

**A review of the trematode genera *Haplospalchnus*
Looss, 1902 and *Prohaplospalchnus* Tang and Lin,
1978 with redescription of three species from the mullet in Libya**

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مراجعة على جنسي التريماثودا هابلوسبلانكنس وبروهابلوسبلانكنس
مع وصف ثلاثة أنواع معزولة من أسماك البوري في ليبيا

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تمت مراجعة جنسي التريماثودا هابلوسبلانكنس وبروهابلوسبلانكنس كما تم وصف
هابلوسبلانكنس انديكا وهابل، سبلانكنس ميوجيليس وبروهابلوسبلانكنس ديوركس من أسماك
الميوجل كابيتو في ليبيا . الثلاثة أنواع تسجل لأول مرة في ليبيا . هابلوسبلانكنس ميوجيليس
وبروهابلوسبلانكنس ديوركس تسجل لأول مرة من سمك الميوجل كابيتو . تم عمل مقارنة بين
النتائج السابقة لـ ١٣ نوع من جنس الهابلوسبلانكنس .

Key Words : Haplospalchnus, Prohaplospalchnus, Mullet.

ABSTRACT

The trematode genera *Haplospalchnus*: Looss, 1902 and *Prohaplospalchnus* Tang Lin, 1978 were reviewed. *H. indica* Gupta and Ahmad, 1979, *H. mugilis* Nahhas and Cable, 1964 and *P. diorchis* Tang and Lin, 1979 were redescribed from *Mugil capito* from Libya. The three species were reported for the first time in Libya. *H. mugilis* and *P. diorchis* were reported for the first time from *Mugil capito*. A comparison between the previous results on 13 species of the genus *Haplospalchnus* were presented.

INTRODUCTION

The genus *Haplospalchnus* was established by Looss (1902), with *H. pachysoma* (Eysenhardt, 1829) Looss, 1902

from *Mugil cephalus* and *M. chelo* at Triest as the type species (1).

The genus *Prohaplospalchnus* was established by Tang and Lin (1978), with *P. siorchis* from mullet caught from Fujian in China as the type species (2).

* Present address : Libya, Misurata, P. O. BOX 1878.

During the present investigation, trematodes belonging to the above two genera were collected from the mullet in Libya.

Material and Methods

During the present investigation there are two observations:

[1] The specimens cannot be mounted on the ventral side because the acetabulum is very large.

[2] The excretory bladder can be seen only in the living specimens.

The identification of fishes as well as methods followed in collection, fixation staining, clearing and mounting were done by the usual way.

[3] Drawings were made to the scale using a Camera Lucida. Measurements are in millimetres, atkenix unless stated otherwise.

Description

I Trematodes of the genus *Haplospalchnus* Looss, 1902.

1 - *Haplospalchnus indica* Gupta and Ahmad. 1979 (Fig.1)

The following description is based on nine specimens collected from the intestine of *Mugil capito* locally called "Bouri" caught from the Libian coastal waters near Misurata in December, 1994.

The body is Y-shaped with unequal arms, aspinose and a broad stem with rounded posterior end, 2.47-3.11 long and 0.77-1.28 in maximum width. Oral sucker subspherical, subterminal, 0.14 - 1.32 long and 0.31 - 0.46 wide. prepharynx 1.011 - 0.059 in length. Pharynx ovoid, 0.13 - 0.23 long and 0.14 - 0.22 wide. Cecum simple straight, 0.60- 0.98 long and 0.16 - 0.19 wide. Cecum ending blindly in anterior third of the body. Ventral sucker cup-shaped, 0.35-0.81 long and 0.21 - 0.45 wide. Excretory bladder Y-shaped. Excretory pore terminal.

Genital pore lies on a prominent papilla, between oral sucker and ventral sucker. Testis oval, single, near hind end of body. 0.29 - 0.41 long and 0.17 - 0.27 wide, at 0.56 - 0.67

from posterior extremity. Vesicula seminalis tubular, 1.23 - 1.44 in length. extending from anterior margin of testis up to pharvnx level. Pars prostatica oval, 0.17 - 0.20 in length surrounded by a large number of prostate gland cells. Genital atrium tubular, 0.17 - 0.31 in length.

