

Systematic Survey of Nematodes Parasitizing Bats (Chiroptera) in Cuba

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Abstract. The species composition of nematodes parasitizing bats of Cuba was studied. In the 371 helminthologically examined bats, belonging to 17 animal species, 12 nematode species (10 in the imaginal and 2 in the larval stage) were found: *Torrestrongylus torrei* Pérez Vigueras, 1935 in the new host *Chilonycteris macleayi macleayi*; *Anoplostrongylus paradoxus* (Travassos, 1918) in the host *Tadarida laticaudata yucatanica* and in the new host *T. macrotis*; *Allintoshius cubaensis* n. sp., in the host *T. brasiliensis muscula*; *Tricholeiperia* sp. in the host *Natalus lepidus*; *Tricholeiperia poeyi* n. sp. in the host *Tadarida minuta*; *Biacantha silvai* n. sp. in the host *Natalus lepidus*; *Histiostongylus coronatus* Molin, 1861 in the host *Phyllonycteris poeyi* and in the new host *Chilonycteris fuliginosa torrei*; *Litosomoides guiterasi* (Pérez Vigueras, 1934) in the hosts *T. laticaudata yucatanica* and *T. brasiliensis muscula*; *Capillaria phyllonycteri* Baruš et Valle, 1967 in the host *Phyllonycteris poeyi*; *C. cubana* Freitas et Lent, 1937 in the new host *Molossus major tropidorhynchus*; *Physocephalus* sp. (larvae) in the hosts *Natalus lepidus* and *Chilonycteris fuliginosa torrei*; *Contracaecum* sp. (larvae) in the host *Noctilio leporinus mastivus*. Descriptions and drawing are given for three nematode species of the subfamily Strongylacanthinae.

In Cuba, the order Chiroptera is represented by 26 animal species belonging to 5 families (Noctilionidae, Phyllostomidae, Natalidae, Vespertilionidae, Molossidae). With regard to the number of its species and dense populations, this is the richest mammalian order in Cuba. Partial information on nematodes, parasitizing hosts of this order in this area can be found in works by PÉREZ VIGUERAS (1934, 1935, 1936, 1941), TEIXEIRA DE FREITAS and LENT (1937), BARUŠ and DEL VALLE (1967). A literary survey on the fauna of ecto- and endoparasites of these hosts was compiled by SILVA TABOADA (1965). At the present, 8 nematode species (7 in the adult and 1 in the larval stage) were recorded from Cuban bats.

In the years 1964 and 1965, a total of 371 bats belonging to the 17 most distributed species were examined helminthologically in various provinces. The parasites recorded belonged to three classes; Trematoda were found in 75 hosts, Nematoda in 44 hosts and Cestoidea in only six hosts. A survey of the number of examined host species and of the incidence of invasion of parasites of the

individual classes is given in Table 1. The systematic evaluation of the collection of parasites, belonging to the class Nematoda showed that the spectrum of species in bats of this area is much wider than recorded in previous publications.

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SURVEY OF THE SPECIES RECORDED

STRONGYLATA

Family: Trichostrongylidae

SUBFAMILY: STRONGYLACANTHINAE YORKE ET MAPLESTONE, 1926

GENUS: *TORRESTRONGYLUS* PÉREZ VIGUERAS, 1935

1. *Torrestrongylus torrei* Pérez Viguera, 1935

Fig. 1

Host: *Chilonycteris macleayi macleayi* (fam. Phyllostomidae) — a new host.

Location: small intestine.

Locality: San José del Lago, Mayajigua (province Las Villas). Out of a total of 21 *Ch. macleayi macleayi* examined this species was found once (intensity of invasion 2 female worms).

This species is the only representative of the monotypical genus *Torrestrongylus*, which was originally described by PÉREZ VIGUERAS (1935) from the host *Macrotus*

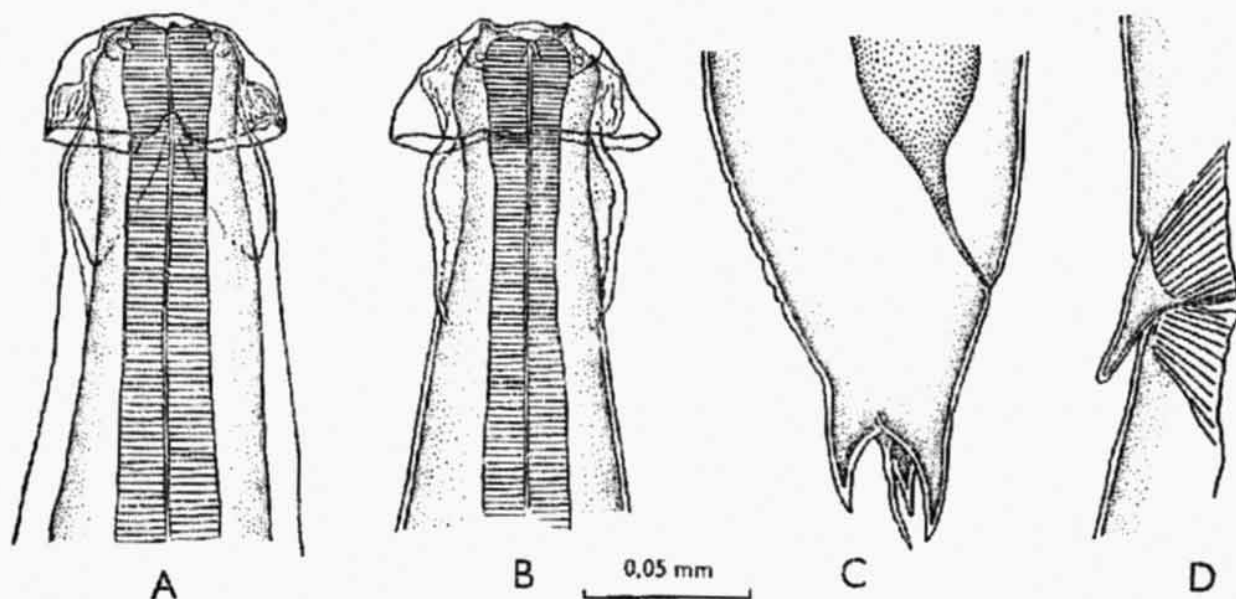


Fig. 1. *Torrestrongylus torrei* Pérez Viguera, 1935 from the small intestine of *Chilonycteris macleayi macleayi*. A — anterior part of body (dorsal view); B — anterior part of body (lateral view); C — posterior part of female (lateral view); D — vulva region (lateral view). Orig.

waterhousei minor (Phyllostomidae) from Cueva del Rincón de Guanabo (province Havana). We consider this nematode species endemic to the Cuban fauna.

GENUS: *ANOPLOSTRONGYLUS* BOULENGER, 1926

2. *Anoplostrongylus paradoxus* (Travassos, 1918)

Fig. 2

Hosts: *Tadarida* (*Tadarida*) *laticaudata yucatanica*; *T. (T.) macrotis* (fam. Molossidae); the latter is a new host.

Location: small intestine.

Locality: Trinidad an Yaguajay (province Las Villas).

Of the total of 9 examined *T. laticaudata yucatanica* this species was found in two hosts (intensity of invasion 1 and 12 nematodes in one host). Three of the seven examined *T. macrotis* were positive (intensity of invasion 1—3 nematodes in one host).

