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AN ASPIDOGASTREAN PARASITE, ROHDELLA ANODONTIASE SP. NOV. FROM THE FRESH WATER MUSSEL, ANODONTA RUBINSE.

(With 2 Figures and one Table)

By

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طفيل اسبيدوجاسترين نوع جديد روديليا انودونتييز

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لقد تم تعريف وتصنيف نوع جديد من طفيليات مجموعة الأسبيدوجاسترين والذي تم جمعه لأول مرة من تجويف حول القلب وتجويف الكلى لحيوان رخوي من ذوات المصرعين التي تعيش مدفونة في الشواطئ الرملية والطينية لنهر النيل بمحافظة سوهاج. وهذا الطفيل له مميزات خاصة به مما تؤهله لأن يكون نوع جديد من جنس روديليا والتابع لتحت عائلة روديلين. وهذه الصفات هي أن عدد الحواجز العرضية ٢٧ كما أن قياساته تختلف عن القياسات للأنواع السابق اكتشافها في نفس الجنس. هذا بالإضافة إلى أنه جمعت العينات من عائل ذات المصرعين الرخوي لأول مرة يسجل منه هذا الطفيل.

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SUMMARY

An aspidogastrean parasite *rohdella anodontiase* sp. nov. is recorded for the first time from the fresh water mussel, *Anodonta rubinse*. It is found in the pericardial and nephridial cavities of the mussel which are collected from the River Nile at Sohag Governorate, Egypt. The present parasite has its own diagnostic characters by which it is considered as a new species belonging to the genus *Rohdella*, subfamily *Rohdellinae*. Such characters are; its measurements are different from those of the other known species of the same genus, the number of transverse septa is 27 and the parasites are collected for the first time from the molluscan bivalve *Anodonta rubinse*.

INTRODUCTION

During the course of investigation of the parasites of the fresh water mussel *Anodonta rubinse* in the River Nile at Sohag Governorate, Egypt, it was noticed that an aspidogastrean species was present in the pericardial and nephridial cavities.

Aspidogastreans have been reported as pathogens in a number of water organisms including the fresh water fishes, *Osteochilus melanopleurus* and *Barbus daruphani* (GIBSON and GHINABUT, 1984), ratfish, *Hydrolagus colliei* (SCHELL, 1973) and *Nephrops norvegicus* (SYMONDS, 1972).

The aspidogastrean parasites are characteristically found in the body cavities of water organisms, specially fishes, but there are no reports of infection in the fresh water mussels.

The taxonomy of the aspidogastrean has been the subject of change. GIBSON (1983) gave a new classification for the subclass. Aspidogastrea, where he divided it into two orders; Aspidogastrida and Stichocotylida. In order Aspidogastrida, he recognized a single family, the Aspidogastridae, which in turn contains 3-subfamilies; Aspidogastrinae, Cotylaspidinae and Rohdellinae.

The parasite under investigation has the diagnostic characters of the subfamily Rohdellinae recognized by GIBSON (1983). It was found to be the first time to record the present parasite infecting the fresh water mussel, *Anodonta rubinse*. So, it was found necessary to give a complete description and identification for that Aspidogastrean parasite.

MATERIAL and METHODS

270 alive fresh water mussels, *Anodonta rubinse* were collected from the River Nile at the north east of Sohag city. The bivalves were dissected and examined for the internal parasites. Adult Aspidogastreaan parasites were collected from the pericardial and nephridial cavities of the present material. They were washed in physiological saline and fixed after mild pressure between the slide and its cover in 10% formalin solution. They were stained in acetic acid alum carmine and mounted in Canada balsam. Drawings were carried out by help of Camera Lucida and measurements were taken from mounted specimens by calibrated ocular micrometer. All measurements are in millimeters.

The characters and identification of the present species were compared with those given by YAMAGUTI (1953, 1963); GIBSON (1983), GIBSON & CHINABUT (1984) and MOHAMADIAN (1989).

RESULTS

Specimens of the present parasite were collected from the pericardial and nephridial cavities of the fresh water mussel *A. rubinse*. Alive parasites are colourless or red brownish in colour. The parasite is small in size, aspinose, dorsoventrally flattened and oval to elongate in shape, measured about 1.473-3.948 X 0.894-0.921 mm in length and width respectively (Fig. 1; PL. 1A). The holdfast covers most of the ventral surface of the body, except a short distance from the anterior and posterior terminal end. The holdfast shows 27 transverse septae. The parasite has an oral funnel, measured about 0.21-0.47 mm in length and 0.08-0.13 mm in width. The oral funnel leads to short prepharynx measuring about 0.013-0.08 mm in maximum length. It leads to a large and well developed muscular pharynx measuring about 0.08-0.16 mm X 0.18-0.26 mm in length and width respectively.

