

**HEMIURUS SHALABYI SP. N (DIGENEA: HEMIURIDAE)
FROM THE CARANGID FISH, *TRACHURUS INDICUS*, IN
LAKE TIMSAH, EGYPT.**

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ABSTRACT

Hemiurus shalabyi sp. n. is the first record of the genus from Lake Timsah and the second species of the genus in Egypt. It is described from the stomach of *Trachurus indicus* (Carangidae) locally named "Bagha Om Ain" from Lake Timsah. The prevalence of the parasite was 18.8% with intensity of infection being 2-4 worms per fish.

Hemiurus shalabyi is easily distinguished from all the other known species of the genus by the number, shape and position of vitellaria, in addition to the extension of the intestinal caeca and the uterus into the ecsoma. The differences between the present new species and the previously described species of the genus from Egypt, *H. suezensis* Aboul-Hag, 1990 were discussed.

INTRODUCTION

Although studies on parasitic worms from Egyptian fish, date back to years before the past century (Wedle, 1862 and Looss, 1896 & 1899), a relatively little knowledge is available on the helminthic fauna of fishes in Egypt. Several works have been carried out on the parasites of Egyptian freshwater fish (El-Naffar, 1970; Imam, 1971; Wannas, 1977; Mohamed, 1978; Noor El-Din, 1981; Aboul-Hag, 1985; Lamloom, 1987 and Negm El-Din, 1987). Marine fishes received similar attention and more than eighty species of trematodes were described in a series of publications over forty years (Nagaty, 1973). Many other works in the Red Sea followed this series (Hassan, 1976; Ramadan, 1979; Saoud & Hassan, 1983; Saoud & Ramadan, 1983 and Aboul-Hag, 1990).

The genus *Hemiurus* was established by Rudolphi, 1809 to include trematodes having cuticular denticulations variable in extent; caeca terminating into tail; seminal vesicle bipartite, pretesticular with thick muscular wall and long pars prostatica. *Hemiurus appendiculatus* from the stomach of *Clupea alosa* in Europe was designated as the type species of the genus.

Looss (1907) studied the morphology of family Hemiuridae Lühe, 1901 and established criteria for the determination of genera and species as follows: relative size relationship of the two parts of the body (soma and ecsoma); relative position of organs in the post-acetabulum portion of the body proper.

Yamaguti (1971) considered *Hemiurus* Rudolphi, 1809 as a valid genus and classified it under the family Hemiuridae Lühe, 1901, subfamily Hemiurinae Looss, 1899 and amended the diagnostic features of the genus.

Several species of the genus *Hemiurus* were recorded from different fish species. Odhner (1905) described *Hemiurus luehei* in *Clupea harengus* and *C. sprattus* from Arctic, Atlantic and Baltic; *H. levinseni* in *Gadus saida* from Greenland and *H. communis* in numerous species of Skandinavian fishes. Yamaguti (1934) described *H. odhneri* in *Theragra chalcogramma* from Toyama Bay, Japan. Also, Yamaguti (1938) described *H. arelisci* in *Areliscus purpureomaculatus* from Sea of Ariake, Japan. Slusarski (1958) described *H. raabei* in *Salmo salar* from Baltic Sea. Balozet & Sicart (1960) re-described *H. communis* in *Anguilla anguilla* from fresh water and salt-water, France. Fischthal & Kuntz (1964) described *H. sigani* from *Siganus striolatus* in Philippines. Gaevskaya (1975) described *H. macrouri* in *Macrourus rupestris* from the northeast Atlantic Ocean.

Recently, Aboul-Hag (1990) described *Hemiurus suezensis* from the intestine of *Trachurus indicus* and *Decapterus microsoma* caught from the Gulf of Suez, Red Sea, Egypt. But during the present investigation, examination of a digenetic trematode obtained from the stomach of *Trachurus indicus* caught from Lake Timsah revealed a new species of *Hemiurus*, which is herein described.

MATERIALS AND METHODS

A total of 85 fish of *Trachurus indicus* (locally named Bagha Om Ain) were collected from Lake Timsah, Suez Canal, Egypt. Most fishes were examined immediately after their catch. The stomach of

the fish was opened by a fine pair of scissors and left in saline solution (0.65%). A hand lens and a binocular dissecting microscope were used for helminthological examination. The collected worms were cleaned by washing several times with isotonic solution in small tubes. Relaxation was carried out by putting the parasite between two slides and then fixed in cold 70% ethyl alcohol. Specimens were stained, differentiated, dehydrated, cleared and mounted as usual. Drawings were made by a Camera Lucida. Specimens were measured by using an ocular micrometer, calibrated against a stage micrometer. All measurements are in millimeters, unless otherwise indicated.

