

## Parasites of the relict fauna of Ceylon.

### II. New species of Cyclophyllidean Cestodes from small hill-vertebrates

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#### Summary

Five new species of cyclophyllidean Cestodes are described from small mammals and an amphibian, collected on the Horton Plains (7,200 ft.) and in Peradeniya (1,600 ft.), in Ceylon.

Four of the new species are hymenolepids, namely : *Vamprolepis solisoricis* from the small intestine of the Ceylon Large Shrew, *Solisorex pearsoni*, an endemic genus and species confined to the hills ; *Vamprolepis montana* and *Hymenolepis sunci*, from the small intestine of the Ceylon Highland Shrew, *Suncus murinus montanus*, an endemic subspecies of the hill country ; and *Pseudhymenolepis eisenbergi* from the stomach of the same host. An unidentifiable *Hymenolepis* sp. was also recovered from the small intestine of the Highland Spiny Rat, *Mus (Coelomys) mayori* (subgenus and species peculiar to Ceylon), from the Horton Plains.

A new nematotaeniid species, *Cylindrotaenia philauti*, is described from the small intestine of the rhacophorid frog, *Philautus variabilis*, collected on the Horton Plains.

#### Résumé

Nous décrivons cinq espèces nouvelles de Cestodes Cyclophyllides trouvées chez des petits Mammifères et un Amphibien. Les hôtes ont été récoltés à Horton Plains (altitude 2195 m) et à Peradeniya (488 m) à Ceylan.

Quatre de ces espèces sont des Hyménolespides, à savoir : *Vamprolepis solisoricis* recueillie dans l'intestin grêle de la Grande Musaraigne de Ceylan (Ceylon Large Shrew), *Solisorex pearsoni*,

genre et espèce endémique qui ne se trouve que dans la zone montagneuse ; *Vampirolepis montana* et *Hymenolepis sunci* dans l'intestin grêle de la Musaraigne des Montagnes de Ceylan (Ceylon Highland Shrew), *Suncus murinus montanus*, sous-espèce endémique du pays montagneux ; et *Pseudhymenolepis eisenbergi* de l'estomac du même hôte. Une espèce non identifiable d'*Hymenolepis* a été également recueillie dans l'intestin grêle du Rat épineux des Montagnes (Highland Spiny Rat), *Mus (Coelomys) mayori*, (sous-genre et espèce endémique) de Horton Plains.

Nous décrivons aussi une espèce nouvelle de Nématotaeniide, *Cylindrotaenia philauti*, trouvée dans l'intestin grêle d'une grenouille Rhacophoride, *Philautus variabilis*, recueillie à Horton Plains.

## Introduction

« Come, come, you froward and unable worms ! »

SHAKESPEARE : *Taming of the Shrew*.

Six cestode species are dealt with in this paper (see Table I), of which five are new species belonging to the genera *Vampirolepis*, *Hymenolepis*, *Pseudhymenolepis* and *Cylindrotaenia*, and one of unsettled identity belonging to the genus *Hymenolepis*. The parasites were collected from the Ceylon Large Shrew, *Solisorex pearsoni*, which is probably a true relict form (genus peculiar to Ceylon), and from the Highland Spiny Rat, *Mus (Coelomys) mayori* \* (species peculiar to Ceylon), the Ceylon Highland Shrew, *Suncus murinus montanus* \* (subspecies peculiar to Ceylon) and the rhacophorid frog, *Philautus variabilis* (species peculiar to Ceylon and S. India).

No apology is made for the inclusion, in this series of papers, of parasites of hosts that may not be true relict forms, because the parasite complex of relict hosts is best studied and assessed with reference to that of related non-relict, but endemic, and even non-endemic, hosts.

All type-specimens of the new species are deposited in the Department of Zoology, University of Ceylon.

### *Vampirolepis solisoricis* sp. nov.

(Fig. 1, A - C)

A single worm of this species was obtained from the small intestine of a male specimen of the Ceylon Large Shrew, *Solisorex pearsoni*, which died in captivity a few days after it was brought to us from the Horton Plains by Dr. John F. Eisenberg. The worm was studied in the live condition and then fixed in Bouin's fluid, stained in acetic acid alum carmine and mounted in Canada Balsam.

\* The nomenclature follows that given by Eisenberg & McKay, 1970.

GENERAL FEATURES: The worm is 25 mm. long, with the greatest width of 0.60 mm. in the posterior region. There are 350 proglottids, all of which are wider than long. There are no gravid proglottids.

