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DIGENEA, PLAGIORCHIIDA

Introduction to Plagiorchiida La Rue, 1957 (Order)

Rafael Toledo, Bernard Fried, and Lucrecia Acosta Soto

Phylum Platyhelminthes

Class Trematoda

Subclass Digenea

Order Plagiorchiida

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Chapter 36

Introduction to Plagiorchiida La Rue, 1957 (Order)

Rafael Toledo

Departamento de Parasitología, Facultad de Farmacia,
Universidad de Valencia, Valencia, Spain
rafael.toledo@uv.es

Bernard Fried

Department of Biology, Lafayette College, Easton,
Pennsylvania, United States

Lucrecia Acosta Soto

Área de Parasitología, Departamento de Agroquímica y
Medio Ambiente, Universidad Miguel Hernández de Elche,
Sant Joan, Alicante, Spain
lacosta@umh.es

Order Plagiorchiida La Rue, 1957

The order **Plagiorchiida** constitutes the second fundamental branch of the **Digenea**, together with Diplostomida, according to Olson and colleagues (2003). This is a large order of trematodes comprising a vast diversity of forms. Included within the Plagiorchiida are digeneans with marked morphological characteristics (that is, absence versus presence of suckers, or simple tail versus forked tail in the cercariae) and biological characteristics (aquatic versus terrestrial life cycles, or infective free-living miracidia versus eggs eaten by the first intermediate host, among others) (Cribb et al., 2003). This makes it difficult to generally characterize the order Plagiorchiida. In fact, Olson and colleagues (2003), in their revision on the classification of the Digenea, divided the class into the order Diplostomida and the remaining digeneans were included within the Plagiorchiida. According to this division, the Plagiorchiida includes a large number of independent lineages that were classified as suborders. The traditional division of the Echinostomida, Plagiorchiida, and Strigeida was considered non-natural. Based on DNA analysis, Olson and colleagues (2003) defined the order Plagiorchiida, including a total of 13 suborders and 19 superfamilies.

Following is a classification of the Plagiorchiida after Olson and colleagues (2003). The bolded suborders are each discussed in greater detail following this introductory section, with special attention to the Xiphidiata.

Order **Plagiorchiida** La Rue, 1957

Suborder Apocreadiata Olson et al., 2003

Superfamily Apocreadioidea Skrjabin, 1942

Suborder **Bivesiculata** Olson et al., 2003

Superfamily Bivesiculoidea Yamaguti, 1934

Suborder Bucephalata La Rue, 1926

Superfamily Bucephaloidea Poche, 1907

Superfamily Gymnophalloidea Odhner, 1905

Suborder **Echinostomata** La Rue, 1926

Superfamily Echinostomoidea Looss, 1902

Suborder **Haploplanchnata** Olson et al., 2003

Superfamily Haploplanchnoidea Poche, 1925

Suborder **Hemiurata** Skrjabin and Guschanskaja,
1954

Superfamily Azygioidea Lühe, 1909

Superfamily Hemiuroidea Looss, 1899

Suborder Heronimata Skrjabin and Schulz, 1937

Superfamily Heronimoidea Ward, 1918

Suborder Lepocreadiata Olson et al., 2003

Superfamily Lepocreadioidea Odhner, 1905

Suborder **Monorchiata** Olson et al., 2003

Superfamily Monorchioidea Odhner, 1911

Suborder Opisthorchiata La Rue, 1957

Superfamily **Opisthorchioidea** Braun, 1901

Suborder Pronocephalata Olson et al., 2003

Superfamily Pronocephaloidea Looss, 1899

Superfamily Paramphistomoidea Fiscoeder, 1901

Suborder **Transversotremata** Olson et al., 2003

Superfamily Transversotrematoidea Witenberg,
1944

Suborder **Xiphidiata** Olson et al., 2003

Superfamily **Allocreadioidea** Looss, 1902

Superfamily Gorgoderoidea Looss, 1901

Superfamily Microphalloidea Ward, 1901

Superfamily Plagiorchioidea Lühe, 1901

Furthermore, Olson and colleagues (2003) considered that Bivesiculata, Transversotremata, and Hemiurata constituted the most basal forms of Plagiorchiida. The remaining suborders were considered to be among the higher Plagiorchiida. Note that Gorgoderoidea Looss, 1901 replaces Allocreadioidea Looss, 1902, according to some taxonomists (Bray et al., 2020; Gibson and Cribb, 2014).

Each selected suborder of Plagiorchiida will be addressed in a separate section with the exception of the monotypic suborder **Heronimata** Skrjabin & Schulz, 1932 since this

suborder is only represented by a single species *Heronimus chelydrae* within the superfamily Heronimoidea Ward, 1917. This superfamily is the only plagiorchiid restricted to tetrapods, specifically, freshwater turtles in North America (mainly Chelydridae, Emydidae, and Kinosternidae). Moreover, other characteristic features of Heronimata are: 1) An anterior and dorsal excretory pore; 2) a single asexual generation within the snail first intermediate host; 3) absence of a ventral sucker in the adult stage; 4) a cercaria with a functional ventral sucker that disappears as the adult worm develops; and 5) mother-sporocysts with enormous lateral branches.

Simple-tailed cercariae are produced in sporocysts within the gastropod intermediate host (mainly physid snails). The cercariae do not emerge from the snail intermediate host but are eaten with the snail by the definitive host (which is turtles). The egg hatches and the miracidia actively penetrates the snail intermediate host (Cribb et al., 2003).

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