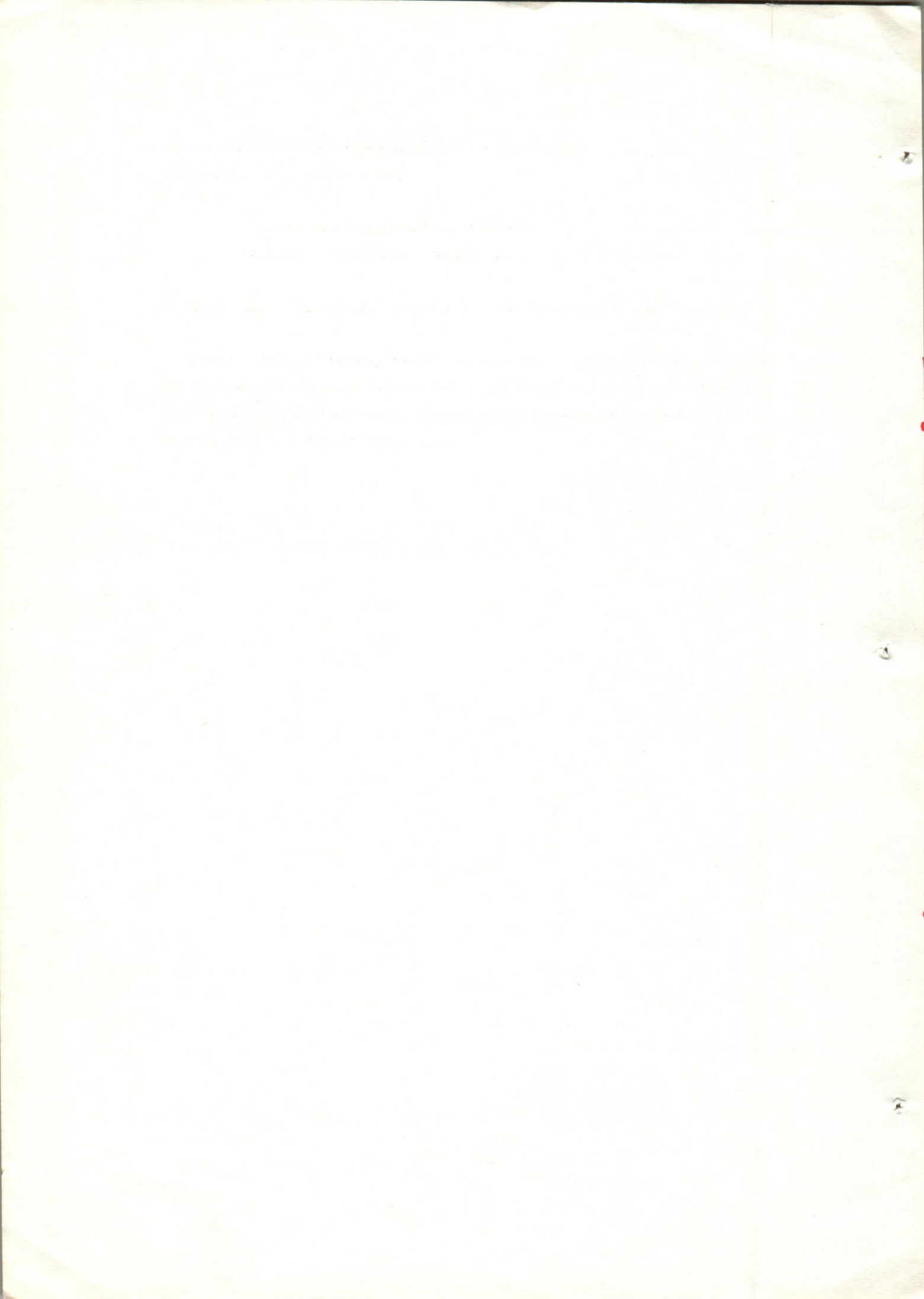


قسم : الطفيليات والميكروبيولوجيا - كلية الطب - جامعة أسيوط .  
رئيس القسم : أ. د / عماد كامل نافع .

