

## HELMINTH PARASITES OF FISHES FROM THE ARABIAN GULF

### 5. ON *HELICOMETRINA QATARENSIS* N. SP. (DIGENEA: OPECOELIDAE) AND *STEPHANOSTOMUM NAGATYI* N. SP. (DIGENEA: ACANTHOCOLPIDAE); PARASITES OF *EPINEPHELUS SPP.* FROM QATARI WATERS

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*Key words:* Arabian Gulf, *Helicometrina* and *Stephanostomum spp.*, Digenetic trematodes, Fishes.

#### ABSTRACT

*Helicometrina qatarensis* n. sp. is described from *Epinephelus tauvina* and *E. summana*. It differs from other species of *Helicometrina* which have 9 testes in the body shape, position of genital pore, distribution of vitellaria and size of eggs. *Stephanostomum nagaty* n. sp. is described from *E. tauvina* and *E. chlorostigma*. The new species is distinguished from other related species of the genus by the number of spines and distribution of vitellaria.

#### INTRODUCTION

Linton (1910) erected the genus *Helicometrina* and gave it a name that would remind one of the genus *Helicometra* from which it was differentiated by the number of testes. The type species *H. nimia* Linton, 1910 was described from the gut of some marine fishes from Dry Tortugas.

The second valid species of the genus, *H. parva* was added by Manter (1933) from the gut of *Tridio bivittatus*. Srivastava (1936) described *H. septorchis* from *Sillago*

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*sihama* and *H. orientalis* from *Scomber microeditorus* in India. Manter and Pritchard (1960) described *H. quadrorchis* from *Gymnothorax bureonsis* and *G. steindachneri*. Siddiqi and Cable (1960) described *H. mirzai* from *Lactophrys bicaudalis* and *H. trachinoti* from *Trachinotus sp.* in Puerto Rico. Al-Yamani and Nahhas (1981) reported *H. nimia* from *Nemipterus tolu* from the Arabian Gulf.

The genus *Stephanostomum* was named by Looss (1899) with *S. cesticillum* (Molin, 1858) as the type species. The genus is a large one; Yamaguti (1971) listed 67 species and over 16 species have been more recently added. Of these, four species were originally described from the Red Sea, namely *S. platacis* Nagaty, 1957; *S. naucrotis* Nagaty 1957; *S. gaabooli* Nagaty and Abdel Aal, 1962 and *S. lebedevi* Parukhin, 1974. Moreover, *S. casum* (Linton, 1910) was also reported from the Red Sea. Ramadan (1983) briefly reviewed the genus and added two more species: *S. egypticum* and *S. bulbposum*. Reimer (1983) reported *S. casum* (Linton, 1910) and *S. ditrematis* (Yamaguti, 1939) from fishes of Mozambique. Moreover, he described three more species, including *S. jesseni*, *S. keilbachi* and *S. mocambi-quensis*.

During the present investigation, two hitherto unknown species of *Helicometrina* and *Stephanostomum* have been discovered in *Epinephelus spp.* caught from the Qatari waters in the Arabian Gulf. These species are described here as new species.

## MATERIAL AND METHODS

Methods used for the collection, identification and examination of fish are described elsewhere (Saoud, Ramadan and Al Kawari, 1986). Techniques used for the relaxation, fixation and staining of trematodes are basically those outlined by Saoud and Ramadan (1983). All measurements are in millimetres unless stated otherwise.

