

Free-living nematodes from nature reserves in Costa Rica Genera *Egtitus* Thorne, 1967 and *Trachypleurosum* Andrásy, 1959 (Dorylaimida: Actinolaimidae)

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Abstract. Some actinolaimid nematode species belonging to the genera *Egtitus* Thorne, 1967 and *Trachypleurosum* Andrásy, 1959 are described or redescribed from Costa Rica. *Egtitus costaricae* sp. nov. is distinguished from the related species, *E. biformis* Andrásy, 2012, *E. neocyatholaimus* (Kreis, 1936) and *E. proximus* (Yeates, 1973), by the wide lip region (21–23 vs 15–17 µm) and the low number of the male supplements (6–8 vs 9–13). The Costa Rican specimens of *Trachypleurosum venezolanum* Coomans, Vinciguerra & Loof, 1990 correspond well with the original description. Three probable new species, viz. *Egtitus* sp. 1, *Egtitus* sp. 2 and *Trachypleurosum* sp. are also described on the basis of male specimens, but due to lack of females they are not provided with species names. In the Appendix five genera and forty-two species of free-living nematodes described as new to science from Costa Rica are listed.

Keywords. Costa Rica, description, *Egtitus*, list of new taxa, taxonomy, *Trachypleurosum*.

INTRODUCTION AND MATERIAL

It is known from the fundamental papers by Esquivel (2003) and Bongers, Esquivel and Arias (2003) that the nematode fauna of Costa Rica is very rich in genera and species. That is due to the wide range of inland and seaside ecosystems on the one hand, and to the regions being almost untouched by human influence on the other. There is hardly another country on the Globe where nature would be protected with such great care as in Costa Rica.

The above-mentioned papers report on about 20,000 nematode specimens belonging to 230 genera deposited in the Nematology Laboratory at the Universidad Nacional in Heredia, Costa Rica. Although these numbers increased considerably in the course of the subsequent years, only a small percent of the nematodes has hitherto been identified to species level. In an “Appendix” at the end of the present paper, we compiled a list of the free-living (inclusive plant-parasitic) nematode genera (5) and species (42) that have been de-

scribed as new to science from Costa Rica.

In this study, we report on some actinolaimid nematodes of the Costa Rican collection belonging to the genera *Egtitus* Thorne, 1967 and *Trachypleurosum* Andrásy, 1959. We studied a total of 44 exemplars (27 females, 15 males and 2 juveniles), mounted on aluminium slides that have been collected in various protected areas of the Central American country. Unfortunately, we had only two populations that contained both female and male specimens. In the other populations, eight in number, we only found either females or males (mostly a single specimen).

As a result, we describe a new species of *Egtitus* and a known but rare species of *Trachypleurosum*. Besides, males of three further species of these genera are presented. It is not impossible that each of them represents a new species, but on the basis of one sex (or one specimen) we do not want to provide them with species names. In those populations where only females were present we could not determine them even to genus level,

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since to separate *Egtitus* and *Trachypleurosum* males are necessary.

Egtitus Thorne, 1967 contains actinolaimid nematodes mainly characterised by the absence of denticles in the dental chamber and by sexual dimorphism in the shape of the tail (long and conical in female, short and rounded in male). Quite recently, Andr ssy (2012) rediagnosed the genus and listed 28 species belonging to it. *Trachypleurosum* Andr ssy, 1959 also has an adenticulate stomatal chamber, but differs from *Egtitus* by having a long and conical tail in both sexes. The latter genus includes five species. As far as is known, both genera are distributed in Asia, Africa and Latin America.

Of the family Actinolaimidae six species have hitherto been recorded from Costa Rica: *Brasilaimus bidentatus* Loof & Zullini, 2000, *B. bryophilus* (Hunt, 1978) Vinciguerra, Zullini & Monteiro, 1999, *B. memorabilis* (Andr ssy, 1968) Vinciguerra, Zullini & Monteiro, 1999, *B. subaquilus* Lordello & Zamith, 1957, *B. vinciguerrae* Loof & Zullini, 2000 and *Practinocephalus secundus* Andr ssy, 1968.

DESCRIPTIONS

Egtitus costaricae sp. nov.

(Figures 1 A–E and 2 A–C)

Holotype female: L = 2.12 mm; a = 44; b = 4.5; c = 11.5; c' = 7.6; V = 51 %.

Paratype females (n = 10): L = 2.00–2.39 mm; a = 38–46; b = 4.3–4.7; c = 11.2–14.0; c' = 6.3–8.0; V = 51–54 %.

Paratype males (n = 7): L = 1.77–2.00 mm; a = 40–52; b = 3.8–4.3; c = 60–74; c' = 0.8–1.0.

General characters. Body nearly straight after fixation, more curved in posterior part of male, 45–62 (female) or 37–48 (male) μm wide at middle. Cuticle smooth under light microscope, 2.0–2.5 μm thick on most body and 3.0–3.5 μm thick on anterior part of the female tail. Lip region

expanded, offset by a depression, 21–23 μm wide and 8–9 μm high. Lips rounded, amalgamated. Body at posterior end of pharynx 2.0–2.4 times as wide as lip region. Amphids caliciform with aperture about half the corresponding body width.

Labial and dental chambers¹ well separated, the former 12–14 μm , the latter 7–8 μm broad. Labial disc 7 μm wide. Vestibular ring corrugated. Pharyngeal denticles absent. Onchia simple, uni-tipped. Guiding ring double but thin, 7–8 μm wide, located at 16–18 μm from labial field. Odontostyle 21–24 μm long and 2.5–3.0 μm thick, about as long as labial diameter or 4.1–4.9 % of pharyngeal length, thicker than cuticle at the same level. Aperture two-fifths to almost half the stylet length. Odontophore 30–35 μm long. Pharynx 470–536 (female) or 436–470 μm (male) long, at 47–50 % expanded. Medial, conoid part of pharynx 60–70 μm long, occupying 13–15 % of total pharyngeal length. Because of the heavy muscular structure, the pharyngeal gland nuclei are difficult to discern. D = 51–52 % or at 11–12 % of total body length. AS1 nucleus invisible, AS2 = 49–52 %, PS1 = 73–75 %, PS2 = 74–77 %. Glandularium 222–258 μm long. Posterior end of pharynx with a shallow disc. Cardia conical.

Female. Reproductive system didelphic, amphidelphic. Genital branches highly and equally developed, each as long as 6.5–8.0 body widths or occupying 15–17 % of body length. Vulva a short longitudinal slit with slightly sclerotized inner lips. Vagina 18–19 μm long, 30–37 % of corresponding body diameter. Uterus packed with spermatozoa. One female with one, another with two, and a third with three uterine eggs measuring 95–110 \times 36–46 μm ; eggs 1.4–2.0 times as long as corresponding body diameter. Distance between posterior end of pharynx and vulva 1.3–1.4 times as long as pharynx. Rectum 1.2–1.6, prerectum 2.1–3.2 anal body widths long. Vulva–anus distance equal to 4.5–5.8 tail lengths. Tail 152–185 μm long, 6.8–8.7 % of entire length of body, rather uniformly tapered to its fine and sharp tip. Posterior half of tail slightly bent dorsally.

¹ See Andr ssy, 2012, Fig. 1.