Ovary spherical, submedian pretesticular, 0.16 - 0.22 in diameter, lies at 0.82 - 0.98 from the blind end of cecum. Receptaculum seminis spherical, 0.15 - 0.20 in diameter Vitellaria poorly developed, extending laterally between ovary and the blind end of cecum. Uterus coiled between anterior margin of testis and phathnx. Eggs elongated, containing developing meracidia with prominent eye spots, 40 - 47 um long and 22- 25 um wide.

Host: *Mugil capito*.

Location: Intestine.

Locality : Misurata, Libya.

2- *Hoplospalchnus mugilis* Nahhas and Cable, 1964 (Fig.2)

The following description is based on seven specimens collected from the intestine of *Mugil capito* locally called "Bouri" caught from the Libian coastal waters near Misurata in December, 1994.

The body is elongate aspinose, tapering posteriorly, 2.28 - 2.65 long and 0.88 - 1.23 in maximum width. Oral sucker 0.26- 0.265 and -0.29 - 0.41 wide. Prepharynx short, 0.02 long and 0.18 - 0.23 wide . Cecum ending blindly in anterior half of the body. Ventral sucker cup - shaped, 0.53 - 0.70 long and 0.31 - 0.36 wide. Excretoty bladder y-shaped. Excretory pore lies on a prominent part in posterior extremity. Genital pore lies between oral sucker and ventral suckers.

Testis oval, elongate,, 0.35- 0.42 long and 0.20 - 0.29 wide. Vesicula seminalis tubular, coiled, 1.14 - 1.38 in length, extending from anterior margin of testis up to pharvnx level. Pars prostatica oval, 0.15-0.22 long and -0.10- 1.12 wide surrounded by a large number of prostate gland cells. Genital atrium tubular, 0.11 - 0.15 in length.

