

***Aspidogaster limacoides* DIESING, 1835
(Trematoda, Aspidogastridae): A new parasite of
Barbus barbus (L.) (Pisces, Cyprinidae) in Austria**

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Abstract

Adults of the trematode parasite *Aspidogaster limacoides* DIESING, 1835 were found in the cyprinid *Barbus barbus* (L.) during a parasitological investigation of endohelminths in the years 2001 and 2002 in the Danube downstream of Vienna, Austria. This is the first record of *A. limacoides* in barbel from the Austrian part of the Danube system.

Zusammenfassung

Adulte Formen des Trematoden *Aspidogaster limacoides* DIESING, 1835 wurden in einer Population der Barbe *Barbus barbus* (L.) in der Donau flussab von Wien gefunden. Die Erfassung erfolgte im Rahmen einer fischparasitologischen Aufnahme in den Jahren 2001 und 2002. Es ist der erste gesicherte Fund von *A. limacoides* in der Barbe im österreichischen Teil der Donau.

Keywords: *Aspidogaster limacoides*, *Barbus barbus*, Trematoda, Austria, Danube

Introduction

The subclass of Aspidogastrea (FAUST & TANG, 1936) consists of a small group of trematodes with a worldwide distribution comprising about 80 species and has not been described for Austria yet. The Aspidogastrea parasitise poikilothermous animals like crustaceans, molluscs, fish, and reptiles in marine and freshwater environments. In contrast to their sister group, the digenean trematodes, they present simple life cycles with no multiplicative larval stages. *Aspidogaster limacoides* DIESING, 1835 was found in molluscs and fish from river basins in the Ponto-Caspian region (e.g. BYKHOVSKAYA-PAVLOWSKAYA & al, 1962, EVLANOV 1990, NAGIBINA & TIMOVEEVA 1971). The hosts involved consist of mollusc and a definitive or facultative vertebrate host, nevertheless most aspidogastrids require only a single host to complete their life cycle (RHODE 1972). This is the first description of the parasite in *B. barbus* (L.) in Austria.

Material and methods

Barbels were sampled at the inflow of a Danubian tributary, namely the Fischa river, at the kilometre 1910 from April 2001 to November 2002. Only specimens with a minimum size of 20 cm were taken for study purpose. Fish were caught with drift nets in the main channel of the river.

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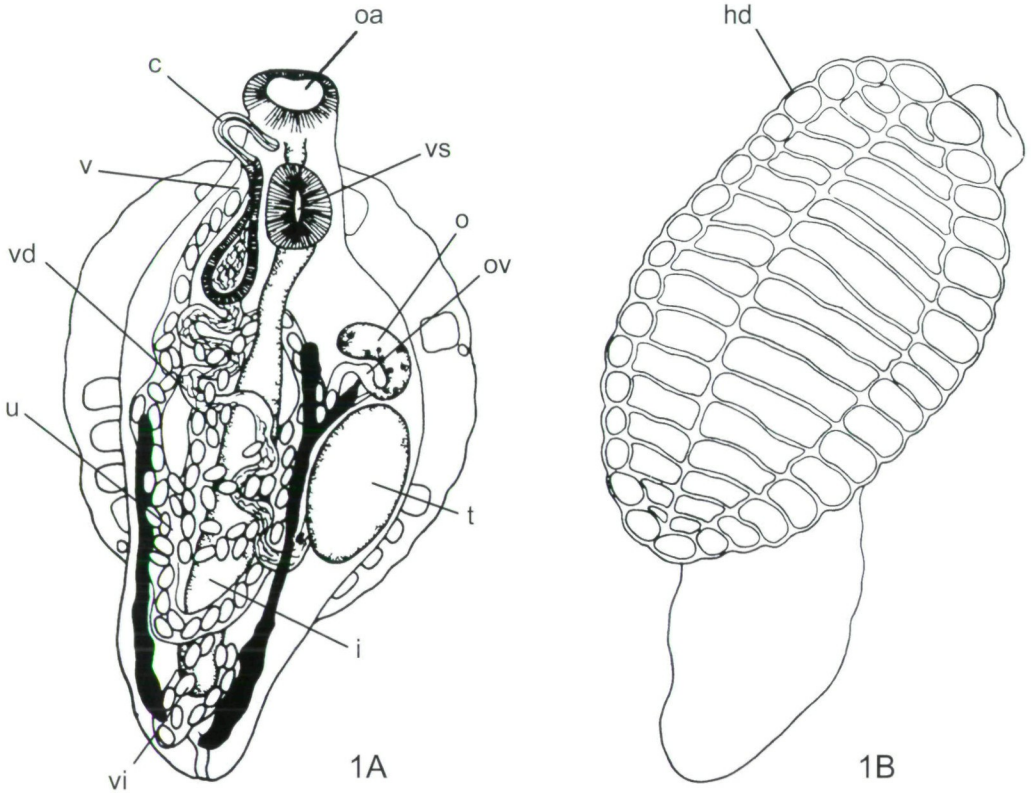


Fig. 1: *A. limacoides*: A. general view, B. holdfast disk; c = cirrus, hd = holdfast disk, i = intestine, o = ovary, oa = oral aperture, ov = oviduct, t = testis, u = uterus, v = vagina, vi = vitellarium, vd = vas deferens, vs = ventral sucker (after BYKHOVSKAYA-PAVLOWSKAYA & al. 1962).

