
3 Order Gyrocotylidea Poche, 1926

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Introduction

Gyrocotylideans are a primitive group of monozoic cestodes parasitic in the spiral valve of holocephalan fishes. In many phylogenetic classifications of the parasitic platyhelminths, including the recent cladistic analyses of Ehlers (1985), Brooks *et al.* (1985) and Brooks (1989), they are considered the most primitive group of cestodes and the most closely related to the Monogenea: indeed, they have been included in the Monogenea by some workers (e.g. Llewellyn, 1986) but this is not supported by preliminary DNA sequence analysis (Blair, 1993). According to Williams *et al.* (1987), the relationship between the gyrocotylideans and their holocephalan hosts has existed with little change for more than 350 million years and the origin of the group may extend back much further.

The nomenclatural and systematic history of the group is long and complicated. The most recent reviews are those of Williams *et al.* (1987) and Bandoni & Brooks (1987b). Problems have arisen because of the great morphological variability which occurs in terms of contractability and change of form in living material, artifactual changes caused by differences in fixation and the lack of meristic or other non-deformable characters. The group has 13 nominal species of which ten are generally considered valid as, for example, in Bandoni & Brooks' recent (1987b) revision of the group. A feature of the group is that only certain holocephalans serve as hosts and yet two or even three species often occur in the same host, although Colin *et al.* (1986) have cast doubts upon the validity of some of the sympatric forms (see below).

Poche (1926) considered the group to be composed of the single genus *Gyrocotyle* Diesing, 1850, but Joyeux & Baer (1951) recognized three genera: *Gyrocotyle* for large forms with a long, contractile posterior attachment organ bearing a small rosette, lacking lateral body folds and with body-spines restricted to two groups; *Amphiptyches* Grube & Wagener in Wagener, 1852 for small forms with the posterior attachment organ bearing a rosette, with fluted lateral

body folds and with a wide distribution of body-spines; and *Gyrocotyloides* Fuhrmann, 1931 for large forms lacking a rosette on the posterior attachment organ, lacking lateral body folds and lacking body-spines. Although *Amphiptyches* was considered a subgenus of *Gyrocotyle* by van der Land & Dieneske (1968), subsequent workers have tended to accept it as a synonym of the latter genus. The status of *Gyrocotyloides*, a monotypic genus, has been a matter of much debate over recent years, although recognized as valid as recently as 1986 by Schmidt. The controversy concerns the status of *Gyrocotyloides nybelini* Fuhrmann, 1931 and its relationship to *Gyrocotyle urna* (Grube & Wagener in Wagener, 1852), both parasites of *Chimaera monstrosa* off Norway. In a detailed study, Colin *et al.* (1986) came to the conclusion that both *Gyrocotyloides nybelini* and *Gyrocotyle confusa* van der Land & Dieneske, 1968 are synonyms of *G. urna*, being within the limits of intra-specific variation of anomalous and/or damaged specimens of this species. This opinion has been disputed by Bandoni & Brooks (1987b) in their cladistic analysis of the group, by Bristow & Berland (1988) in a preliminary electrophoretic study, and by Berland *et al.* (1989) using fatty acid profiles. Although the validity of the species *Gyrocotyloides nybelini* is still in question, all of these authors are in agreement in considering *Gyrocotyloides* a synonym of *Gyrocotyle*.

ORDER GYROCOTYLIDEA POCHE, 1926

Diagnosis: Body monozoic, stout, fusiform to elongate. Anterior extremity with muscular sucker-like attachment organ. Posterior region of body attenuated and normally terminates in rosette-like adhesive organ (occasionally lost or ? lacking). Lateral margins fluted or not. Spines on body surface widely distributed, narrowly distributed or ? absent. Testes follicular, in two anterolateral fields. Cirrus-sac absent. Genital pores separate. Male pore ventromedial, between anterior extremity and uterine pore. Ovary follicular, in V- or U-shaped band around seminal receptacle; posterior to uterus. Vaginal pore dorsal, lateral to male pore. Vagina long, reaching back to open into seminal receptacle. Uterus coiled medially in middle of body between seminal receptacle and uterine pore; terminal part of uterus forms uterine sac; uterine pore ventromedial in anterior part of body. Eggs operculate; cercomer of larva bearing ten hooks. Vitellarium follicular, filling lateral regions of body. Osmoregulatory system reticulate, with two anterior pores. In spiral intestine of holocephalan fishes.

Family Gyrocotylidae Benham, 1901

Diagnosis: With characters of order. Type-genus *Gyrocotyle* Diesing, 1850.

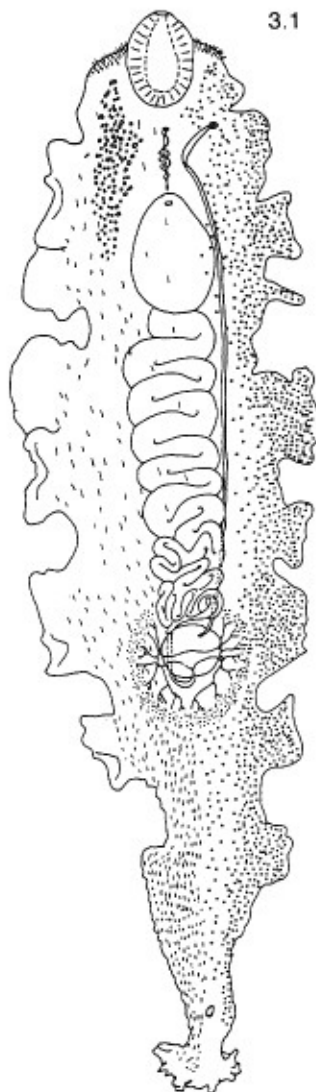


Fig. 3.1 Gyrocotylidean, dorsal view. Testes and body-spines shown only on left; vitelline follicles shown only on right. Modified after Williams *et al.* (1987).

Genus *Gyrocotyle* Diesing, 1850 (Fig. 3.1)

(Syns *Crobylophorus* Krøyer, 1852; *Amphiptyches* Grube & Wagener in Wagener, 1852; *Gyrocotylodes* Fuhrmann, 1931)

Diagnosis: With characters of family. Type-species *G. rugosa* Diesing, 1850.