دراسة عن الديدان في بعض الحيوانات الثديية الصغيرة في محافظة أسيوط .  
٢ - تريماتودا الخفاش الصحراوي والريتيوموسا هارد وسكي سستوسيس

هد المجيد فهمي ، محمد عرفه ، رفعت خليفية ، عبد الرحمن محمد ، محمود الهادي

تمت دراسة الديدان الطفيلية في ٢١ خفاشا من النوع الصحراوي ريثيوموسا هارد وسكي سستوسيس  
ولقد تم عمل مسح للديدان ووجد الباحثون ثلاثة أنواع من الديدان منها جد يد تم اكتشافه لأول مرة  
وهو الانكتريميا اكانسس كذلك صنف جد يد وهو البروثودا فدريم بيرنا رينومومي ولقد تم وصف هذه الأنواع  
ودراسة نسبة اصابة هذا النوع من الخفافيش بها .



STUDIES ON HELMINTH PARASITES IN SOME SMALL MAMMALS IN ASSIUT GOVERNORATE  
II. TREMATODE PARASITES OF THE DESERT BAT RHINOPOMA HARDWICKEI CYSTOPES.

(With 4 Tables & 2 Figures)

By

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SUMMARY

The trematode fauna of 71 desert bats Rhinopoma hardwickei cystops was estimated and surveyed. Three different species of trematode parasites were examined and described; from them one new species and one new variety were reported. these are; Anchitrema acanthus n. sp. and Prothodendrium (Prothodendrium urna var. rhinopomi n. var.

INTRODUCTION

Bats are known to be source of infection to animals and man. The literature on the parasites of bats in Egypt is fairly comprehensive. These animals have attracted the attention of several parasitologists working in Egypt (e.g. LOOSS, 1896, 1899), MOHAMMED and SAAUD (1964), and SAOUD and RAMADAN (1976). The aim of this work was therefore to explore the trematode parasites of desert bats in Assiut province.

MATERIALS and METHODS

Bats were collected from caves in the hills about Dir Rifa, a village near the west bank of the river Nile about 15 km. South east of Assiut Egypt. Intestinal parasites were examined in 70% alcohol or 10% formalin fresh as well as from specimens fixed & stained in acetic acid alum carmine. Measurements were taken by the aid of eye piece micrometer and all drawings were done by camera lucida.

RESULTS and DISCUSSION

Family Lechithodendriidae ODHNER, 1910

Subfamily Lecithodendriinae LUHE, 1910

Genus Prothodendrium DOLLFUS, 1931

1- Prothodendrium (Prothodendrium) Khalili SAOUD & RAMADAN 1977

This parasite was encountered in the small intestine of the desert bats Rhinopoma hardwickei cystops captured from Dir Rifa Village in the vicinity of Assiut city. Description of the parasite & measurements of the body are shown in table (1). Incidence of infection is shown in table (2).

Discussion:

Prothodendrium (P.) Khalili was described by SAOUD & RAMADAN (1977 b) in the small intestine of Tapozus n. nudiventris at Cairo & from Asellia T. tridens in Quena (Upper Egypt). The present material appears to be identical with P. (P.) Khalili. However, the present material is generally bigger (Table 2) in relative measurements, has a shorter oesophagus, smaller ratio of body length & width, as well as oral & ventral suckers. ratio. All these minor differences could be explained by the occurrence in a different definitive host. This is the first record of this parasites in Rhinopoma hardwickei cystops in Assiut city.

2- Prothodendrium (Prothodendrium) urna var. rhinopomi n. var.

