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## **CATHAEMASIA HIANS (DIGENEA, CATHAEMASIIDAE) FROM *PLANORBIS PLANORBIS* (MOLLUSCA, GASTROPODA) IN RESERVOIRS OF CENTRAL POLISSYA**

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***Cathaemasia hians* (Digenea, Cathaemasiidae) from *Planorbis planorbis* (Mollusca, Gastropoda) in Reservoirs of Central Polissya.** Zhytova O. P., Korol E. N. — The paper presents the description of *Cathaemasia hians* Rudolphi, 1809 trematode found on the territory of Ukraine in an intermediate host, fresh-water molluscs *Planorbis planorbis*. We present also a comparison of metrical characters of the studied *C. hians* cercariae and those described by other researchers.

**Key words:** *Cathaemasia hians*, cercariae, rediae, molluscs, *Planorbis planorbis*.

***Cathaemasia hians* (Digenea, Cathaemasiidae) от *Planorbis planorbis* из водоёмов Центрального Полесья.** Житова Е. П., Король Э. Н. — В статье приведены описания редий и церкарий трематоды *Cathaemasia hians* (Rudolphi, 1809), обнаруженных в Центральном Полесье у пресноводных моллюсков *Planorbis planorbis* (Linnaeus, 1758). Представлено сравнение размерных признаков обнаруженных нами личинок *C. hians* с церкариями этого же вида, описанными другими исследователями.

**Ключевые слова:** Digenea, *Cathaemasia hians*, церкария, редия, моллюски, *Planorbis planorbis*.

### **Introduction**

The family Cathaemasiidae Fuhrmann, 1928 (Digenea) is a small but diverse group of trematodes. It consists of two subfamilies, five genera, and about 20 species (Grabda-Kazubska et al., 1990; Kostadinova, 2005). Species of the genus *Cathaemasia* inhabit intestine of black and white storks (*Ciconia ciconia* and *C. nigra*). Macko (1960) assigned trematodes from the black stork to the subspecies *Cathaemasia hians hians*, and those from the white stork — to *Cathaemasia hians longivittellata*. In the fauna of Ukraine, only *C. hians longivittellata* was reported (Sharpilo and Iskova, 1985).

The life cycle of *C. hians* involves three hosts: intermediate hosts — molluscs of the families Planorbiidae and Lymnaeidae; second intermediate hosts — amphibians; and definitive hosts — birds (Volgar-Pastukhova, 1959; Ryzhikov et al., 1980; Grabda-Kazubska et al., 1990; Iskova et al., 1995; Merino et al., 2001; Gvozdev et al., 2006).

U. Szidat first described *Cercaria choanophila* from *P. planorbis* (Szidat, 1936). Later in 1940, Szidat (in Bykhovskaya-Pavlovskaya and Kulakova, 1977) had proved the identity of *Cercaria choanophila* to *Cathaemasia hians*; this fact was important to confirm the relationships between Cathaemasiidae and Echinostomatidae.

The larvae of *C. hians* were reported from Central and Eastern Europe (Szidat, 1936; Alishauskaite, 1958; Kiseliene, 1966; Bykhovskaya-Pavlovskaya and Kulakova, 1977; Grabda-Kazubska et al., 1990; Faltynkova et al., 2008). In Ukraine, the cercariae of *C. hians* were found in molluscs of the genera *Planorbis* and *Anisus* in western Polissya and Transcarpathia (Zdun, 1961). However, the description of *C. hians* cercaria by Zdun (1961) is rather superficial and incomplete. Our examination of cercariae from *P. planorbis* in Zhytomyrska oblast (central Polissya) allowed to identify them as *C. hians*. We think it necessary to give a

detailed description and dimensional characteristics of rediae and cercariae of the trematode *C. hians* based on original material.

### Material and methods

Naturally infected *P. planorbis* (1488 specimens studied, 1.21 % infected) were collected monthly in the Olevsky region (Zhytomyrska oblast) during the field seasons of 2005–2006. Molluscs were identified based on the book by A. P. Stadnychenko (1990). They were kept in glass containers for the study of mature cercariae. Thereafter, molluscs were dissected and their tissues were compressed and examined under low-magnification microscope in order to establish the localization of larvae. Larval trematodes were observed alive, using vital dyes (neutral red and Nile blue sulphate) and a part of larvae was fixed in hot formalin and 70 % ethanol (Zdun, 1961; Ginetsinskaya, 1968; Chernogorenko, 1983). The drawings were made with the aid of a drawing tube RA-6. The drawings and description of cercariae were made based on live specimens. All measurements of cercariae ( $n = 19$ ) and rediae ( $n = 9$ ) are in millimetres (mean  $\pm$  standard error; minimum- maximum).

### Results and discussion

**Redia.** Body cylindrical, large,  $1.94 \pm 0.07$  (1.760–2.100) long and  $0.29 \pm 0.01$  (0.265–0.34) wide, with well-marked collar (fig. 1, *c*). Pharynx spherical,  $0.068 \pm 0.004$  (0.063–0.081) in diameter. Intestine  $0.603 \pm 0.0006$  (0.601–0.608) long. Intestine filled with remnants of hepatopancreas reaching locomotor appendages in posterior part of the body. Rediae containing 2–3 cercariae at various stages of development and germinal balls.