Ovary spherical, pretesticular, lies at 0.22 - 0.28 from the

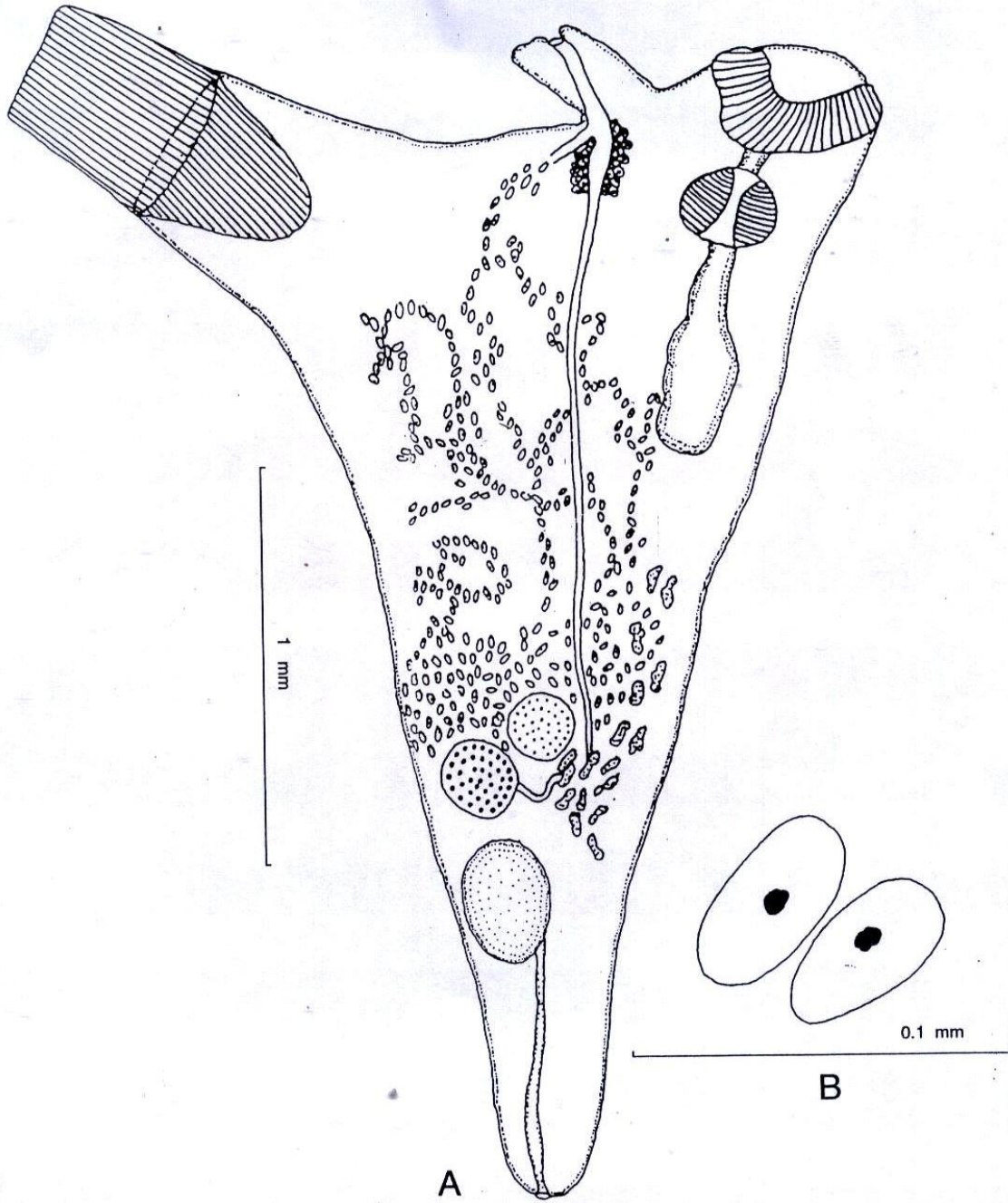


Fig. 1 : A - Ventrolateral view of the worm
B - Eggs.

