

**A New Cercaria from the Freshwater Snail *Melanoides tuberculatus*  
Müller, 1774, in Asir Province, Saudi Arabia**

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(Accepted for publication; January 26, 1990)

**Abstract**

A new form of cercaria is described from the freshwater snail *Melanoides tuberculatus* collected from Asir Province, Saudi Arabia. It is named *Cercaria asiri* VI. It resembles the pleurolophocercous cercariae in having two eye-spots, a protrusible penetration organ, and absence of esophagous and gut ceca. However, it lacks a cuticular fin-fold along its tail. *Cercaria asiri* VI has seven pairs of penetration glands and develops within a redia. Its flame cell formula is  $2[(2+2)+(2+2)]=16$ .

**Key words:** Cercaria; *Melanoides*; Saudi Arabia; Asir; Trematoda

**Introduction**

*Melanoides tuberculatus* Müller, 1774 is one of the most commonly found snails in Saudi Arabia (Alio, 1967). This snail is cosmopolitan where it occupies most of the inland water bodies of Southern Asia, most of Africa and the Near East (Tchernov, 1975; Brown, 1980). Thus, this snail is expected to act as intermediate host for many digenetic trematodes. So far, more than 50 different forms of cercariae have been recovered from it (Premvati, 1953, 1954, 1956; El-Gindy and Yousif, 1963; Gupta and Taneja, 1969; Gold and Lengy, 1974; Fahmy *et al.*, 1976, 1977; Mohandas, 1976; Khalifa *et al.*, 1977; Khan and Haseeb, 1981; Saxena, 1982; Haseeb, 1984; Ismail and Saliba, 1985). Recently, Ismail *et al.* (1988b) have described a new pleurolophocercous cercariae, named *Cercaria asiri* V, from *M. tuberculatus* snails collected from Wadi Bisha, Al-Farsha District, Saudi Arabia. The present study describes a new cercaria from *M. tuberculatus* snails collected from Saudi Arabia.

**Materials and Methods**

Snails were collected from permanent streams in Wadi Qana, Tihama, Asir Province, during

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March 1988. Individual snails were placed in separate small glass dishes containing filtered stream water, and examined the following morning. All snails, whether or not had shed cercariae, were then crushed and dissected and examined for developing larval stages. Cercariae were studied live, unstained, or irrigated with intravital stains. Unstained specimens were killed and fixed in hot 70% ethanol.

Camera Lucida drawings from fixed material were completed free hand from observations on live specimens using a compound microscope. Measurements were made on a minimum of 10 live and 10 fixed specimens. Fixed specimens are deposited in the helminthology collection of the Biology Department, College of education, King Saud University, Abha Branch, Saudi Arabia.

**Results**

A new cercaria was found in *Melanoides tuberculatus* snails. Since new forms of cercariae described from freshwater snails in Asir Province were named *Cercaria asiri* I through V (Ismail *et al.*, 1988a, 1988b) this cercaria is named *Cercaria asiri* VI.

**Description:**

This is a relatively small cercaria. Measurements of live and fixed cercariae are presented

Table 1 Measurements of fixed and live specimens of *Cercaria asiri* VI. All numbers are in microns.

	Body length	Body width	Tail length	Tail width
Fixed:				
Mean	131.3	68.8	122.8	19.5
S.D.*	13.0	8.4	8.4	2.2
Range	100–162.5	55–80	112.5–137.5	16.3–25
Live:				
Mean	119.8	64.5	130.6	18.1
S.D.*	13.0	10.1	13.5	4.2
Range	100–150	50–80	112.5–150	12.5–25

\* One standard deviation.

in Table 1. The body is heart-shaped and covered with fine spines which are more numerous anteriorly than posteriorly. There are also four sensory setae distributed evenly on each side of the body. The tail which is as long as the body, is spinose and is recessed into the body to a depth of 6–9  $\mu\text{m}$ . It lacks fin folds. There are two darkly pigmented eye spots located in the anterior third of the body and measure 7 by 4  $\mu\text{m}$ . The oral sucker is modified into a protrusible penetration organ which measures 32 by 29  $\mu\text{m}$ . The inner edge of the penetration organ is provided with eight strong spines. The digestive system is made up of a pharynx at about 3  $\mu\text{m}$  from the posterior border of the penetration organ. The pharynx measures 10–11  $\mu\text{m}$  in diameter. The excretory bladder is relatively large and occupies the posterior quarter of the body. It receives two ascending ducts which bifurcates into anterior and posterior collecting tubules. Caudal excretory canal opens at the tip of the tail. Flame cells are arranged symmetrically in the body and are absent in the tail. The flame cell formula is  $2[(2+2)+(2+2)]=16$ . There are seven pairs of penetrating glands. These glands empty their contents into two outer and two inner bundles of penetration gland ducts which open at the inner edge of the protrusible organ. The outer bundle consists of three ducts, while the inner one consists of four ducts. In addition, there are about 20 groups of cells in the body which probably contain cystogenous matter. The genital primordium consists of a relatively large mass of

cells above the excretory bladder.

#### Behaviour:

This cercaria swims actively by the action of its tail. When at rest at the bottom of the dish, it assumes a typically heart-shaped appearance. This cercaria shows positive phototaxis as well as thigmotaxis tending to concentrate along the rim of the dish. Cercariae swim actively for about 24 hours and die without encystment within 36 hours post-emergence from the snail host.