This parasite was encountered in the small intestine of the bat Rhinopoma hardwickei cystops. The body of the worm is oval in shape & is aspinosed. Body length varies from 0.516 - 0.580 by 0.385 - 0.400 mm the oral sucker is subterminal & measures 0.086 - 0.096 by 0.086 - 0.100 mm. The ventral sucker is prequatorial & measures 0.046

- 0.050 mm in diameter (Fig. 1). Prepharynx is lacking. A small pharynx follows the oral sucker & measures 0.020 - 0.026 mm in diameter. Oesophagus indistinct. Intestinal caeca are thick-walled, club-shaped & end anteriorly for from the testes. The testes occur at the level of the ventral sucker, where the worm is most wide. They are oval in shape & more or less equal in size. They are horizontally situated. The left testis measures 0.100 - 0.108 by 0.050 - 0.054 mm while the right testis measures 0.100 - 0.110 by 0.050 - 0.060 mm. The ovary is pre-testicular & spherical in outline. Its diameter varies from 0.068 - 0.072 mm. The uterus is full of ova & its loops fill most of the posterior half of the body. The vitelline glands are in the form of two pyramidal masses, each of which is found of 20 - 22 moderate-sized follicles. The eggs measure 20 - 23 by 11 - 13  $\mu$ . Incidence of infection is shown in Table 1.

#### Discussion:

*Prothodendrium urna* was described from Egypt by LOOSS, (1907) from the small bat *Vesperugo kubli*. MACY *et al.* (1961) recorded *P. urna* from *Rhinolophus clivosus arcticus*, *Pipistrellus ps.* and *Rhinolepis blasis* in some localities of Egypt. SAOUD & RAMADAN (1977 b) reported the parasites from *Taphosus n. nudiventris*, *Nycteris thebaica* and *Asellia t. tridens*. (Table 2) shows a comparison between *P. urna* and the present variety which differs in

- 1- Absence of an oesophagus.
- 2- Ratio of oral & ventral sucker.
- 3- Extent, size & number of vitelline follicles.
- 4- Final hosts.

The previously mentioned morphological features are of taxonomic importance particularly the presence or absence of oesophagus & characters of vitelline follicles. Therefore, the present material is considered as a distinct variety from *P. urna*. The name *rhinopomi* was given to the variety after the name of the host of the parasite.

Family *Dicrocoeliidae* ODHNER, 1910

Subfamily *Dicrocoeliinae* LOOSS, 1899

Genus *Anchitrema* LOOSS, 1899

*Anchitrema acanthus* n. sp.

This parasite has an elongate body measuring 3.42 - 4.00 mm in length & 0.80 - 0.93 mm in width. Cuticle is devoid of any appendages. Oral sucker is subterminal & more or less spherical measuring 204 - 234  $\mu$ . The ventral sucker is slightly smaller in size (Fig. 2). Measuring 180 - 184 by 180 - 192  $\mu$ . The ratio of oral to ventral sucker is about 1.2 : 1. Prepharynx is lacking. Pharynx is strongly muscular & measures 72 - 80 x 110 - 120  $\mu$ . A short oesophagus is measuring 60 - 80  $\mu$ . The intestinal caeca are thin-walled, longer than the length of the body as denoted by a characteristic thirst of the caeca at the level of the testes. Intestinal caeca end near the posterior extremity of a body & have a characteristic club-shaped terminations. Male genitalia are represented by 2 testes occurring near the middle of a body. They are smooth contoured and oval in shape. The right testis measures 500 - 560 by 240 - 260  $\mu$  & a left is 560 - 600 by 260 - 300  $\mu$ . The right testis is smaller & occurs at a more anterior level. Cirrus pouch is irregularly rounded & lies anterior to the ventral sucker. It is smaller than the ventral sucker, measuring 165 - 172 by 168 - 174  $\mu$ . The female genitalia is composed of a single ovary situated in the middle line gently between the test & partly posterior them. It is oval in shape & smooth - outline measuring 185 - 192  $\mu$  in diameter. A smaller rounded ootype exists just behind the ovary. The uterus is coiled & occupies most of the posterior half of the body, terminating away from the posterior extremity (Fig. 2).

The vitelline glands are in the form of well developed follicles occupying the lateral field posterior to the uterus. The vagina is a longitudinal tube ending in the genital atrium midway between the ventral sucker & intestinal bifurcation. The ova are yellowish in colour, operculated & measures 22.5 - 25 by 14.5 - 17  $\mu$ .

Location: Small intestine

Host : *Rhinopoma hardwickei* cystops

Locality: Assiut, Upper Egypt.

Type species: Specimens are kept in the Department of Parasitology, Faculty of Medicine, Assiut University. Incidence of the parasite is shown in Table (1).

