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بعض السمك المستودا من بعض أسماك بحيرة ناصر بأسوان

مع وصف نوع جديد " مارسيوسيفالس اجتياكس "

محمد النفار ، محمد سعودي* ، اسماعيل حسن

تم عمل حصر للديدان الشريطية التي جمعت من ٣٣٢ عينة
من أسماك بحيرة ناصر بأسوان ، وتبين وجود أربع
أنواع من الديدان الشريطية ومنها نوع جديد ، وهذه
الأنواع الأربعة هي : مارسيوسيفالس اجتياكس نوع جديد ،
بروتيو سيفالس سلكتس ، كاريوفللس لاتيسييس ، بوتريوسيفالس
باريس . هذا وقد وصفت الصفات المورفولوجية لهذه
الطفيليات وقورنت بالأنواع الأخرى ونوقشت مناقشة مستفيضة .

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**SOME CESTODES FROM SOME FISHES OF LAKE NASSER AT ASSWAN,
INCLUDING A NEW MARSYPOCEPHALUS'
MARSYPOCEPHALUS AEGYPTIACUS N. SP.**

(With 1 Table & 4 Figs.)

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SUMMARY

A survey of the cestode parasites collected from 332 specimens of freshwater fishes of Lake Nasser at Asswan, revealed the presence of 4 species, one of which is new (Marsypocephalus aegyptiacus n. sp. from Clarias lazera; Proteocephalus sulcatus from Clarias lazera & C. anguillaris; Caryophyllaeus laticeps from Barbus bynni and Bothriocephalus barbatus from Barbus bynni).

In addition to the new species and revised data on the morphology and variability of the individual parasite species, taxonomic problems, the range of hosts and geographical distribution are also discussed.

INTRODUCTION

Owing to the economical importance of lake Nasser in the production of fishes in Egypt, especially if we know that the problem of food constitute today the most dangerous one among the human problems throughout the world, and due to the few investigations that had been carried out on the fish parasites in lake Nasser, consequently, the present studies were decided owing to throw the light on the helminth parasites which may infest the fishes at lake Nasser of Asswan.

MATERIAL and METHODS

The present parasites were collected from the intestine of Clarias lazera, C. anguillaris and Barbus bynni caught from Lake Nasser at Asswan. The collected worms were adequately washed in physiological saline solution to detach any mucous adhere to them. Then, they were examined alive and were relaxed by chilling overnight. The parasites were cut into suitable portions, then flattened and fixed in 10% formal saline. They were stained in Acetic acid Alum Carmine and mounted in Canada balsam. Measurements are taken from mounted specimens and all drawings were done by Camera lucida. All the measurements are in millimeters.

RESULTS

Family Proteocephalidae LA RUE, 1914 - Subfamily Marsypocephalinae WOODLAND, 1923
Genus Marsypocephalus WEDI, 1861 - Marsypocephalus aegyptiacus n.sp.

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This is a rare parasite of the fish Clarias lazera in Lake Nasser. Fifty fishes were examined but only four specimens were collected from one host.

Description:

The length of the four worms is 580 mm., 780 mm., and 1080 mm. respectively. The maximum width attained is 6.19 mm.

The scolex (Fig. 1a) is 1.25-2.22 mm. in length and its breadth is 2.61-2.66 mm. The four spherical suckers are relatively large and measures 0.64-0.77 mm. in diameter. The margins of the suckers possessing conspicuous muscular knob-like thickening and the neck is absent.

The anterior segments are immature and the premature segments (Fig. 1b) with the uterus in the form of a median sac, are much broader than long, with uterus in the form of a median sac. The mature segments (Fig. 1c) are slightly larger than broad measuring 3.77-4.33 X 3.40-3.99 mm. The gravid segments (Fig. 1d) are nearly squarish in shape or slightly broader than long measuring 2.66-3.12 X 3.11-3.39 mm.

The lateral genital atrium lies at about the level of the anterior third of the segment, irregularly alternating, the opening is slightly bulging to the out side of the margin of the segment and do not covered by a curious flap of the lateral body wall. The cirrus sac is prominent and is more or less elongated, measuring 0.44-0.47 X 0.22-0.27 mm. The cirrus is very long when extruded, nearly reaching the posterior border of the segment and measuring 0.88-1.33 mm. in length. Vas deferens is greatly coiled.

The testes are numerous, 270-290 per segment, and lie in one field across the segment only separated by the developing uterus. They are spherical in shape, each testis measures 0.08-0.11 mm. in diameter.

The ovary is bilobed, lying at the posterior end of the segment. The two ovarian lobes are more or less rounded and connected by a narrow thick isthmus. The Mehlis gland is small rounded body measuring up to 0.22 mm. in diameter and situated between the ovarian lobes, behind the isthmus at the posterior end of the segment. The vitellaria are formed of two lateral bands, occupying the length of the segment. The uterus is in the form of a median sac when first formed, then it has 14-17 uterine branches on each side of the longitudinal axis.