SCOLEX: The scolex is well developed and set off from the neck (fig. 1, A). It measures 0.37 mm. in diameter. The suckers are well developed and unarmed, measuring 0.0615 mm.-0.110 mm. in diameter. The rostellum is well developed and provided with a rostellar sheath and a crown of 49 Y-shaped hooks. The handle of the hook is very long and the guard, which is bluntly rounded at its end, is shorter than the curved and pointed blade. The hooks are 49.2  $\mu$  in length (fig. 1, B).

Table I

Parasite	Host and Habitat	Locality and Elevation above Mean Sea-level	Collector of Host and Date of Collection
Fam. <i>Hymenolepididae</i> :			
1. <i>Vampirolepis solisoricis</i> sp. nov.	<i>Solisorex pearsoni</i> The Ceylon Large Shrew (Small intestine)	Horton Plains 2 195 m (7,200 ft.)	J. F. Eisenberg 22-1-69
2. <i>Vampirolepis montana</i> sp. nov.	<i>Suncus murinus montanus</i> The Ceylon Highland Shrew (Small intestine)	Horton plains	G. M. McKay 19-2-69
3. <i>Hymenolepis sunci</i> sp. nov. . . . .	<i>Suncus murinus montanus</i> (Small intestine)	Peradeniya 488 m (1,600 ft.)	A. M. Heem Banda 26-11-69
4. <i>Hymenolepis</i> sp.	<i>Mus (Coelomys) mayori</i> The Highland Spiny Rat (Small intestine)	Horton Plains	J. F. Eisenberg 10-2-69
5. <i>Pseudhymenolepis eisenbergi</i> sp. nov. . . . .	<i>Suncus murinus montanus</i> (Stomach)	Horton Plains	J. F. Eisenberg 10-2-69
Fam. <i>Nematotaeniidae</i> :			
6. <i>Cylindrotaenia philauti</i> sp. nov. . . . .	<i>Philautus variabilis</i> Rhacophorid frog (Small intestine)	Horton Plains (World's End region)	H. Crusz 22-7-69

**MALE GENITALIA :** There are three large, rounded testes, arranged in a transverse row, in each mature proglottid. Two of the testes lie on the aporal (left) side of the ovary, while the third one lies on the poral side near the cirrus sac. When fully mature, the three testes measure 0.020-0.061 mm. by 0.041-0.082 mm. The cirrus sac is well developed, aspinose and situated near the anterior margin of the segment. It measures 0.041-0.123 mm. by 0.012-0.020 mm. The genital pores are unilateral and dextral (fig. 1, C).

**FEMALE GENITALIA :** The ovary is elongated transversely and situated near the posterior margin of the segment. It measures 0.041-0.060 mm. by 0.020-0.028 mm. Vitelline glands and uterus were not clearly recognizable and, as there are no gravid segments, eggs were not observed.

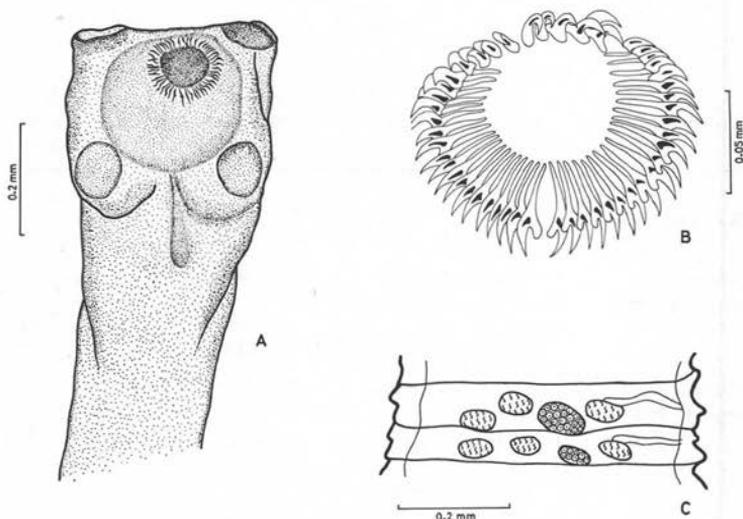


FIG. 1. — *Vampirolepis solisoricis* sp. nov. A: Anterior end. B: Crown of rostellar hooks. C: Mature proglottids.

### Discussion :

The specimen described here belongs to the genus *Vampirolepis* which has the following diagnostic characters :

Hymenolepid with the scolex carrying unarmed suckers and a more or less well developed rostellum which is longer than broad ; rostellum carries numerous Y-shaped hooks ; guard of the hooks is nearly as long as, longer or shorter than the blade ; cirrus pouch is small.