### *HELICOMETRINA QATARENSIS* N. SP.

(Fig. 1)

### DESCRIPTION

The following description is based on five specimens collected from *Epinephelus tauvina* and *Epinephelus summana*. The body is elongated to pyriform, measuring 2.7 - 6.9 long with a maximum width of 1.2 - 2.0 at the region of the gonads. The length to width ratio is 2.1 - 4.0: 1. Tegument is smooth. The oral sucker is subterminal, fairly round, 0.25 - 0.42 long and 0.28 - 0.45 wide. The ventral sucker lies 1.17 - 2.5 from the anterior end; it measures 0.35 - 0.57 long and 0.30 - 0.51

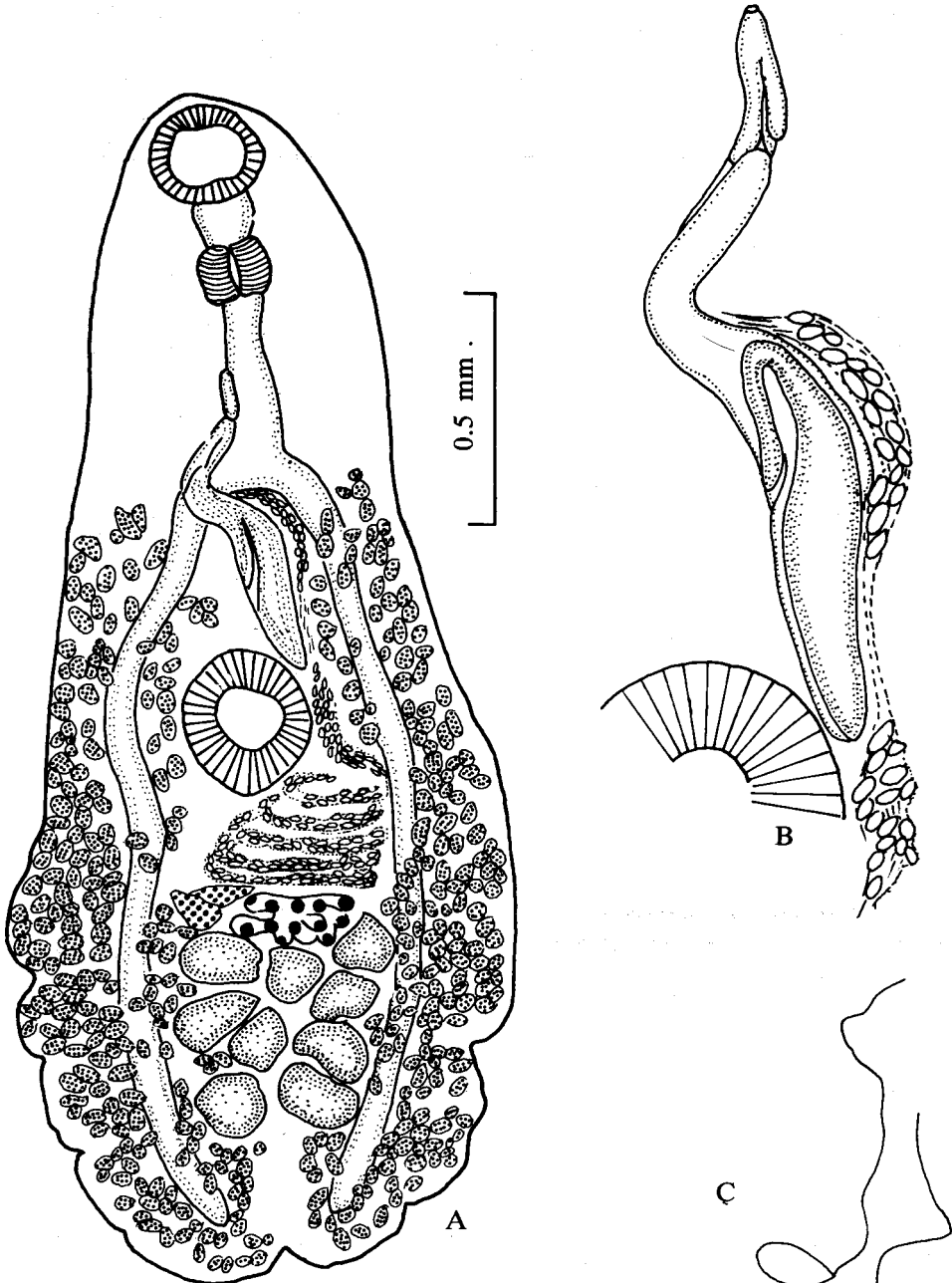


Fig. 1: *Helicometrina qatarensis* n. sp.