The eggs inside the gravid uterus are numerous, spherical shaped, thick shelled, small in size measuring 0.013-0.016 mm. in diameter.

DISCUSSION

WEINLAND (1858), erected the genus Proteocephalus for the Proteocephalan group of fish cestodes.

LA RUE (1911), erected the family Proteocephalidae, and in (1914) he made a revision of this family and recognised two families, Monticelliidae, with one genus Monticella LA RUE, 1911, and Proteocephalidae with six genera: Proteocephalus WEINLAND, 1858; Corallobothrium FRITSH, 1886; Acanthototaenia Von LINSTOW, 1903; Crepidobothrium MONTICELLI, 1899; Choanoscolex LA RUE, 1911 and Ophiotaenia LA RUE, 1911.

WOODLAND (1925-1937), surveyed the known Proteocephalan tapeworms and suggested their inclusion within one family the Proteocephalidae, with a much reduced number of genera as he refused to attach generic value to external characters such as the scolex. WOODLAND,

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also divided the family Proteocephalidae into eight subfamilies namely: Proteocephalinae; Zygobothrinawe; Morsypocephalinae; Ephedrocephalinae; Rudolphiellinae; Endorchinae; Monticellinae; and Pletidocotylineae.

FUHRMANN (1931), followed Woodland's scheme but recognise more genera than WOODLAND would accept.

Family Proteocephalidae is now divided into the above eight subfamilies to which YAMAGUTI (1959) has added one, Pellidocotylineae, and KHALIL (1963) has added the tenth, Sandonellinae.

The species under consideration shows all the characters of the family Proteocephalidae, where the holdfast is with true suckers, the parenchyma is divided into cortical and medullary regions by a layer of longitudinal muscles, and the uterine-pore is present. It is also a parasite of fish. The present species also, shows the characters of the subfamily Marsypocephalinae, whereas the vitellaria are in the medulla, and the vitellaria are also in two compact lateral banda.

The subfamily Marsypocephalinae WOODLAND, 1923 includes the genus Marsypocephalus. This genus was erected by Wedi in 1861 for the cestode M. rectangulus obtained from the Nile siluroid fish Heterobaranchus anguillaris.

HARWOOD (1933) referred M. rectangulus together with two other species of the genus Marsypocephalus to the genus Proteocephalus, but this was not accepted by other workers, as well as the present authors. YAMAGUTI (1959), amended the name of the genus to Marsipocephalus.

KHALIL (1971), stated that the genus Marsypocephalus WEDI, 1861 includes 4 species, all reported from clariids, and is restricted to Africa.

The four species of the African Marsypocephalus cestodes are: Marsypocephalus deveyi WOODLAND, 1937; M. heterobranchus WOODLAND, 1925; M. rectangulus WEDI, 1861; and M. tanganyikae (KUHRMANN & BAER, 1925).

The present new species resembles M. rectangulus in the suckers which possessing conspicuous muscular knob, but it differ in that the surface of the scolex did not divided longitudinally by grooves into quadrants, and in that the genital atrium did not covered by a curious flap of the lateral body wall. Also, the great difference in the body length and other parts of the body.

From M. heterobranchus, the present new species differs in the body length and width where it measures about 1080 mm. length and 6.90 mm. width, While the length and width of M. heterobranchus in Khalil's specimens was 52 mm. and 1.2 mm. respectively. Also, the difference in the measurments of the other parts of the body.

From M. deveyi and M. tanganyiki, the present new species differs greatly in the measurements of all parts of the body, the host and geographical distribution.

The present authors believe that they are justified in identifying the present species as Marsypocephalus aegyptiacus n.sp. Host: Clarias lazera.

Location: intestine.

Locality: lake Nasser of Asswan, A.R. Egypt.

Type: Helminthological collection, Department of Zoology, Eaculty of Science, Univ. of Assiut.

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Subfamily Proteocephalinae MOLA, 1929

Genus Proteocephalus WEINLAND, 1858

Proteocephalus sulcawtus (KLAPTOCZ, 1906)

This cestode parasite was collected from the intestine of both Clarias lazera and C. anguillaris. Thirty out of 50 and 23 out of 32 of these fishes respectively, were harboured this species and each with 6 - 10 specimens.

Description:

The length of the worm varies from 80 mm., and the maximum width attained is 1.94-2.66 mm.

The scolex (Fig. 2a) is rounded, but sometimes broader than long measuring 0.88 mm. long and 1.33 mm. broad, and carries four prominent more or less rounded suckers measuring 0.44-0.55 mm. in diameter. The scolex is followed by a long neck measuring about 10.94 X 1.11 mm.

The anterior segments are much broader than long, but gradually the length of the segment increases. The mature segment (Fig. 2b) measures 1.99-2.11 X 2.22-2.66 mm. The gravid segment (Fig. 2c) are much longer than broad measuring 4.66-4.99 X 1.99-2.11 mm. They continue to increase in length while the width gradually decreases. The genital atrium is lateral, generally situated at the 1st and 2nd fourth of the segment, and they are irregularly alternating.