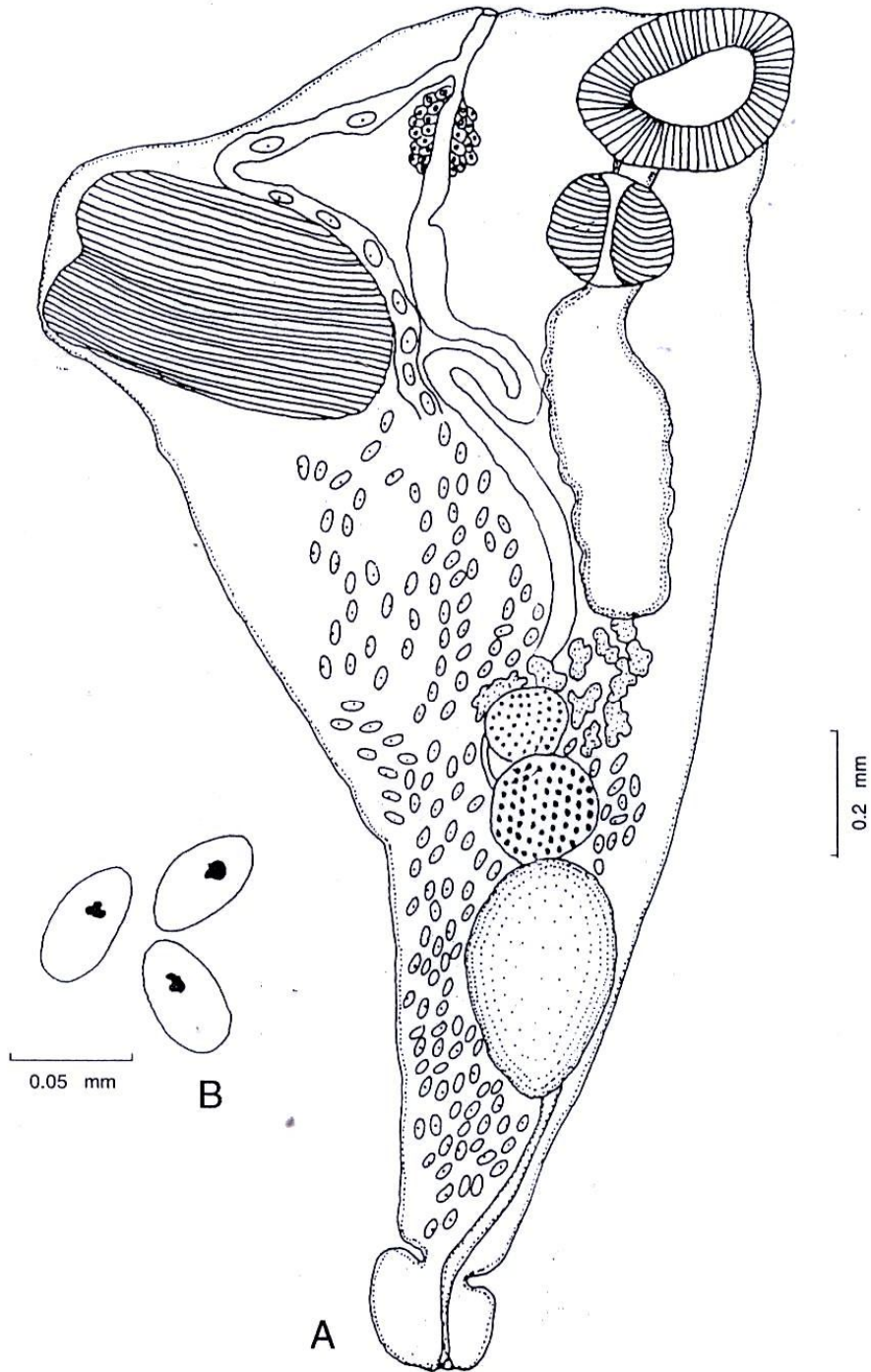


Fig. 2 : A - Ventrolateral view of the worm
B - Eggs.

blind end of cecum, 0.16 - 0.19 in diameter. Receptaculum seminis spherical 0.11, - 0.16 in diameter. Vitellaria occupying a little field between the blind end of cecum and ovary.

Uterus extending between pharynx and posterior extremity. Eggs elongate, containing developing miracidia with prominent eye spots, 47- 52 um long and 25-27 um wide.

Host: Mugil capito.

Location : Intestine.

Locality : Misurata, Libya.

DISCUSSION

Looss [1] established the genus *Haplospalchnus* to accommodate *Haplospalchnus pachysoma* (Eysenhardt, 1829) Looss, 1902 (Syn. *Distoma pachysoma* Eysenhardt, 1829 L; *Podocotyle pachysomum* (Eysenhardt, 1829) Stossich, (1829) from *Mugil cephalus* and *M. chelo* at Trieste. Looss [1] gave a detailed account of the anatomy of the flukes. Wlassenko [4] and Yamaguti [5] reported the same species from *M. cephalus* from the Black Sea and Japan respectively.

In Florida, Manter [6] reported *H. acutus* (Linton, 1910) from the intestine of *Tylosurus crocodilus*, *Hemiramphus marginatus* and *H. georgii*. Two years later, Srivastava [7] erected the genus *Laruea* with *L. caudatus* as the type species. He also described *H. purii* from *Mugil waigiensis* from Puri Bay of the Bengal. Osmanov [8] recorded *H. pachysoma* from *Mugil auratus* from the Black Sea. Skrzjabin and Guschanskaja [9] synonymized *Laruea* Srivastava, 1939 with *Haplospalchnus* Looss, 1902. Eight years later, Fischthal and Kuntz [10] reported *H. pachysoma* from *Mugil cephalus* and *M. ramada* collected from Giza market in Egypt.

In 1958 Mikailov reported *Haplospalchnus pachysoma* from *Mugil saliens* from the Caspian Sea [11]. In the same year Yamaguti regarded the genus *Laruea* as a valid genus [12]. Pritchard and Manter [13] and Nahhas and Cable [14] agreed with Skrzjabin and Guschanskaja, 1955 in considering *Laruea* as a synonym of *Haplospalchnus mugilis* was described from *Mugil cephalus* from Curacao [14].

Overstreet [15] reported *H. sparisoma* Manter, 1937, *H. acutus* (Linton, 1910) Manter, 1937 and *H. kypbosi* Manter, 1937 from *Nibolsina usta*, *Strongylura timucu* and *Kypbosus sectatrix* respectively caught from the East Coast of Florida.