An aberrant female was also found in the population studied. It had a reduced anterior genital branch, more a sack, 1.8 body widths long, and a shorter tail than the other females of the same population (98 μm , $c' = 5.2$ vs 152–185 μm , $c' = 6.3$ –7.6)

Male. Testes two, straight, moderately developed, the anterior 6–7 body widths long, or occupying 12–13 % of total body length, the posterior 7–8 body widths long, or occupying 14–15 % of total body length. Spermatozoa fusiform, 7 μm long. Spicula dorylaimoid, 40–45 μm long, distinctly longer than tail. Ventromedian supplements very small, hardly discernible, spaced, six to eight in number (6 or 8 in one male each and 7 in five males); posteriormost of them at a distance of 45–55 μm from cloaca. Series of supplements 55–70 μm long. Prerectum beginning at level of the first or second supplement. Tail conoid-rounded, 22–30 μm long, occupying 1.3–1.7 % of entire length of body.

Diagnosis and relationships. Body in male somewhat under, in female over 2 mm (on average 1.87 and 2.20 mm, respectively), the male is slimmer than the female. Other main characteristics are the broad and moderately separated lip region, medium long odontostyle equal in length to the labial diameter, broad labial chamber, pharynx expanded at its middle, rather short prerectum, short spicula, six to eight very small supplements, medium long and uniformly tapered female and short, conoid-rounded male tail.

In having a body length ranging from 2.0 to 2.4 mm and a medium long tail (equalling to 6–8 anal body widths), this new species resembles *Egtitus biformis* Andr ssy, 2012, *E. neocyatholaimus* (Kreis, 1936) Thorne, 1967 and *E. proximus* (Yeates, 1973) Vinciguerra, 1988. It can easily be distinguished from them by the number of the male supplements (6–8 vs 10, 12–13 and 9–10, respectively) as well as by the width of the lip region (21–23 vs 15–17 μm , in *E. proximus* originally not given).

The overwhelming majority of *Egtitus* species inhabit Asia–Australasia (22 species), from the American continent (Central- and South America) four species have been recorded hitherto (Andr ssy, 2012), while two species are known to occur in Africa. If we compare *E. costaricae* sp. nov. with the American species – *E. bryophilus* Thorne, 1967 (Puerto Rico, Peru), *E. chilenus* Andr ssy, 2012 (Chile), *E. elaboratus* (Cobb, 1906) Thorne, 1967 and *E. surinamensis* (Micoletzky, 1925) Thorne, 1967 (Surinam, Guayana) – we find that it differs from *E. bryophilus* by the wider lip region (21–23 vs 15–17 μm), longer odontostyle (21–24 vs 17–19 μm) and longer female tail ($c' = 6.3$ –8.0 vs 5.4–6.0), from *E. chilenus* by the broader lip region (21–23 vs 18–19 μm), longer tail ($c' = 6.3$ –8.0 vs 4.3–5.3) and lower number of supplements (6–8 vs 10–11), from *E. elaboratus* by longer body (2.0–2.4 vs 1.7–1.8 mm) and longer tail ($c' = 6.3$ –8.0 vs 4.4–5.3), and from *E. surinamensis* (incompletely described) by the longer body of male (1.8–2.0 vs 1.4 mm; female unknown in *surinamensis*).

Type habitat and locality. Rotten tree branch with many small basidiocarps taken close to a freshwater stream in a primary forest, 200 to 300 m above sea level, Hitoy Cerere Biological Reserve, La Amistad Caribe Conservation Area, Costa Rica. Collected in August 1998 by A. Esquivel, A. Zullini and R. G mez.

Type specimens. Holotype female on slide No. 360.09. Paratypes: 13 females and 7 males (on the slides No. 360.07–14), deposited at the Nematology Laboratory of the Universidad Nacional in Heredia, Costa Rica.

Etymology. Named after the country where found, Costa Rica.

Egtitus sp. 1

(Figures 3 A–D)

Male (n = 3): L = 1.47–1.54 mm; a = 53–60; b = 3.9–4.5; c = 86–110; $c' = 0.7$ –0.8.

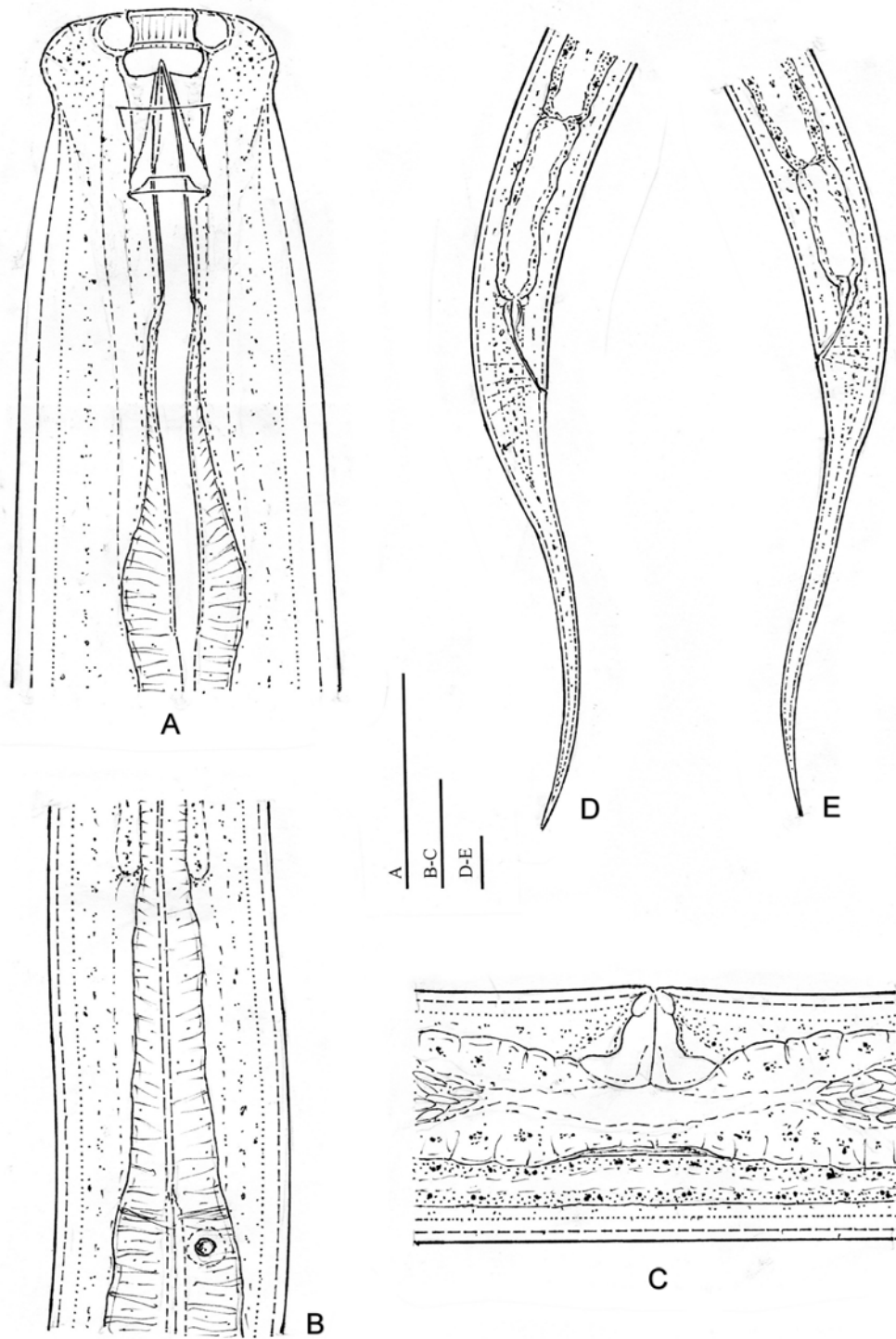


Figure 1. *Egtitus costaricae* sp. nov. A: anterior end; B: medial section of pharynx; C: vulval region; D–E: tail of females. (Scale bars = 20 μ m)