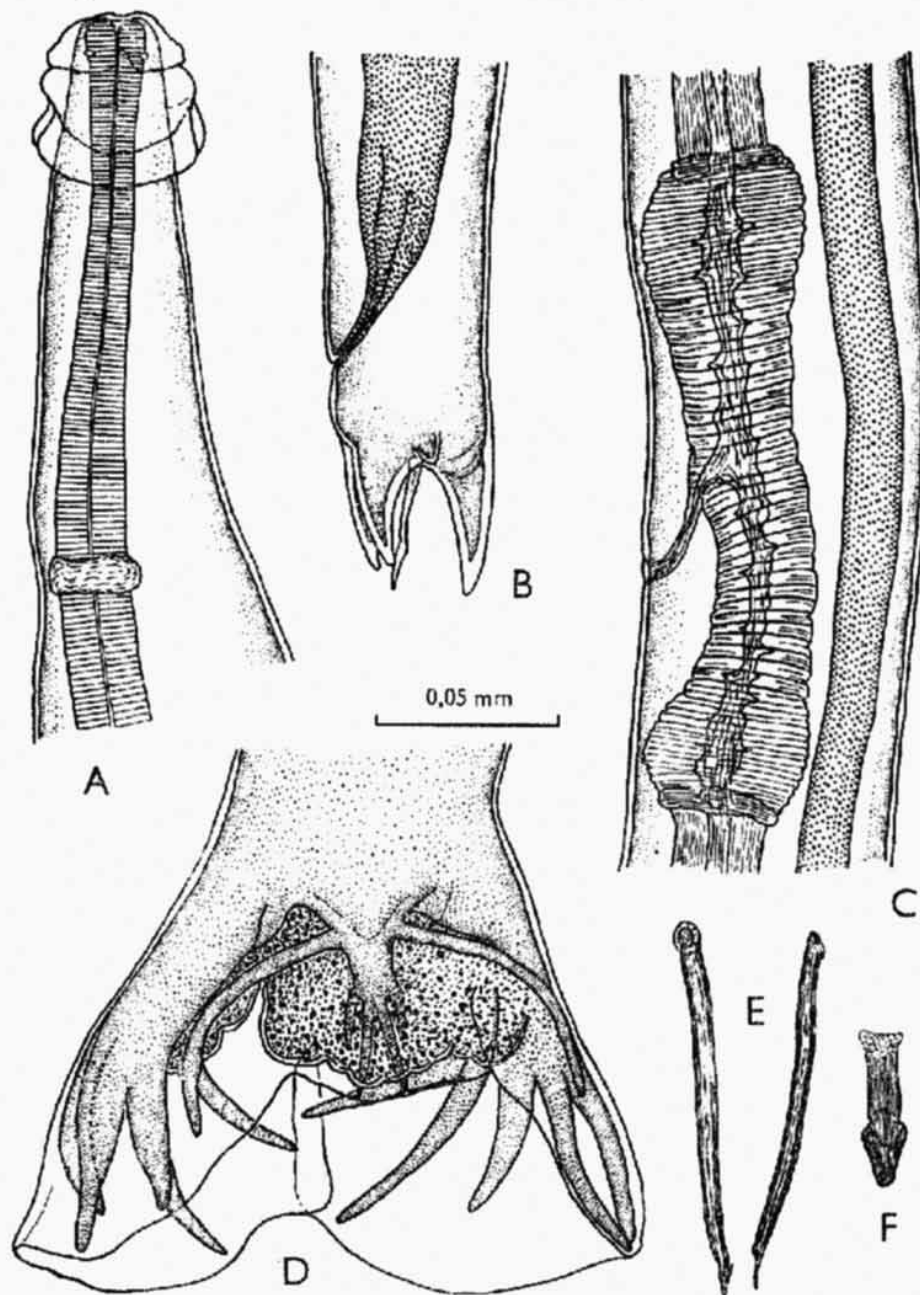


Fig. 2. *Anoplostrongylus paradoxus* (Travassos, 1918) from the small intestine of *Tadarida macrotis*. A — anterior part of body; B — posterior part of female (lateral view); C — vulva region (lateral view); D — bursa copulatrix (dorsal view); E — spicules; F — gubernaculum. Orig.

This nematode species was described originally by TRAVASSOS (1918) from the hosts *T. brasiliensis* and *Promops perotis* (fam. Molossidae) from Brasil. Later it was redescribed by LENT, FREITAS and PROENCA (1946) from the host *T. laticaudata* from Paraguay. We found it first in Cuba and from a new host. The specimens of this species in our collection are in full morphological agreement with the original description and redescription; some slight metric differences (especially in the sizes of the female worms) could be explained by the fact that our material consisted only of juvenile specimens (without developed eggs).

GENUS: *ALLINTOSHUIS* CHITWOOD, 1937

3. *Allintoshius cubaensis* n. sp.

Fig. 3

Host: *Tadarida* (T.) *brasiliensis muscula* (fam. Molossidae).

Location: small intestine.

Locality: Bahia la Ortigosa, Cabañas (province Pinar del Río).

This nematode species was found only in one of the 12 examined *T. brasiliensis muscula* (1 male and 2 female worms).

Description: The nematodes are white with a cuticle of indistinct transverse striation. Two lateral cuticular alae extend almost throughout entire body length. A transversely striated cephalic vesicle surrounds the anterior part of the body. Mouth terminal, surrounded by 6 small papillae. Neither the cervical nor prebursal papillae were found.

Holotype (male): Body 3.22 mm long, maximum width 0.108 mm. Head vesicle 0.039 mm long. Anterior portion of body with cephalic vesicle 0.036 mm wide. Maximum width of lateral cuticular alae 0.030 mm. Oesophagus 0.342 mm long, maximum width 0.039 mm. Nerve ganglion at a distance of 0.165 mm from anterior end, excretory pore at 0.171 mm. Gubernaculum well pseudochitinized, length 0.051 mm. Two spicules of equal length and shape, length 0.165 mm, width of their proximal end 0.009 mm. Distal end uncleaved. Bursa copulatrix slightly damaged, but the shape and distribution of its individual rays observable. Dorsal and externodorsal rays arising from common trunk. Dorsal ray bifurcated in its distal part to a depth of 0.018 mm, giving off near its tip two slender outer branches, directed to both sides. Length of dorsal ray measured from the point of separation of the externodorsal rays — 0.061 mm. Lateral rays arising from a common trunk, extend divergently. Postlateral ray shorter than medio- and anterolateral ray. Ventral rays arise from a common trunk, diverge and are of approximately equal length.

Allotype (female): body 7.01 mm long, maximum width 0.190 mm. Cephalic vesicle 0.078 mm long. Width of anterior portion with head vesicle 0.045 mm. Oesophagus 0.360 mm long, maximum width 0.045 mm. Nerve ganglion at a distance of 0.153 mm from anterior end. Vulva terminated at posterior half of the body at a distance of 2.65 mm from the tip of the tail, dividing the body in a ratio of 2.6—3.1 : 1. Lateral, pre- and postvulvar cuticular ornamentations absent. Vagina short. Total