Yamaguti [16] did not agree with the previous authors and considered *Laruea* as a valid genus. He also, amended the diagnostic characters of *Haplospalchnus* Looss, 1902. In the same year Zhukov described *H. bivitellosus* from *Mugil cephalus* and *M. so-iuy* from Japan [17]. This species is closely similar to *H. purii*, but differs from it in having poorly developed vitelline glands. In Venezuela, *H. venezuelensis* was described [18] from the intestine of *Antennarius multiocellatus* from Los Roques Islands. They also outlined the differences between their species and *H. mugilis* [19]. Skinner reported *H. mugilis* Nahhas and Cable, 1964 from the intestine of *Mugil cephalus* from Florida. [20]. Gupta and Ahmad described *Laruea orientalis* from the intestine of *Pellona elongata* from the Bay of Bengal. They also, amended the differences between *Laruea orientalis* and *L. caudatum* Srivastava, 1939.

Tnag and Lin (2) added *H. elongatus* and *H. cuneatus* from the intestine of *Mugil cephalus* from Min River, Fujian China. Madhavi reported *H. purii* Srivastava, 1939 and *H. caudatus* (Srivastava, 1939) Skrzjabin and Guschanskaja, 1955 from *Mugil waigiensis* and *M. cephalus* from Waltair Coast Bay of Bengal [21]. He supported the view that *Laruea* was a synonym of *Haplospalchnus*; he also considered the body shape as variable and could not be used as a reliable taxonomic character. Gupta and Ahmad added four other species *H. orientalis* from the intestine of *Pellona elongata*, *H. stunkardi* from the intestine of *Acanthurus sandvicensis*, *H. otolithi* from the intestine of *Otolithus ruber* and *H. indica* from the intestine of *Mugil waigiensis*, caught from the Bay of Bengal [22]. They also considered *Laruea* as a synonym of *Haplospalchnus*. In India, both *H. vinodae* and *H. guptai* were described by Ahmad [23] from *Mugil cephalus*. Also, *H. bengalensis* was described by Gupta and Puri [24] from *Acanthurus sandvicensis*.

In Egypt, Sahlab [25] redescribed *H. pachysoma* from the intestine of *Mugil cephalus* caught from Lake Manzala. Five years later, Al-Basswi [26] redescribed four species of the genus *Haplospalchnus* from the intestine of *Mugil* spp.

