History & Ecology:

The order Embioptera (webspinners or embiids) is another group within the Orthopteroid complex that probably appeared early in the Carboniferous period. Many insect taxonomists believe webspinners represent another evolutionary "dead end" that diverged about the same time as Plecoptera. Determining phylogenetic relationships for this group is unusually difficult because the Embioptera have a number of adaptations not found in any other insects. The tarsi of the front legs, for example, are enlarged and contain glands that produce silk. No other group of insects, fossil or modern, have silk-producing glands in

the legs. The silk is used to construct elaborate nests and tunnels under leaves or bark. Webspinners live gregariously within these silken nests, feeding on grass, dead leaves, moss, lichens, or bark. Nymphs and adults are similar in appearance. Embiids rarely leave their silken tunnels; a colony grows by expanding its tunnel system to new food resources. Well-developed muscles in the hind legs allow these insects to run backward through their tunnels as easily as they run forward. Only adult males have wings. Front and hind wings are similar in shape and unusually flexible; they fold over the head when the insect runs backward through its tunnels. Blood (hemolymph) is pumped into anterior veins to stiffen the wings during flight. In Embioptera, the mouthparts are directed forward (prognathous) rather than downward as in other primitive orthopteroids. This may simply be an adaptation for life in a tunnel, or as some taxonomists have suggested, it may mean that Embioptera are really more closely related to earwigs (order Dermaptera). Most Embioptera are tropical or subtropical.

Distribution:

Uncommon - found in silken nests under bark or leaves in tropical and subtropical climates.

	North America	Worldwide
Number of Families	3	8
Number of Species	9	~200

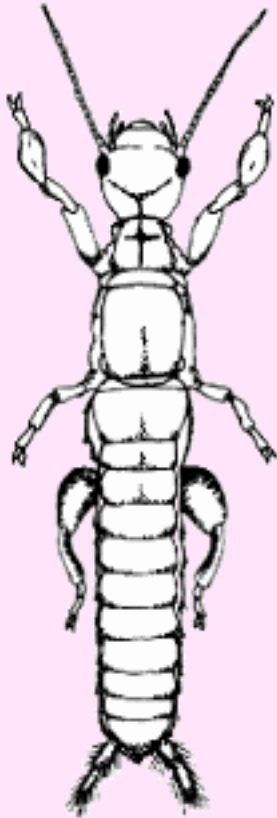
Classification:

Hemimetabola
incomplete development (egg, nymph, adult)

Orthopteroid
closely related to Orthoptera and Plecoptera

Physical Features:

Adults and Immatures



1. Antennae slender, filiform
2. Mouthparts mandibulate, prognathous
3. Tarsi 3-segmented; basal segment of front tarsi enlarged, bearing silk glands
4. Hind femur enlarged, adapted for running backward
5. Wings present only in adult males, highly flexible, smoky in color
6. Cerci 1-2 segmented; asymmetrical in males

Economic Importance:

Webspinners have no economic significance. The insects are small, reclusive, and do not feed on living plants.

Major Families:

Only three families are present in North America:

- **Anisembiidae** -- 2 species
- **Teratembiidae** -- 4 species
- **Oligotomidae** -- 3 species

All of these occur in the southern United States and most have fairly restricted ranges.

Fact File:

- Only adult males are winged. They apparently disperse from one colony to another before mating, and die soon after mating. Sometimes they are eaten by their mate.
- Females of different species are so similar in appearance that it is often impossible to tell them apart. Identification keys are based entirely on male characters.
- Many insects produce silk, but only the Embioptera make it with glands located in the forelegs. Other insects produce silk with their Malpighian tubules or with modified salivary or labial glands.

Hot Links and Illustrations:

- [Gordon Ramel's Embioptera Page](#)

- [Ecowatch Embioptera Page](#)
- [Tree of Life Web Project - Webspinners](#)
- [Discover Life - Embioptera](#)

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