## TREMATODE PARASITES OF THE DESERT BAT

Discussion:

Anchitrema sanguineum (SONSINO, 1894) LOOSS, 1899 was described from Egypt on four occasions: by SONSINO (1894) from the reptile Chamaeleon vulgaris. Later, LOOSS (1899) established the genus Anchitrema for the same trematode which he also recorded from the Egyptian bats. Recently SAOUD & RAMADAN (1977 a) redescribed the parasite from the insectivorous bats Asellia t. tridens, Taphozus n. nudiventris, Rhinopoma hardwickei, Rhinoloph clivosus brochygnathus and Otonycteris hemopichi caught from different Provinces in Egypt but not from Assiut Province. EL-NAFFAR et al. (in press) redescribed the parasite from the bat Vespertilio innesi from Assiut.

The parasite described in the present study differs in many respects from the previous descriptions (Table 4). SAOUD & RAMADAN (1977 a) stated that there was a wide range of variations in Anchitrema parasites, but concluded that the following characters were constant & could be used in the differential of the genus:

- 1- Ratio of body length & width.
- 2- Ratio of oral & ventral sucker.
- 3- Relation measurements of both pharynx & oesophagus.
- 4- Shape of intestinal furca.
- 5- Shape & position of the cirrus pouch & its size in relation to a ventral sucker.
- 6- Measurements of eggs.

The present material differs from Anchitrema sanguineum (SONSINO, 1894) in all the previously mentioned characters. Moreover, it lacks tegumental appendages. SAOUD & RAMADAN (1977 a) described the new species Anchitrema longiformis from the small intestine of Asellia tridens tridens caught from differ from the parasite under discussion in having an elongated body in a length of the oesophagus, the relative measurements, the egg measurements as well as the final host. As the present species is characterised by having spinose cuticle, a character which is absent in all other members of the genus described by YAMAGUTI (1958), the name Anchitrema acanthus is proposed for it as a new species.

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Table (1): Trematode parasites in Bats in Assiut province

Host	No examined	No infected	%	type of infection			%	worm burden	Name of parasite
				single	%	mixed			
<u>Rhinopoma</u>	23	17	74	4	17.4	13	56.6	2.9 (5)	<u>P.(P.) Khalili</u>
<u>Hardwickei</u>	23	18	78.3	6	26.1	12	52.2	4-12(6)	<u>P.(P.) urna var</u>
<u>cystops</u>									<u>rhinopomi n. var</u>
(desert bat)	23	4	17.2	1	4.3	3	12.9	2-6 (3)	A. achanthus n. sp.

Table (2)

Comparison Between Prosthodendrium P. Khalili (1977) and The Present Material  
(Measurements are in Millimeters)

	<u>Prosthodendrium Khalili</u> <u>Seoud&amp;Ramadan(1977)</u>	Present material
Host	<u>Taphozus n. nudiventris</u> & <u>Asellia t.tridens.</u>	<u>Rhinopoma hardwickei</u>
Distribution	Cairo & Quena	Assiut
Body length	0.542 - 1.021	1.640 - 1.800
Body breadth	0.338 - 0.901	1.350 - 1.500
Length/width ratio	0.96 - 1.95:1	1.20 - 1.21:1
Oral sucker	0.109 - 0.151x	0.132 - 0.148x
	0.113 - 0.170	0.140 - 0.157
Pharynx	0.34 - 0.057x	Usually obscured by vitelline gland
	0.040 - 0.053	0.075 - 0.090x
		0.066 - 0.090
Oesophagus	Completely absent	very short (0.060)
Ventral sucker	0.075 - 0.90 x	0.108 - 0.114x
	0.066 - 0.094	0.100 - 0.118
Onal/ventral sucker ratio	1.4 - 2:1	1.2 - 1.3:1
Right testis	0.094 - 0.225 x	0.108 - 0.240 x
	0.091 - 0.282	0.180 - 0.300
Left testis	0.109 - 0.25 x	0.148 - 0.27 x
	0.075 - 0.310	0.196 - 0.300
Ovary	Not mentioned	0.200 - 0.24 x
		0.130 - 0.135
Eggs	0.015 - 0.026 x	0.020 - 0.022 x
	0.009 - 0.015 M	0.013 - 0.015 M