About 25 species of *Vampirolepis* have been recorded from mammals, of which seven species are from shrews. All the forms from shrews are characterized by the presence of 22-27 rostellar hooks, while the present species from *Solisorex pearsoni* has 49 hooks. These latter hooks are also much larger than those of *Vampirolepis* spp. hitherto recorded.

The features shown by this single specimen are so distinctive, that we have no hesitation in assigning it to a new species, *Vampirolepis solisoricis*.

HOST: Ceylon Large Shrew, *Solisorex pearsoni* Thomas, 1924. Genus and species peculiar to Ceylon.

HABITAT: Small intestine.

LOCALITY: Horton Plains, Ceylon, 2 195 m. (7,200 ft.) above mean sea level. The shrew was caught in a trap under a small road-bridge, about a mile from the Farr Inn, on the Diyagama Road.

### *Vampirolepis montana* sp. nov.

(Fig. 2, A - C)

Two specimens of this species were collected in the living condition from the small intestine of the Ceylon Highland Shrew, *Suncus murinus montanus*. The host was caught, by Mr. George McKay, on the Horton Plains, near the newly established potato farm.

GENERAL FEATURES: The worms measure 7-13 mm. in length and 0.67-1.23 mm. in maximum width. The strobila has 97-140 proglottids which are all broader than long, but which increase in length posteriorly. The male genitalia appear first, at about the fortieth proglottid.

SCOLEX: The scolex is well developed and clearly set off from the neck. It measures 0.47-0.49 mm. in diameter and is provided with four large, muscular suckers and a muscular, conical rostellum enclosed in a sheath. The suckers are spherical, with a diameter of 0.10-0.14 mm. The rostellum measures 0.102-0.131 mm. by 0.061-0.082 mm. and is armed with a crown of 24-28 Y-shaped hooks (fig. 2, A). The handle of the hook is very long and the guard, which is bluntly rounded at its end, is shorter than the blade. The hooks measure 53.3-65.0  $\mu$  in length (fig. 2, B).

MALE GENITALIA: Each mature proglottid has three large oval testes arranged in a transverse row. They measure 0.069-0.143 mm. by 0.057-0.082 mm. Two of the testes lie on the left side of the ovary and the third one is on the right side (fig. 2, C).

FEMALE GENITALIA: The ovary is small and rounded in the anterior proglottids but becomes transversely elongated and bilobed in older proglottids. It measures 0.123-0.369 mm. in diameter. In the gravid proglottids the uterus extends transversely and completely fills the proglottids. The eggs are small, rounded, thin-shelled and embryonated, and 0.020-0.025 mm. in diameter (fig. 2, C).

**Discussion:** The worms described here have all the characteristics of a species of *Vampirolepis*, but differ from other species of the genus in the size of the hooks, which are the longest yet recorded, and in body and egg dimensions, which are quite small when compared with those of other species.

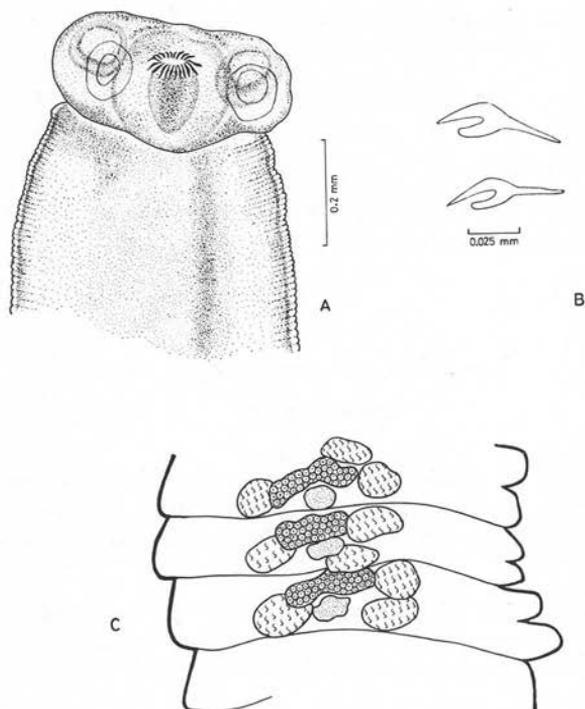


FIG. 2. — *Vampirolepis montana* sp. nov. A: Anterior end.  
B: Rostellar hooks. C: Mature proglottids.