The pharynx leads to a long tubular caecum extending posteriorly to about 1.45 to 2.1 mm and terminates at the level of the posterior end of the holdfast. It is important to note that, the oral sucker is absent in the present parasite.

A single and large testis lies posterior to the ovary are placed in the third quarter of the body. It is globular to oval shaped and measured about 0.36-0.53 mm X 0.31-0.34 mm in length and width respectively (Fig. 1; OL. 1B).

A comma-shaped ovary lies at the front of the testis in the middle or near to the posterior half of the body (Fig. 1; PL. 1B). Its measurement ranged from 0.21-0.26 X 0.32-0.34 mm in length and width respectively. A coiled uterus lies in the

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midway between the extreme posterior end and the middle of the pre-ovarian region (Fig. 1). It contains a large number of eggs. Egg of the present parasite is oval in shape, operculated and lacking spines or filaments. It measures about 0.08-0.09 mm and 0.04-0.05 mm in length and width respectively (P1. 1C).

Male and female genitalia meet together forming a sinus-like hermaphroditic duct, measuring about 0.24-0.63 mm X 0.07-0.17 mm in long and short axes respectively (P1 1D). The hermaphroditic duct is non-protrusible and opens in the genital pore sinistro-lateral on the fore body dorsal to holdfast organ (P1 1E).

DISCUSSION

The taxonomy of Aspidogastrea parasites has been the subject of change. GIBSON (1983) and GIBSON and CHINABUT (1984) reviewed the classification of Aspidogastreans as follows:

Class: Trematoda

Subclass: Aspidogastrea.

Order: Aspidogastrida Dollfus (DOLLFUS, 1958).

Family: Aspidogastridae (POTCHE, 1907).

Subfamily: Aspidogastrinae (POTCHE, 1907).

Subfamily: Cotylaspidinae (CHAUHAN, 1954).

Subfamily: Rohdellinae (GIBSON & CHINABUT, 1984).

Order: Stichocotylida (GIBSON & CHINABUT, 1984).

Family: Stichocotylidae (FAUST & TANG, 1936).

Family: Multicaycidae (GIBSON & CHINABUT, 1984).

Family: Rugogastridae (SCHELL, 1973).

According to GIBSON and CHINABUT (1984) the subfamily Aspidogastrinae is distinguished by median alveoli of holdfast divided by single longitudinal septa (2 rows), the hermaphroditic duct is absent and the intromittent organ formed a cirrus, but the subfamily Cotylaspidinae is characterized by undivided holdfast, the absence of hermaphroditic duct and intromittent organ formed a cirrus when it is found, while the subfamily Rohdellinae is characterized by the median alveoli of holdfast undivided, the hermaphroditic duct is present and the intromittent organ form asinus organ and not cirrus organ.

In the present species, the median alveoli of the holdfast is undivided, the hermaphroditic duct is present and the intromittent organ form a sinus organ. These characters are in accordance with those of the subfamily Rohdellinae and genus *Rohdella*. So, the suggested classification of the present parasite is as follows:

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Class: Tre matoda.

Subclass: Aspidogastrea.

Order: Aspidogastrida.

Family: Aspidogastridae.

Subfamily: Rohdellinae.

Genus : Rohdella.

Up to date, the genus *Rohdella* contains two species. The first one is *R. siamensis* which was described by GIBSON and CHINABUT (1984) and investigated from freshwater fishes; *Osteochilus melanopleurus* and *Barbus daruphani* collected from Thailand. The second species is *R. clariasa* described by MOHAMADIAN (1989) investigated from fresh water fish *Clarias lazera* collected from the Rive Nile in Egypt.

The comparison between *R. clariasa*; *R. siamensis* and the present species in Table (1) shows that the species under investigation has its own specific characters and a new host not known before for the genus *Rohdella*. These diagnostic and specific characters are different from those of the other two species of the genus *Rohdella* (Table 1). So, the specific characters of the present material suggest that this parasite is a new species and it will be considered as a third one in the genus.

Diagnostic characters of the species:

- 1- **Host:** Freshwater mussel, *Anodonta rubinse*.
- 2- **Distribution of host:** River Nile.
- 3- **Location of parasite inside the host:** Pericardial and nephridial cavities.
- 4- **Specific Characters:**
 - (A) The tranverse septa of the holdfast are 27.
 - (B) Identity of host: *Anodonta rubinse*.