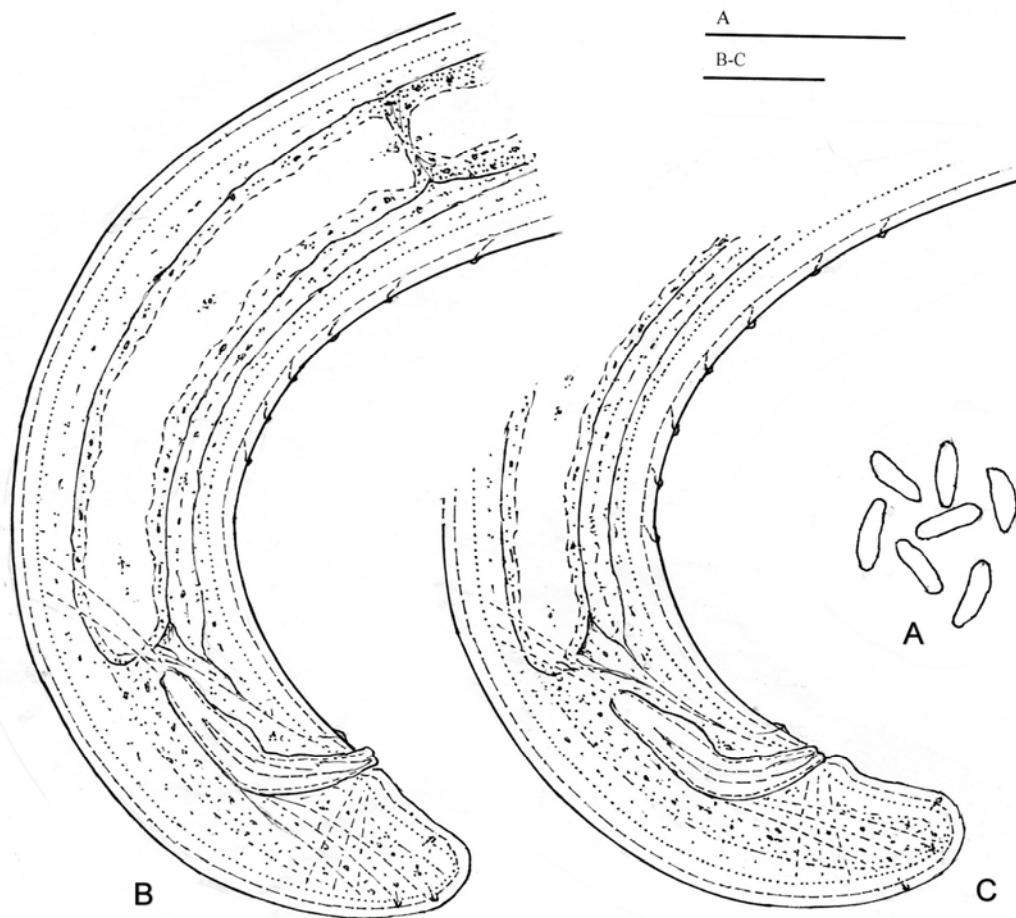


Figure 2. *Egitus costaricae* sp. nov. A: spermatozoa; B-C: posterior end of males. (Scale bars = 20 μ m)

General characters. Body C-shaped after fixation, slender, 41–48 μ m wide at middle. Cuticle smooth under light microscope, only 1.5–2.0 μ m thick on most body, but very thick, 5–8 μ m on pre-cloacal (supplemental) region. Lip region expanded, wider than adjacent body, offset by a depression, 23–24 μ m wide and 9–10 μ m high. Lips rounded, completely amalgamated. Body at posterior end of pharynx 2.0–2.2 times as wide as lip region. Amphids caliciform with aperture about half the corresponding body width.

Labial and dental chambers well separated, the former 14–15 μ m, the latter 7–9 μ m broad; labial disc 7–8 μ m wide. Vestibular ring corrugated.

Pharyngeal denticles absent. Onchia simple, uni-tipped. Guiding ring double but thin, 8 μ m wide, located at 17–18 μ m from oral field. Odontostyle 24–25 μ m long and 3 μ m thick, hardly longer than labial diameter, thicker than cuticle at the same level. Aperture nearly half a stylet length. Odontophore 32–36 μ m long. Pharynx 564–630 μ m long, at 43–44 % expanded, heavily muscular in posterior part. Pharyngeal gland nuclei difficult to discern. D = 45–47 % or at 11–12 % of total body length. AS nuclei inconspicuous, PS = 75–78 %. Glandularium 292–324 μ m long. Posterior end of pharynx with a shallow disc. Cardia tongue-shaped.

Male. Testes two, straight, well-developed, 6.8–7.2 body widths long, or occupying 11–12 % of total body length. Spermatozoa ovoid to fusiform, 7–8 μm long, about as long as one-sixth body diameter. Spicula dorylaimoid, 52–55 μm long, distinctly longer than tail. Ventromedial supplements very small but with distinct innervations, spaced, in one male 9, in two males 11 in number; posteriormost at a distance of 50–55 μm from cloaca. Their series amounts to 75–90 μm . Prerectum long, beginning well before the row of the supplements. Tail conoid-rounded, 22–28 μm long, occupying 0.9–1.1 % of entire length of body.

Remarks. The medium-long and very slender body, expanded lip region, odontostyle with long aperture, pharynx enlarging before its middle, long prerectum, the number of supplements and the very thick cuticle on the supplemental region characterise this species.

In length of the body, width of the lip region, length of the odontostyle and number of the ventral supplements, this species fairly resembles *Egtitus itanagrus* Khan, Ahmad & Jairajpuri, 1994, but the latter is an Asian species recorded from India, Seychelles and China. If comparing the present males with the American *Egtitus* species, viz. *E. bryophilus* Thorne, 1967 (Puerto Rico, Peru), *E. chilenus* Andr ssy, 2012 (Chile), *E. costaricae* sp. nov. (Costa Rica), *E. elaboratus* (Cobb, 1906) Thorne, 1967 (Hawaii) and *E. surinamensis* (Micoletzky, 1925) Thorne, 1967 (Surinam, Guayana), they differ from them by having a slenderer body, broader lip region (23–24 vs 15–17, 18–19 and 21–23 μm , respectively; not known in *E. surinamensis*), longer odontostyle (24–25 vs 17–19, 20–23, 21–24 μm , respectively; unknown in *E. surinamensis*), and a long prerectum. Not having female specimens, we decline at this time to provide this nematode with a species name.