The testes vary in number between 195-215. Each testis measures up to 0.09 mm. in diameter. The cirrus sac measures 0.27-0.44 X 0.16-0.18 mm., extending about one fourth of the segment. The vas deferens is slightly coiled outside the cirrus sac, while inside this sac it became much coiled.

The ovary is bilobed and situated at the posterior border of the segment, each lobe being broader than long in the anterior segments and separated by a narrow thick isthmus, but gradually the lobes elongate and extend laterally. In the posterior segments the ovarian lobes are longer than broad, connected by a wide, thin isthmus and extend laterally to the vitelline glands. The Mehli's gland is small compressed mass situated between and slightly posterior to the median line of the two lobes. The vagina, which is a thin tubular structure, dilates slightly before opening separately posterior to the genital atrium. The median uterus has 10-12 lateral branches on each side. The vitellaria are in the form of two compact follicular bands, extending along the whole length of the segment laterally.

The eggs within the uterus are numerous, spherical shaped, thick shelled, and small in size measuring 0.0125-0.0134 mm. in diameter.

Proteocephalus sulcatus was originally described by KLAPTOCZ (1906) as Ichthyotaenia sulcata from two different hosts Polypterus endlicheri and Clarotes laticeps from the white Nile in Sudan at Duem and Khartoum region respectively.

LA RUE (1911) listed this species among other species of Proteocephalus.

KHALIL (1963) redescribed this species as Proteocephalus sulcatus from Clarotes laticeps only at Khartoum area and did not find it in the type host (Polypterus endlicheri) examined from the original type locality (Duem region) in the Sudan.

However, the present material agrees with Klaptoecz's and Khalil's description a part from minor differences. The maximum length of Klaptoecz's material was 68 mm. of a specimen from Clarotes and 60 mm. of one from Polypterus, and the length of Khalil's specimens from Clarotis

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only reached 95 mm., while our specimens reached 140 mm. in length. The cirrus sac is also slightly larger in our specimens, being 0.27-0.44 mm. long while it is 0.2-0.25 mm. and 0.29-0.31 mm. long in Klaptocz's material respectively. In general, the comparison of the present measurements of P. sulcatus and the measurements given by KHALIL (1963) for the same species, are given in Table (1).

None of the above differences is exceptional and therefore do not provide any doubt in identifying our specimens as above.

A general speaking about Proteocephalus species, KHALIL (1971) stated that about 57 species are assigned to this genus from most Zoogeographical regions, all from fishes, and of these 8 are found in Africa, none of the eight are found outside Africa.

These eight African species of genus Proteocephalus WEINLAND, 1858 are:

- Proteocephalus beauchampi FUHRMANN & BAER, 1925.
- P. bivitellatus WOODLAND, 1937.
- P. cunningtoni FUHRMANN & BAER, 1925.
- P. dinopteri FUHRMANN & BAER, 1925.
- P. glanduliger JANICKI, 1928.
- P. pentastoma KLAPTOCZ, 1906.
- P. sulcatus KLAPTOCZ, 1906.
- P. synodontis WOODLAND, 1906.

Proteocephalus sulcatus is redescribed here to imply the original description of Klaptocz and the redescription of KHALIL (1963) where none of them give the measurement of the neck, or the gravid segment and eggs which given in the present description.

Both Clarias anguillaris and C. lazera are new host for this parasite, and Lake Nasser constitutes a new locality.

Family Caryophyllaeidae LUCKART, 1878. - Subfamily (Caryophyllaeinae NYBELIN, 1922.

Genus Caryophyllaeus MUELLER, 1787.
Caryophyllaeus laticeps PALLAS, 1718.

This species of tapeworms was collected from the intestion of Barbus bynni from Lake Nasser. Out of one hundred fish examined, 39 (39%) were infected with this species, and each with 3-10 specimens.

Description:

The adult tapeworm (Fig. 3) has simple undivided body measuring 21.66-48.16 mm. (33.52 mm.) in length by 1.50-2.24 mm. (1.80 mm.) in width.

Scolex is simple with anterior rounded end devoid of any adhesive organs and measuring 0.83-1.28 mm. (1.03 mm.) long by 1.31-2.17 mm. (1.69 mm.) wide. However, in some specimens the scolex has a small apical lapet or disc measuring 0.04-0.05 mm. (0.05 mm.) long by 0.17-0.30 mm. (0.24 mm.) wide. The scolex is followed by a short neck measuring 0.56-1.11 mm. (0.91 mm.) long by 1.44-2.06 mm. (1.90 mm.) wide, and the neck region is clearly free from reproductive organs. In one specimen the neck was ill-defined and the scolex became more delimited from the body with ruffled shape.