HOST: Ceylon Highland Shrew, *Suncus murinus montanus* (Kelaart, 1850). Subspecies peculiar to Ceylon.

HABITAT: Small intestine.

LOCALITY: Horton Plains.

### *Hymenolepis sunci* sp. nov.

(Fig. 3, A - C)

The material on which the following account is based was collected from the Ceylon Highland Shrew, *Suncus murinus montanus*, at Peradeniya. The collection included one complete worm, five scolices and six gravid proglottids.

GENERAL FEATURES: The fully mature worm was sturdy and thick, measuring 40-50 mm. in length and 2.38 mm. at its widest. It increases in width steadily behind the scolex until it reaches its full width.

**SCOLEX:** The scolex is strongly developed, measuring 0.31-0.55 mm. in diameter and bears four large muscular suckers. The suckers are 0.06-0.14 mm. in diameter (fig. 3, A).

The strobila is segmented immediately behind the scolex, there being no recognizable neck. It consists of a very large number of very narrow segments.

The excretory system is conspicuous, particularly in the early segments, before the genital rudiments become recognizable. It appears as two prominent dorsal canals which take a wavy course, marking out the segments roughly into thirds. There is also a pair of ventral canals, which are much less prominent.

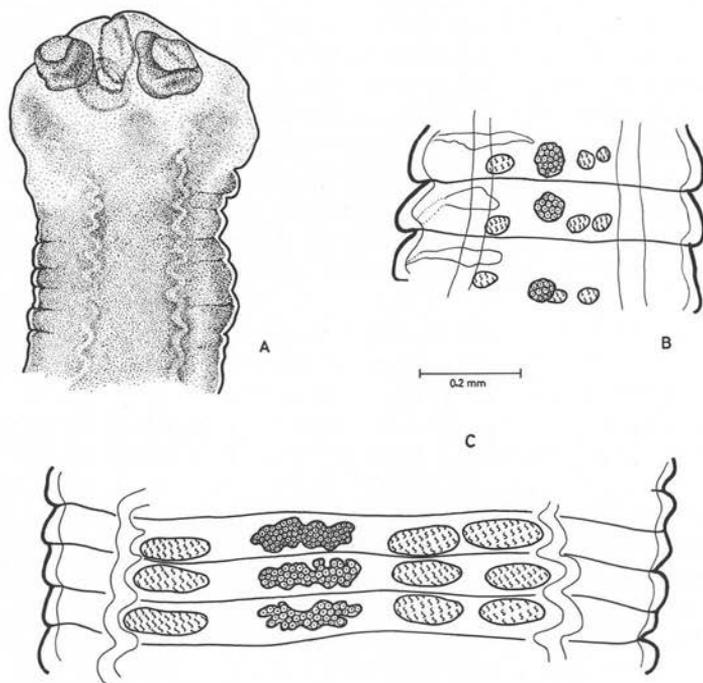


FIG. 3. — *Hymenolepis sunci* sp. nov. A: Anterior end. B: Anterior maturing proglottids. C: Mature proglottids.

**MALE GENITALIA:** In the first few segments, immediately behind the scolex, no organization of genitalia has yet occurred, but once the genital anlagen have become apparent, in and after about the 30th-40th segment, differentiation takes place rapidly and the three testes can be seen to lie in a straight line across the segment, one on the poral side and two on the aporal side. The testes are flattened oval bodies measuring 0.114-0.135 mm. by 0.041-0.053 mm. In the anterior segments they measure 0.08-0.095 mm. by 0.047-0.080 mm.

The genitalia are situated within the range of the two excretory canals. The genital pores are unilateral and open about the middle of the dextral margins of the segments. There is a small cirrus sac, 0.12 mm. long, situated antero-laterally in the maturing segments (fig. 3, B).

**FEMALE GENITALIA:** The ovary is a lobed organ, with irregular margins, and develops between the testis on the poral side and the two testes on the aporal side. It measures 0.075 mm. by 0.060 mm. in the anterior maturing segments. More posteriorly they measure 0.192-0.210 mm. in width (fig. 3, C). The gravid proglottids are packed with rounded, embryonated eggs, which are 0.05 mm. in diameter.

**Discussion:** Of all the genera of the Hymenolepidinae, to which subfamily the present species belongs, there are five that have an unarmed rostellum, namely *Protogyrella*, *Myotolepis*, *Cryptocotylepis*, *Insectivorolepis* and *Hymenolepis*.