Habitat and locality. Soil from a secondary forest, between 400 and 500 m above sea level, Barbilla Biological Reserve, La Amistad Caribe Conservation Area, Costa Rica; collected in February 2000 by A. Esquivel, I. Popovici, H. Arias

and R. G mez. (Three males on the slides No. 563.08, 563.19 and 563.22).

Egtitus sp. 2

(Figures 4 A–C)

One male: L = 3.02 mm; a = 60; b = 4.6; c = 102; $c^2 = 0.7$.

General characters. Body nearly straight after fixation, 50 μm wide at middle. Cuticle smooth under light microscope, thin, 2.0 μm thick on most body and 3.0 μm thick in supplement region. Lip region expanded, well offset by a deep constriction, 24 μm wide and 9 μm high, wider than adjacent body. Lips rounded, amalgamated. Body at posterior end of pharynx 2.4 times as wide as lip region. Amphids caliciform with aperture more than half the corresponding body width.

Labial and dental chambers well separated, the former 15 μm , the latter 9 μm wide; labial disc 7 μm wide. Vestibular ring corrugated. Pharyngeal denticles absent. Onchia simple, uni-tipped. Guiding ring double but thin, 9 μm wide, at 18 μm from labial field. Odontostyle 26 μm long and 3 μm thick, slightly longer than labial diameter, thicker than cuticle at the same level. Aperture two-fifths of stylet length. Odontophore 35 μm long. Pharynx 656 μm long, at 44 % expanded. Medial, conoid part of pharynx 95 μm long, occupying 14 % of pharyngeal length. Medial section 65 μm long, 10 % of neck length. Because of the heavy muscular structure, the pharyngeal gland nuclei are rather inconspicuous with exception of D nucleus which lies at 53 % of pharynx or 12 % of total body length. AS nuclei invisible, PS = 73–75 %. Glandularium 336 μm long. Posterior end of pharynx with a shallow disc. Cardia conical.

Male. Testes two, straight, well developed, the anterior 10 body widths long or occupying 18 % of total body length, the posterior 8.6 body widths long or occupying 15 % of total body length. Their germinative sections unusually long, each

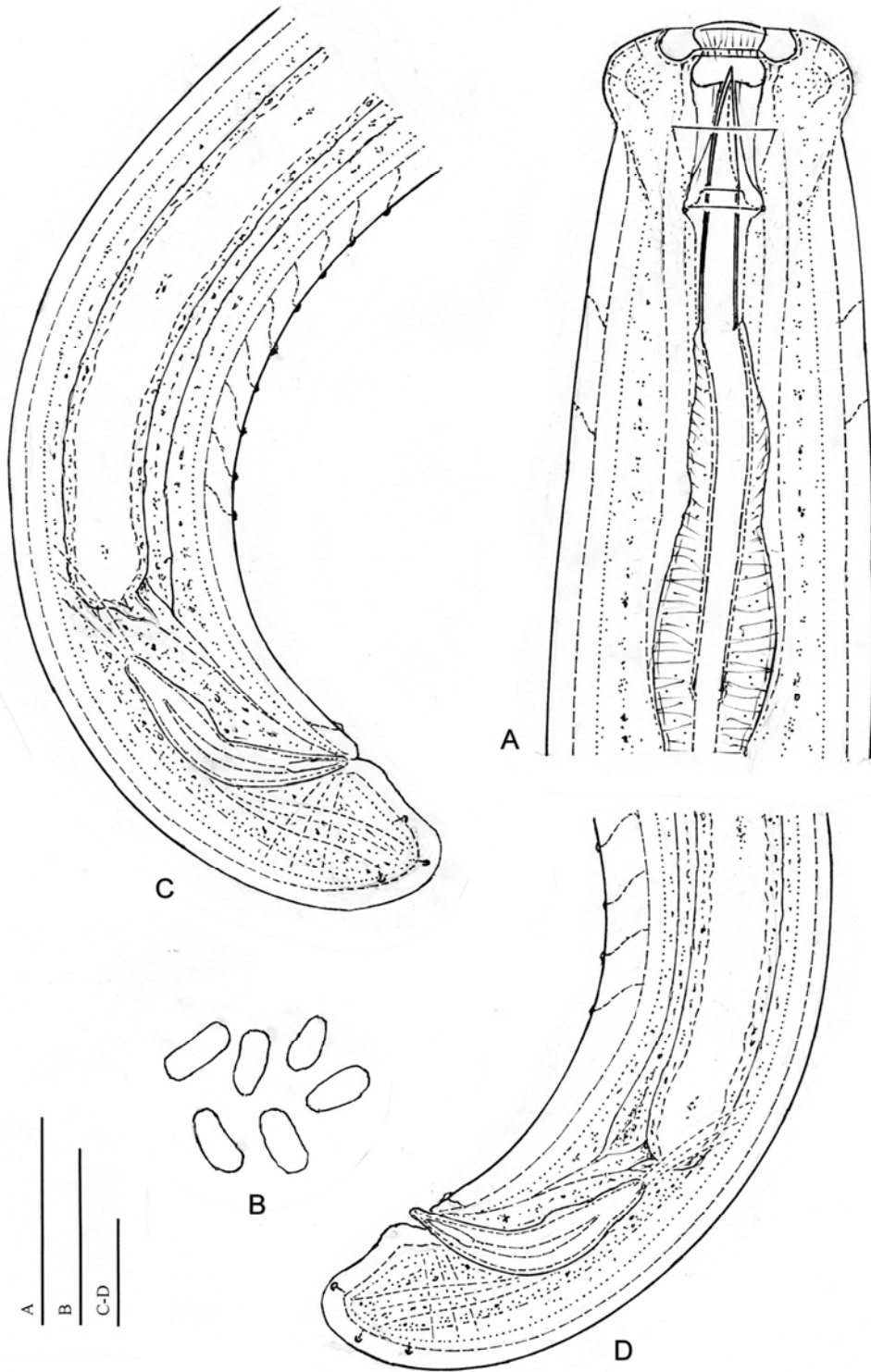


Figure 3. *Egitus* sp. 1. A: anterior end; B: spermatozoa; C–D: posterior end of males. (Scale bars = 20 µm)

occupying 25–30 % of the testis length. Spermatozoa very numerous, ovoid, 8–10 μm long, about as long as one-fifth corresponding body diameter. Spicula dorylaimoid, 55 μm long, distinctly longer than tail. Ventromedial supplements nine, very small, spaced, 10–15 μm apart; posteriormost of them at a distance of 60 μm from cloaca. Series of supplements 105 μm long. Prerectum beginning at level of the first supplement. Tail broadly rounded, hemispheroid, 22 μm long, occupying merely 0.7 % of entire length of body.

Remarks. The long body (3 mm), broad and strongly offset lip region, medium long odontostyle, unusually long germinative section of testes, and presence of nine small supplements characterise this species. We may suppose that the female belonging to this male is longer, over 3 mm, what means, this species would be the longest representative of the genus *Egtitus*. There is a single species, *E. nudus* (Wu & Hoeppli, 1929) Thorne, 1967 which was described with body length of 2.0–3.0 mm (female) and 2.6 mm (male). Its description is however very meagre, even the number of the male supplements was not determined.