A: Ventral View

B: Terminal Genitalia

C: Eggs

wide. The suckers ratio is 1: 1.2 - 1.3. A prepharynx is present, measuring 0.04 - 0.15 long. The pharynx measures 0.20 - 0.31 long and 0.21 - 0.28 wide. The oesophagus is long, measuring 0.35 - 0.57 in length. The intestinal bifurcation is located midway between the oral sucker and ventral sucker. Intestinal caeca are long, reaching to the posterior extremity of the body.

There are nine testes: they are intercaecal with irregular outline. The testes measure 0.19 - 0.24 long and 0.22 - 0.25 wide. The cirrus sac is long, extending in front of the acetabulum to reach the oesophageal level; it measures 1.07 - 1.50 long and contains long, tubular seminal vesicle and a cirrus. The genital pore is prebifurcal, and opens at various levels between pharynx and intestinal bifurcation.

The ovary is pretesticular with 7 - 9 lobes, measuring 0.17 - 0.31 long and 0.25 - 0.50 wide. A seminal receptacle is present; it measures 0.21 - 0.26 long and 0.14 - 0.16 wide. The vitellaria are follicular, extending from the level of intestinal bifurcation to the posterior end of the body. The uterus is pre-ovarian; it has many coils, occupying the space between the ovary and the acetabulum. The metraterm is well developed, extending as a longitudinal tube along the cirrus pouch; it contains oval eggs that measure 67 - 78  $\mu\text{m}$  by 24 - 39  $\mu\text{m}$ . The egg is characterized by a long filament.

A tubular median excretory vesicle appears in stained specimens to extend from the posterior end to the level of the posterior testes.

## DISCUSSION

Linton (1910) described *Helicometrina nimia* as the type species of the genus. Srivastava (1936) described *H. septorchis* and *H. orientalis* and gave a key to distinguish between four species of *Helicometrina*. The position of genital pore was said to be post-bifurcal in *H. nimia* and *H. parva*; and prebifurcal in *H. septorchis* and *H. orientalis*.

Deelman (1960) stated that a continuum between *H. nimia* and *H. elongata* was established by using a combination of characters, namely testes shape, position of genital pore and vitelline distribution. Accordingly, he suggested placing *H. orientalis* and *H. elongata* in synonymy with *H. nimia*. The present writers do not accept Deelman's opinion and suggest keeping these species as distinct. *H. nimia* and *H. orientalis* can be distinguished clearly by the distinctive distribution of the vitellaria in both species.

Al-Yamani and Nahhas (1981) wrongly identified digeneans from *Nemipterus tolu* in the Arabian Gulf as *H. nimia*. They based their description on the examination of three specimens which were referred to that species with some reservation. The

present writers do not accept their identification because of the clear position of genital pore midway between the pharynx and the intestinal bifurcation. In *H. nimia* the genital pore is post-bifurcal.

The above specimens recently described from the Arabian Gulf are mainly characterized by the prebifurcal position of genital pore, which is found slightly anterior to half the distance between the pharynx and the intestinal bifurcation, the position of the ventral sucker, lying almost at the middle of the body, the irregular outline of the 9 testes, and the ovary having 7 - 9 lobes. *H. qatarensis* differs from *H. nimia* mainly in the position of the genital pore and the larger eggs. It differs from *H. orientalis* in the body shape, the position of ventral sucker, the shape and arrangement of testes, the length of oesophagus and the larger size of eggs.

*H. qatarensis* also differs from *H. elongata* mainly by the continuous distribution of vitellaria from the intestinal bifurcation to the posterior end, the shape of testes and the more lobulated ovary. It is also distinguished from the material of Al-Yamani and Nahhas (1981) in the presence of a prepharynx, the longer oesophagus, the larger size of eggs (33 - 55  $\mu\text{m} \times 19 - 27 \mu\text{m}$  as compared with 67 - 78  $\mu\text{m} \times 24 - 39 \mu\text{m}$  in the present species) and the host species.