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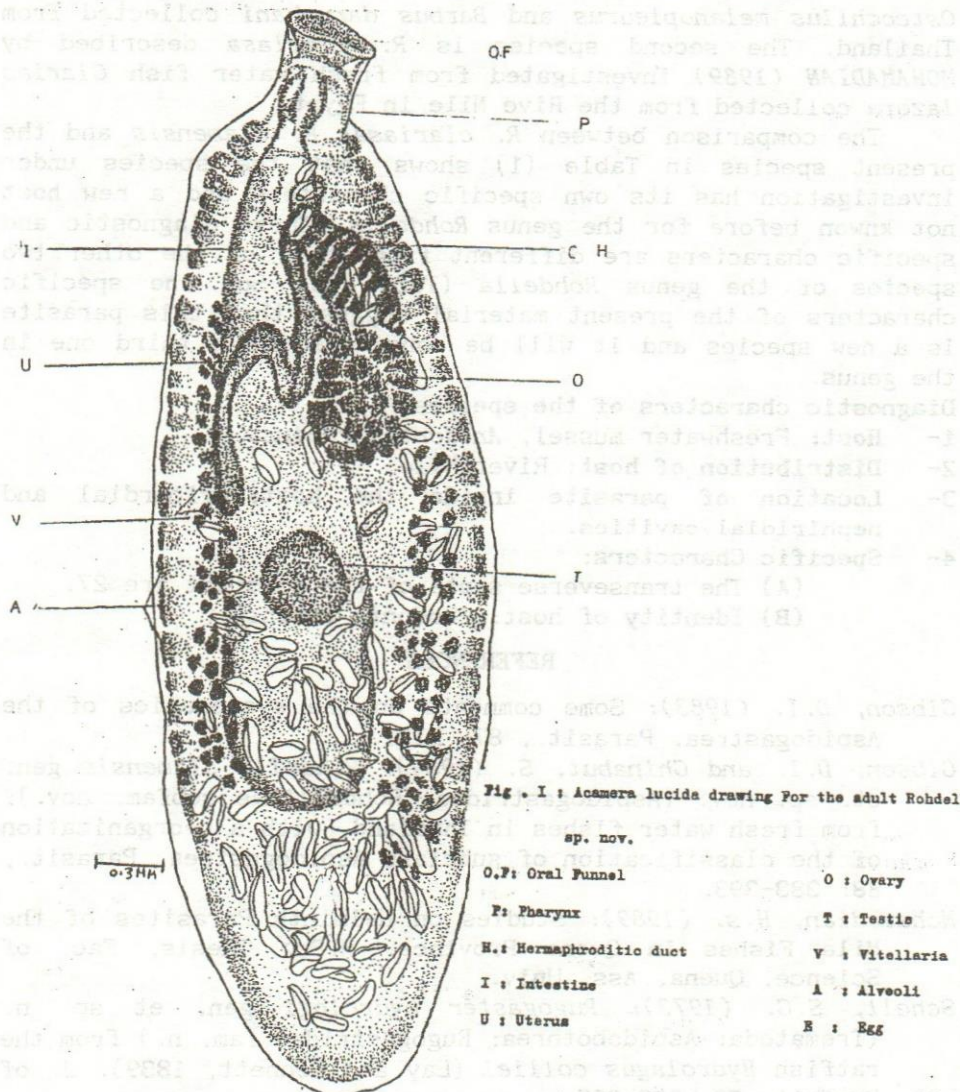


Fig. 1 : *Acamera lucida* drawing For the adult *Rohdella anodontiase*

sp. nov.