Of these genera, *Hymenolepis* best fits the present form, owing to the presence of three testes which are not close together in the middle of the proglottid, and because the scolex is small, without longitudinal bolsters, and the uterus fills the entire gravid proglottid, instead of forming an ovoid median sac.

A species of *Hymenolepis* was reported from the shrew *Suncus caeruleus* (= *Suncus murinus*) caught in Bombay (Voge, 1957). This was identified as *Hymenolepis jacobsoni* von Linstow, 1907, which originally came from *Crocidura murina* (= *Suncus murinus*) from Java. Subsequently, however, it was placed in the genus *Rodentolepis* Spassky, 1954, which are forms with armed rostellum, recorded from rodents and shrews.

Srivastava and Pande (1964) recorded an unarmed *Hymenolepis* sp. from *Crocidura caerulea* (= *Suncus murinus*), which on closer study was found to resemble *H. macyi* Locker and Rausch, 1952. The present species differs even from this, in the smaller size of its proglottids (220  $\mu$  by 160  $\mu$ , as against 500  $\mu$  by 250  $\mu$ ), in having an uterus packed with eggs, and in the absence of the prominent parenchyma surrounding the egg-filled uterus.

In many aspects of its structure, the present form appears to be close to *Hymenolepis* spp. from rodents, particularly *H. diminuta* and *H. vogueae*. *H. diminuta*, however, is five to twelve times as long (200-600 mm); and *H. vogueae* is about three times as long (120-140 mm), has a varying number of testes (1-4) and a distinct seminal receptacle. The form described here is therefore considered as belonging to a new species which is named *Hymenolepis sunci*, after its type host.

**HOST:** *Suncus murinus montanus* (Kelaart, 1850).

**HABITAT:** Small intestine.

**LOCALITY:** Rajawatte in Peradeniya, 488 m. (1,600 ft.).

### *Hymenolepis* sp.

Three specimens of a *Hymenolepis* sp. were collected from the small intestine of the Highland Spiny Rat, *Mus (Coelomys) mayori*. Since a considerable time elapsed between collecting the specimens and recovering the parasites, the latter were not in a good state of preservation. It was possible however to fix, stain and mount one of the specimens.

**GENERAL FEATURES:** The worm is slender and long, measuring 35 mm. in length. The proglottids are broader than long.

**SCOLEX:** The scolex has a diameter of 0.14 mm. The rostellum is unarmed. The suckers are spherical, measuring 0.03-0.04 mm. in diameter.

**MALE GENITALIA:** The three testes, measuring 0.04-0.06 mm. in diameter, are situated one on the poral side and two aporally. Of the latter, one lies anterior to the other. All the testes are within the limits of the longitudinal excretory canals. The cirrus sac is large, measuring 0.17 by 0.06 mm., and extends from almost the middle of the proglottid to the lateral end. The genital pores are unilateral, situated nearer the anterior end of each proglottid.

**FEMALE GENITALIA:** The ovary is situated in the middle of the proglottid. It is bilobed and measures 0.07 mm. in length. No eggs were observed.

**Discussion:** Owing to the poor state of preservation of these worms, and the meagre details available as a consequence, their specific status cannot be determined. They appear to resemble somewhat the species *Hymenolepis vogeeae* Singh, 1956 in *Mus buduga* from Lucknow, India.

**HOST:** The Highland Spiny Rat, *Mus (Coelomys) mayori* (Thomas, 1915). Subgenus and species peculiar to Ceylon.

**HABITAT:** Small intestine.

**LOCALITY:** Horton Plains.

*Pseudhymenolepis eisenbergi* sp. nov.

(Fig. 4, A - D)

Six specimens of *Pseudhymenolepis* were collected from cysts in the stomach of the Ceylon Highland Shrew, *Suncus murinus montanus* caught in Horton Plains on 10.2.69. Two worms were cut serially and whole mounts were made of the remaining four.

**GENERAL FEATURES:** The worms are 12-15 mm. long, and dorsoventrally flattened. The strobila is distinctly segmented. There are 160-180 proglottids, which gradually increase in width when they become gravid and then decrease in width again in the posterior region. The immature proglottids measure 0.27-0.39 mm., mature proglottids 0.47-0.87 mm. and gravid proglottids 0.76-1.03 mm., in maximum width.