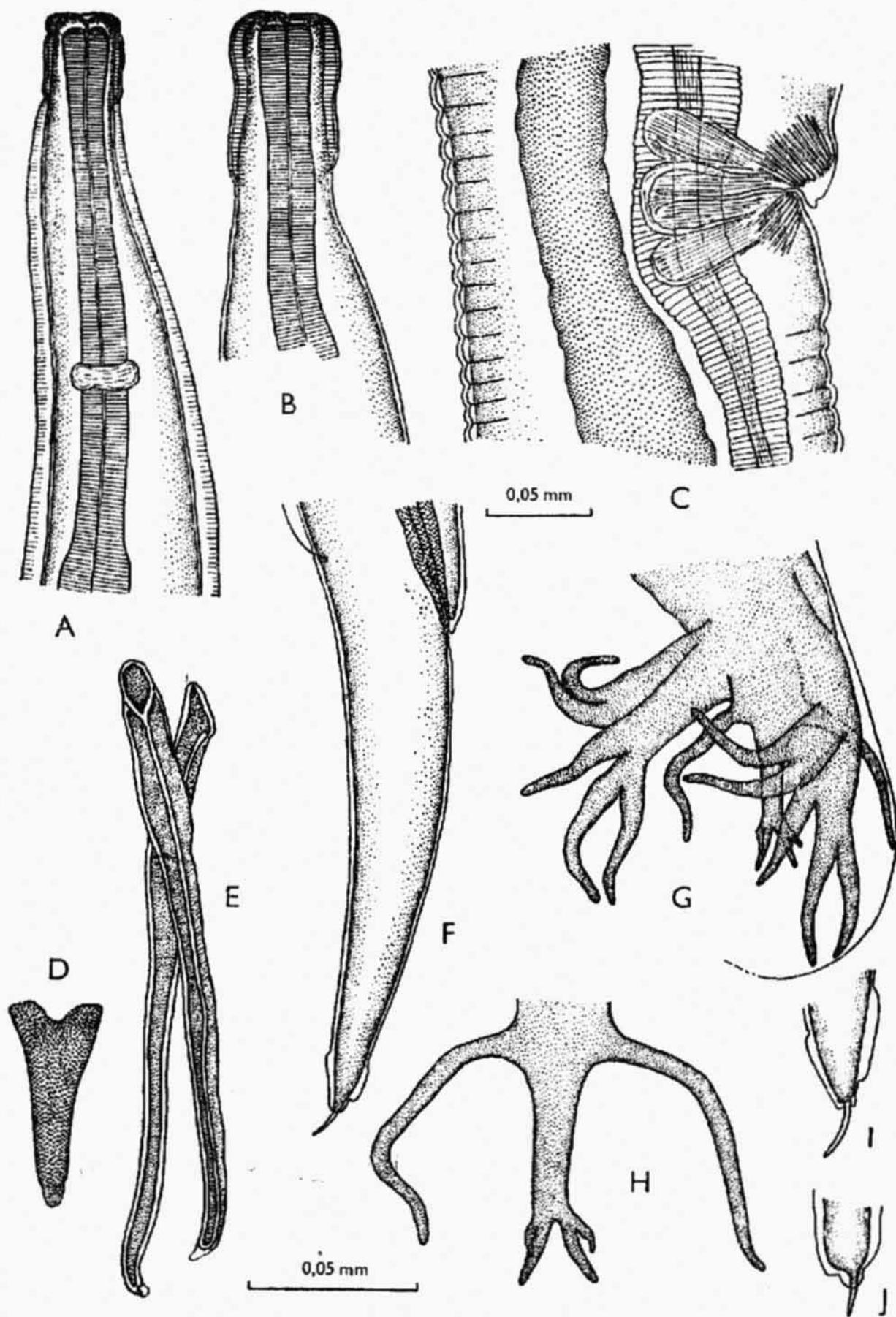


Fig. 3. *Allintoshia cubaensis* n. sp., from the small intestine of *Tadarida brasiliensis muscula*. A, B — anterior part of male and female; C — vulva region (lateral view); D — gubernaculum; E — spicules; F — posterior part of female (lateral view); G — bursa copulatrix; H — dorsal and externodorsal rays; I, J — detail of posterior end of female. Orig.

length of ovijector between the two sphincters 0.630 mm. Eggs elliptic with slightly segmented content. Size of eggs 0.078—0.084 by 0.039—0.045 mm. Posterior end gradually tapering, bluntly rounded with a sharp cuticular spine of 0.012 mm in length arising from it. The presence of small papillae close to the base of the caudal spine could not be determined. Anus situated at a distance of 0.233 mm from the tip of the tail. (Paratype sizes are shown in Tab. 2.)

Table 1. Survey of examined bats and the distribution of parasites (in classes).

Hosts	Total of examined hosts	Total of positive hosts	of the classes		
			Trema- toda	Cestoidea	Nematoda
Fam. Noctilionidae					
1. <i>Noctilio leporinus mastivus</i> (VAHL)	9	6	5	—	1
Fam. Phyllostomidae					
2. <i>Chilonycteris macleayi macleayi</i> GRAY	21	4	4	—	1
3. <i>Ch. fuliginosa torrei</i> G. M. ALLEN	72	33	29	—	7
4. <i>Mormoops blainvillei</i> LEACH	4	1	1	—	—
5. <i>Macrotus waterhousei minor</i> GUNDLACH	11	2	2	—	—
6. <i>Monophyllus cubanus cubanus</i> MILLER	5	—	—	—	—
7. <i>Brachyphylla nana</i> MILLER	5	—	—	—	—
8. <i>Artibeus jamaicensis parvipes</i> REHN	1	—	—	—	—
9. <i>Phyllonycteris poeyi</i> GUNDLACH	31	5	1	1	4
10. <i>Erophylla sezekorni sezekorni</i> (GUNDLACH)	30	1	1	—	—
Fam. Natalidae					
11. <i>Natalus lepidus</i> (GERVAIS)	48	26	17	—	14
Fam. Vespertilionidae					
12. <i>Eptesicus fuscus dutertrei</i> (GERVAIS)	7	2	2	—	—
Fam. Molossidae					
13. <i>Tadarida brasiliensis muscula</i> (GUNDLACH)	12	10	7	5	1
14. <i>T. laticaudata yucatanica</i> (MILLER)	9	3	2	—	2
15. <i>T. macrotis</i> (GRAY)	7	3	—	—	3
16. <i>T. minuta</i> (MILLER)	12	8	4	—	5
17. <i>Molossus major tropidorhynchus</i> GRAY	17	6	6	—	6

Differential diagnosis: The species *Allintoshius cubaensis* n. sp. has been listed to the genus *Allintoshius* Chitwood, 1937. This diagnosis (as conceived by YAMAGUTI 1961) varies from that of the species described by us with regard to the absence of lateral cuticular vulval alae in our species. This sign brings the species *A. cubaensis* n. sp. closer to the species of the genus *Parallintoshius* Araujo, 1940. From the recorded species of the genus *Allintoshius* (*A. nycticeius* Chitwood, 1937 and *A. travassosi* Chandler, 1938), our species differ principally in the spicule

length, the length of the gubernaculum and in the distance of the vulva and the anus from the posterior end. Basic fundamental differences were observed in the shape of the spicules, the gubernaculum, the dorsal ray and in the formation of the vulval region. From the known species of the genus *Parallintoshius* (*P. parallintoshius* Arango, 1940; *P. tadaridae* Caballero, 1942; *P. urumiac* Freitas et Mendonca, 1960 and *P. nudicianus* Freitas et Mendonca, 1963), our species differ distinctly in the length of the spicules, the gubernaculum and in the distance of the vulva and anus from the posterior end. Morphological differences were mainly found in the shape of the spicules, the gubernaculum, the dorsal ray, the posterior end of the female and in the formation of the vulval region. A survey of all up to date known species of the genus *Allintoshius* and *Parallintoshius* and a comparison with the species *A. cubaensis* n. sp. is given in Tab. 2.

The type and allotype of the species *A. cubaensis* n. sp. are in the collections of the Biological Institute, Cuban Academy of Sciences, Havana; the paratype is in the collections of the Institute of Parasitology, Czechoslovak Academy of Sciences, Prague.

GENUS: *TRICHOLEIPERIA* TRAVASSOS, 1935

4. *Tricholeiperia* sp.

Fig. 4

Host: *Natalus* (*Nyctiellus*) *lepidus* (fam. Natalidae).

Location: small intestine.