The present male probably represents a hitherto undescribed species, but on the basis of a single specimen we decline to name it.

Habitat and locality. Soil around trees on Path Palmito, 1200 to 1300 m above sea level, in a primary cloudy forest, Tapanti National Park, La Amisto Pacifico Conservation Area, Costa Rica; collected in July, 1998 by A. Esquivel, A. Zullini and R. Gómez. (One male on the slide No. 338.24).

***Trachypleurosum venezolanum* Coomans,
Vinciguerra & Loof, 1990**

(Figures 5 A–D and 6 A–C)

Females (n = 5): L = 1.88–2.05 mm; a = 36–43; b = 4.0–4.2; c = 15.0–18.4; c' = 4.3–5.6; V = 52–54 %.

Males (n = 3): L = 1.80–1.99 mm; a = 44–49; b = 3.7–4.1; c = 16.4–20.1; c' = 3.3–4.8.

General characters. Body of female nearly straight, that of male arcuate at posterior end, 48–56 μm (female) or 40–42 μm (male) μm wide at middle. Cuticle smooth, 2.5–3.0 μm thick on most body regions. Lip region offset by expansion, 24–28 μm wide and 9–10 μm high, lips rounded and amalgamated. Body at proximal end of pharynx 1.5–2.0 times as wide as head. Amphids caliciform with aperture one-half of corresponding body width.

Labial and dental chamber separated, the former 14–18, the latter 9–11 μm broad. Vestibular ring corrugated. No pharyngeal denticles. Onchia uni-tipped. Odontostyle slender, 25–28 μm long and 2.0–2.5 μm thick, about as long as labial diameter, as thick as or thicker than cuticle at same level. Aperture about two-fifths of stylet length. Odontophore 35–40 μm long. Guiding ring double but thin, 8 μm wide, located at 18–20 μm from oral field. Pharynx 450–492 μm long, at 48–51 % expanded; medium section 70–75 μm long, 14–16 % of pharyngeal length. Dorsal nucleus at 51–54 % of pharyngeal length or 12–14 % of total body length. Other pharyngeal nuclei rather inconspicuous, PS1-2 = 72–75 %. Glandularium 175–225 μm long. Cardia conical.

Female. Genital organ paired with equally long branches. Vulva pore-like, vagina 14–18 μm long, occupying one-third or less of corresponding body width. Uterine eggs not observed. Distance between posterior end of pharynx and vulva a little longer (1.1–1.2 times) than pharynx itself. Rectum as long as 1.2, prerectum as 2.0–2.8 anal body diameters. Vulva–anus distance equal to 6.1–7.6 tail lengths. Tail 110–133 μm long, 5.4–6.6 % of entire length of body, elongate-conical with sharp tip.

Male. Testes straight, opposed, each 4.0–5.9 body widths long or occupying 10–13 % of body length. Spermatozoa fusiform, slender, 8–10 μm long, as long as one-quarter or one-fifth body diameter. Spicula dorylaimoid, 45–50 μm long.

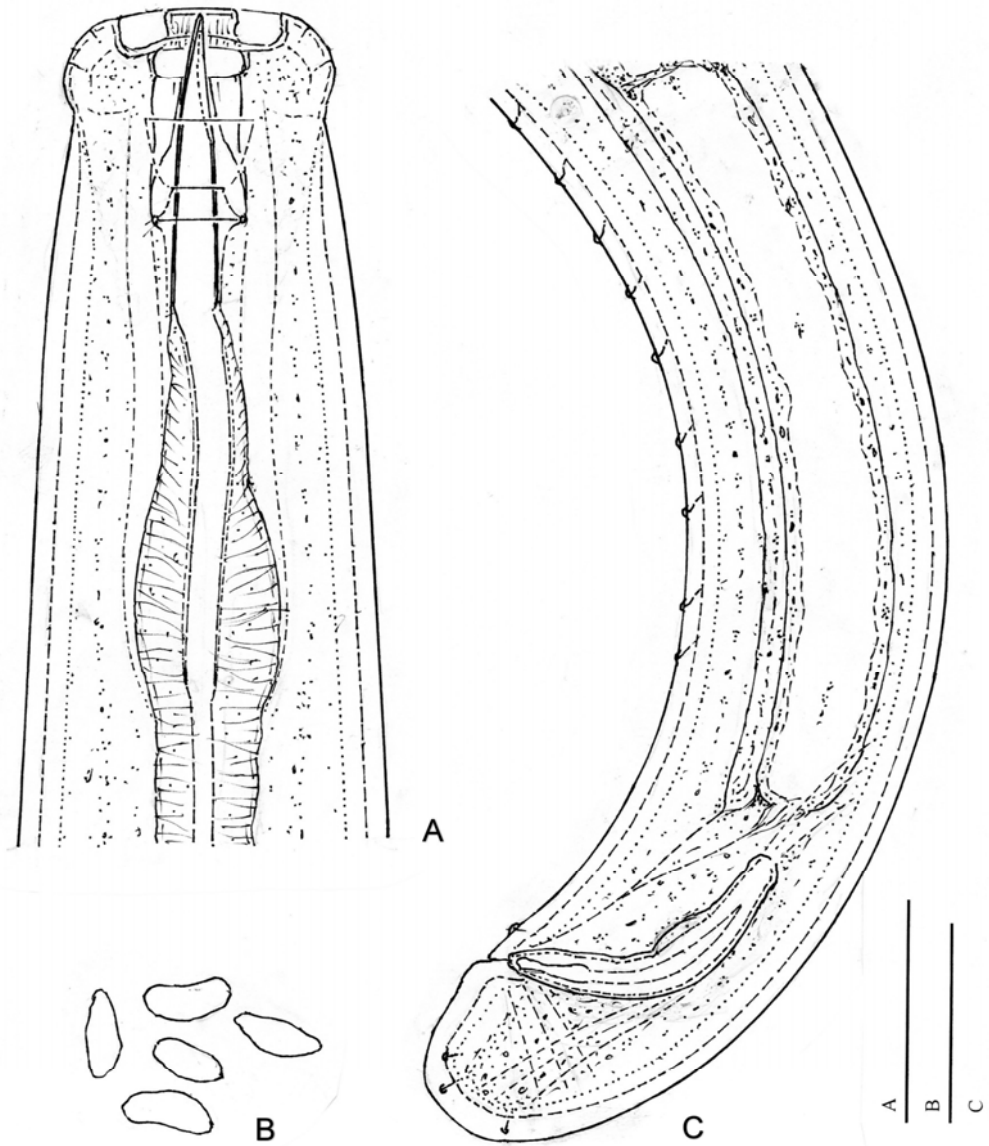


Figure 4. *Egitus* sp. 2. A: anterior end; B: spermatozoa; C: posterior end of male. (Scale bars = 20 μ m)