The testicular region follows the neck region. The testes are small. rounded to elliptical in shape, centrally or medullary and extend from the neck region to the level of the cirrus

pouch. They are 560-603 (580) in number, each testis measures 0.11-0.20 mm. (0.14 mm.) in diameter. In one specimen (Fig. 4). The testes are situated in the medullary region, but in two separate fields diffused shortly in front of the cirrus pouch. The vas deferens is convoluted, in middle position surrounded by testes and vitellaria. It runs posteriorly and enters the cirrus pouch. The latter is highly muscular, oval to slightly rounded in shape, contains the seminal vesicle, and lies in the median line of the body near the part of the worm anterior to the ovary. It measures 0.83-1.06 mm. (0.94 mm.) long by 0.74-1.11 mm. (0.89 mm.) wide. The external seminal vesicle is absent, and the internal seminal vesicle inside the cirrus pouch is long, coiled, and terminate by a short cirrus. The cirrus pouch opens in the mid-ventral line by the male genital pore.

Pre-ovarian vitellaria extend anteriorly at the same level, or slightly anterior to the testes, and extend posteriorly in two lateral fields lateral to the testes. A few follicles, however confused with the latter except in one specimen (Fig. 4) where the pre-ovarian vitellaria are in two lateral bands and did not confused with the testes. The post-ovarian group of vitellaria are medullary forming a compact group of follicles at a level half way between the post ovarian region and the extreme end of the worm. The vitelline follicles are smaller in size than the testes measuring up to 0.8 mm. in diameter. The vitelline duct is obscure due to the extensive vitellaria.

The bilobed ovary is H-shaped, situated near the posterior end of the worm. Both of the two ovarian lobes measure about 1.28-1.98 mm. (1.57 mm.) long by 0.31-0.53 mm. (0.35 mm.) wide, and they are connected by a narrow thick isthmus. The distance from the isthmus to the anterior border of the cirrus pouch and the posterior end of the worm is 2.33-2.89 mm. (2.75 mm.); and 1.72-2.39 mm. (2.10 mm.) respectively.

The uterus takes the form of a large coiled tube situated between the two ovarian lobes, then, it proceeds anteriorly. It unites with vagina to form uterovaginal canal. The latter opens separately in a common utero-vaginal pore, in the mid-ventral line of the body just behind the male genital pore.

The ripe eggs within the uterus, are numerous, such egg is thick shelled, operculated and oval shaped, measuring 0.06-0.07 mm. (0.06 mm.) long by 0.02-0.03 mm. (0.03 mm.) wide.

LEUCKART 1878, was the first who established the family Caryophyllaeidae.

HUNTER (1930) recognized four subfamilies within the above family. These four subfamilies are; Caryophyllaeinae NYBELIN, 1922; Lytocestinae HUNTER, 1927; Capingentinae HUNTER, 1930; and Wenyoninae HUNTER, 1927. Hunter also included the family Caryophyllidae in the order Pseudophyllidea CARUS, 1863.

WARDLE and MCLEOD (1952) elevated the family Caryophyllaeidae to ordinal rank (Caryophyllidea) and gave the four subfamilies recognized by Hunter familial rank.

YAMAGUTI (1959) retained the order Caryophyllidea (but improperly included it in the Cestodaria), and retained a single family Caryophyllaeidae, consisting of three subfamilies: Caryophyllaeinae; Capinogentinae; and lytocestinae. Yamaguti, also reduced the family Wenyonidae to a genus Wenyonia WOODLAND, 1923.

JOYEUX and BAER (1961) added the fourth subfamily, Bovieniinae FUHRMANN, 1931 to the previously mentioned subfamilies recognized by YAMAGUTI. Furthermore, they retained the family Caryophyllaeidae in the order Pseudophyllidea.

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The above description coincides with the characters of the family Caryophyllaeidae LUCKART 1878; Subfamily Caryophyllaeinae NYBELIN, 1922.

Eleven genera, including Caryophyllaeus MUELLER, 1787, are generally assigned to the Subfamily Caryophyllaeinae. The present material, also shown all the characters of the genus Caryophyllaeus.

KHALIL (1971) in studying the geographical affinities of the helminth parasites of African freshwater fishes Stated that, 13 species assigned to 6 genera represent the unsegmented tape-worms of the mainly freshwater family Caryophyllaeidae in African freshwater fishes. He also, said that a single species of the genus Caryophyllaeus MUELLER, 1787 namely C. laticeps was reported from African fishes, and this is a very common European species but is also reported from Morocco and Lake Tanganyika in Africa from fishes of the genus Barbus.

Indeed, Caryophyllaeus laticeps was firstly described under the name Taenia laticeps by Pallas in 1718. This old name was redetermined as C. laticeps by Diesing in 1850.

The present material highly agrees with C. laticeps in description apart from some differences in the measurements but none of these minor differences is exceptional. Since, the present authors believe that they are justified to identify the present material as above.

This is the first record of Caryophyllaeus species from Barbus bynni of lake Nasser, Egypt.