The determination of *A. limacoides* followed BYKHOVSKAYA-PAVLOWSKAYA & al. (1962): The animal displays a body size of 0.5 to 4.0 mm in length and 0.4 to 1.5 mm in width. The body is broadly oval and tapering anteriorly and posteriorly. The typical ventral holdfast organ has the form of a large oval convex disk and consists of two median rows of 12 to 18 and four longitudinal rows of not more than 72 suckorial pits. The terminal oral aperture, which lacks an oral sucker but is surrounded by a sucker like musculature. The large esophagus is followed by a long, one-trunked, and saccular intestine. The sexual organs consist of paired vitellaria and an unpaired oval testis. The genital bursa opens into the expanded distal portion of the uterus. The genital pore lies ventral, anterior to the holdfast organ. The eggs have a size of 0.06 to 0.10×0.03 to 0.04 mm.

Fish were examined using conventional parasitological techniques. Epidemiological definitions were those used by BUSH & al. (1997). Individuals of *A. limacoides* collected during this study are deposited in the Evertebrata-Varia collection of the Natural History Museum in Vienna (NHMW-EV 19.876 - 19.878).

Results

A total of 57 barbels were sampled during the entire period and five endohelminth species were found, five species in 2001 and four in 2002. These included two species of trematodes – *A. limacoides*, *Diplostomum spathaceum* (RUDOLPHI, 1819), two cestodes – *Caryophyllaeus brachycollis* JANISZEWSKA, 1951 and *Bathybothrium rectangulum* (BLOCH, 1782), one nematode – *Rhabdochona hellichi* (SRÁMEK, 1901), and one acanthocephalan – *Pomphorhynchus laevis* (MÜLLER, 1776).

All recovered aspidogastrids were *A. limacoides*. The parasite was found over the whole sampling period. All individuals were found in the epithel of the oesophagus of *B. barbuis*. Prevalence and mean intensities were lower in 2002 than in 2001. The mean abundance of *A. limacoides* was higher in 2002 than in 2001 (Table 1). The epidemiological values of the parasite at the Danubian sample site at the inflow of the River Fischa present a clearly overdispersed distribution of the parasite with variance/mean intensity = 1.7 in 2001 and variance/mean intensity = 25.5 in 2002.

Tab. 1: Prevalence, mean intensity, intensity, and mean abundance of *A. limacoides* in *B. barbuis*; nh = number of hosts; np = number of parasites; PREV = prevalence; MINT = mean intensity \pm SE; MAB = mean abundance \pm SE.

| year | nh | np | PREV | MINT | MAB |
|------|----|----|------|-----------------|-----------------|
| 2001 | 33 | 17 | 15.2 | 3.4 \pm 1.1 | 0.52 \pm 0.30 |
| 2002 | 24 | 33 | 8.3 | 16.5 \pm 14.5 | 1.38 \pm 1.29 |

Discussion

The aspidogastreaan trematode *A. limacoides* was firstly described by DIESING (1835), yet the sample site was not stated. Further records of the parasite came from BYKHOVSKAYA-PAVLOWSKAYA & al. (1962), EVLANOV (1990), and NAGIBINA & TIMOVEEVA (1971) from molluscs and fish from river basins in the Ponto-Caspian region. ZHOKOV (2001) reported *A. limacoides* as a parasite of *Dreissena polymorpha* PALLAS that concludes its life cycle without a vertebrate host while cyprinid fish could act as facultative hosts when feeding on mussels. The bivalve hosts harboured the parasite in the kidneys, the pericardial, and the renal cavities – but *A. limacoides* was also found attached to the ventral surface of the visceral mass and inside the gonads of *D. polymorpha* (MOLLOY & al. 1996, ZHOKOV 2001). Further it was found in a wide range of mollusc hosts including the genera *Cardium* and *Adacna* from the Caspian Sea and *Pisidium*, *Sphaerium*, and *D. polymorpha* from the Volgograd Reservoir, Russia (NAGIBINA & TIMOVEEVA 1971).

In fish, *A. limacoides* was recovered only from the oesophagus (e.g. BYKHOVSKAYA-PAVLOWSKAYA & al. 1962, MARKEVICH 1951). BYKHOVSKAYA-PAVLOWSKAYA & al. (1962) and MARKEVICH (1951) described the parasite from *Silurus glanis* (L.), cyprinids and gobiids from river basins of the Black Sea, the Azov Sea, and the Caspian Sea. *Aspidogaster limacoides* was recorded from *Rutilus rutilus* (L.), *Abramis bjoerkna* (L.), *Leuciscus idus* (L.), and *Abramis brama* (L.) in the Rybinsk Reservoir, Russia (ZHOKOV 2001) and from *R. rutilus* in the Kuybyshev Reservoir, Russia (EVLANOV 1990). NAGIBINA &

TIMOVEEVA (1971) recovered *A. limacoides* from *Abramis bjoerkna*, *A. brama*, *A. sapa* (PALLAS), *L. idus*, and *R. rutilus* in the Volgograd Reservoir, Russia. So far, five mollusc genera and at least eight fish species, including *B. barbuis*, have been described as hosts of the parasite. In three of the infested *B. barbuis* from the sample site at the inflow of the River Fischa, quantities of mussel shells were found in the intestine. A host-parasite relationship similar to that stated by ZHOKOV (2001) may be expected for *A. limacoides* and *B. barbuis* in Austria, too.

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