O.F: Oral Funnel

O : Ovary

P: Pharynx

T : Testis

H.: Hermaphroditic duct

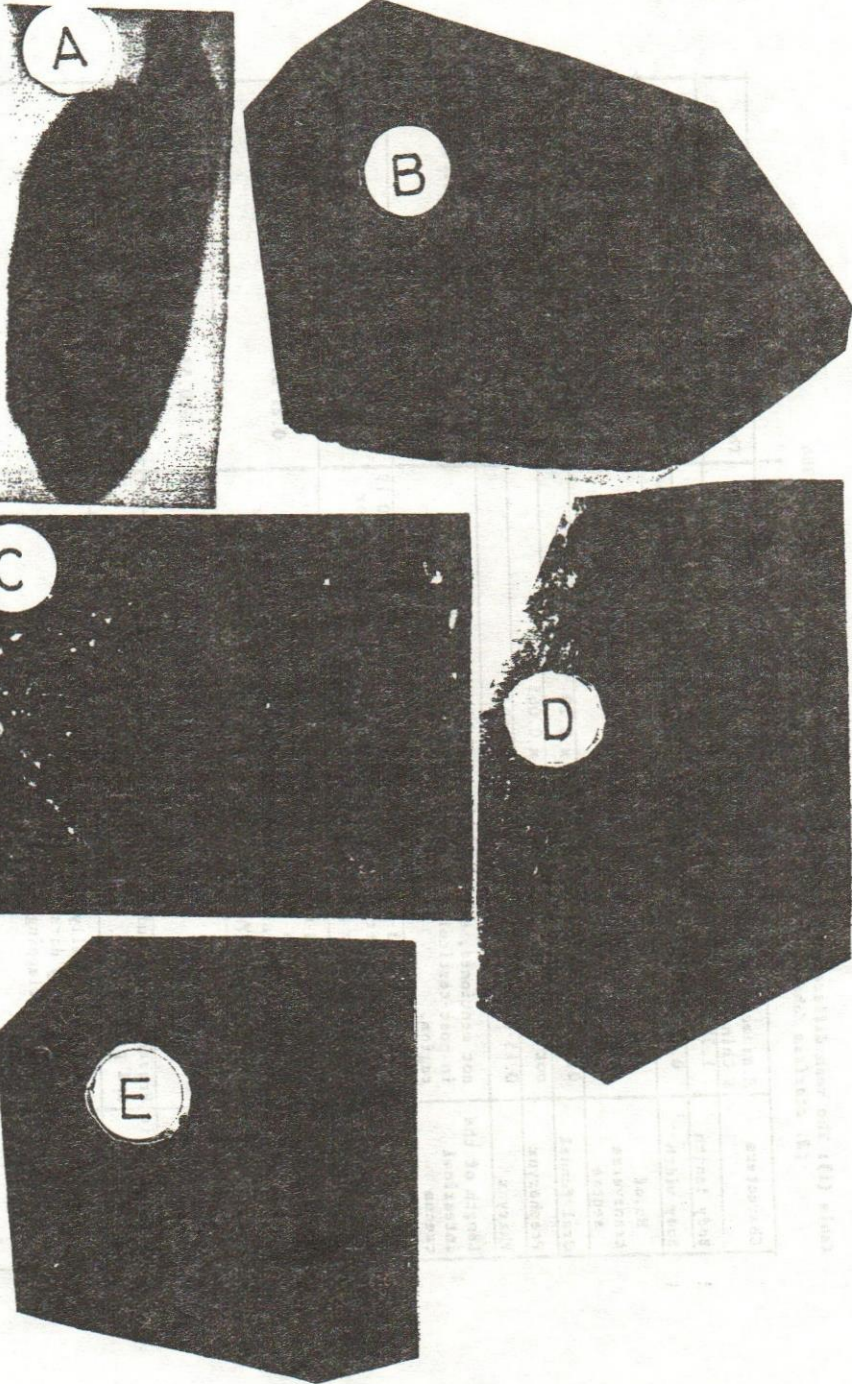
V : Vitellaria

I : Intestine

A : Alveoli

U : Uterus

E : Egg



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Table (1): The mean differences between *R. siamensis* Gibson and Chinabut, 1984
; *R. clariassa* Mohamadain, 1989 and *R. anodontias* n. sp.

Characters	<i>R. siamensis</i> Gibson & Chinabut, 1984	<i>R. clariassa</i> Mohamadain, 1989	The present species
Body length	1.35-3.5	2.196-2.49 (2.343)	1.473-3.948
Body width	0.63-4.0	1.032-1.049 (1.0405)	0.894-0.921
No. of transverse septae	24	28	27
Oral funnel	0.15-0.4 x 0.15-0.37	0.114 x 0.29	0.079-0.13 x 0.21-0.47
Prepharynx	not mentioned.	0.147 x 0.065	0.0130-0.079
Pharynx	0.15-0.4 x 0.13-0.32	0.360-0.360	0.08-0.16 x 0.18-0.26
Length of the intestinal caecum	not mentioned, end in post-testicular region.	1.9, end in post-testicular region.	1.45-2.1, end in post-testicular region.
Testis	0.17-1.22 x 0.13-1.30 in third quarter of the body.	0.295-0.377 x 0.196 (0.336 x 0.0.19 in the middle or in the posterior third of the body.	0.31-0.34 x 0.36-0.35
Ovary	0.05-0.60 x 0.05-0.56 comma-shaped, in the middle or just inside post-half of body.	0.245-0.331 x 0.131-0.163 (0.778 x 0.147), comma-shaped, in the middle or in the anterior half of the body.	0.21-0.26 x 0.32-0.34
Dimension of holdfast organ	not mentioned	0.918 x 0.246	2.6 x 0.57
Hermaphroditic duct	Present, long tubular and protrusible.	Present but short and non-protrusible.	Present, non-protrusible.
Genital pore	Sinistrolaterally on the fore body dorsal to the overlapping holdfast.	The same.	The same.
Eggs	0.081-0.109 x 0.04-0.055 operculate, lack spines or fillaments.	0.079-0.1 x 0.034-0.036 (0.088 x 0.035). Operculate, lack spines or fillaments.	0.04-0.05 x 0.08-0.09 Operculate, lack spines or fillaments.