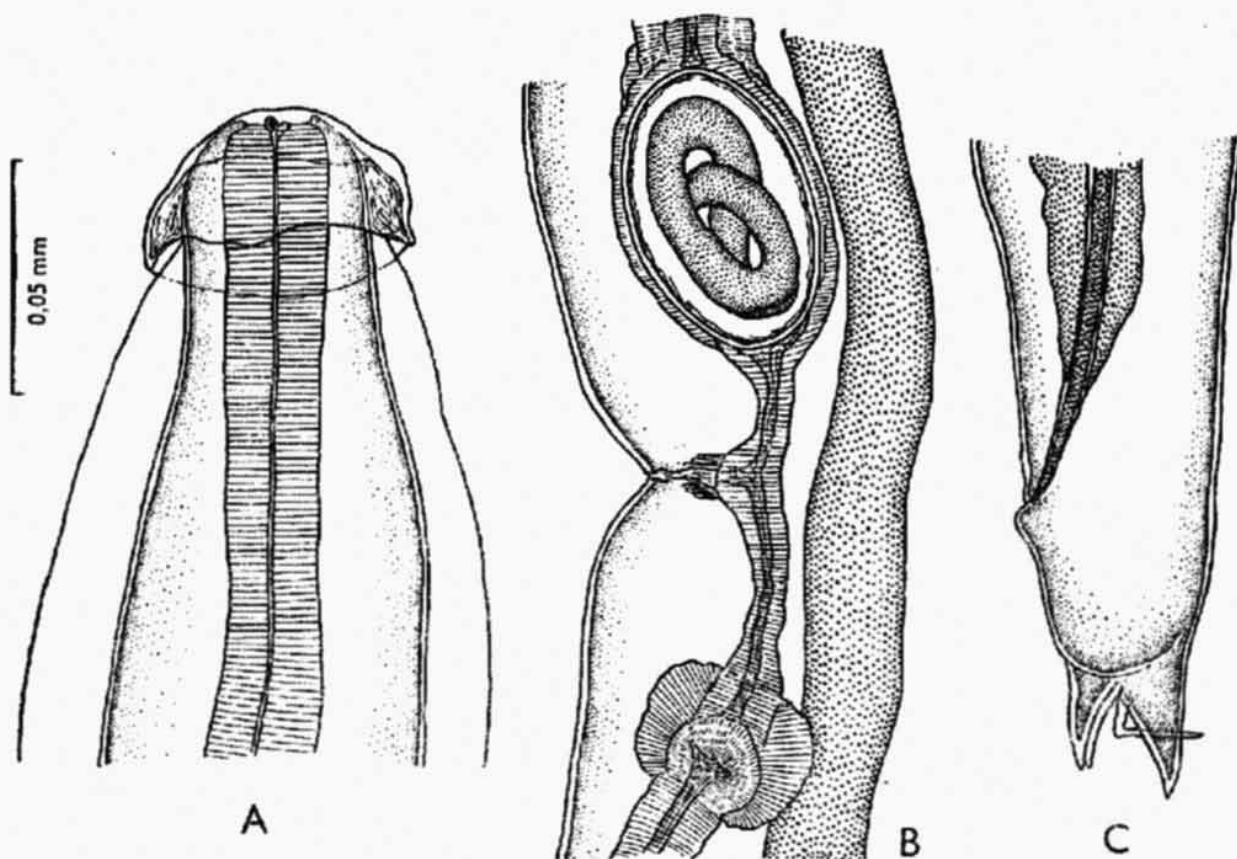


Fig. 4. *Tricholeiperia* sp. from the small intestine of *Natalus lepidus*. A — anterior part of body; B — vulva region (lateral view); C — posterior part of female (detail). Orig.

Table 2. Survey of important body dimensions of nematodes of the genus *Allintoshius* Chitwood, 1937 and *Parallintoshius* Araujo, 1940 (in mm)

Species	<i>Allintoshius cubaensis</i> n. sp.	<i>A. nycitecius</i>	<i>A. travassosi</i>	<i>Parallintoshius parallintoshius</i>	<i>P. tadaridae</i>	<i>P. urumiac</i>	<i>P. nudicianus</i>
Dimensions	Our measurements	After CHITWOOD (1937)	After CHANDLER (1938)	After LENT, FREITAS ET PROENCA (1946)	After CABALLERO (1942)	After FREITAS ET MENDONCA (1960)	After FREITAS ET MENDONCA (1963)
MALES							
Body length	3.22	2.5—2.6	3.5—4.5	2.92—3.48	4.923—5.189	3.28	1.66—1.91
Maximum width	0.108	0.066—0.085	0.082	0.065—0.081	0.067—0.083	0.070	0.05—0.07
Length of cephalic vesicle	0.039	—	0.07	0.061—0.070	0.082—0.108	0.042	0.061—0.065
Width of cephalic vesicle	0.036	—	0.04	0.025—0.029	0.033—0.045	0.029	0.025—0.032
Oesophagus length	0.342	0.2—0.23	0.3	0.25—0.27	0.263—0.372	0.24	0.28
Spicule length	0.165	0.103—0.108	0.07—0.075	longer	0.061—0.065	0.034	0.036—0.040
Gubernaculum length	0.051	—	0.025	0.156—0.168 shorter 0.135—0.148 0.053—0.061	0.016—0.020	0.007	absent
FEMALES							
Body length	7.01—7.85	5.2	8—10	4.49—5.35	7.288—8.571	3.40—5.02	3.15
Maximum width	0.190—0.204	0.10	0.125—0.14	0.081	0.125—0.176	0.075	0.08
Length of cephalic vesicle	0.078	—	0.07	0.066—0.070	0.098—0.102	0.055—0.067	0.065
Width of cephalic vesicle	0.042—0.045	—	0.04	0.033—0.045	0.033—0.041	0.023—0.025	0.022
Oesophagus length	0.360	0.316	0.3	0.30—0.32	0.335—0.380	0.23—0.29	0.33
Vulva distance from posterior end	2.58—2.65	—	1.05—1.25	1.30—1.33	1.749—2.082	0.95—1.21	0.66
Anus distance from posterior end	0.201—0.233	—	0.125—0.150	0.074—0.082	0.098—0.110	0.063—0.076	0.08
Eggs	0.078—0.084 × 0.039—0.045	0.085—0.090 × 0.033—0.037	0.072 × 0.040	0.061—0.066 × 0.037—0.041	0.082—0.090 × 0.045—0.049	0.050—0.059 × 0.029—0.034	0.072 × 0.043

Locality: Cueva de William Plamer, Guanajay (province Pinar del Río).

This species was found only in one of the 48 specimens of *N. lepidus* examined (one female worm).

Description: Body yellow, 3.11 mm long, maximum width 0.084 mm. Cuticle with fine transverse striation. Cephalic cuticle bell-shaped, 0.030 mm in length, maximum width 0.054 mm. Mouth spherical, buccal cavity small with a short blunt tooth. Cervical alae distinctly developed extend close to oesophagus termination. The width of their central part is 0.024 mm. Thin, indistinct, cervical papillae situated at a distance of 0.243 mm from anterior end. Oesophagus 0.510 mm long, maximum width 0.030 mm. Nerve ganglion placed at a distance of 0.141 mm from anterior end. Vulva—a transverse slit—placed on the bottom of a slight depression at a distance of 0.645 mm from the posterior end. Posterior end slightly attenuated, terminating in a thin median spine, which is surrounded by three enormous spines, length 0.020—0.024 mm. Anus at a distance of 0.051 mm from posterior end. Vagina very short. Complete length of ovijector from one sphincter to another 0.195 mm. Ova contain a coiled larva, dimensions of ova 0.054 by 0.039 mm.

The found female specimen, designated *Tricholeiperia* sp. is both morphologically and metrically very close to the species *Tricholeiperia proencai* Travassos, 1935 from the host *Noctilio leporinus* (fam. Noctilionidae). Differences were found only in the distance of the anus and the vulva from the posterior end. For the absence of a male specimen we had to abstain from a more exact determination.

5. *Tricholeiperia poeyi* n. sp.

Fig. 5

Host: *Tadarida* (*Mormopterus*) *minuta* (fam. Molossidae).

Location: small intestine.

Locality: Trinidad, Yaguajay (province Las Villas).

This species was found in 5 of the 12 specimens of *T. minuta* examined (1—10 nematodes in one host). Our material consisted of 5 male and 17 female worms.

Description: Body whitish with distinct longitudinal cuticular ridges. Indistinct transverse striation of the cuticle. Lateral cuticular alae extending along the body. Cephalic vesicle divided by a moderate constriction into two parts; the anterior part of the cephalic vesicle is without transverse striation, the posterior part has a distinct transverse striation. Mouth spherical, terminal. Mouth cavity very small. **Holotype (male):** Body 1.87 mm long, maximum width 0.045 mm. Cephalic vesicle 0.027 mm long. Anterior end with cephalic vesicle 0.021 mm wide. Oesophagus 0.246 mm long, maximum width 0.018 mm. Nerve ganglion at a distance of 0.120 mm from anterior end. Lateral cuticular alae 0.019 mm wide, with distinct transverse striation. Two spicules of equal length, 0.660 mm. No distinct division of their distal end. Gubernaculum 0.042 mm long. Bursa copulatrix almost symmetrical, with wide lateral lobes and an indistinct dorsal lobe. Externodorsal rays arising from common trunk with dorsal ray. Distal end of dorsal ray cleaved into two