The present writers believe that all these differences are sufficient to designate the present material as a new species.

#### Specific Diagnosis

The body is elongated to pyriform, measures 2.7 - 6.9 long and 1.2 - 2.0 wide. Oral sucker is subterminal, fairly round, 0.25 - 0.42 long and 0.28 - 0.45 wide. The ventral sucker nearly at the middle of the body, measures 0.35 - 0.57 long and 0.30 - 0.51 wide. The suckers ratio 1: 1.2 - 1.3. A prepharynx is present, 0.04 - 0.15 long, leads to a muscular pharynx that measures 0.20 - 0.31 long and 0.21 - 0.28 wide and a long oesophagus 0.35 - 0.57 long. The intestinal bifurcation is located midway between the two suckers, intestinal caeca reaching the posterior end of the body. There are nine testes with irregular outline; measuring 0.19 - 0.24 long and 0.22 - 0.25 wide. The cirrus sac is long; measures 1.07 - 1.50 long, extending in front of the acetabulum to reach the oesophageal level, containing long, tubular seminal vesicle and cirrus. The genital pore is prebifurcal, between pharynx and intestinal bifurcation. The ovary is pre-testicular with 7 - 9 lobes; measures 0.17 - 0.31 long and 0.25 - 0.50 wide. A seminal receptacle is present; measures 0.21 - 0.26 long and 0.14 - 0.16 wide. The vitellaria are follicular; extending from the intestinal bifurcation to the posterior end. Uterus has many coils, metraterm is well developed. Eggs are oval with long filament; measuring 67 - 78  $\mu\text{m} \times 24 - 39 \mu\text{m}$ .

*Hosts* : *Epinephelus tauvina* and *Epinephelus summana*

*Locality* : Arabian Gulf

*Location*: Intestine.

Types : Holotype deposited in the Helminthological Collection, Department of Zoology, Faculty of Science, University of Qatar. Paratypes deposited in the Helminthological Collection of the Zoology Department, Faculty of Science, Ain Shams University and the Commonwealth Institute of Parasitology.

*STEPHANOSTOMUM NAGATYI* N. SP.

(Fig. 2)

DESCRIPTION

The following description is based on 7 specimens collected from *Epinephelus tauvina* and *E. chlorostigma*. The body is elongate, narrowing greatly pre-acetabularly; it measures 3.7 - 5.1 long with a greatest width of 0.78 - 1.1. The body tegument is beset with spines which measure 24 - 35  $\mu$ m in length. The body length to width ratio is 3.3 - 4.8: 1. The oral sucker is terminal, measuring 0.12 - 0.17 long and 0.28 - 0.35 wide. There are 64 - 68 oral spines which are arranged in two uninterrupted rows; each row consists of 32 - 34 spines. A spine measures 35 - 49  $\mu$ m in length. The acetabulum lies 1.0 - 1.14 from the anterior end; it measures 0.27 - 0.32 long and 0.28 - 0.42 wide. The oral sucker to ventral sucker ratio is 1: 1.8 - 2.2. There is a prepharynx which is longer than the pharynx, both measure 0.28 - 0.50 and 0.25 - 0.35 in length respectively. The oesophagus is short, measuring 0.07 - 0.10 long. The intestinal caeca bifurcate shortly anterior to the acetabulum and terminate very close to the posterior extremity of the body.

The testes are smooth, tandem, located at the posterior half of the body. In six out of seven specimens, the two testes are separated by vitelline follicles while the ovary is not separated from the anterior testis. In one specimen, however, the two testes are not separated by vitelline follicles while the ovary is separated by these follicles from the anterior testis. The anterior testis measures 0.30 - 0.50 long and 0.28 - 0.57 wide while the posterior testis measures 0.28 - 0.54 long and 0.25 - 0.51 wide. The cirrus sac is elongate and originates midway between the acetabulum and the ovary; it measures 1.0 - 1.2 long and contains a posterior saccular seminal vesicle that leads anteriorly to the cirrus which is elongated and coiled, lying beside the acetabulum. The genital pore is median, immediately pre-acetabular and measures 10 - 14  $\mu$ m in diameter.