RESULTS

Hemiurus shalabyi sp. n.

(Figs. 1 & 2)

The present description is based on three specimens belonging to the family Hemiuridae, subfamily Hemiurinae with characteristics of the genus *Hemiurus* Rudolphi, 1809. They were collected from the stomach of *Trachurus indicus* locally named "Bagha Om Ain" from Lake Timsah.

Description:

The body is elongated, with cuticular denticulations extending from behind the acetabulum until the beginning of the tail. Body length measures 3.28–3.40, while the maximum width attained at acetabular level was 0.60–0.70. The ratio between body length/width is 4.90–5.40:1. The oral sucker is subterminal, nearly rounded and measures 0.14–0.18 long and 0.14–0.16 wide. Acetabulum is larger than oral sucker near anterior extremity and measures 0.40–0.42 long and 0.44–0.46 wide. The ratio between oral sucker/ acetabulum 0.35–0.42:1. Prepharynx absent, pharynx well developed and measures 0.08–0.09 long and 0.09–0.10 wide, oesophagus is very short, caeca extending into tail.

The testes are nearly rounded, diagonal, some distance posterior to acetabulum. Anterior testis measures 0.17–0.18 long and 0.20–0.22 wide, while the posterior one measures 0.19–0.20 long and 0.18–0.19 wide. Seminal vesicle pretesticular, small, constricted into two portions. It measures 0.25–0.30 long and 0.09–0.10 wide, pars-prostatica long measuring 0.70–0.75. Hermaphroditic duct is slender

and the genital pore situated adjacent to the right posterior margin of the oral sucker.

The ovary is located posterior to testes from which it is separated by the uterus and measures 0.13-0.14 long and 0.18-0.19 wide. Receptaculum seminis is contiguous with the ovary measuring 0.07-0.08 long and 0.08-0.12 wide. The vitellaria lie immediately behind ovary and consist of seven winding lobes. The uterus extends into tail and passes anteriorly to form a metraterm, which opens into the hermaphroditic duct. Eggs are small, numerous and each measures 18-20 μ m long and 12-15 μ m wide.

The excretory opening is terminal and the excretory bladder is seen clearly in ecsoma. It is tubular in shape, while its arms are hardly seen in soma due to the massive uterine loops.

DISCUSSION

Hemiurus shalabyi sp. n. can be easily distinguished from the other known species of the genus *Hemiurus* by the number, shape and position of vitellaria; and the extension of intestinal caeca and the uterus into the ecsoma.

The present species differs from *Hemiurus appendiculatus* Rudolphi, 1809 in many aspects. Cuticular denticulations in the latter species extend along the body except the tail, while in the present species they begin from behind the acetabulum until the end of soma. Seminal vesicle is far from acetabulum with very long and winding pars prostatica, while in the present species, it is slightly posterior to acetabulum with long and straight pars prostatica. Vitellaria in *H. appendiculatus* are formed of two indented lobes, while in the present species of seven winding lobes. Testes in *H. appendiculatus* are juxtaposed in the middle third of the body, while in the present species are oblique in the middle third of the body.

Moreover, the present species differs from *H. odhneri* Yamaguti, 1934 in the oral sucker, being smaller than the acetabulum.

Although, it resembles *H. levinseni* Odhner, 1905 in body shape, egg size and the position of genital pore, being ventral to oral sucker, it differs in many aspects. Acetabulum is larger than the oral sucker instead of being smaller. Ecsoma represents about third the length of soma instead of being very small. Intestinal caeca extend for a long distance in ecsoma. Vitellaria composed of seven, winding lobes instead of two compact follicles.

Also, the present species is similar to *Hemiurus sigani* Fischthal & Kuntz, 1964 in body shape and bipartite seminal vesicle, though it lacks the thick muscular wall.