## TREMATODE PARASITES OF THE DESERT BAT

Table (3)  
Comparison Between *Prosthodendrium P. urna* And The Present Material,  
(Measurements are Millimeters)

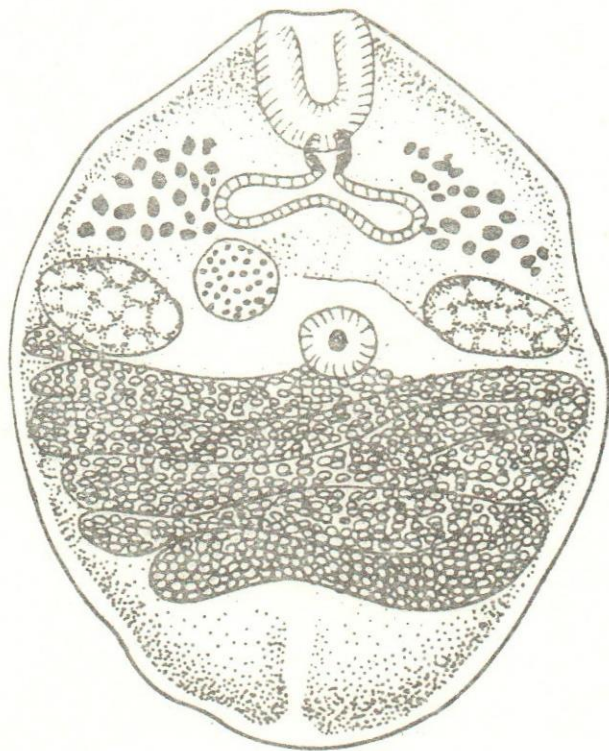
	<i>Prosthodendrium Urna</i> (Looss, 1907)	<i>P. urna</i> Saoud & Ramadan, 1977	<i>P. Urna</i> var <i>rhinopomi</i>
Body length	0.5 - 0.55	0.930 - 1.479	0.516 - 0.580
body breadth	0.3 - 0.33	0.599 - 0.845	0.385 - 0.408
Length width	1.6 : 1.6 :1	1.2 - 1.8 :1	1.3 - 1.5 :1
Oral sucker	0.060 - 0.070	0.064 - 0.094 x 0.075 - 0.126	0.086 - 0.096 x 0.086 - 0.100
Farynx	0.030 - 0.033	0.034 - 0.057 x 0.37 - 0.057	0.020 - 0.026
Oesophagus	Double the pharynx length	0.113 - 0.189	No Oesophagus
Ventral sucker	0.040 - 0.050 x 0.055	0.062 - 0.91 x 0.060 - 0.102	0.046 - 0.050 ( Diameter )
O.S./V.S. ratio	1.4 :1	0.92 - 1.2 :1	2 : 1
Testes	-	0.132 - 0.225 x 0.124 - 0.241 0.113 - 0.236 x 0.128 - 0.253	0.100 - 0.108 x 0.050 - 0.054 0.100 - 0.108 x 0.050 - 0.060
Ovary	Medial	Post acetabulum 0.141 - 0.211 x 0.117 - 0.225	Preacetabular, medial 0.068 - 0.072
Vitelline gland	Extend from anterior border	of testes up to intestinal bifurcation. 0 - 22 glands	20 - 22 glands on each sides
Eggs	0.024 - 0.026 length	0.021 - 0.023 x 0.008 - 0.011	0.020 - 0.023 x 0.011 - 0.013
Host	<i>Vesperugo Kuhl</i>	<i>Taphozus n. nudiventis</i> , <i>Nycteris thebaica</i> <i>Asellia</i> <i>t. tridens</i> .	<i>Rhinopoma harwickei</i> <i>cystops</i> .