The ovary is almost round in shape; it is found just in front of the anterior testis and measures 0.18 - 0.31 long and 0.25 - 0.40 wide. The vitellaria are formed of densely packed follicles which extend behind the acetabulum to reach the posterior end of the body. The vitelline follicles are continuous, extending above the caeca, surround the gonads and are confluent between the testes. The uterus has few coils

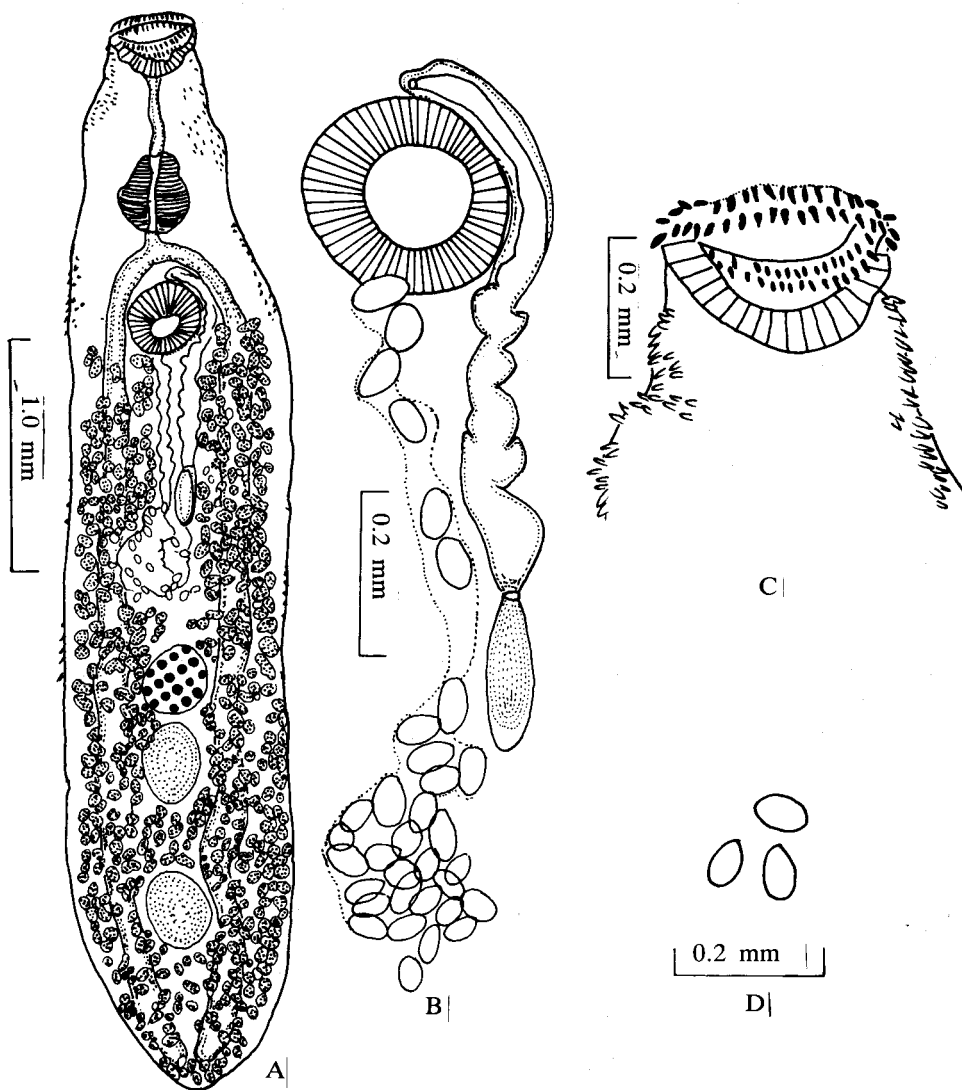


Fig. 2: *Stephanostomum nagatyi* n. sp.