TABLE (1)
A COMPARISON BETWEEN 13 SPECIES OF THE GENUS *HAPLOSPALANCHNUS* LOOSS, 1902

Parasites Species	Body Size	Oral sucker	Pharynx	Cecum	Acetabulum	Testis	Ovary	Vitellaria	Eggs	Hosts	Locality
<i>H. Puri</i> SRIVASTAVA, 1939	1.9 x 0.79	0.20 In diameter	oval	0.9 Long	0.35 x 0.35	0.2 - 0.3 0.18 - 0.28	0.12 - 0.22 0.08 - 0.16	thin band	49 - 68 23 - 34	<i>Mugil waigiensis</i>	Bay of Bengal
<i>H. mugilis</i> Nahhas & Cable, 1964	0.78 - 1.15 0.22 - 0.46	0.075 - 0.12 0.083 - 0.13	0.037 - 0.063 diameter	Extend to ovary	0.13 - 0.18 0.096 - 0.16	0.15 - 0.16 0.083 - 0.12	0.090 - 0.12 0.053 - 0.10	10 - 12 in number	48 - 63 x 30 - 36 u	<i>Mugil curema</i>	Jamaica
<i>H. bivittulosus</i> Shukiy, 1971	0.79 - 1.22 0.35 - 0.56	0.10 X 0.18	0.08 - 0.096 0.047 - 0.096	0.13 - 0.41 long	0.16 x 0.23	0.14 x 0.24	0.07 - 0.12 0.092 - 0.12	two ribbons	50 - 54 25 - 33	<i>Mugil So-luy bas</i>	Japan Sea
<i>H. venezuelensis</i>	1.28 X 0.46	0.13 X 0.12	0.06 x 0.07	Extend to testis	0.191 x 0.194	0.2 x 0.16	0.11 x 0.10	two bunches	58 - 65 30 - 33 u	<i>Anternarius multiocellatus</i>	Venezuela
<i>H. Cuneatus</i> Tang & Lin, 1978	1.23 - 1.63 0.41 - 0.72	0.13 - 0.22 0.17 - 0.22	oval	0.28 - 0.38 long	0.2 - 0.3 0.2 - 0.22	0.12 - 0.17 0.1 - 0.15	0.086 x 0.12	poorly developed	51 x 26 u	<i>Mugil cephalus</i>	Fujian
<i>H. Caudatus</i> * Srivastava, 1939	3.6 - 3.8 in length	0.2 - 0.24 0.28 - 0.35	0.12 - 0.12 0.14 - 0.16	0.32 - 0.5 long	0.96 - 1.8 0.32 - 0.54	0.22 - 0.34 0.24 - 0.38	0.18 - 0.28 long	poorly developed	38 - 40 u long	<i>Mugil waigiensis</i>	India
<i>H. pachyostomus</i> ** Looss, 1902	1.13 - 1.8 0.67 - 0.97	0.15 - 0.24 0.15 - 0.25	0.10 - 0.14 0.13 - 0.16		0.36 - 0.68 0.19 - 0.24	0.17 - 0.31 0.12 - 0.24	0.10 - 0.14 0.09 - 0.16	connected follicles	45 - 54 25 - 29	<i>Mugil spp.</i>	Egypt
<i>H. elongatus</i> Tang & Lin, 1978	2.89 X 0.87	0.15 X 0.19	0.095 x 0.13	0.93 long	0.30 - 0.076	0.26 x 0.17	0.17 x 0.13	linear line	47 - 56 25 - 38 u	<i>Mugil cephalus</i>	Fujian
<i>H. stunkardi</i> Gupta & Ahmad, 1979	1.24 - 1.7 0.64 - 0.69	0.14 - 0.148 0.19 - 0.21	0.24 - 0.34 from body end	0.12 - 0.27 wide	0.69 - 0.99 0.30 - 0.37	0.17 - 0.27 0.17 - 0.22	0.11 - 0.12 0.14 - 0.15	poorly developed	40 - 42 18 - 20 u	<i>Acanthurus snadvicensis</i>	Bay of Bengal
<i>H. orientalis</i> Gupta & Ahmad, 1979	2.49 X 1.18	0.18 X 0.20	0.11 x 0.115	0.36 x 0.15	0.81 x 0.31	0.21 x 0.14	0.13 x 0.11	between ovary & caecal end	35 - 42 18 - 20	<i>Pellona clongata</i>	Puri, orissa
<i>H. Indica</i> Gupta & Ahmad, 1979	2.60 X 0.80	0.13 X 0.28	0.11 - 0.14	0.84 x 0.14	0.38 x 0.33	0.40 x 0.26	0.15 x 0.15	poorly developed	49 - 68 23 - 34 u	<i>Mugil waigiensis</i>	Bay of Bengal
<i>H. otolithi</i> Gupta & Ahmad, 1979	1.04 - 0.18 0.6 - 0.64	0.12 - 0.14 0.2 - 0.22	0.065 - 0.09 0.08 - 0.12	0.4 - 0.5 long	0.27 - 0.35 0.23 - 0.30	0.14 - 0.16 0.20 - 0.22	0.07 - 0.08 0.1 - 0.11	between testis & caecal end	58 - 70 30 - 40 u	<i>Oolith ruber</i>	Puri, orissa
<i>H. edkuensis</i> Al Bassel, 1990	2.2 X 0.7	0.27 x 0.17	0.11 - 0.14	0.39 x 0.13	0.68 x 0.23	0.15 x 0.15	0.08 x 0.08	extend to near bodyend	40 - 46 18 - 22	<i>M. capito</i>	Lake Edku in Egypt

* Cited from Tang and Lin, 1978

** Cited from Fischthal and Kuntz, 1963

*** Cited from Fischthal and Nasir, 1974

caught from Lake Qarun, *H. caudatus* (Srivastava, 1939) Skrjabin and Guschanskaja 1955 from *Mugil capito*, *H. stunkardi* Gupta and Ahmad, 1979 from *Mugil cepito*, *M. chelo* and *M. capito* Brglez, and paradiznik [27] reported *H. pachysoma* from *Mugil cephalus* from the Northern Adriatic. Al-Bassel [3] added *H. edkuensis* from the intestine of *Mugil capito* caught from Lake Edku in Egypt. He also redescribed *H. otolithi* Gupta and Ahmad, 1979 from *Mugil cephalus* from the fish from Barseek in Behera Governorate in Egypt. A comparison Between 13 species so far described from the genus *Haplospalchnus* were presented in (Table 1).