Table (4)  
Showing The Differences Between The Different Species of Genus *Anchitrema* In Bats  
(Measurement are in Millimeters)

	<i>A. sanguineum</i> Saoud & & Ramadan 1977	<i>A. sanguineum</i> El-Naffar, et al.	<i>A. longiformis</i> Saoud & Ramadan 1977	<i>A. acenthus</i> (n.sp.)
Length	1.79 - 3.73	2.321 - 4.292	2.69 - 3.02	0.42 - 4.00
Breadth	0.63	0.792 - 1.397	0.37 - 0.38	0.80 - 0.93
Length ratio	2.8 - 3.8 :1	Not mentioned	7.21 - 7.92 :1	4.2 - 4.5 :1
O.S.	0.23 - 0.25x0.18 - 0.32	0.228 - 0.418	0.23 - 0.25x0.24 - 0.26	0.204-0.22x0.22-0.234
V.S.	0.18 - 0.32	0.216 - 0.360	0.23 - 0.24x0.13 - 0.14	0.18 -0.18x0.188-0.193
Ratio O./V. suckers	1 - 1.4 :1	1.25 :1	1 : 1	1.22 : 1
Tegument	Covered with minute spines	till thee anterior half of the body	As <i>A. Sangiunenm</i>	Devoid of appendages
Pharynx	0.09 - 0.13x0.08 - 0.14	0.129 - 0.165 x 0.136 - 0.165	0.09 - 0.11 x 0.09 - 0.10	0.072-0.08x0.11-0.12
Oesophagus	Not detected	Not detected	0.085 - 0.099	0.06 - 0.08
Intestinal caeca	Blunt end	Blunt end	Blunt end	Club shaped termi- nation
Testes site	In anterior half	In anterior half	Per-equatorial	near middle of body
Right testis	0.32 - 0.49 x 0.18 - 0.27	0.556 - 0.655 x 0.324 - 0.445	0.25 - 0.43 x 0.18 - 0.21	0.560 - 0.560 x 0.24 - 0.26
Left testis	0.32 - 0.48 x 0.18 - 0.25	0.561 - 0.655 x 0.324 - 0.403	0.23 - 0.43 x 0.08 - 0.17	0.56 - 0.6 x 0.26 - 0.3
Ovary	0.18 - 0.24 x 0.15 - 0.21	0.18 - 0.288	0.15 - 0.20 x 0.10 - 0.13	0.165 - 0.172 x 0.168 - 0.174
Ovum	0.019 - 0.023 x 0.009 - 0.010	0.017 - 0.02 x 0.009 - 0.012	0.019 - 0.025 x 0.011 - 0.012	0.022 - 0.025 x 0.014 - 0.017





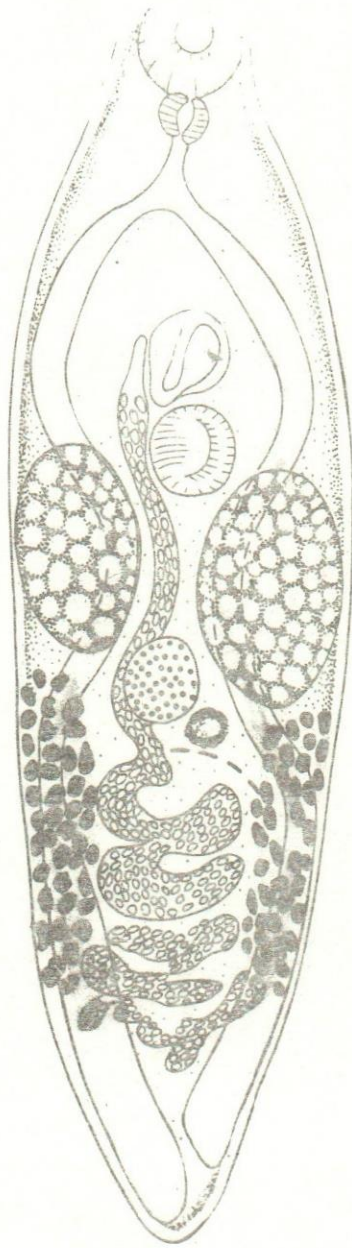


0.2 mm



Fig (1)





0.5 mm

Fi. (2)