A: Ventral View

B: Terminal Genitalia

C: Oral Sucker, showing spines

D: Eggs

and occupies a pre-ovarian position. The metraterm is nearly equal to or slightly less longer than the cirrus sac. The eggs measure 71 - 85  $\mu\text{m}$   $\times$  35 - 42  $\mu\text{m}$ .

## DISCUSSION

The basis for identifying the various species in the rather over-crowded genus *Stephanostomum* is still unsatisfactory, although Caballero (1952) after reviewing the literature and recognizing 29 species, clarified some confusions. The number of oral spines seems to be relatively constant within the range of a species, but these spines are difficult to count accurately in many specimens. More information is needed regarding intra-specific variations between some species e.g. *S. triglae* and *S. baccatum*. On the other hand, Linton (1910) probably had more than one species under the names *S. tenve* (Linton, 1898) Linton, 1910 and *S. dentatum* (Linton, 1900). Caballero (1952) considered *S. sentum* Linton, 1910 to be a synonym of *S. minutum* (Looss, 1901) and named *S. lebourae* for *S. caducum* (Looss, 1901), Lebour, 1908.

*Stephanostomum nagatyi* n. sp. is nearest to *S. australis* Manter, 1954 from which it differs in having 64-68 spines on the oral sucker (54 in *S. australis*), an intertesticular space and vitellaria reaching anteriorly to the posterior end of the acetabulum.

It also differs from *S. admicrostephanus* Perez Viguera, 1955 which has 70 - 80 spines in 3 rows and the eggs are smaller (60  $\times$  53  $\mu\text{m}$ ).

The new species differs from *S. casum*, *S. dentatum*, *S. japonocasum* in having much more oral spines. It differs from *S. cloacum* (Srivastava, 1938) Manter and Van Cleave, 1951 from the Indian Ocean in having 34 spines in 2 alternating rows dorsally and a single row ventrally. It differs from *S. gaabooli* Nagaty and Abdel Aal, 1962 from the Red Sea in having smaller number of oral spines (32-42) and from *S. naurotis* Nagaty, 1957 in the number and shape of spines on the oral sucker, prepharynx length, and extension of vitellaria. It differs from *S. polymixiae* Yamaguti, 1970 in which the oesophagus bifurcates far away from the acetabulum.

It differs from *S. egypticum* and *S. bulboposum* recently described by Ramadan (1983) from Red Sea fishes in the number of oral sucker spines (30-32 in *S. egypticum*) and from *S. bulboposum* in the number of oral spines (28) and the absence of the muscular bulb.

*S. nagatyi* n. sp. differs from species of the genus *Stephanostomum* described recently from Mozambique: *S. jesseni* Reimer, 1983, *S. keilbachi* Reimer, 1983 and *S. mocambiquensis* Reimer, 1983 mainly in the number of spines on the oral sucker being 34, 32 and 48 spines respectively in these species.



The present writers believe that all these differences are sufficient to designate *Stephanostomum nagatyi* as a new species. It is named in the honour of Professor H.F. Nagaty for his distinguished contributions in the field of Fish Parasitology in Egypt.

It is also important to note that Reimer (1983) recorded - without description - an unidentified juvenile specimen of *Stephanostomum* from the gut of *Trachurus trachurus* which had the same number of spines on the oral sucker (64-68) as *S. nagatyi* n. sp. The study of some more specimens of the adults of that species from Mozambique may lead to a definite identification of that material.