**SCOLEX:** The scolex (fig. 4, A) is well developed, 397-492  $\mu$  in diameter, and is provided with 4 large muscular suckers, which are 70-102  $\mu$  in diameter, and an armed rostellum measuring 123-164  $\mu$  by 82-106  $\mu$ . The rostellum is provided with a single row of 13 hooks, 69.7-82  $\mu$  long. Each hook has a long handle, a short, blunt guard and a curved and pointed blade (fig. 4, B).

**MALE GENITALIA:** There are three large, rounded testes, one situated anterior to the ovary and two on either side of the ovary (fig. 4, C). They measure 61.5-82  $\mu$  by 41-61.5  $\mu$ . The cirrus pouch is well developed, claviform, and measures 61.5-90  $\mu$  by 16.4-20  $\mu$ . There are both external and internal seminal vesicles. Genital pores are unilateral and dorsal to the excretory ducts.

**FEMALE GENITALIA :** There is a large, bilobed ovary situated below the middle testis. It measures  $24.6-28.7 \mu$  by  $28.7-61.5 \mu$  and leads into a well developed vagina, *via* the oviduct, which opens on the ventro-posterior side of the cirrus pouch. The seminal receptacle is very prominent and is  $57.4-60 \mu$  in length. The uterus breaks down into capsules, each containing a single egg (fig. 4, D). The eggs are embryonated, rounded, measuring  $32.8-41 \mu$  by  $20.5-32.8 \mu$  and containing well developed onchospheres, each having 6 embryonic hooks. These hooks measure  $12.3-16.4 \mu$  in length.

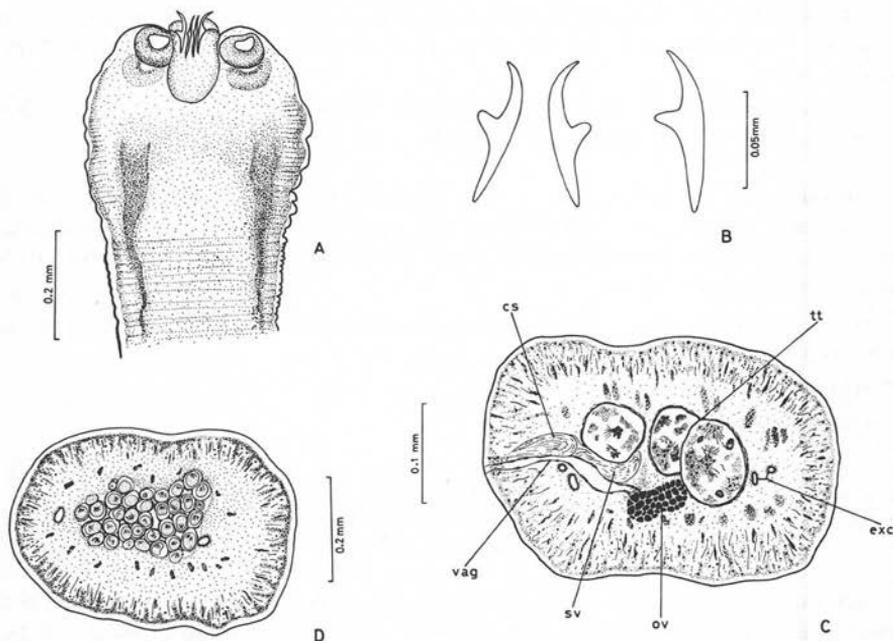


FIG. 4. — *Pseudhymenolepis eisenbergi* sp. nov. A: Anterior end. B: Rostellar hooks. C: T.S. mature proglottid. D: T.S. gravid proglottid. *tt* - testes, *ov* - ovary, *sv* - seminal vesicle, *cs* - cirrus sac, *vag* - vagina, *exc* - excretory canals.

**Discussion :** Although the presence of three testes in the present form is a typical hymenolepid character, the breaking down of the uterus into egg-capsules, each containing a single egg, relegates it to the subfamily Pseudhymenolepidinae. This subfamily is represented so far in mammals by the only genus and species *Pseudhymenolepis redonica* Joyeux et Baer, 1935, which has been reported from the small intestine of *Sorex araneus* in France and from the small intestine of *Crocidura russula* in France, Switzerland and Morocco. It is noteworthy that the present form was recovered from the stomach, and not the small intestine, of its host. A close comparison of it with *Pseudhymenolepis redonica* reveals the following differences :

1. Although *P. redonica* is provided with 14 rostellar hooks and the present form comes very near it with 13 hooks, the hooks are much smaller in *P. redonica*, being only  $21 \mu$  in length, while in the present form they are  $69.7-82.0 \mu$  long.

