

Thysanura (Silverfish And Fire Brats)

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Thysanura

(Silverfish and fire brats)

Class Insecta

Order Thysanura

Number of families 4

Evolution and systematics

Fossils of thysanurans are known from the upper [Carboniferous period \(/earth-and-environment/geology-and-oceanography/geology-and-oceanography/carboniferous-period\)](#), including *Ramsdelepidion schusteri*, a very large silverfish 2.36 in (60 mm) long found in the state of Illinois in the [United States \(/places/united-states-and-canada/us-political-geography/united-states\)](#).

The order Thysanura is considered the sister group of the Pterygota (winged insects), with which it shares a double articulation between mandibles and head and a well-sclerotized thoracic pleuron.

The Thysanura, or Zygentoma, includes four extant families: Lepidotrichidae, with only one extant species; Nicoletiidae, with soil, subterranean, and myrmecophilous (associated with ants) species; Lepismatidae, including the common domestic species, and Maindroniidae, including species of restricted distribution that live under rocks.

Physical characteristics

Thysanurans are primitively wingless insects. Most species are covered with overlapping silvery-gray scales although some lack scales. Members of the order are usually 0.4–0.8 in (10–20 mm) long, but may range from 0.04–1.9 in (1–50 mm); the bodies are dorsoventrally flattened. The compound eyes are small or absent; there are long filiform antennae; and the external mouthparts include mandibles with two points of articulation to the head. Thysanurans have short styli on abdominal segments two through seven, and two cerci and a median caudal filament at the tip of the abdomen. Females have a jointed ovipositor. The eggs are elliptical, about 0.04 in (1 mm) long. They are soft and white when first laid, but after several hours turn yellow and eventually brown. The larvae resemble small adults.

Distribution

There are about 370 species of thysanurans worldwide.

Habitat

Thysanurans are found in humid locations; under bark, rocks, rotting logs, and leaf litter; in caves; in ant and termite nests; and in synanthropic situations (those associated with human habitation). A few species live in sandy deserts.

Behavior

Silverfish hide under stones or leaves during the day and emerge after dark to search for food. All are fast running. They are nocturnal, even the early larval instars.

Feeding ecology and diet

Thysanurans are omnivorous, feeding on decaying or dried vegetable material and animal remains. Domestic species feed on starchy material such as paper, binding, and artificial silk. Some species associated with ants are cleptobiotic, robbing food from the ants. Species that live in deserts are able to absorb water through the rectum.

Reproductive biology

Thysanurans have ametabolous development; the larvae of silverfish resemble the adults, but are generally smaller in size. Silverfish continue to molt throughout their lives and individuals may live for up to six years. Most silverfish reproduce sexually, with the male depositing a sperm packet on the substrate beneath a silken thread, which is picked up by the female. Some species are parthenogenetic. Females use their ovipositor to insert the oval, whitish eggs into cracks and soil litter.

Conservation status

No species in Thysanura is listed by the IUCN.

Significance to humans

Domestic species of thysanurans are common household pests, causing extensive damage to household goods by feeding on wallpaper paste, book bindings, cardboard, and other paper products, and starch sizing of some textiles.

Species accounts

List of Species

[Relic silverfish](#)

[Silverfish](#)

[Cubacubana spelaea](#)

Relic silverfish

Tricholepidion gertschi

family

Lepidotrichidae

taxonomy

Tricholepidion gertschi Wygodzinsky, 1961, 2 mi (3.2 km) north of Piercy, Mendocino County, California, United States ([/places/united-states-and-canada/us-political-geography/united-states](#)).

other common names

English: Venerable silverfish.

physical characteristics

Length 0.47 in (12 mm); body elongated, lacks scales. Compound eyes and three ocelli; caudal appendages longer than rest of body. Color reddish brown to yellowish.

distribution

Restricted to the redwood-mixed conifer forest of the coastal range of northern California.

habitat

Lives under rotten bark and decaying wood of Douglas fir (*Pseudotsuga menziesii*).

behavior

When uncovered, tries to run away at high speed or displays warning posture elevating the body above the substrate, standing on the tips of the claws and moving the tip of the abdomen and caudal appendages laterally.

feeding ecology and diet

Feeds on vegetable detritus and terrestrial algae.

reproductive biology

After male and female encounter one another, foreplay takes place, in which the male waves his caudal appendages intensively and for short periods in rapid succession, and the female follows the male in "tandem-walks," touching the male appendages with her antennae. The male then rotates and faces the female, runs past the female several times, and finally bends the abdomen dorsally and laterally, at the same time walking slowly and rotating while secreting threads of silk, upon which he ultimately place a spermatophore. The female then walks toward the male, and the male grasps her with his caudal appendages until she picks up the spermatophore with her ovipositor.

conservation status

Not listed by the IUCN. This species lives in association with fallen Douglas firs in an advanced state of decay, and is also myrmecophilous, depending on the presence of a species of carpenter ants (*Camponotus* spp.). It will not be at risk as long as forest management practices leave sufficient fallen trees in a suitable stage of decay, and do not alter the thermal or moisture conditions of the forest understory.

significance to humans

The family Lepidotrichidae was known only from Oligocene fossils until living specimens were discovered in northwestern California in 1959, and is represented today only by *Tricholepidion gertschi*. The family is thus of interest to scientists because it is considered the most primitive of the thysanurans and the link between primitive wingless and winged insects.

Silverfish

Lepisma saccharina

family

Lepismatidae

taxonomy

Lepisma saccharina Linnaeus, 1758, America, Europe, Sweden.

other common names

English: Bristletail, common silverfish, fishmoth, fringetail, furniture bug, paper moth, shiner, silver witch, slicker, sugar fish, sugarlouse, tasseltail, wood fish; French: Poisson d'argent; German: Gemeines Silberfischchen; Spanish: Pescadito de plata.

physical characteristics

Length 0.4 in (10 mm); body covered with silver scales (modified setae).

distribution

Probably native to tropical Asia; has been spread by humans around the world.

habitat

Domestic, found in warm, damp places, such as basements, closets, bookcases, shelves, and baseboards.

behavior

Nocturnal.

feeding ecology and diet

Immature and adult stages are fond of flour and starch and are sometimes found in cereal; they can also feed on muslin, starched collars and cuffs, lace, carpets, fur, and leather. They are also cannibalistic, feeding on molted skins and dead and injured individuals.

reproductive biology

Male spins a silk thread and deposits a spermatophore (packet of sperm) underneath; female picks it up and introduces it in her genital chamber. Eggs are laid singly or in batches of two to three, and are deposited in crevices or under objects. Under optimum conditions, an adult female lays an average of 100 eggs during her life span. Larvae have no scales up to their third molt. After 10 molts they reach sexual maturity, and the adults, with a life span of two through eight years, keep molting about four times per year.

conservation status

Not threatened.

significance to humans

Household pest; does not transmit any disease.

No common name

Cubacubana spelaea

family

Nicoletiidae

taxonomy

Cubacubana spelaea Galan, 2000, Toca da Boa Vista, Bahia, Brazil.

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