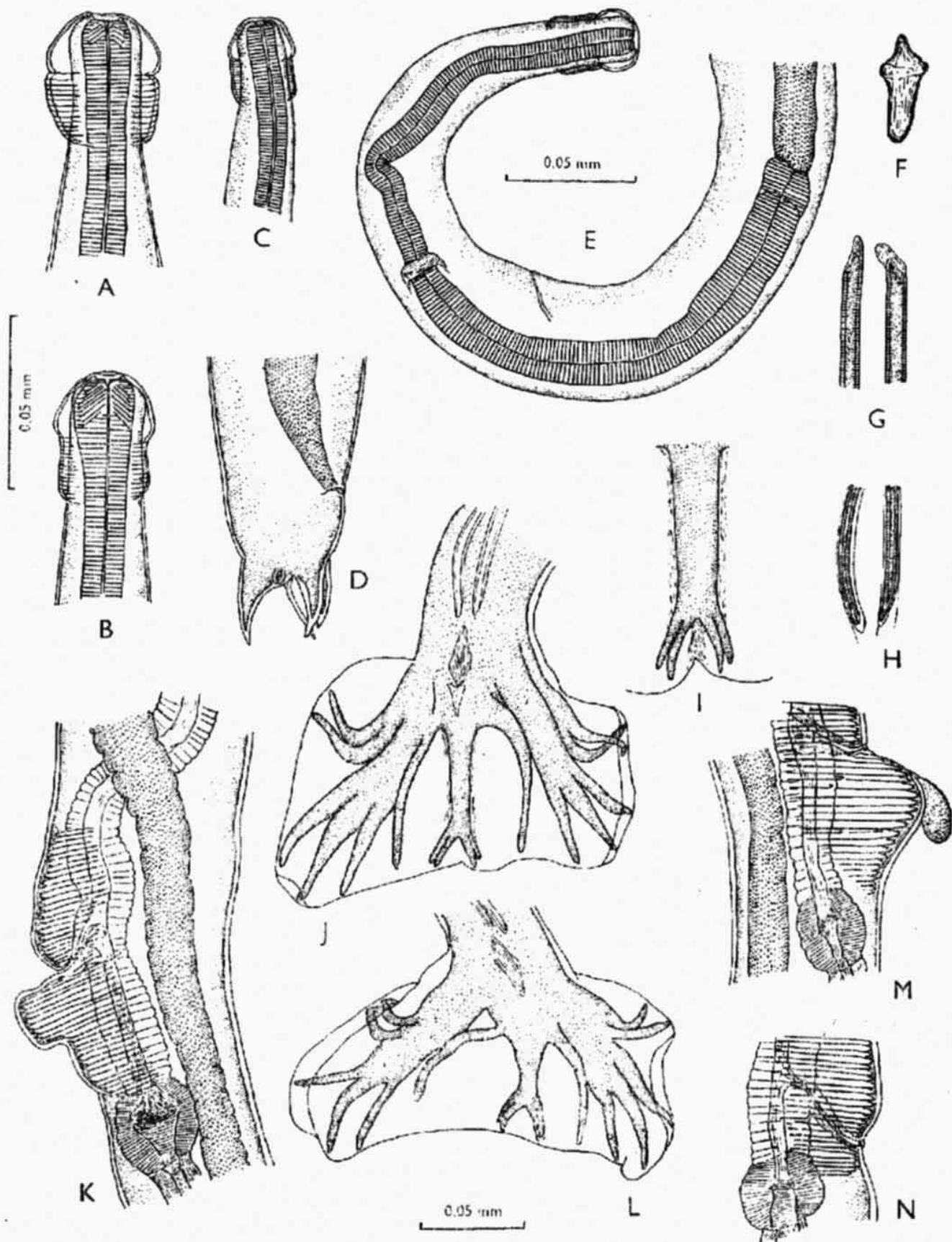


Fig. 5. *Tricholeiperia poeyi* n. sp. from the small intestine of *Tadarida minuta*. A, B, E — anterior part of female; C — anterior part of male; D — posterior part of female (lateral view); F — gubernaculum; G — proximal spicule end; H — distal spicule end; I — dorsal ray; J, L — bursa copulatrix (ventral view); K, M, N — vulva region (lateral view). Orig.

stumps; these divided into two small branches, running close together throughout their course. Lateral rays arising from common trunk, divergent. Ventral rays arising from common trunk, also divergent.

Allotype (female): Body 4.33 mm long, maximum width 0.090 mm. Cephalic vesicle 0.039 mm long. Anterior portion with cephalic vesicle 0.030 mm wide. Oesophagus 0.387 mm long, maximum width 0.033 mm. Nerve ganglion at a distance of 0.171 mm from anterior end. Vulva slit-shaped with prominent surrounding musculature. The lower vulval lip conspicuously protruding to a length of 0.054 mm (in some paratypes less distinct). Vulva at a distance of 1.03 mm from posterior end. Length of ovijector between the sphincters 0.286 mm. Vagina short, uteri divergent. Anus at a distance of 0.036 mm from tip of the tail. Eggs symmetrically oval, size 0.099—0.105 mm by 0.057—0.060 mm. Posterior end of body slightly attenuated, terminating in a slender median spine, which is surrounded by three thick hook-like processes of 0.033 mm in length. One small indistinct papilla arising from the base of each hook. (Paratype sizes are given in Tab. 3.)

Differential diagnosis: The species *Tricholeiperia poeyi* n. sp. was listed to the genus *Tricholeiperia* Travassos, 1935. TRAVASSOS (1937) and YAMAGUTI (1961) mentioned in their diagnosis of this genus the absence of the gubernaculum. In analysing the composition of species of this genus we noted that the gubernaculum was found by the author of the original description in the species *Tricholeiperia proencai* Travassos, 1937. Considering this fact the generic diagnosis will have to be extended.

Our species differ morphologically from the up to date known and described species of this genus (*T. leiperi* Travassos, 1935; *T. proencai* Travassos, 1937 and *T. carnegiensis* Chitwood, 1938) in the shape of the cephalic vesicle, the spicules, the dorsal ray and in the formation of the vulva. Metric differences were found in all body dimensions (see Tab. 3). From the species *T. pearsei* Chitwood, 1938, the description of which is not too complete, it differs in the topography of the rays of the bursa copulatrix and in the length of the spicules. In the species *T. pearsei* Chitwood, 1938 the spicules are 0.8 mm long. By the shape of the cephalic vesicle the species *T. poeyi* n. sp. comes close to the species *N. uncicollis* Baylis, 1930, the only known representative of the genus *Nycteridostromylus* Baylis, 1930. However, there are distinct differences in all other morphological signs of these species. The species has been named in commemoration of the prominent Cuban zoologist Prof. Dr. Felipe Poey.

Type and allotype of the species *Tricholeiperia poeyi* n. sp. are in the collections of the Biological Institute, Cuban Academy of Sciences, Havana. Paratypes are in the collections of the Institute of Parasitology, Czechoslovak Academy of Sciences, Prague.

Table 3. Survey of important body dimensions of nematodes of the genus *Trichoileiperia* Travassos, 1935 and *Nycteridostrongylus* Baylis, 1930 (in mm).

Species	<i>Trichoileiperia poeyi</i> n. sp.	<i>T. leiperi</i>	<i>T. proencai</i>	<i>T. carnegiensis</i>	<i>Nycteridostrongylus uncillolus</i>
Dimensions	Our measurements	After TRAVASSOS (1937)	After TRAVASSOS (1937)	After CHITWOOD (1938)	After BAYLIS (1930)
MALES					
Body length	1.87—2.60	9.3—11.5	4.1—5.0	2.5	5.0—5.5
Maximum width	0.045—0.084	0.15—0.16	0.09—0.12	0.080	0.16—0.17
Length of cephalic vesicle	0.027	0.064—0.08	0.025—0.03	—	0.055—0.065
Width of cephalic vesicle	0.018—0.024	—	—	—	0.045—0.05
Oesophagus length	0.246—0.279	0.45—0.49	0.4—0.45	—	0.33—0.39
Spicule length	0.660—0.729	0.81—0.92	0.217—0.262	0.3	0.6
Gubernaculum length	0.033—0.039	absent	0.03	—	present
FEMALES					
Body length	3.82—5.46	16.0—17.0	4.4—6.2	2.54—2.98	6.1—6.9
Maximum width	0.090—0.153	0.21—0.23	0.11—0.16	0.080—0.090	0.19—0.24
Length of cephalic vesicle	0.036—0.042	0.064—0.08	—	—	0.055—0.065
Width of cephalic vesicle	0.030—0.039	—	—	—	0.045—0.05
Oesophagus length	0.315—0.450	0.52—0.56	0.5	0.34—0.35	0.36—0.44
Ovijector length	0.240—0.357	0.6	0.13—0.15	—	0.35
Vulva distance from posterior end	0.625—1.210	4.0—4.6	1.3—1.9	—	0.652—1.210
Anus distance from posterior end	0.039—0.054	0.061—0.16	0.09—0.13	—	0.087
Eggs	0.099—0.117 × 0.048—0.066	0.081—0.083 × 0.45	—	—	0.087—0.105 × 0.050—0.062

6. *Biacantha silvai* n. sp.