2. The testes are arranged in the form of a triangle and are posterior to the ovary in *P. redonica*, while in the form described here one testis is anterior to, and the other two are almost on a level with the ovary and on either side of it.

3. The strobila is indistinctly segmented in *P. redonica*, while in this form it is distinctly segmented.

4. Large differences are also noted in the measurements of the rostellar lengths, sucker diameter, and holdfast measurements. (See Table II).

Table II

Characters	<i>Pseudhymenolepis redonica</i>	<i>Pseudhymenolepis eisenbergi</i>
1. Holdfast or Scolex (diameter) . . . . .	112-130 $\mu$	397-492 $\mu$
2. Suckers (diameter) . . .	47-54 $\mu$	70-102 $\mu$
3. Rostellum . . . . .	90 $\mu$ long.	123-164 $\mu$ by 82-106 $\mu$
4. Rostellar hooks (number) . . . . .	14 (with slightly bifid guards)	13 (with simple guards)
5. Rostellar hooks (length) . . . . .	21 $\mu$	69.7-82.0 $\mu$
6. Strobila . . . . .	Free, isolated proglottids in intestine of host	Strobila entire and within cysts in stomach wall of host
7. Testes . . . . .	3 testes, posterior to ovary and arranged in the form of a triangle, 2 anterior, one posterior, 30 $\mu$ in diameter	3 testes, one anterior to ovary and the other two on either side of ovary 61.5-82.0 $\mu$ by 41.0-61.5 $\mu$
8. Cirrus pouch . . . . .	58-72 $\mu$ by 11-14 $\mu$	61.5-90.0 $\mu$ by 16.4-20.0 $\mu$
9. Ovary . . . . .	Multilobed	Bilobed 24.6-28.7 $\mu$ by 28.7-61.5 $\mu$
10. Receptaculum seminis (diameter) . . .	—	57.4-60.0 $\mu$
11. Egg-capsules . . . . .	Spherical (30.8-41.0 $\mu$ in diameter) or ovoid (46-49 $\mu$ by 38.5 $\mu$ ).	32.8-41.0 $\mu$ by 20.5-28.7 $\mu$
12. Onchosphere . . . . .	17-23 $\mu$	20.5-24.6 $\mu$ by 12.3-16.4 $\mu$
13. Embryonic hooks (length) . . . . .	13.8-14.0 $\mu$	12.3-16.4 $\mu$

Owing to these differences, the cestode dealt with here is assigned to a new species, which is named *Pseudhymenolepis eisenbergi*, as a tribute to D<sup>r</sup> John Frederick Eisenberg, Resident Scientist of the Smithsonian Institution's National Zoological Park and Leader of the Smithsonian's Ceylon Elephant Ecosurvey Team.

HOST : *Suncus murinus montanus* (Kelaart, 1850).

HABITAT : Stomach.

LOCALITY : Horton Plains.

*Cylindrotaenia philauti* sp. nov.

(Fig. 5, A - D)

Eight complete worms and thirteen fragments of a nematotaeniid species were collected in live condition from the small intestine of a female rhacophorid frog *Philautus variabilis*. The host was collected in Horton Plains (World's End region) and was brought to the laboratory for a study of its parasites. Permanent mounts were made of the eight worms and eight fragments, and five fragments were serially sectioned.

GENERAL FEATURES : The worms are slender and cylindrical, 5.5-13.3 mm. in length and 0.205-0.369 mm. in maximum width. They are provided with a non-rostellate holdfast (fig. 5, A) 0.069-0.340 mm. in diameter. The holdfast has four large, circular suckers measuring 0.102-0.176 mm. in diameter. Body segmentation is distinct only in the posterior region. The genitalia are simple and the genital pores are irregularly alternate.

The excretory system is very conspicuous in the anterior region, immediately following the holdfast. It appears as two prominent dorsal canals which take a wavy course and then almost lose their prominence at the level of the mature proglottids. Both dorsal and ventral excretory canals are easily recognizable in transverse sections.

MALE GENITALIA : There is a single, large testis in each segment, on the aporal side of the proglottid. It measures 0.041-0.065 mm. by 0.020-0.028 mm. The cirrus sac measures 0.045-0.053 mm. by 0.012-0.020 mm. (fig. 5, B).