Family Bothriocephalidae BLANCHARD, 1849.

Genus Bothriocephalus RUDOLPHI, 1808.

Bothriocephalus barbus FAHMY et al. 1976.

This cestode was recovered from the intestine of Barbus bynni from Lake Nasser at Asswan. Out of 100 fish examined, fifteen were found to harbour this species, each with 3-4 specimens. This species was previously reported by FAHMY et al. 1976 from the stomach and ileum of Barbus bynni in the River Nile of Assiut, Egypt. This is the 1st record of the Bothriocephalid species in Barbus bynni of Lake Nasser of Asswan.

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Table (1)
Proteocephalus sulcatus (Klaptocz, 1906)

	P. sulcatus measurements by the present authors	P. sulcatus measurements by Khalil (1963)
The length	80 - 140	65 - 95
The width	1.24 - 2.66	1.2 - 1.8
Scolex	0.88 X 1.33	1.2 - 1.3 X 1.4 - 2.0
Sucker	0.44 - 0.55 in diameter	0.32 - 0.38 in diameter
Neck	10.94 X 1.11	-
Mature segment	1.99 - 2.11 X 2.22 - 2.66	1.6 - 2.3 X 1.0 - 1.9
Gravid segment	4.66 - 4.99 X 1.99 - 2.11	-
Testes number	195 - 215	117 - 130
Testis diameter	up to 0.09 in diameter	-
Cirrus sac	0.27 - 0.44 X 0.16 - 0.18	0.29 - 0.31 X 0.16 - 0.18
Uterine branches	10 - 12	11 - 13
Egg	0.0125 - 0.0134 in diameter	-

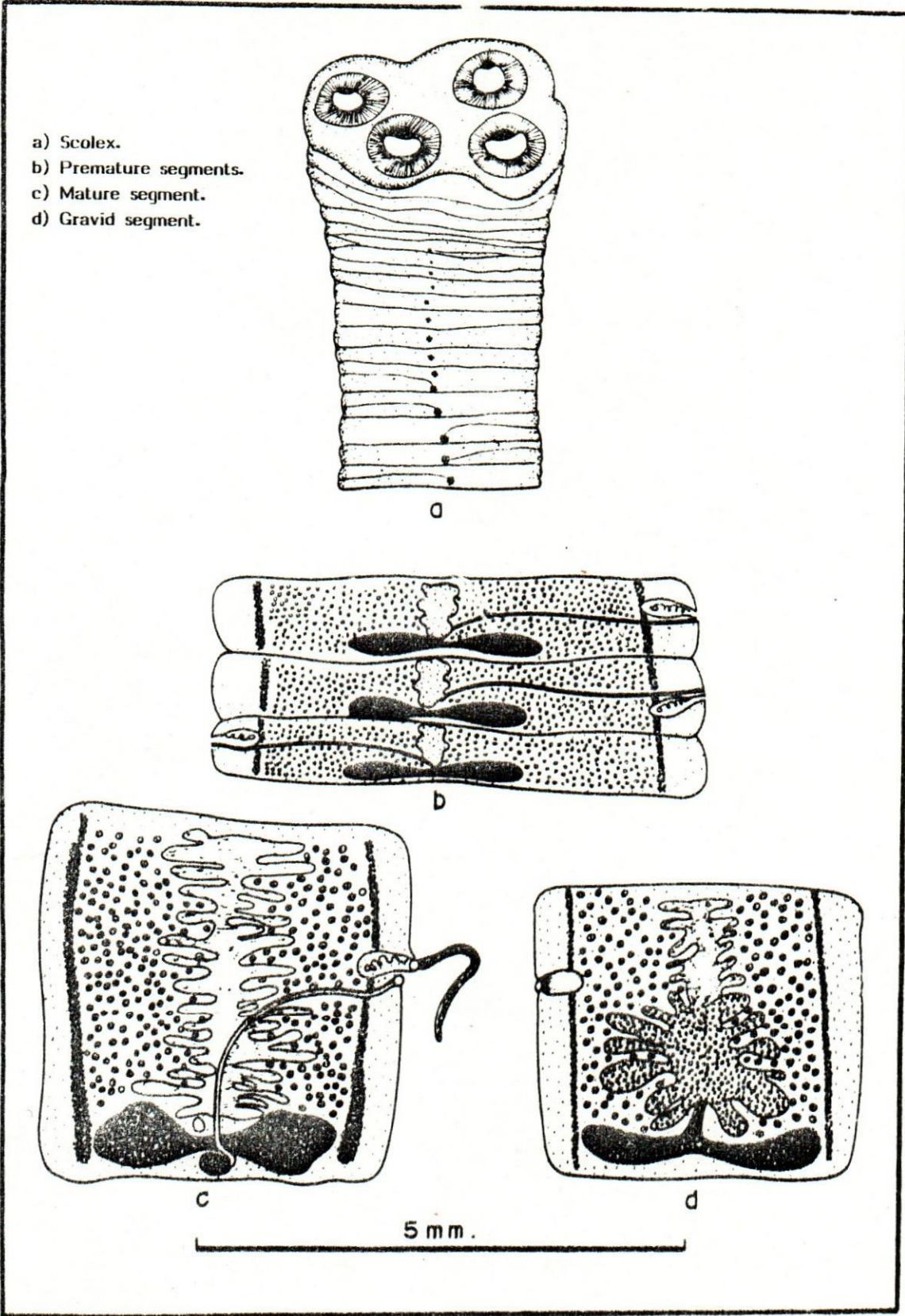


Fig. (1): *Marsypocephalus aegyptiacus* n.sp.