#### Development:

*Cercaria asiri* VI develops within an elongated redia which is 520–800 by 100–150  $\mu\text{m}$ . The redia possesses a relatively small pharynx which measures 17–25  $\mu\text{m}$  in diameter. Rediae were found packed with developing cercariae and germ cells.

### Discussion

The taxonomic position of *Cercaria asiri* VI is uncertain. It resembles cercariae of the pleurolophocercous group of Sewell (1922) in being small in size, presence of eye-spots, absence of acetabulum, esophagous or gut ceca, and the modification of the oral sucker into a protrusible penetration organ. However, it lacks a cuticular fin-fold along the tail, which is a characteristic of the pleurolophocercous group. *Cercaria asiri* VI closely resembles *Cercaria indicae* III (Sewell, 1922) and *Cercaria Levantina* II (Gold and

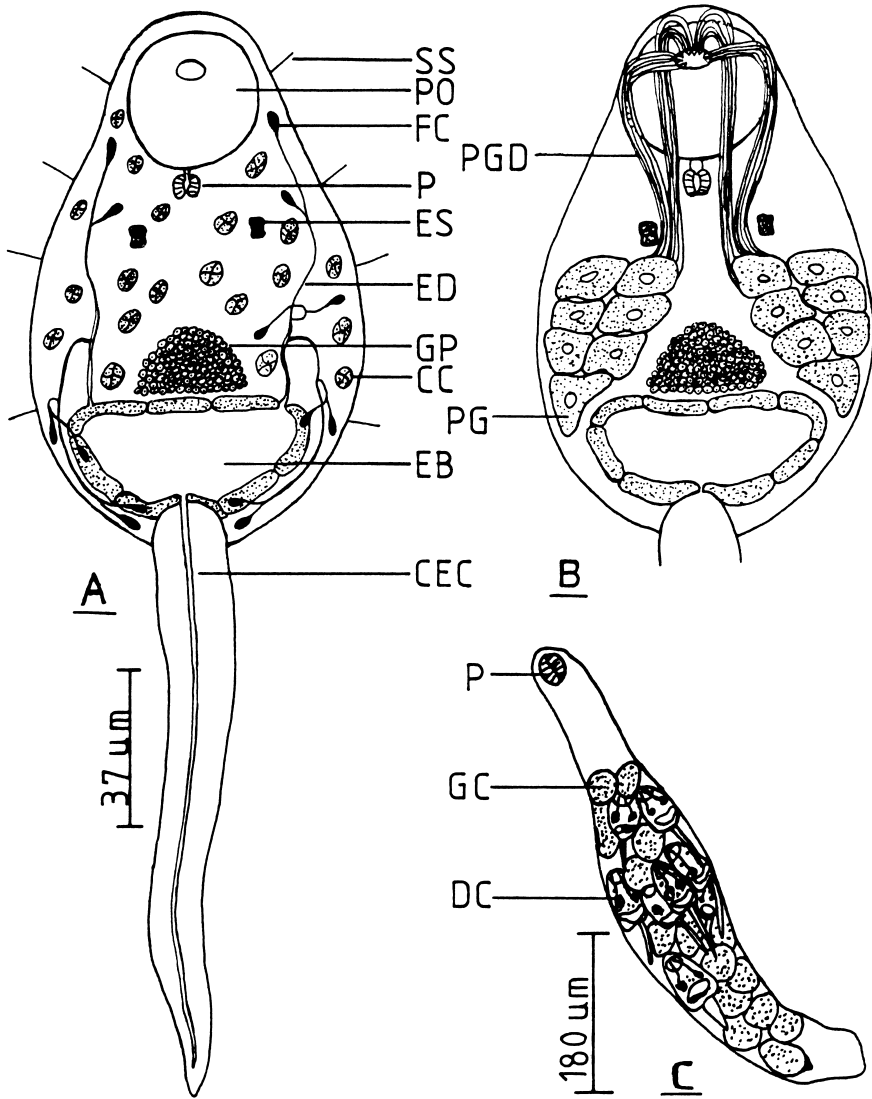


Fig. 1 *Cercaria asiri* VI. A, entire specimen showing the excretory system, cystogenous cells, sensory setae and genital primordium. B, penetration glands and their ducts. C, redia.

Abbreviations for The Figure

- |                              |                                |
|------------------------------|--------------------------------|
| CC : Cystogenous cells       | GC : Germinal cells            |
| CEC : Caudal excretory canal | GP : Genital primordium        |
| DC : Developing cercaria     | P : Pharynx                    |
| EB : Excretory bladder       | PG : Penetration glands        |
| ED : Excretory duct          | PGD : Penetration glands ducts |
| ES : Eye-spot                | PO : Penetration organ         |
| FC : Flame cell              | SS : Sensory seta              |

Lengy, 1974), which were considered as pleurolophocercous cercariae. *Cercaria asiri* VI differs from both cercariae in having more flame cells (16 vs 10 and 14, respectively) and develops in different redia. In addition, the excretory bladder of *C. asiri* VI is larger than that in *C. indicae* III and *Cercaria Levantina* II.

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