

A Checklist of the Aspidogastrea (Platyhelminthes: Trematoda) of the World

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Abstract

A checklist of records of aspidogastrean trematodes (Aspidogastrea) is provided on the basis of a comprehensive survey of the literature since 1826, when the first aspidogastrean species was reported, until December 2014. We list 61 species representing 13 genera within 4 families and 2 orders of aspidogastreans associated with 298 species of invertebrate and vertebrate hosts. The majority of records include bivalves (44% of the total number of host-parasite associations), whereas records from bony fishes represent 32% of host-parasite associations. The aspidogastreans have worldwide distribution, with the highest number of records in the Nearctic Region for freshwater hosts and the North Atlantic Ocean for marine ones. The checklist includes a parasite-host list with data on host habitat, site of infection and distribution area of parasites, and a host-parasite list. A limited number of molecular studies on aspidogastreans does not allow us to unravel phylogenetic relationships within the Aspidogastrea.

Key words: Biodiversity, Taxonomy, Aspidogastridae, Multicalycidae, Rugogastridae, Stichocotylidae

Introduction

Aspidogastrean trematodes are a small group of parasitic flatworms (Neodermata) with worldwide distribution, characterized by having a ventral holdfast organ with rows of alveoli or suckerlets, or just presenting a row of rugae or suckers (Rohde 2005). Aspidogastreans parasitize molluscs as obligate hosts and vertebrates (fishes and turtles) as facultative or obligate final hosts (Rohde 2002); they represent the most basal group of trematodes (Trematoda) (Olson *et al.* 2003).

The first described species of aspidogastrideans was *Aspidogaster conchicola* von Baer, 1826 recovered from the pericardial cavity of unionid mussels of the genera *Anodonta* Lamarck and *Unio* Retzius in Prussia, a historical region of Germany (currently part of Poland and the Kaliningrad Region of Russia). Since then, several attempts have been made to classify these trematodes that possess a peculiar ventral attachment apparatus.

In a first attempt to classify the Trematoda, Burmeister (1856) suggested the division of them into three groups (Pectobothrii, Malacobothrii and Aspidobothrii); the last one was proposed to accommodate the genus *Aspidogaster* von Baer. However, some authors (Cunningham 1884, 1887) considered the group to belong to polystomids (currently a subclass of the Monogenea) or used the name Aspidobothrea Monticelli for this group. Thereafter, several new genera and species were erected (Leidy 1857; Olsson 1869; Cunningham 1884).

A new classification was proposed by Monticelli (1892) based on a critical review of Burmeister's (1856) classification, with the suborder Aspidocotylea Monticelli replacing the former terms for aspidogastreans, including the single family Aspidobothridae Monticelli. The etymology of Aspidocotylea is stemming from inclusion of *Aspidocotylus* Diesing into the group. However, this genus clearly does not belong to aspidogastreans and it was excluded by several authors (Faust & Tang 1936; Dollfus 1956, 1958a; Yamaguti 1963; Rohde 1972). At present, it is considered to be a digenetic genus *incertae sedis* within the Paramphistomoidea (Jones 2005).

within them (Littlewood 2006). More robust analyses based on morphological and molecular data (including multigenes) are necessary to clarify the relationships within Aspidogastrea and thus to improve our knowledge on the evolution of both aspidogastrean and digenetic trematodes.

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