Fig. 6

Host: *Natalus* (*Nyctiellus*) *lepidus* (fam. Natalidae).

Location: stomach and small intestine.

Locality: Cueva de William Palmer, Guanajay (province Pinar del Río).

Nine of the examined 48 hosts *N. lepidus* were found positive (intensity of invasion 1—3 nematodes in one host). The complete material comprised 6 male and 7 female worms of this species.

Description: Small nematodes of brownish colour. Cuticle with a distinct longitudinal and indistinct transverse striation. Buccal cavity small, mouth terminal. Short

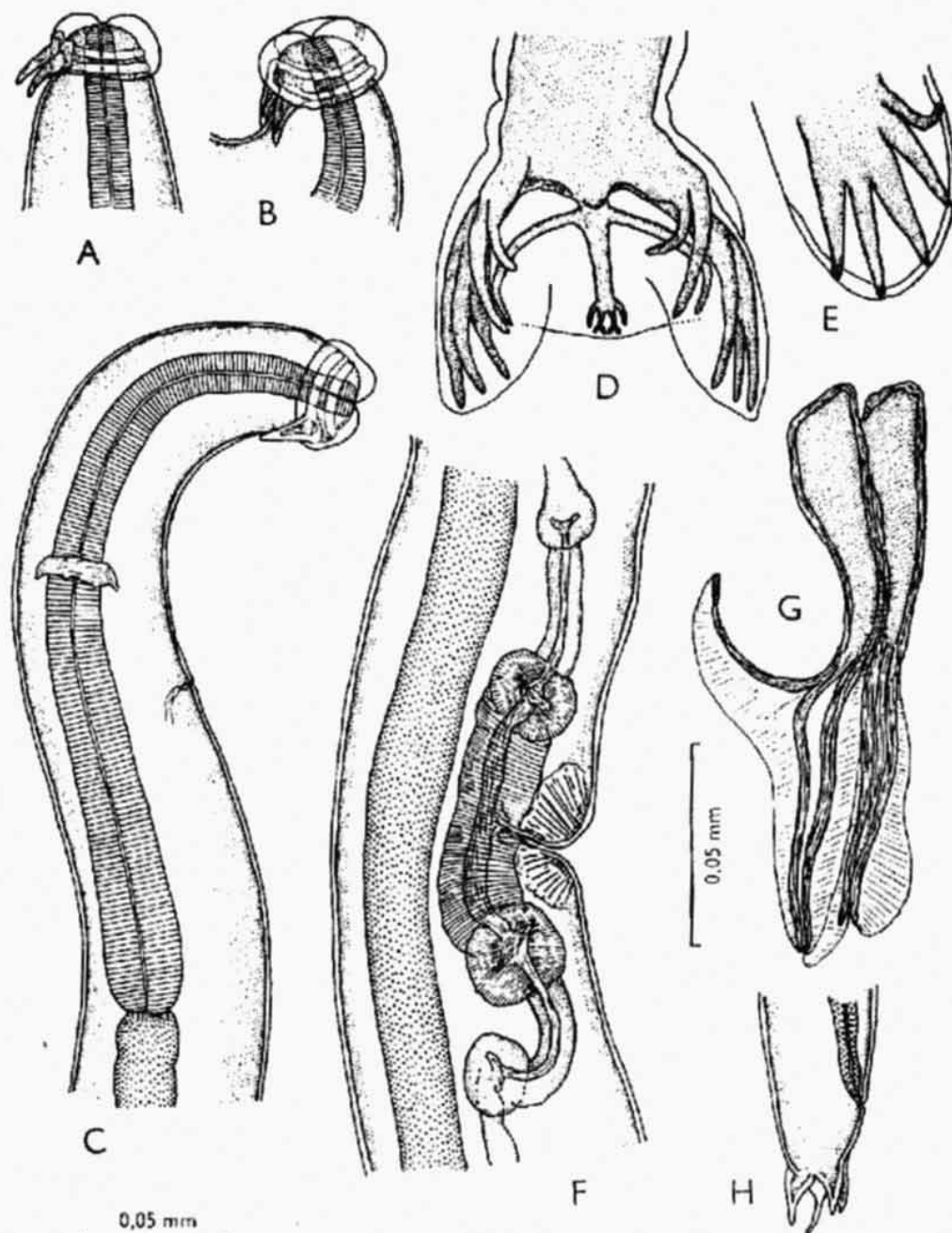


Fig. 6. *Biacantha silvai* n. sp. from the stomach and small intestine of *Natalus lepidus*. A, B, C — anterior part of body (lateral view); D — bursa copulatrix (ventral view); E — lateral lobe of bursa copulatrix; F — vulva region (lateral view); G — spicules; H — posterior end of female (lateral view). Orig.

cephalic cuticle expanded widely over the anterior portion of the body, ventrally provided with two stout pseudochitinized hooks, directed caudally. The base of hooks forms a ring round the anterior end. Nerve ganglion and excretory pore at middle third of oesophagus length.

Holotype (male): Length 2.29, maximum width 0.072 mm. Cephalic vesicle 0.024 mm long. Width of anterior portion with cephalic vesicle 0.039 mm. Length of hooks arising from cephalic vesicle 0.021 mm. Length of oesophagus 0.435 mm, maximum width 0.024 mm. Two spicules of equal length and shape present. The upper half of the spicule compact, the lower half divided into three processes with wide cuticular borders. Spicule length 0.144 mm. Gubernaculum little distinct. Bursa copulatrix symmetrical with wide lateral lobes and an almost unseparated dorsal lobe. Externodorsal rays arising from common trunk with dorsal, caudad, reaching bursal margin. Dorsal bifurcated distally into four branches and lower down into two small branches. Lateral rays arising from common trunk, divergent, reaching the bursal margin. Ventral rays deeply divided from each other, latero-ventral rays thicker and longer than ventroventral, directed cephalad.

Allotype (female): 2.79 mm long, maximum width 0.111 mm. Cephalic vesicle 0.030 mm long. Width of anterior part with cephalic vesicle 0.051 mm. Length of hooks arising from vesicle 0.030 mm. Oesophagus 0.453 mm long, maximum

Table 4. Survey of important body dimensions of nematodes of the genus *Biacantha* Wolfgang, 1954 (in mm)

Species	<i>Biacantha desmoda</i> After WOLFGANG (1954)		<i>Biacantha silvai</i> n. sp. Our measurements	
	Male	Female	Male	Female
Body length	6.76—6.94	6.57—8.06	1.14—2.29	1.87—2.79
Maximum width	0.23	0.20—0.23	0.072—0.078	0.111
Length of cephalic vesicle	0.05—0.06	0.03—0.04	0.024—0.033	0.027—0.030
Width of cephalic vesicle	0.09	0.04	0.030—0.045	0.044—0.051
Length of cephalic hooks	0.02	0.03	0.021—0.024	0.030
Oesophagus length	0.62—0.65		0.213—0.435	0.453
Distance of nerve ganglion from anterior end	0.09		—	0.195
Spicule length	0.16	—	0.135—0.144	—
Vulva distance from posterior end	—	in the posterior half of body	—	0.476—0.789
Anus distance from posterior end	—	0.18—0.23	—	0.042—0.057
Length of caudal spines	—	0.03—0.04	—	0.021—0.024
Eggs	—	0.10—0.17	—	0.075—0.084
		× 0.08—0.14		× 0.048—0.054

width 0.036 mm. Nerve ganglion at a distance of 0.195 mm from anterior end. Vulva in posterior half of body at a distance of 0.789 mm from the termination of the tail. Slit-shaped, placed inside a small impression. Anterior and posterior vulval lip rounded. Ova, numbering four (in the other females, the number of ova not exceeding six), size 0.075—0.084 by 0.048 to 0.054 mm. Posterior end slightly attenuated into a slender tail, surrounded by three cuticular spines. Anus at a distance of 0.057 mm from posterior end. (Paratype sizes given in Tab. 4.)