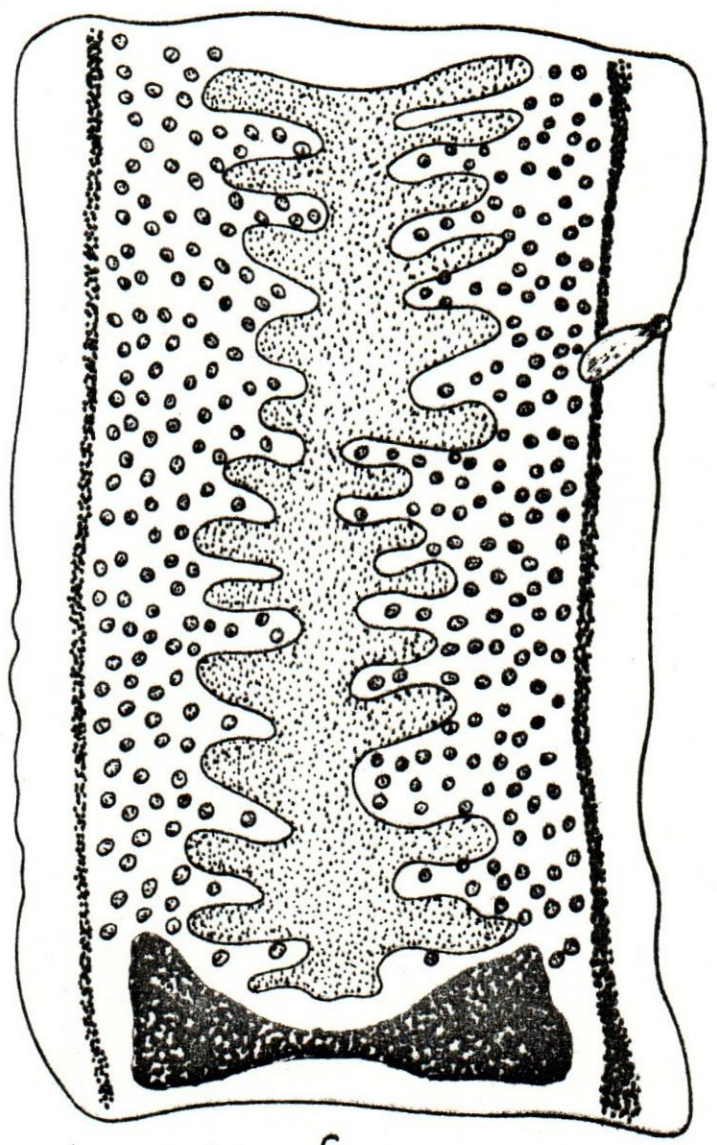
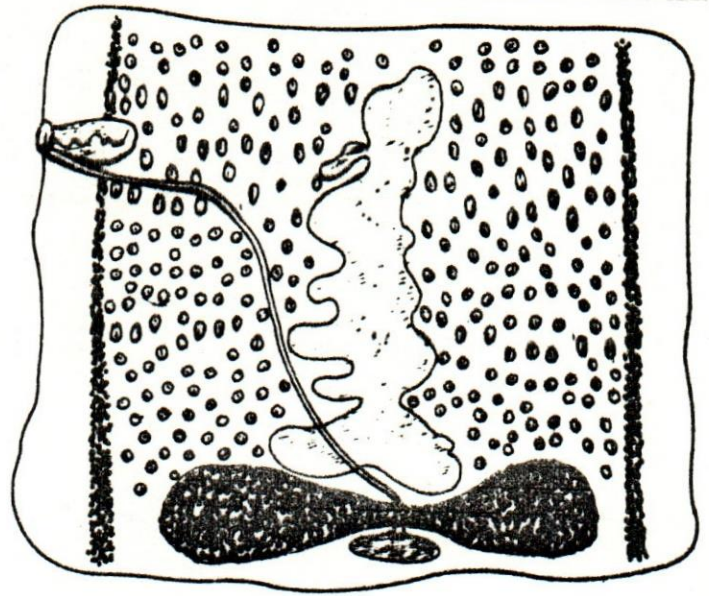
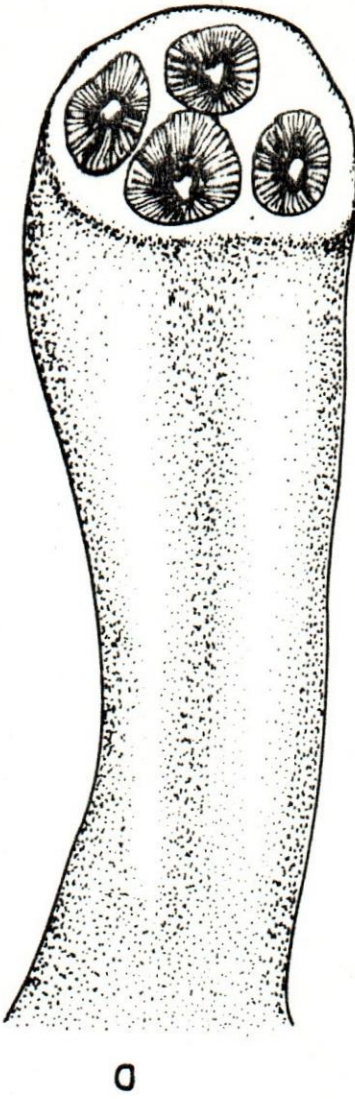
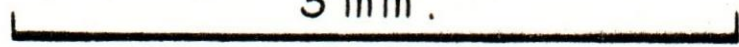