In Egypt, Aboul-Hag (1990) described *Hemiurus suezensis* from the intestine of *Trachurus indicus* and *Decapterus microsoma* during his survey of helminth parasites of some fishes from the Gulf of Suez, Red Sea. By comparing the present species with the previously described species, it is evident that they differ in many features (Table 1) as follows:

1- Cuticular denticulations extend from anterior to the end of soma in *H. suezensis*, while they begin from behind the acetabulum to the end of soma in the present species.

2- Intestinal caeca extend for short distance in ecsoma in *H. suezensis*, while in the present species they extend for long distance in ecsoma.

3- Uterus in *H. suezensis* not entering the ecsoma, while in the present species enters the ecsoma.

4- Genital pore to the left posterior margin of the oral sucker in *H. suezensis*, while it is ventral to the oral sucker in the present species.

5- Receptaculum seminis absent in *H. suezensis*, while it is present in the present species.

6- Vitellaria in *H. suezensis* are composed of two indented compact lobes, one on each side post-ovarian and separated from it by some uterine coils, while in the present species they are composed of seven winding lobes just behind the ovary.

From all the above-mentioned differences between the present species and the previously described species of the genus *Hemiurus*, the authors are satisfied to establish *Hemiurus shalabyi* as a new species. Thus, The present description of *H. shalabyi* sp. n. represents the first record of the genus from Lake Timsah, Suez Canal, and the second record of that genus in Egypt.

Taxonomic summary:

Host: *Trachurus indicus*.

Infection site: Stomach.

Locality: Lake Timsah, Egypt.

Type of specimens: Holotype, Allotype and Paratypes are deposited in the parasites collection, Zoology Department, Faculty of Science, Zagazig University (Benha Branch), Egypt.

Etymology: The new species is named in honour of the late professor A.A. Shalaby, the Founder and Ex-Chairman Zoology Department and Ex—Dean of Faculty of Science, Zagazig University.

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Explanation of figures

Figure 1: Drawing of *Hemiurus shalabyi* sp. n. from *Trachurus indicus* from Lake Timsah showing:

- (A) Adult worm (ventral view). Cuticular denticulations (CD); eggs (EG); intestinal caeca (IN); oral sucker (OS); testes (TE) and ventral sucker (VS).
- (B) Terminal genitalia. Metraterm (ME), oral sucker (OS) and ventral sucker (VS).
- (C) Eggs

Figure 2: Light microscopy photomicrographs of *Hemiurus shalabyi* sp. n. showing:

- (A) Large acetabulum near anterior extremity, pretesticular seminal vesicle (SV), which is constricted into two portions and metraterm (ME), which opens into hermaphroditic duct. Oral sucker (OS), ventral sucker (VS). X 100.
- (B) Cuticular denticulations (CD), diagonal testes (TE) and intestinal caeca (IN). X 100.
- (C) Ovary (OV), eggs (EG) and seven winding vitellaria (VI). X 100.

Table (1): Comparison between the Egyptian species of the genus *Hemirurus* Rudolphi, 1809.

Character	<i>Hemirurus suezensis</i> Aboul-Hag, 1990	<i>Hemirurus shalabyi</i> sp. n.
Body shape	Elongate, blunt at both ends	Elongate, smooth
Length	0.67 - 0.78	3.28 - 3.4
Width	0.12 - 0.17	0.60 - 0.70
Length/Width	5.43 - 7.5 : 1	4.90 - 5.40 : 1
Oral sucker	Ovoid, subterminal, 0.04-0.06 x 0.04-0.05	Nearly round, subterminal, 0.14-0.18x0.14-0.16
Ventral sucker	0.11 - 0.16 x 0.11 - 0.14	0.40 - 0.42 x 0.44 - 0.46
Oral/ventral ratio	0.33 - 0.41 : 1	0.35 - 0.42 : 1
Prepharynx	Absent	Absent
Pharynx	0.02 - 0.04 x 0.02 - 0.03	0.08 - 0.09 x 0.09 - 0.10
Oesophagus	0.01 - 0.02 long	Very short
Anterior testis	0.02 - 0.06 x 0.03 - 0.06	0.17 - 0.18 x 0.20 - 0.22
Posterior testis	0.03 - 0.08 x 0.06 - 0.07	0.19 - 0.20 x 0.18 - 0.19
Cirrus pouch	With bipartite seminal vesicle	With bipartite seminal vesicle
Ovary	0.18 - 0.21 x 0.01 - 0.03 Slightly rounded, post-testicular 0.06 - 0.09 x 0.05 - 0.08	0.25 - 0.30 x 0.09 - 0.10 Slightly rounded, post-testicular 0.13 - 0.14 x 0.18 - 0.19
Receptaculum seminis	Absent	Contiguous with ovary, 0.07 - 0.08 x 0.06 - 0.12
Vitellaria	Composed of two compact intented lobes	Composed of seven winding lobes
Eggs	Small, 23 - 25 µm x 10 - 12 µm	Small, 18 - 20 µm x 12 - 15 µm
Hosts	<i>Trachurus indicus</i> , <i>Decapterus microsoma</i>	<i>Trachurus indicus</i>
Localities	Gulf of Suez, Red Sea, Egypt	Lake Timsah, Egypt

