

# Chapter XXVII —Class Turbellaria



## (Flatworms or Planarians/Dugesia)- Phylum Platyhelminthes

Turbellaria and Nemertea are common and often very numerous inhabitants of freshwaters. Even though more than 200 species of Turbellaria and 3 species of Nemertea live in North America, their ecology and systematics have been less studied than that of many other common aquatic invertebrates. Most turbellarians become unrecognisable after a routine preservation of field samples in alcohol or formalin.

### Life History

Most freshwater microturbellaria are less than 1 mm in length., although some can reach several millimetres. Triclad (often called planarians) are distinctly larger, with most species exceeding 10 mm and the largest being several centimetres long.

The turbellarian body is elongated, relatively soft, and usually tapered at the ends. Sometimes a short tail-like section or lateral flaps are present near the cerebral region. With the exception of triclads, flatworms are generally not flat- despite their common name. Most microturbellaria are cylindrical in cross-section, with some differentiation of shape of the dorsal and ventral surfaces. Moreover, species that reproduce asexually may be composed of several zooids, giving a chain-like appearance to an individual. Turbellarians may be colourless, white, red, bluish, green, black, brown, or yellowish depending on epidermal and parenchymal pigments, gut content, and symbiotic algae. Anatomically, the most prominent turbellarian features are a ciliated epidermis, rhabdoids, an intestine without anus, ventral mouth, and complex reproductive system.

In most species, miniature replicas of the adult hatch directly from eggs; these juveniles differ from adults chiefly by the absence of reproductive systems. Some freshwater turbellarians, however, may be ovoviviparous (*Mesostoma*) or may have a larval stage distinctly different from the adult (*Rhynchoscolex*). Many seasonally occurring species are univoltine, particularly those associated with temporary habitats or at the extremes of geographical ranges. Most other species are multivoltine, with the number of generations depending on habitat availability. A similar diversity of life cycles is observed in triclads. As a rule, turbellarians are hermaphroditic. Asexual reproduction by means of paratomy, that is transverse division of the body, is common in several genera of microturbellaria.

### Habitat and distribution

Freshwater turbellarians are largely free-living animals, although a few European freshwater species are ectoparasitic on crustaceans. Several other freshwater forms, including triclads, occurring in Europe and Australia are commensal on crustaceans and turtles. The great majority of freshwater turbellarians are free-living and live in various aquatic systems such as ponds, lakes, streams, hyporheic water, ditches, and temporary puddles. However, some may be found in aquatic habitats normally excluded from the domain of freshwater ecology, such as water films among fallen leaves in a mesic forest or in capillary soil water of a grassy meadow.

The ecological distribution of both microturbellarians and triclads has been studied more intensively in Europe but most of the results are directly relevant to North American fauna. Ecological differentiation of microturbellarians in running waters is more pronounced than in lakes.

**Table XXVII-1: Selected characteristics of commonly recognized turbellarian orders and suborders occurring in freshwaters (Thorp & Covich, 1991)**

Taxon			
Order Suborder Superfamily	Approx. number of species	Average body size (mm)	Comments and special features
<b>Microturbellarians</b>			
Catenulida	60	0.5-1	Thin chains of zooids; common in various habitats
Acoela	3	0.5-1	Most species marine
Macrostomida	50	1.0-3	Common in various habitats
Prolecityphora	5	5.0-10	Many marine species
Lecithoepitheliata	10	3.0-10	Many marine species; some are terrestrial or semiaquatic
Proseriata	4	2.0-5	Many marine species
<b>Rhabdozoa</b>			
Dalyellioida	100	0.8-1	Common in various habitats
Dalyelliida		0.8-1	Common in various habitats
Temnocephalida		1.0-14	Commensals on crustaceans, snails, turtles, one parasitic
<b>Typhloplanoida</b>			
Typhloplanida	150	0.5-6	Common in various habitats including terrestrial and semiaquatic
Kalyptorhynchia	15	1.0-2	Rare; most species marine
<b>Macroturbellarians</b>			
Tricladida (planarians)	100	5-20	Greatest diversity associated with karst habitats

### Feeding and functional role in the ecosystem

All triclads are predatory. Microturbellarians eat bacteria, algae, protozoans, and invertebrates, while triclads feed predominantly on larger invertebrates. Several invertebrates and vertebrates may consume triclads.

High densities of both triclads and microturbellarians suggest that their role in biotic interactions of benthic communities may be greater than their contribution to the diet of other organisms. In some cases, microturbellaria may regulate population dynamics of zooplankton in ponds. More important, perhaps, is the functional role of microturbellaria as consumers of protozoans, rotifers, and algae.

### References

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- Thorp, James H., and Alan P. Covich. 1991. Ecology and Classification of North American Freshwater Invertebrates. Academic Press, Inc. xii, 911pp.