FEMALE GENITALIA : The ovary lies mediad to the testis and measures 0.024-0.061 mm. in diameter. The vitellaria are compact and are situated anterior to the ovary, between ovary and testis (fig. 5, B). They measure 0.016-0.028 mm. in diameter. There are two paruterine organs (fig. 5, C & D) one dorsal and one ventral. They measure 0.053-0.102 mm. by 0.012-0.041 mm., and enclose 4-8 egg-capsules. Each egg-capsule contains a single embryonated egg, and measures 0.021-0.033 mm. by 0.016-0.020 mm. The eggs are fusiform and bipolar, and measure 0.025-0.032 mm. by 0.012-0.021 mm. (fig. 5, C & D).

**Discussion :** The worms described above have all the characters of a nematotaeniid. They belong to the genus *Cylindrotaenia*, since there is a single testis and only two paruterine organs in each segment, with 8 or fewer eggs per paruterine organ.

Two species of *Cylindrotaenia* have been described so far, namely *C. americana* Jewell, 1916, from North and South America, Africa and Burma, and *C. quadrijugosa* Lawler, 1939, from North America. *C. quadrijugosa* differs conspicuously from the form described here in having transverse ridges on its body surface in four sets of nine to twelve each.

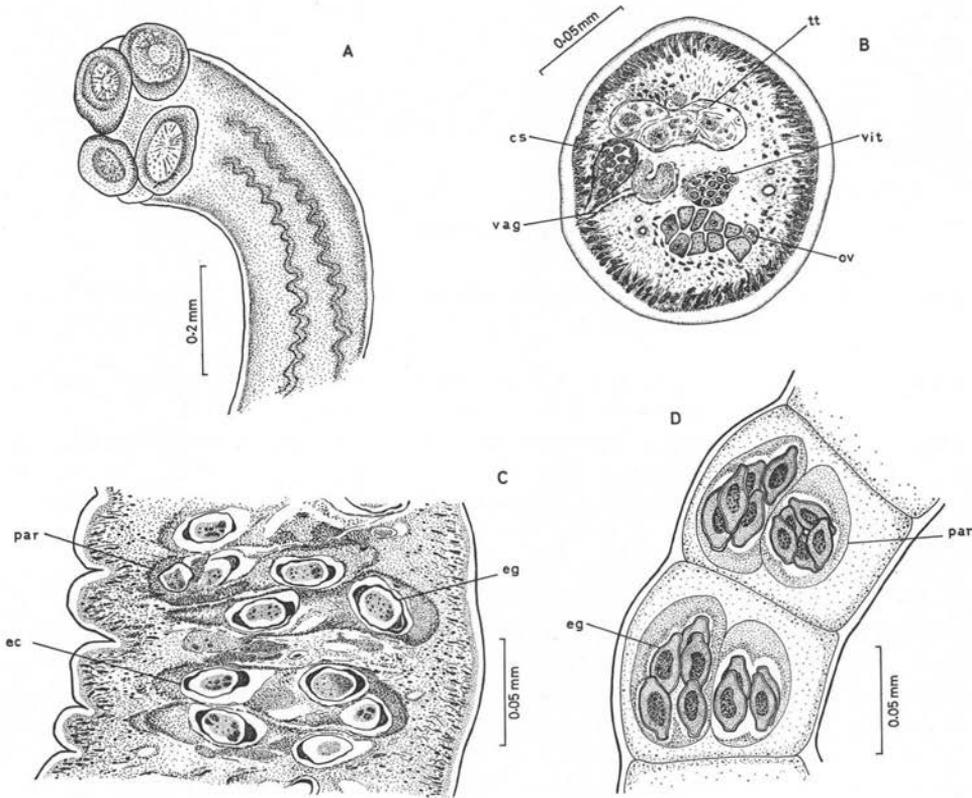


FIG. 5. — *Cylindrotaenia philauti* sp. nov. A: Anterior end. B: Mature proglottid (transverse section). C: Early gravid proglottids (horizontal section). D: Late gravid proglottids (whole mount). *tt* - testis, *vit* - vitellaria, *ov* - ovary, *vag* - vagina, *cs* - cirrus sac, *par* - paruterine organ, *ec* - egg-capsule, *eg* - egg.

*C. americana* resembles the present form in its lack of cuticular ridges, but differs from the latter in the shape and size of the eggs and in general body measurements. The nematotaeniid dealt with here is therefore considered as belonging to a new species which is named *Cylindrotaenia philauti* after the type host.

HOST: *Philautus variabilis* (Günther, 1858). Species peculiar to Ceylon and S. India.

HABITAT: Small intestine.

LOCALITY: Horton Plains (World's End region).

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