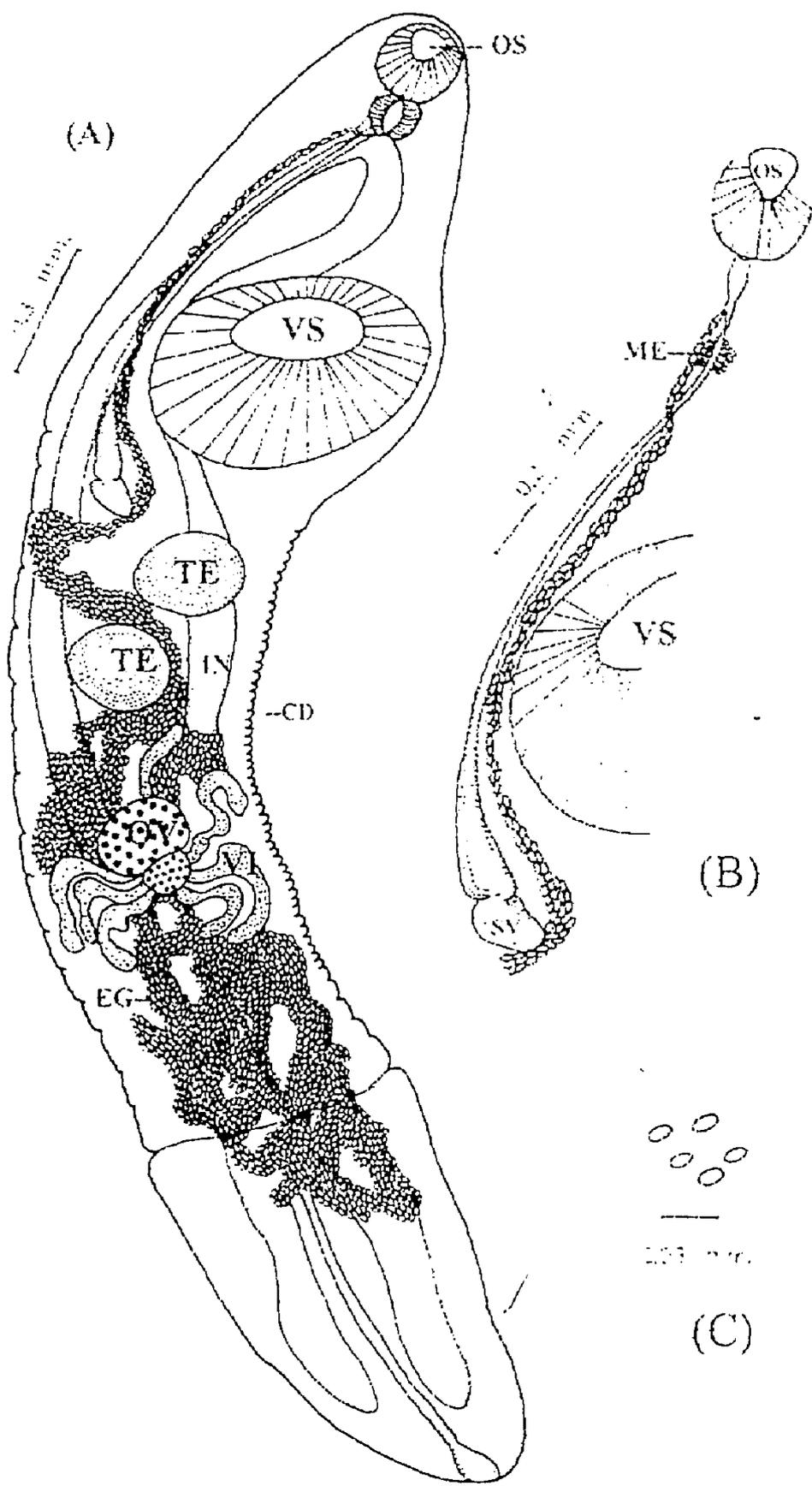


Figure 1