**Cercaria.** Body length  $0.502 \pm 0.008$ , maximum width near ventral sucker  $0.228 \pm 0.006$  (fig. 1, *a*). Body filled with brown cystogenous gland cells. Body surface unarmed. Head collar armed with 47 collar spines arranged in single row. Two pairs of lateral spines situated at each corner of head collar (fig. 1, *b*). Oral sucker  $0.069 \pm 0.001$  long and  $0.075 \pm 0.002$  wide. Ventral sucker larger than oral,  $0.080 \pm 0.001$  long,  $0.083 \pm 0.003$  wide. Ventral sucker located in posterior half of body. Its centre located

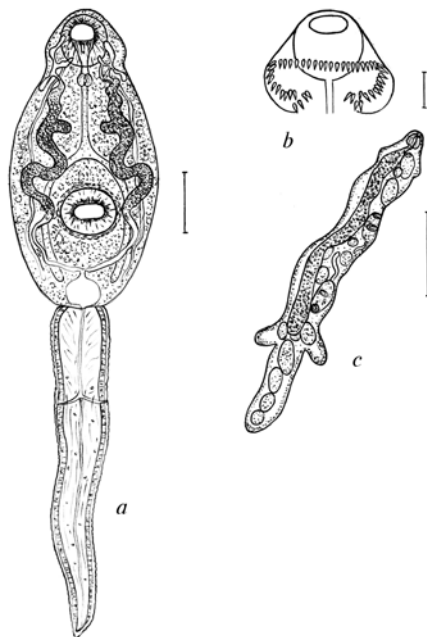


Fig. 1. *Cathaemasia hians*: *a* — cercaria; *b* — head collar with collar spines; *c* — redia. Scale bars: *a* — 0.1 mm; *b* — 0.01 mm; *c* — 0.5 mm.

Рис. 1. *Cathaemasia hians*: *a* — церкария; *b* — околоротовой воротниковый вырост с шипами; *c* — редия. Масштабные линейки: *a* — 0,1 мм; *b* — 0,01 мм; *c* — 0,5 мм.

Table 1. Metrical characters of *Cathaemasia hians* cercariaeТаблица 1. Метрические характеристики церкарий *Cathaemasia hians*

Characters, mm	Present study	After Zdun (1961)	After Bykhovskaya-Pavlovskaya and Kulakova (1977)	After Grabda-Kazubaska (1990)	After Szidat (1936)
Body length	0.460–0.650	0.4–0.5	0.533–0.650	0.433–0.502	0.48
Width of body	0.189–0.297	0.380	0.233–0.250	0.184–0.200	0.2
Length of the tail	0.612–0.820	0.3–0.6	0.610–0.670	0.740–0.870	0.8
Width of the tail	0.063–0.086	0.045	0.067–0.094	0.076–0.087	–
Length of the oral sucker	0.063–0.072	0.05	0.067–0.072	0.062–0.073	0.06
Width of the oral sucker	0.063–0.081	0.05	0.083	0.062–0.073	0.06
Length of the ventral sucker	0.072–0.090	0.06	0.083–0.099	0.073–0.080	0.08
Width of the ventral sucker	0.072–0.10	0.06	0.083–0.105	0.080–0.093	0.08
Length of the pharynx	0.030–0.036	–	0.028–0.039	0.03–0.034	–
Width of the pharynx	0.028–0.029	–	0.028	0.028	–

at 0.34 from anterior end. Pharynx length  $0.033 \pm 0.0004$ , width  $0.028 \pm 0.0001$ . Long oesophagus ( $0.1 \pm 0.003$ ) bifurcating into two thin intestinal branches situated at small distance from ventral sucker and not reaching end of body.

Excretory system of “stenostoma” type, consisting of small excretory bladder and two curved excretory canals situated near acetabulum. Excretory canals filled with large excretory granules. Excretory canals turning backward at level of pharynx and forming loop with blind appendages. It is the character that distinguishes larvae of *C. hians* from other echinostomatid cercariae. Excretory pore opening in anterior half of tail. Excretory formula:  $2 [3 + 3 + 3 + 3 + 3 + (3 + 3 + 3 + 3 + 3)] = 60$ . According to I. E. Bykhovskaya-Pavlovskaya and A. P. Kulakova (1977) there are 58–60 flame cells in *C. hians* cercariae; and B. Grabda — Kazubaska (1990) numbered 54 flame cells. Tail  $0.674 \pm 0.013$  long and  $0.069 \pm 0.002$  wide, transparent, without swimming membrane.

Cercariae from *P. planorbis* are similar to those of *C. hians* described by I. E. Bykhovskaya-Pavlovskaya, Kulakova (1977) and B. Grabda-Kazubaska (1990).

In our opinion, the fact of *P. planorbis* infection by *C. hians* larvae is related to the presence of intermediate and definitive hosts. At the time of research we observed several families of white storks near the reclamation channel (site of the studies). Some storks fed directly in the channel. The present study of cercariae and combination of our own and literature data (table 1) add to the knowledge on the variability of some morphological characteristics and confirms the identification of the studied larvae as *C. hians*. This species is first reported from central Polissya.

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