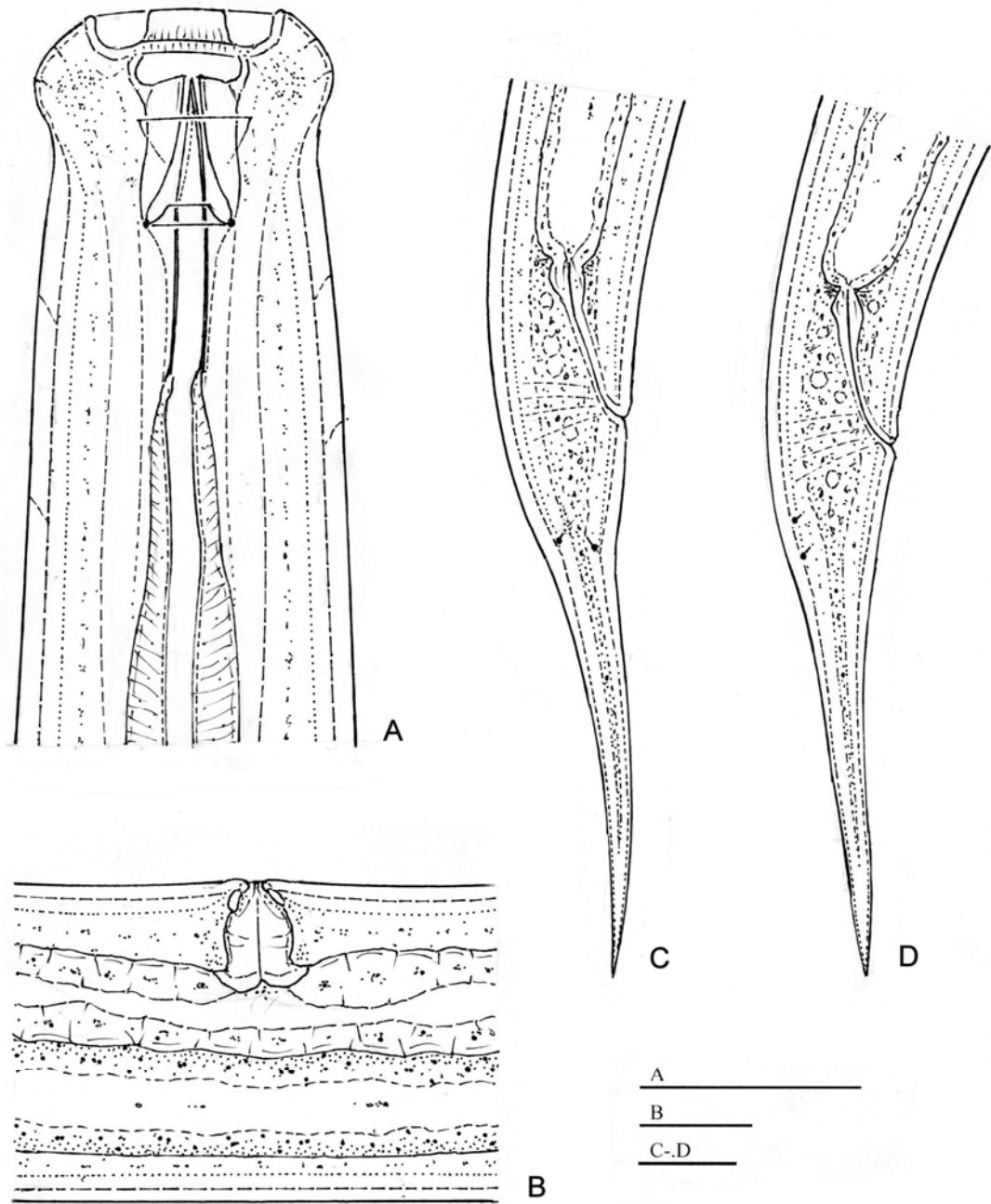


Figure 5. *Trachypleurosom venezolanum* Coomans, Vinciguerra & Loof, 1990. A: anterior end; B: vulval region; C–D: tail of females. (Scale bars = 20 μ m)

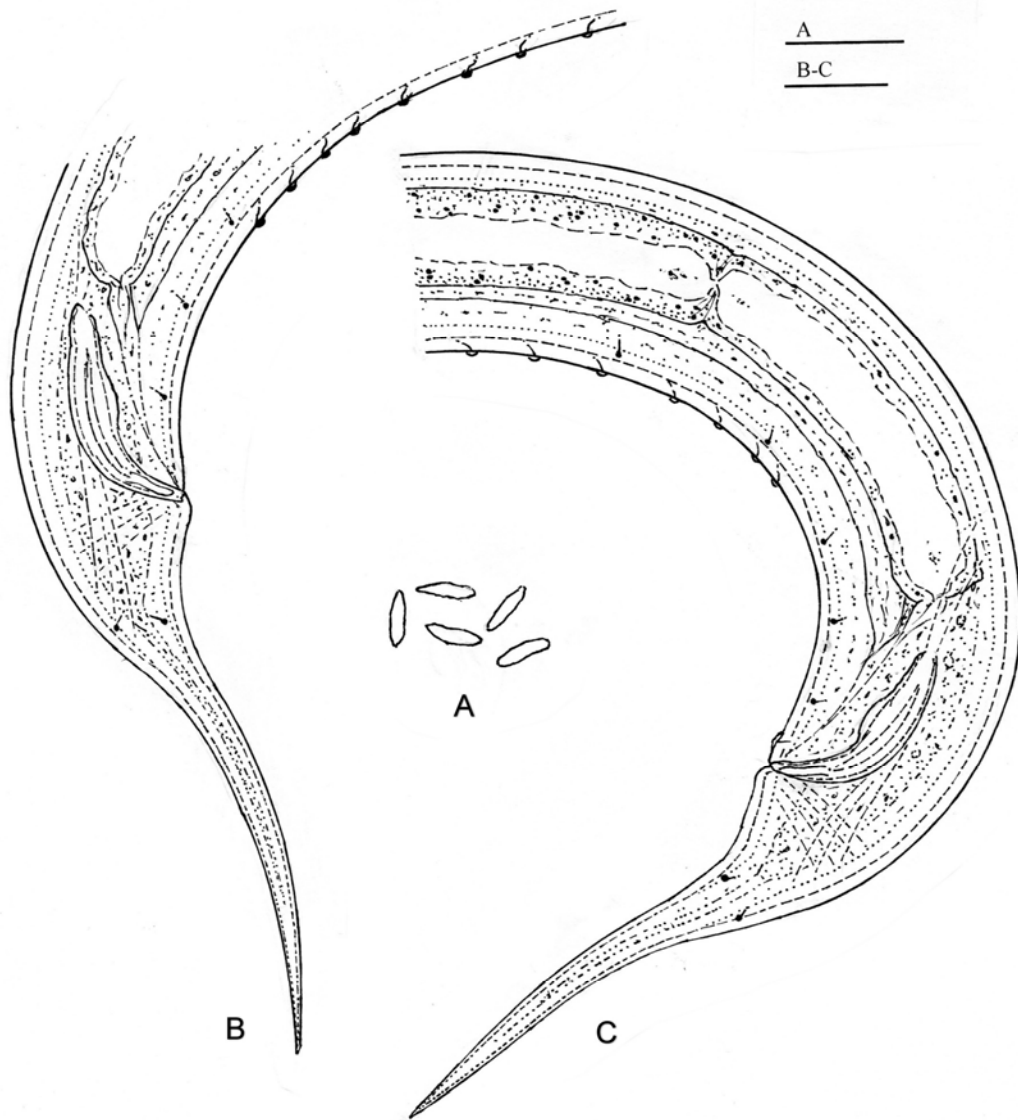


Figure 6. *Trachypleurosum venezolanum* Coomans, Vinciguerra & Loof, 1990. A: spermatozoa; B-C: posterior end of males. (Scale bars = 20 μ m)

Ventromedian supplements 7–8, small, rather evenly spaced, their series extending 85–114 μm . Posteriormost supplement at a distance of 55 to 70 μm from cloaca. Prerectum beginning in range of supplements, at level of the 4th or 5th supplement. Tail 96–110 μm long, similar to that of female, occupying 4.8–6.2 % of total length of body.