Haplospalchnus indica Gupta and Ahmad, 1979 was originally described from *Mugil waigiensis* from the Bay of Bengal at Puri, Orissa [22].

In the present investigation *H. indica* was recorded for the first time in Libya. The present material is similar to the specimen described by Gupta and Ahmad in the main characteristics but there are certain minor differences in the body length, cecum length, egg size, oral sucker and acetabulum.

Haplospalchnus mugilis Nahhas and Cable, 1964 was originally described from *Mugil curema* from Curacao [14]. In the present investigation *H. mugilis* was recorded for the first time from *Mugil capito* from Libya as a new host and locality recorded. The present material is similar to the specimens described by Nahhas and Cable, 1964 in the main characteristics but there are certain minor differences in the oral sucker, acetabulum, testis and ovary.

The following key is suggested to distinguish between 13 species of *Haplospalchnus* Looss, 1902.

Genital pore between the bifurcation of the body arms (1)

Genital pore between oral sucker and ventral sucker (2)

1 - Uterus extending between testis and acetabulum *H. caudatus* Srivastava, 1939.

Uterus extending between middle of testis and middle of acetabulum *H. stunkardi* Gupta and Ahmad, 1979.

Uterus extending between the acetabulum and the hind

end of body *H. orientalis* Gupta and Ahmad, 1979.

2 - Vitellaria scythe - scyaped and extending between receptaculum seminis and opposite body wall *H. purii* Srivastava, 1939.

Vitellaria arranged in one group dorsal to seminal vesicle, each vitelline follicle tubular, club - shaped *H. caneatus* Tang and Lin, 1978.

Vitellaria extend in the from of two somewhat twisted ribbons from the testit to middle of body *H. bivitellosus* Zhukov, 1971.

Vitellaria arranged in two lateral grape- like bunches at testicular level *H. venezuekensis* Fischthal and Nasir, 1974.

Vitellaria follicular, poorly developed extending between testis and the blind end of the intestinal cecum (3).

3 - Cecum extending up to middle of testis *H. otolithi* gupta and Ahmad, 1979.

Cecum extending up to anterior of testis (4).

4 - Uterus extending up to posterior of testis, vitelline follicles 11 - 13 in number and having larger eggs (48 - 63 x 30 - 36u) *H. mugilis* Nahhas and Cable 1964.

Uterus extending up to anterior of testis (5).

5 - Uterus extending up to ovarian complex *H. pachysoma* Looss, 1902.

Uterus extending up to anterior margin of testis (6).

6 - Cecum extending up to middle of body and the post-testicular space is wide *H. elongatus* Tang and Lin, 1978.

Cecum extending up to ne third of body lenght and the post- testicular space is narrow *H. indica* Gupta and Ahmad, 1979.

Cecum extending up to just posterior to the acetabulum (7).

7 - Vitellaria extending from post-cecal ends to near posterior extremity and the ovary situated posterior to testis *H. edkuensis* Al-Bassel, 1990.

II Trematodes of the genus *Prohaplanchnus* Tang and Lin, 1978.

Prohaplanchnus diorchis Tang and Lin, 1978 (Fig. 3)

The following description is based on five specimens collected from the intestine of *Mugil capito* caught from the Libian Coastal waters near Misurata in December, 1994.

The body is oval-shaped, aspinose, rounded posteriorly 2.49 - 2.54 long and 1.26 - 1.38 in maximum width. The worm lies on its lateral side and is symmetrical in appearance. Oral sucker 0.29 - 0.34 long and 0.38 - 0.45 wide. Pharynx spherical 0.18 - 0.22 long and 0.22 - 0.25 wide. Cecum short, sac-shaped. 0.60 - 0.70 long and 0.16 - 0.19 wide. Cecum extends to about anterior half of the body length. Ventral sucker very large, retracted into body parenchyma, 1.11 - 1.20 long and 0.38 - 0.48 wide. Reproductive organs situated near posterior end of the body. Testes two in number arranged either side by side and equal in size, each measures 0.30 - 0.38 long 0.33 - 0.40 wide. Vesicula seminalis, a curved slender tube filled with spermatozoa, leads to genital pore at some distance behind the oral sucker, it measures 0.88 - 0.95 in length. Pars prostatica is surrounded by clusters of prostate cells. Ovary oval-shaped, 0.19 - 0.23 long and 0.15 - 0.18 wide. Ovary is closely connected with receptaculum seminis by an oviduct arising from its anterior aspect. Receptaculum seminis oval