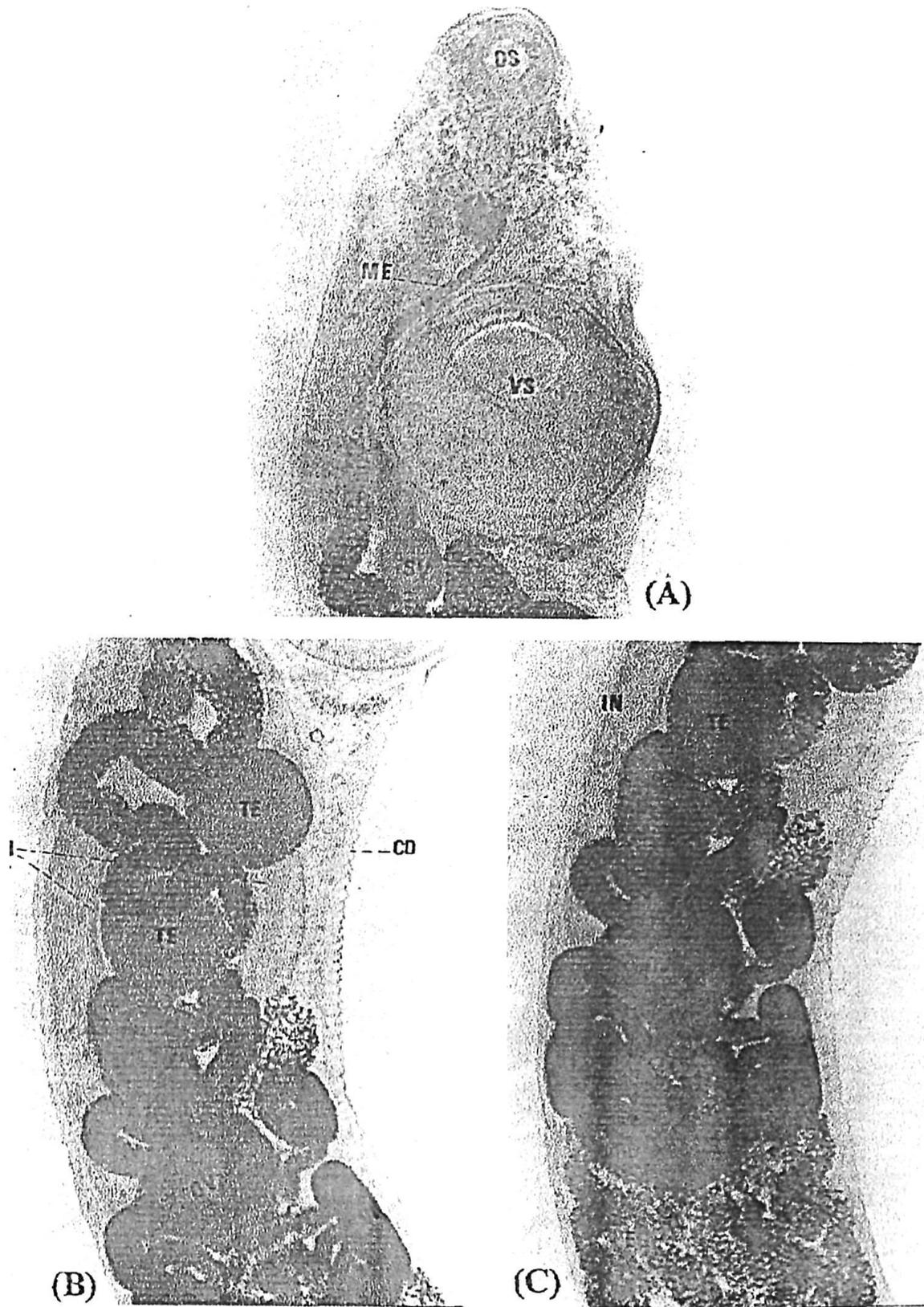


Figure (2)