Remarks. The genus *Trachypleurosum* Andrásy, 1959 contains five species: *T. conforme* (Schneider, 1935) Andrásy, 1959, *T. venezolanum* Coomans, Vinciguerra & Loof, 1990, *T. indicum* Khan, Ahmad & Rahaman, 1991, *T. karnatakum* Khan & Jairajpuri, 1994 and *T. balforum* Bloemers, Ahmad, Wanless & Hodda, 1995 (see also Table 1). Two of them (*T. indicum* and *T. karnatakum*) were reported from Asia (India), other two (*conforme* and *balforum*) from Africa (Ivory Coast and Cameroon, resp.) and one (*venezolanum*) is known from Central- and South America (Costa Rica and Venezuela). The present species, *T. venezolanum* differs from *T. karnatakum* and *T. balforum* by the larger body (1.7–2.3 vs 1.2–1.5 mm), from *T. indicum* by the longer odontostyle (25–31 vs 18–21 μm), and from *T. conforme* by the lower number of supplements (7–10 vs 15).

In morphological and morphometric structures, the present specimens well correspond to the type ones described by Coomans, Vinciguerra and Loof (1990) from Venezuela. Only the two males from Cocos Island have a thinner cuticle (1.4–1.7 vs 2.5–3.0 μm) and a narrower lip region (21–22 vs 24–28 μm), but in other respects they also agree with the typical specimens.

Habitat and locality: (1) Mosses from tree trunks, 100 to 200 m above sea level, primary forest, Agujas Biological Station, Path Real, Osa Conservation Area, Costa Rica (five females, one male and two juveniles, on slides No. 225.01–03); collected in November 1997 by A. Esquivel and T. Bongers. (2) Mosses from trunks, between 10 and 100 m above sea level, Cocos Island (Isla del Coco, an uninhabited island in the Pacific Ocean approximately 550 km from the shore of Costa

Rica) (two males, on the slide No. 576.02); collected in 2000 by A. Alvarado.

Trachypleurosum sp.

(Figures 7 A–C)

One male: L = 1.85 mm; a = 38; b = 4.3; c = 20.8; c' = 3.3.

General characters. Body C-shaped after fixation, 48 μm wide at middle. Cuticle smooth, 2.0–2.5 μm thick on most regions, but 5 μm thick at level of the supplements. Lip region 15 μm wide, moderately separated by a slight constriction. Body at proximal end of pharynx three times as wide as lip region. Labial chamber 9, dental chamber 6, labial disc 5 μm broad. Odontostyle 18 μm long and 2 μm thick, thicker than cuticle at same level. Odontophore 35 μm long. Guiding ring 6 μm wide, at a distance of 13 μm from oral field. Pharynx 430 μm long, at 52 % expanded, its median section cca 60 μm long. D = 54 %, PS = 74–75 %. Glandularium 197 μm long.

Male. Diorchic, each testis 4.6 body widths long or occupying 12 % of body length. Spermatozoa fusiform, small, 4.5–5.0 μm long, only about one-tenth as long as corresponding body diameter. Spicula 45 μm long. Ventromedian supplements 10, distinct. Prerectum beginning well anterior to the row of supplements. Tail 80 μm , 4.8 % of entire length of body, slightly dorsally bent.

Remarks. The single male specimen observed differs from the other Costa Rican congener, *Trachypleurosum venezolanum* Coomans, Vinciguerra & Loof, 1990 by the much narrower lip region (15 vs 24–28 μm), less spacious labial chamber (9 vs 14–18 μm broad), shorter odontostyle (18 vs 25–28 μm), longer prerectum of male, smaller spermatozoa (4–5 vs 8–10 μm) and more numerous supplements (10 vs 7–8).

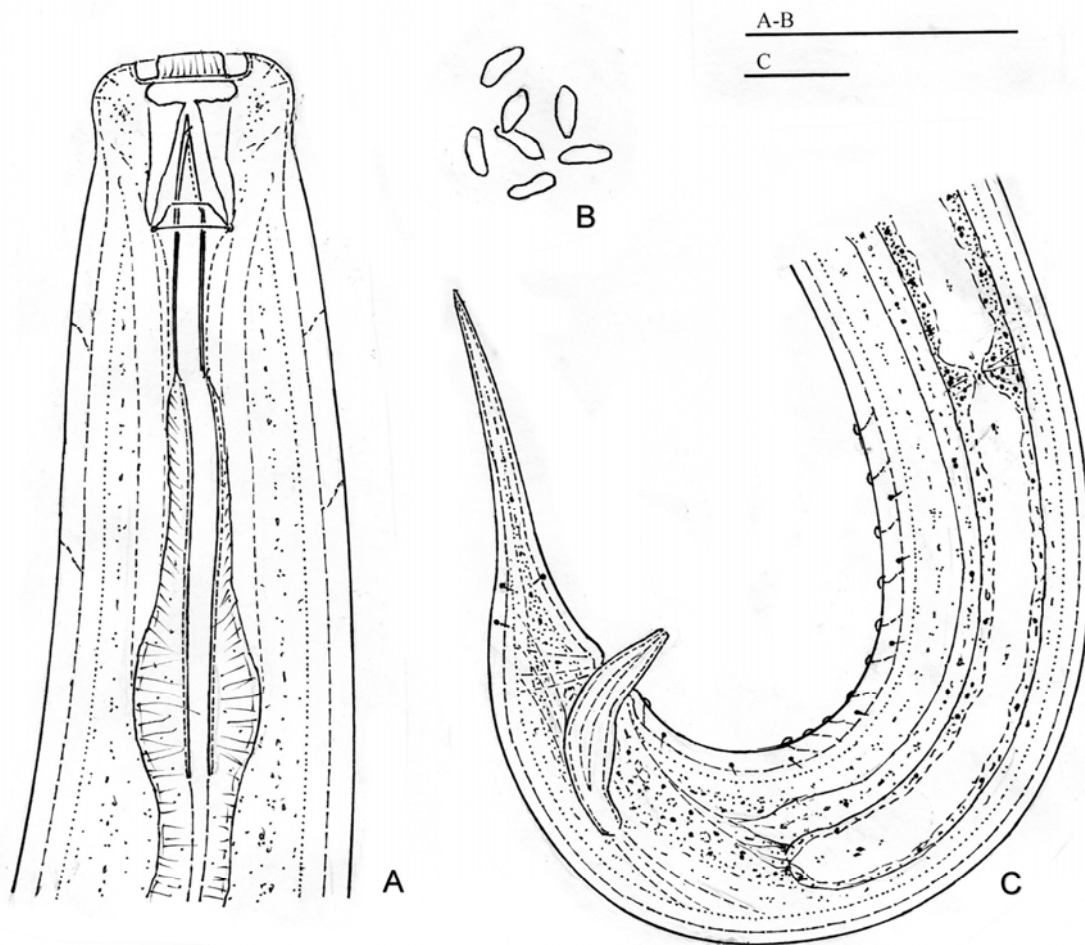


Figure 7. *Trachypleurosum* sp. A: anterior end; B: spermatozoa; C: posterior end of male. (Scale bars = 20 μ m)

The present species differs also from the four other representatives of the genus in having a narrow lip region (15 vs 18–28 μ m) and a short odontostyle (18 vs 20–31 μ m). It is likely new to science, but a single specimen is not enough to handle it as such.