Discussion: The new nematode species *Biacantha silvai* n. sp. from the host *N. lepidus* has been listed to the genus *Biacantha* Wolfgang, 1954. This genus comprises only a single species *B. desmoda* Wolfgang, 1954 from the host *Desmodus rufus* (fam. Desmodontidae) from the island of Trinidad. The morphology of the species *B. silvai* n. sp. is in full agreement with the generic diagnosis of the genus *Biacantha*. By the shape of the dorsal ray and the topography (distribution) of the other rays of the bursa copulatrix this species is in close relation to the species *B. desmoda*. Significant differences were observed in the other morphological and especially metric signs (see Tab. 4), which justified the erection of *B. silvai* n. sp. as a new taxon. The species was named in honour of Dr. Gilberto Silva Taboada, research officer of the Biological Institute, Cuban Academy of Sciences, Havana.

The type and allotype of the species *B. silvai* n. sp. are in the collections of the Biological Institute of the Cuban Academy of Sciences, Havana. The paratypes are in the collections of the Institute of Parasitology, Czechoslovak Academy of Sciences, Prague.

SUBFAMILY: SPINOSTRONGYLINAE TRAVASSOS, 1935

GENUS: *HISTIOSTRONGYLUS* MOLIN, 1861

7. *Histiostrongylus coronatus* Molin, 1861

†

Fig. 7

Host: *Phyllonycteris poeyi* and *Chilonycteris fuliginosa torrei* (fam. Phyllostomidae).

Location: Stomach and small intestine.

Locality: Cueva de William Palmer, Guanajay (province Pinar del Río) and San José del Lago, Mayajigua (province Las Villas).

Of the total of 31 hosts *P. poeyi* examined this species was found in 4 hosts (intensity of invasion 3 to 7 nematodes in one host). Of the 74 examined *Ch. fuliginosa torrei* this species was found only in one host (3 nematodes).

This nematode species was described by MOLIN (1861) from the host *Phyllostoma discolor* (fam. Phyllostomidae) from Brasil (Matto Grosso region). The second and still only finding was described by PÉREZ VIGUERAS (1941), who added a detailed redescription of this species. He found this species in the host *Phyllonycteris poeyi* in Cuba (locality Jamaica near Havana). Our material from this host and from the new host *Ch. fuliginosa torrei* is morphologically in full agreement with the redescription by PÉREZ VIGUERAS (1941).

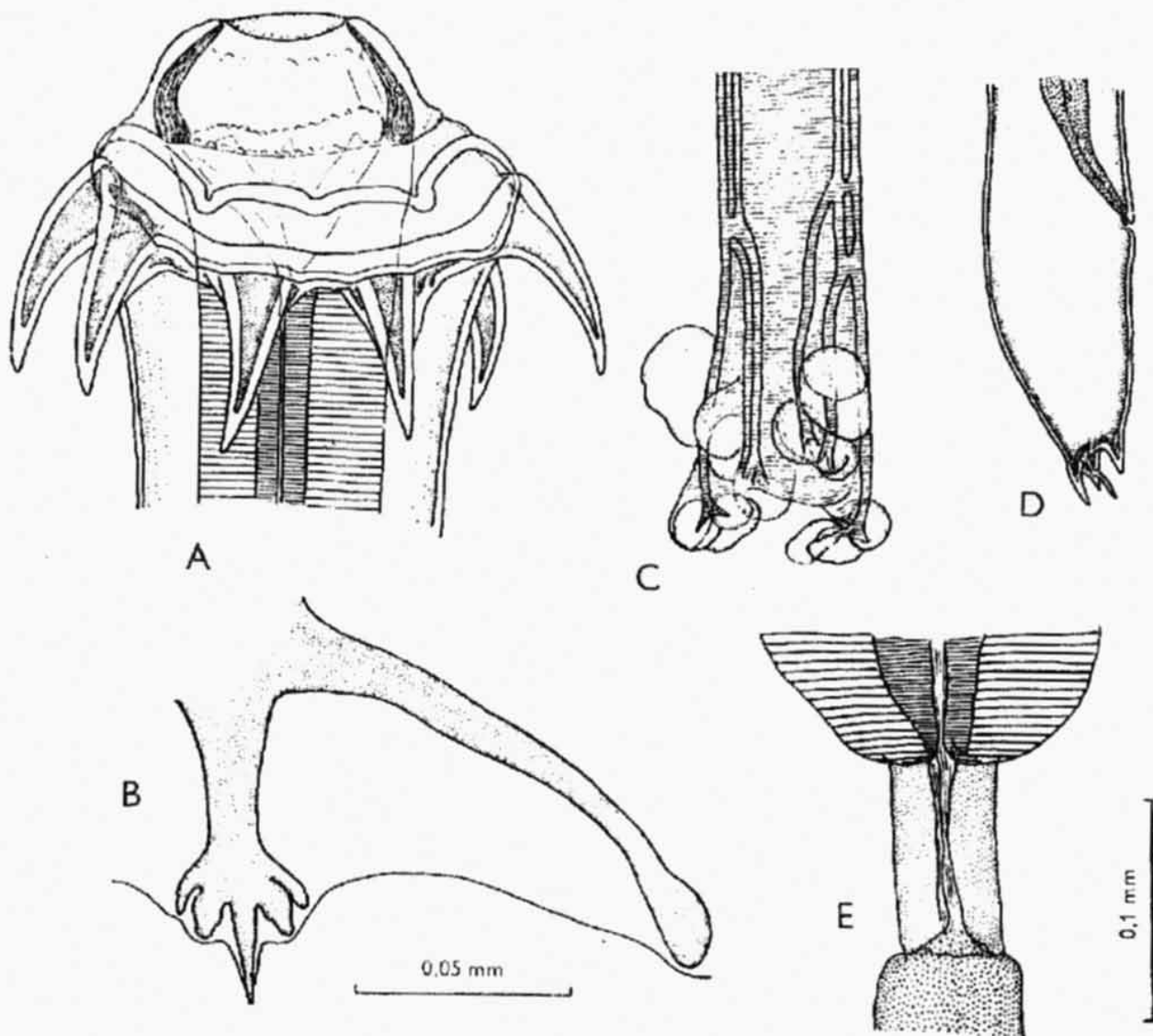


Fig. 7. *Histiostrogylus coronatus* Molin, 1861 from the stomach and the small intestine of *Phyllonycteris poeyi*. A — anterior part of body; B — dorsal and externodorsal ray; C — distal spicule end; D — posterior end of female (lateral view); E — termination of oesophagus. Orig.

SPIRURATA

Family: Spiruridae

GENUS: *PHYSOCEPHALUS* DIESING, 1861

8. *Physocephalus* sp. (larvae)

Hosts: *Natalus* (*Nyctiellus*) *lepidus* (fam. Natalidae) and *Chilonycteris fuliginosa torrei* (fam. Phyllostomidae).

Location: In cysts on the stomach wall and the intestine (each cyst containing one larva).

Locality: Cueva de William Palmer, Guanajay (province Pinar del Río).

Of a total of 48 *N. lepidus* examined the nematode larvae of this genus were found in 5 hosts (intensity of invasion 2—40 larvae in one host). Of the 72 examined *Ch. fuliginosa torrei*, larvae were found in 6 hosts (intensity of invasion 2—40 larvae in one host).