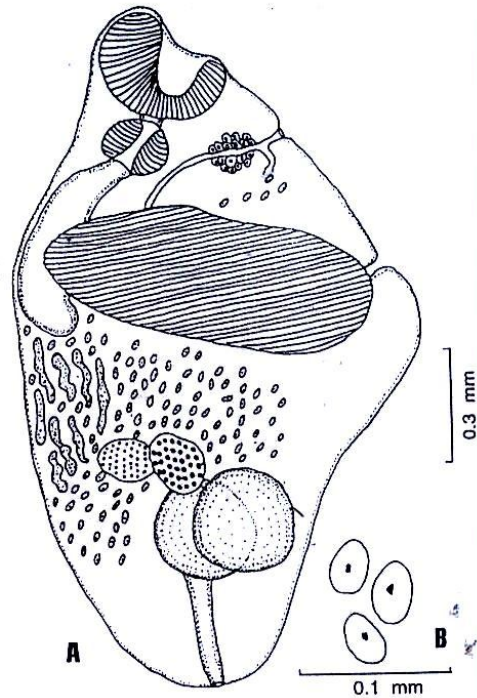


Fig. 3 : A - Ventrolateral view of the worm
B - Eggs.

(Table 2)

A comparison between the original and present description of *P. diorchis*
Tang and Lin, 1978

Charaters	<i>P. diorchis</i> from China	<i>P. diorchis</i> from Libya
Baby-shaped	---	Oval - shaped, aspinose
Length	1.7 - 1.9	2.4 - 2.54
Width	0.62 - 1.1	1.26 - 1.38
Oral sucker	0.17 - 0.24 X 0.19 - 0.28	0.29 - 0.34 X 0.38 - 0.46
Ventral sucker	0.20 - 0.26 X 0.38 - 0.51	1.11 - 1.20 X 1.38 - 1.48
Pharynx	0.057 - 0.12 X 0.11 - 0.15	0.18 - 0.22 X 0.22 - 0.25
Cecum	0.41 - 0.62 X 0.11 - 0.20	0.60 - 0.70 X 0.16 - 0.19
Testes	Two equal 0.20 - 0.28 X 0.15 - 0.18	Two, equal, 0.30 - 0.38 X 0.33 - 0.40
Genital pore	Behind the oral sucker	Behind the oral sucker
Vesicula seminalis	Tubular	Tubular, 0.88 - 0.95
Ovary	0.15 - 0.27 X 0.11 - 0.15	0.19 - 0.23 X 0.15 - 0.18
Recepta, seminis	---	0.16 - 0.19 X 0.14 - 0.18
Vitellaria	Follicles, linear	Follicles, linear
Eggs	43 - 51 X 20 - 30u	44 - 48 X 28 - 36 u
Excretory vesicle	---	y-shaped
Hosts	<i>Mugil cephalus</i>	<i>Mugil capito</i>
Location	Intestine	Intestine
Locality	China, Fujian	Libya, Misurata

in shape, 0.16 - 0.19 long and 0.10 - 0.14 wide. A Laurer's canal is present. Vitelline follicles linear, club-shaped, grouped together on the dorsal part of the body posterior to the cecum. Uterine coils winding from level of testes to genital pore. Eggs numerous 44 - 48 μ long and 28 - 36 μ wide. Excretory vesicle y-shaped with terminal excretory pore.

Host: *Mugil capito*.

Location: Intestine.

Locality: Misurata, Libya.

Discussion

Tang and Lin [2] established the genus *Prohaploplanchnus* to accommodate *P. diorchis* from *Mugil cephalus* from Fujian in China. *P. diorchis* was originally described by Tang and Lin, 1978 from *Mugil cephalus* from China. The present material is similar to the specimens described by Tang and Lin, 1978, but the present description added more details on the body length and excretory vesicle, (Table 2). It is worthy to mention that *P. diorchis* is reported for the first time in Libya. The species is also recorded from new host viz *Mugil capito*.

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