Habitat and locality. Mosses in the vicinity of a stream, primary forest, Hitoy Cerere Biological Reserve, La Amistad Caribe Conservation Area, Costa Rica; collected in August 1998 by A. Esquivel, A. Zullini and R. Gómez. (One male on the slide No. 356.07.)

Table 1. Main morphometric characters of *Trachypleurosum* species

| | L | a | b | c | c' | V | Lip w. | Odont. | Tail | Spic. | Suppl. |
|--------------------|--------------------|----------------|--------------------|----------------|--------------------|-------|--------|--------|--------------------|-------|----------------|
| <i>balforum</i> ♀ | 1.2–1.5 | 26–35 | 3.3–3.5 | 10–12 | 4.8–5.2 | 50–54 | 21–23 | 22–25 | 110–134 | 38–41 | 7–9 |
| ♂ | 1.1–1.6 | 26–41 | 3.2–3.9 | 10–14 | 3.6–4.8 | | | | 116–133 | | spaced |
| <i>conforme</i> | 2.1 2.3 | 36 54 | 4.0 4.6 | 18 20 | 3.9 3.2 | 54 | 18 | 24 | 118 110 | 50 | 15 spaced |
| <i>indicum</i> | 1.6–2.0 1.5–1.6 | 36–44 38–43 | 3.7–4.7 3.7–4.1 | 11–15 12–13 | 4.3–6.1 3.8–4.6 | 49–54 | 18–21 | 18–21 | 122–156 106–133 | 37–45 | 7–9 spaced |
| <i>karnatakum</i> | 1.4 1.5–1.6 | 37 39–41 | 3.5 3.5–3.9 | 11 14 | 5.5 4.0 | 52 | 20–22 | 21–23 | 127 101–111 | 41–42 | 9 spaced |
| <i>venezolanum</i> | 1.7–2.3 1.6–2.2 | 30–51 41–53 | 3.5–4.3 3.6–4.7 | 13–19 14–23 | 3.8–5.6 2.5–4.8 | 51–55 | 23–28 | 25–31 | 110–149 84–143 | 43–52 | 7–10 spaced |
| Range | 1.2–2.3 | 26–51 | 3.3–4.7 | 10–19 | 3.8–6.1 | 49–55 | 18–28 | 18–31 | 110–156 | 37–52 | 7–15 |

APPENDIX

New genera and species of free-living nematodes described from Costa Rica

A) Genera

Ecanema Ahmad & Shaheen, 2005 – Nordiidae
Inbionema Loof & Zullini, 2000 – Nordiidae
Parapalus Loof & Zullini, 2000 – Paraxonchiidae
Pseudaphelenchus Kanzaki, Giblin-Davis, Scheffrahn, Center & Davies, 2009 – Aphelenchoiidae
Scalpelus Ahmad, 2004 – Qudsianematidae

B) Species

ARAEOLAIMIDA

Leptolaimidae

Paraplectonema americanum Zullini, Loof & Bongers, 2002
Paraplectonema loofi Holovachov & Boström, 2004

Aphanolaimidae

Anonchus pulcher Zullini, Loof & Bongers, 2002

Chronogastridae

Chronogaster costaricae Zullini, Loof & Bongers, 2002

RHABDITIDA

Cephalobidae

Eucephalobus iaculo-caudatus Boström & Holovachov, 2011

Osstellidae

Deficephalobus mirabilis Holovachov, Esquivel & Bongers, 2005

Bunonematidae

Rhodolaimus arboreus Holovachov, Esquivel & Bongers, 2003

APHELENCHIDA

Aphelenchoididae

Pseudaphelenchus yukiae Kanzaki, Giblin-Davis, Scheffrahn, Center & Davies, 2009

TYLENCHIDA

Telotylenchidae

Paratrophurus costaricensis López-Chaves, 1986

Pratylenchidae

Pratylenchus gutierrezii Golden, López-Chaves & Vilchez-Rojas, 1992

Hoplolaimidae

Helicotylenchus stylocercus Siddiqi & Pinochet, 1979

Rotylenchus phaliurus Siddiqi & Pinochet, 1979

Meloidogynidae

Meloidogyne arabicida López-Chaves & Salazar-Figueroa, 1989

Meloidogyne salasi López-Chaves, 1984

ENOPLIDA

Pelagonematidae

Thalassogenus brzeskii Loof & Zullini, 2000

Onchulidae

Limonchulus costaricanus Holovachov, Wini-szewska, Sturhan, Esquivel & Wu, 2008

MONONCHIDA

Mononchidae

Mononchus laminatus Zullini, Loof & Bongers, 2002

Anatonchidae

Miconchus gomezi Zullini, Loof & Bongers, 2002

DORYLAIMIDA

Dorylaimidae

Calcaridorylaimus andrassyi Ahmad & Shaheen, 2004

Laimydorus esquiveli Ahmad & Shaheen, 2004

Laimydorus tropicus Ahmad & Shaheen, 2004

Prodorylaimus paraobesus Ahmad & Shaheen, 2004

Thornenematidae

Coomansinema brevicauda Ahmad & Shaheen, 2004

Actinolaimidae

Brasilaimus bidentatus Loof & Zullini, 2000

Brasilaimus vinciguerrae Loof & Zullini, 2000

Egtitus costaricae sp. nov.

Qudsianematidae

Scalpelus loofi Ahmad, 2004

Aporcelaimidae

Makatinus macrostylus Shaheen & Ahmad, 2004

Paraxonchiidae

Parapalus arboricola Loof & Zullini, 2000

Crateronematidae

Chrysonema inbionis Ahmad & Shaheen, 2005

Sicorinema esquiveli Loof & Zullini, 2000

Nordiidae

Actinolaimoides ecae Shaheen & Ahmad, 2004

Ecanema ecae Ahmad & Shaheen, 2005

Inbionema bifforme Loof & Zullini, 2000

Oriverutus belloi Liébanas, Esquivel & Peña-Santiago, 2011

Oriverutus tropicus Ahmad & Shaheen, 2003

Longidoridae

Xiphinema costaricense Lamberti & Tarjan, 1974

Leptonchidae

Tyleptus bongersi Loof & Zullini, 2000

Xiphinemella monohystera Loof & Zullini, 2000

Tylencholaimidae

Pachydorylaimus holovachovi Esquivel, Guerrero, Peña-Santiago & Powers, 2007

Pachydorylaimus schizodontus Loof & Zullini, 2000

Encholaimidae

Echinodorus saccatus Shaheen & Ahmad, 2004

**PUBLICATIONS CONTAINING
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