Our larvae are in their morphology and measurements almost in harmony

with the description of larvae of the species *Physocephalus sexalatus* (Molin, 1861) after RYZHIKOV (1952). This species parasitises in its adult stage in the stomach and intestine of mammals (principally of the family Suidae). The distribution of the invasive larvae of this nematode in various vertebrates which is a typical manifestation of reservoir habitationism (RYŠAVÝ, BARUŠ 1965) was recorded by many authors, e.g. CRAM (1930), CHABAUD (1950), RYZHIKOV (1952) RYZHIKOV and NAZAROVA (1959), DUBININA and KULAKOVA (1960), BARUŠ (1966).

ASCARIDATA

Family: Stomachidae

GENUS: *CONTRACAEUM* RAILLIET ET HENRY, 1912

9. *Contracaecum* sp. (larvae)

Fig. 8

Host: *Noctilio leporinus mastivus* (fam. Noctilionidae).

Location: stomach.

Locality: Cueva Grande Gaguanes, Mayajigua (province Las Villas).

Of the total of 9 *N. leporinus mastivus* examined this larvae were found in a single host (2 specimens). Up to date, no recordings have been made on the findings of larva or adult stages of nematodes of the genus *Contracaecum* in hosts of the order *Chiroptera*. Ecological conditions are convenient for the occurrence of nematode larvae of this genus in *N. leporinus mastivus*, feeding on fish.

Description: Larval body yellowish, cuticle with distinct transverse striation, length 3.48—5.65 mm, maximum width 0.204 to 0.312 mm. Buccal cavity surrounded by three lips and small indistinct interlabia. Width of anterior part at the level of lip base 0.057 mm. Oesophagus 0.80—1.08 mm long, maximum width 0.060—0.096 mm. Stomach length 0.072—0.122 mm, width 0.072—0.095 mm, appendix 0.237 to 0.297 mm long and 0.066—0.115 mm wide. Intestinal caecum 0.513—0.693 mm long and maximum width 0.072—0.136 mm. Nerve ganglion at a distance of 0.201—0.231 mm from anterior portion. Posterior portion conically attenuated, terminating in a rounded tip. Anus at a distance of 0.072—0.096 mm from posterior end.

FILARIATA

Family: Dipetalonematidae

GENUS: *LITOSOMOIDES* CHANDLER, 1931

10. *Litosomoides guiterasi* (Pérez Vigueras, 1934)

Hosts: *Tadarida* (*Tadarida*) *laticaudata yucatanica*: *T. (T.) brasiliensis muscula* (fam. Molossidae).

Location: body cavity.

Locality: Cueva de William Palmer, Guanajay (province Pinar del Río).

Of the 9 examined *T. laticaudata yucatanica* two were positive (we found 1 male and female nematode of this species). Of the 12 examined *T. brasiliensis muscula* only one specimen was positive (fragments of one female worm).

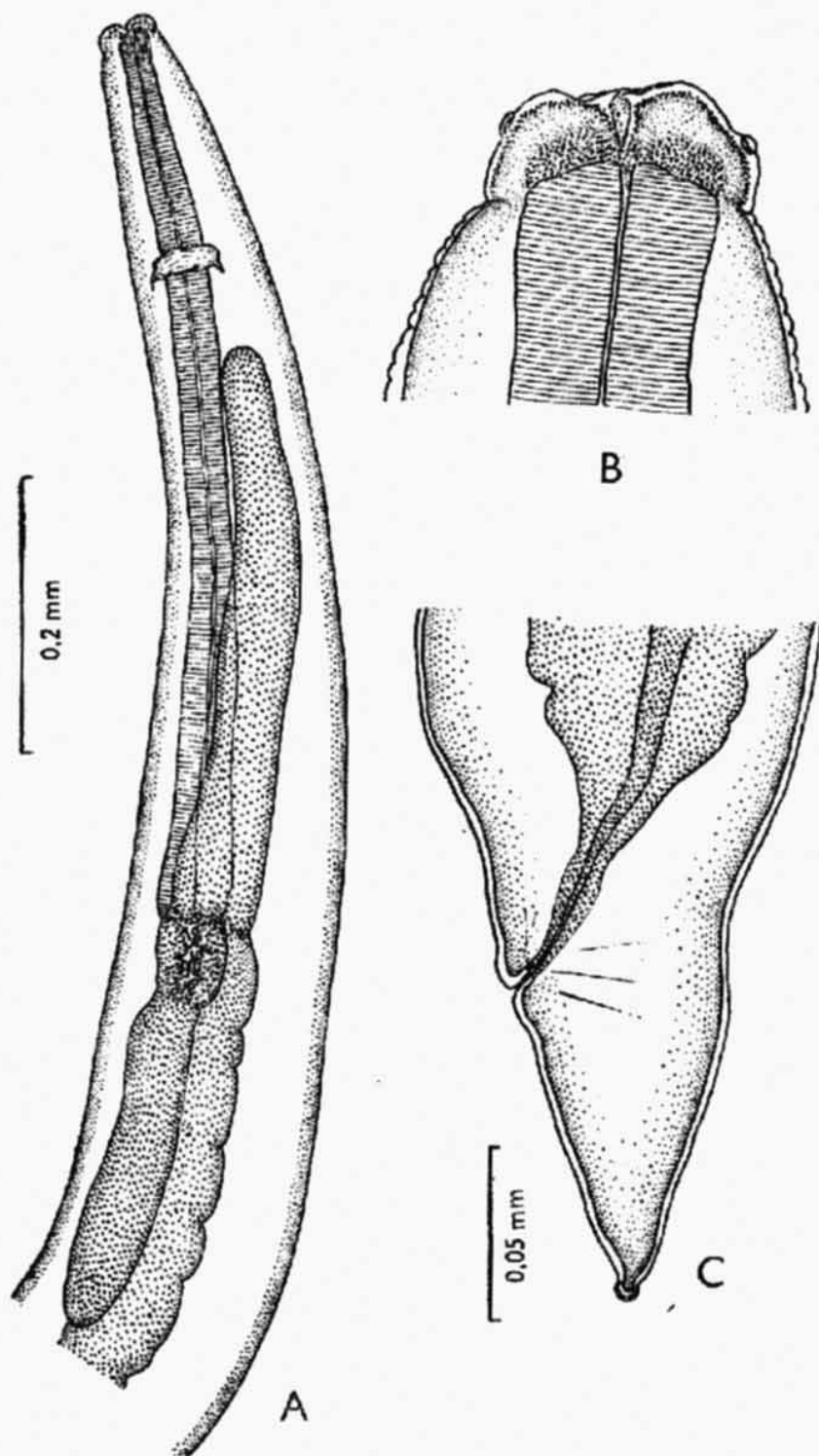


Fig. 8. *Contracaecum* sp. (larvae) from the stomach of *Noctilio leporinus mastivus*. A, B — anterior part of body; C — posterior part of body (lateral view). Orig.

This nematode species was first described by PÉREZ VIGUERAS from the host *Artibeus jamaicensis parvipes* (fam. Phyllostomidae) from localities of the provinces Santa Clara and La Habana and designated *Finlaynema guiterasi*. SANDGROUND (1934), after a revision of the original material, relisted this species to the genus *Litosomoides*.

TRICHOCEPHALATA

Family: Capillariidae

GENUS: *CAPILLARIA* ZEDER, 1800

11. *Capillaria cubana* Freitas et Lent, 1937.

Host: *Molossus major tropidorhynchus* (fam. Molossidae).

Location: stomach.

Locality: Santiago de Cuba (province Oriente) and Marianao-La Habana (province La Habana).

This nematode species was found in 6 of the 17 examined *M. major tropidorhynchus* (intensity of invasion 1—6 nematodes in one host).

This species was first described by FREITAS and LENT (1937) from the host *Artibeus jamaicensis parvipes* (fam. Phyllostomidae) from the localities Santa Clara and La Habana. Our material of this species found in a new host, is morphologically and metrically in full agreement with the original description.

12. *Capillaria phyllonycteri* Baruš et del Valle, 1967

Host: *Phyllonycteris poeyi* (fam. Phyllostomidae).

Location: Cueva de William Palmer, Guanajay (province Pinar del Río).

Nematodes were found in 2 of the examined 31 *P. poeyi* (7 female worms and fragments of 3 males in the one host, in the other 2 female worms). The original description of this species was published by BARUŠ and DEL VALLE (1967).

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