Fig. (2): *Proteocephalus sulcatus*
(Klaptocz, 1906)

- a) Scolex.
- b) Mature segment.
- c) Gravid segment.

3 mm.



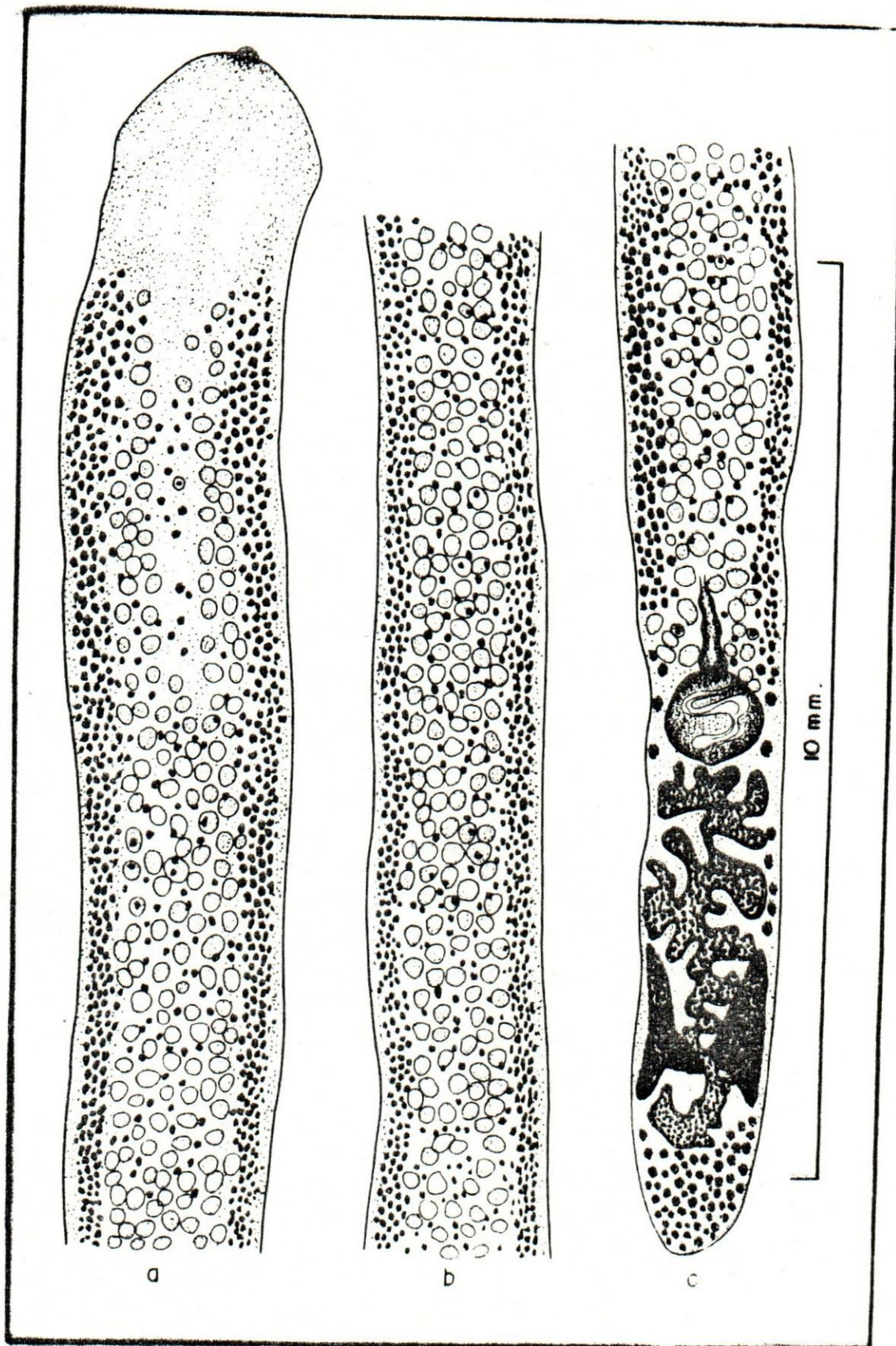
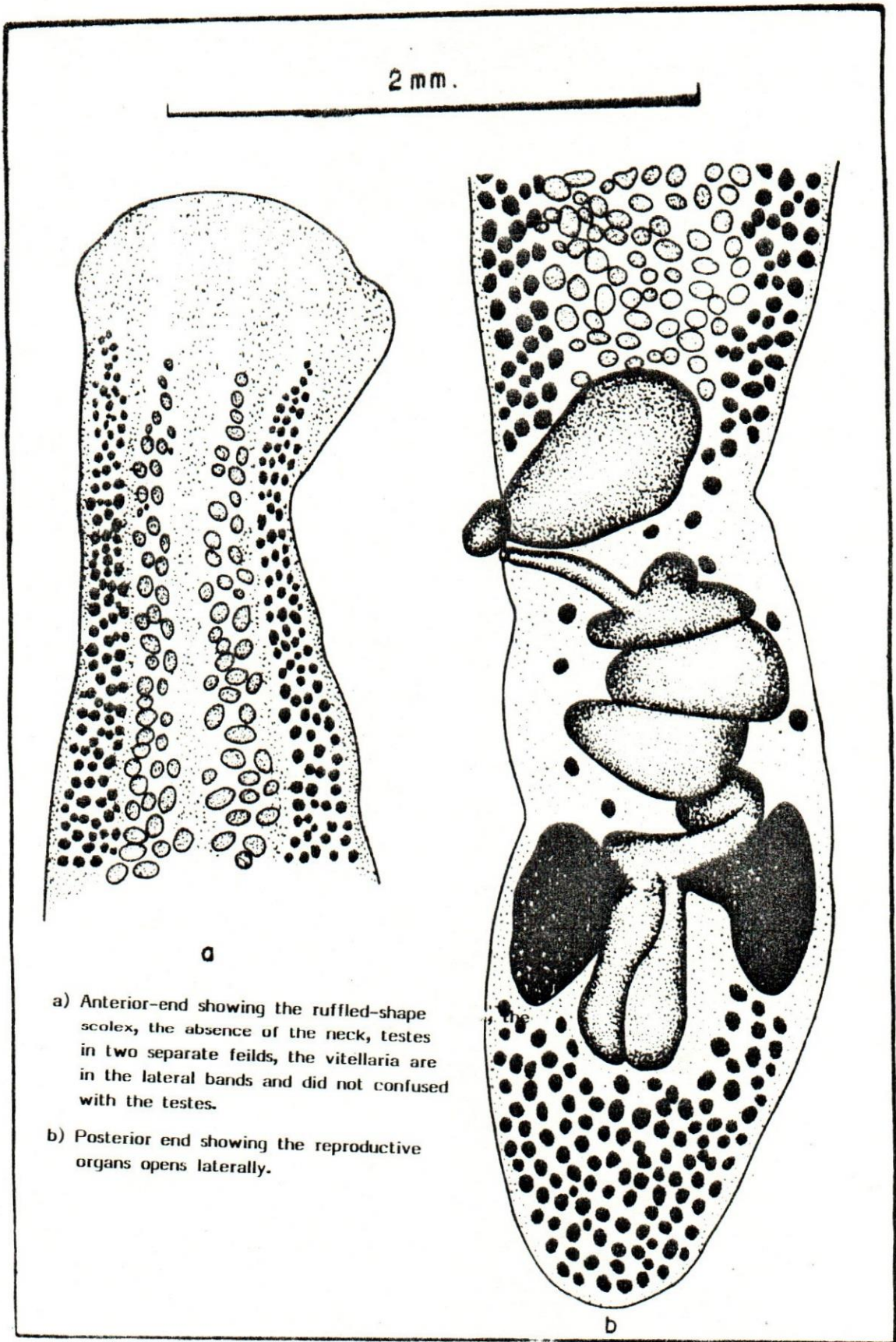


Fig. (3): *Garyophyllaeus laticeps* (Pallas, 1718)

a, b & c) Ventral view of a complete gravid adult worm (the usual form).



a) Anterior-end showing the ruffled-shape scolex, the absence of the neck, testes in two separate feilds, the vitellaria are in the lateral bands and did not confused with the testes.

b) Posterior end showing the reproductive organs opens laterally.

Fig. (4): *Caryophyllaeus laticeps* (Pallas, 1718).
 (The unusual form as seen in one specimen)