#### Specific Diagnosis

The body is elongate, measures 3.7 - 5.1 long and 0.78 - 1.1 wide. Tegument spined. The length to width ratio is 3.3 - 4.8: 1. The oral sucker is terminal measuring 0.12 - 0.17 long and 0.28 - 0.35 wide, surrounded by 64 -68 oral spines in two uninterrupted rows. The acetabulum measures 0.27 - 0.32 long and 0.28 - 0.42 wide. The oral sucker to ventral sucker ratio is 1: 1.8 - 2.2. The prepharynx is 0.28 - 0.50 long and pharynx is 0.25 - 0.35 long. The oesophagus is 0.07 - 0.10 long. The intestinal caeca terminate near posterior extremity. Testes tandem, in the posterior half of the body, measuring 0.30 - 0.50 × 0.57 and 0.28 - 0.54 × 0.25 - 0.51 respectively. The cirrus sac is elongate and originates midway between the acetabulum and the ovary, it contains saccular seminal vesicle and elongated coiled cirrus. The genital pore is median, immediately pre-acetabular. The ovary is round, pretesticular, measures 0.18 - 0.31 × 0.25 - 0.40. The vitellaria extend from the acetabulum to the posterior end. The uterus with few coils and eggs are large 71 - 85 × 35 - 42  $\mu$ m.

Hosts : *Epinephelus tauvina* and *E. chlorostigma*

Location: Stomach and Intestine

Locality : Arabian Gulf

Types : Holotype deposited in Department of Zoology, Faculty of Science, University of Qatar. Paratypes deposited in the Helminthological Collection of Zoology Department, Faculty of Science, Ain Shams University and Commonwealth Institute of Parasitology.

#### KEY TO SPECIES OF GENUS *STEPHANOSTOMUM* FROM RED SEA AND ARABIAN GULF.

The present writers suggest modifying the key presented by Ramadan (1983) to distinguish between the species of *Stephanostomum* described so far from Red Sea and Arabian Gulf fishes as follows:

1. Oral sucker followed by a muscular bulb.....*S. bulboposum* Ramadan, 1983  
Oral sucker not followed by a muscular bulb ..... 2
2. Vitellaria reach up to pharynx level ..... *S. lebedevi* Parukhin, 1974  
Vitellaria reach the posterior margin of acetabulum..... 3  
Vitellaria not reaching the posterior margin of acetabulum ..... 4
3. Oral sucker spines 32-36 and cirrus pouch extending less than halfway between acetabulum and ovary .....*S. casum* (Linton, 1910)  
McFarlane, 1934  
Oral sucker spines 64-68 and cirrus pouch extending half way between acetabulum and ovary ..... *S. nagatyi* n. sp.  
Oral sucker spines 32 and cirrus pouch extending more than halfway between acetabulum and ovary ..... *S. egypticum* Ramadan, 1983
4. Testes without inter-testicular space ..... *S. platacis* Nagaty, 1957  
Testes with inter-testicular space..... 5
5. Vitellaria extending between testes ..... *S. naucrotis* Nagaty, 1957  
Vitellaria not extending between testes.....  
*S. gaabooli* Nagaty and Abdel Aal, 1962

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## الديدان الطفيلية في أسماك الخليج العربي :

(٥) نوعان جديان من التريماتودات ثنائية العائل ، هليكومترينا قطرنايس ( فصيلة أوبيسيليدي ) وستفانوستومم نجاتي ( فصيلة أكانثوكولبيدي )

محمد فتحي عبد الفتاح سعود - مصطفى محمود رمضان  
و كلثم سالم الكواري

يصف المؤلفون نوعين جديدين من التريماتودات ثنائية العائل التي تتطفل في بعض أنواع أسماك الهامور التي جمعت من المياه القطرية في الخليج العربي .  
وأول هذان النوعان هو هيلكوبترينا قطرنايس تم وصفه من نوعين من أسماك الهامور ، ويتميز النوع الجديد عن باقي الأنواع المعروفة في جنس هليكومترينا بشكل الجسم ومكان الثقب التناسلي وتوزيع الغدد المخية بالإضافة إلى حجم البيض .  
والنوع الثاني ، ستفانوستومم نجاتي ، وُصف من نوعين من الأسماك ، ويميز النوع الجديد عدد الأشواك وتوزيع الغدد المخية .