

Four new species of *Pachydorylaimus* gen. n. and *Tylenchodorus tylosus* gen. n., sp. n. (Dorylaimida : Qudsianematinae) from Colombian rain forest

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SUMMARY

Pachydorylaimus gen. n. and *Tylenchodorus* gen. n. belong to Qudsianematinae. *Pachydorylaimus furcatus* gen. n., sp. n., *P. pachyvulvus* sp. n., *P. longicaudatus* sp. n., *P. notabenus* sp. n. and *Tylenchodorus tylosus* gen. n., sp. n. are described and illustrated from nematodes collected in Colombian rain forest during Colombian Amazonas Expedition. *Pachydorylaimus* differs from *Eudorylaimus* in having a truncate lip region, small oval amphid apertures, thick-walled odontostyle with prominently furcate base, odontophore with basal sclerotized flanges and elongate pointed tail with a long terminal hyaline portion. *Tylenchodorus* gen. n. differs from other genera of the Qudsianematinae in having an odontophore provided with round basal knobs.

RÉSUMÉ

Quatre espèces nouvelles de *Pachydorylaimus* gen. n. et *Tylenchodorus tylosus* gen. n., sp. n. (*Dorylaimida* : *Qudsianematinae*) originaires de la forêt humide de Colombie

Pachydorylaimus gen. n. et *Tylenchodorus* gen. n. appartiennent aux Qudsianematinae. *Pachydorylaimus furcatus* gen. n., sp. n., *P. pachyvulvus* sp. n., *P. longicaudatus* sp. n., *P. notabenus* sp. n. et *Tylenchodorus tylosus* gen. n., sp. n. sont décrits et illustrés. Ils ont été trouvés parmi les nématodes collectés dans la forêt humide de Colombie par la Colombian Amazonas Expedition. *Pachydorylaimus* diffère d'*Eudorylaimus* par sa région labiale tronquée, ses ouvertures amphidiennes petites et ovales, son odontostyle à paroi épaisse avec une base fortement fourchue, son odontophore aux épaisissements basaux sclérotisés et sa queue allongée et pointue comportant une longue partie terminale. *Tylenchodorus* gen. n. diffère des autres genres de Qudsianematinae par son odontophore muni de boutons basaux arrondis.

A rich collection of nematodes made by Ms. Kate Williamson during the Colombian Amazonas Expedition in 1977 was submitted for identification to the Commonwealth Institute of Parasitology, St. Albans. Several new genera of dorylaimid nematodes have been reported from this collection (Siddiqi, 1982). Five new species belonging to two new genera of the dorylaimid subfamily Qudsianematinae are described here.

Nematodes were killed by applying heat, fixed in 3-5 % formaldehyde solution and mounted in anhydrous glycerine by processing through warm lactophenol.

Pachydorylaimus gen. n.

DIAGNOSIS

Qudsianematinae. Body short (less than 1 mm) and plump. Cuticle thick, bearing fine transverse and radial striae. Lip region abruptly expanded, truncate ; papillae not prominently raised. Amphid apertures oval, small (about 1/4 lip region-width). Odontostyle short and broad, thick-walled, with small aperture and prominently furcate base. Odontophore also broad, with sclerotized basal flanges. Oesophagus muscular, gradually enlarging at or

slightly behind middle; orifice and nucleus of dorsal gland close to beginning of enlargement. Vulva transverse. Didelphic-amphidelphic; ovaries small sized, with less than fifteen oocytes. Prerectum one to two anal body-widths long. Tail conoid in anterior and drawn out in posterior half with a long terminal hyaline region. Male with dorylaimoid spicules, a few (two in type-species) widely spaced ventromedian supplements and tail similar to that of the female.

TYPE-SPECIES

Pachydorylaimus furcatus gen. n., sp. n.

OTHER SPECIES

Pachydorylaimus longicaudatus sp. n.

P. notabenus sp. n.

P. pachyvulvus sp. n.

RELATIONSHIP

Pachydorylaimus gen. n. differs from *Eudorylaimus* Andrassy, 1959 in having a truncate lip region, an elongate-pointed tail bearing a large hyaline terminal region, small oval amphid apertures, odontostyle thick-walled and prominently furcate at base and odontophore with sclerotized basal flanges (a somewhat similar flanged odontophore was illustrated and described for *Qudsianema* by Jairajpuri (1965) but this genus is a junior synonym of *Eudorylaimus* (Siddiqi, 1966).

Pachydorylaimus furcatus gen. n., sp. n.

(Fig. 1, A-I)

MEASUREMENTS

Females (paratype; $n = 10$) $L = 0.54-0.78$ (0.72) mm; $a = 19-25$ (21); $b = 2.7-3.3$ (3); $c = 6-9$ (8); $c' = 4.2-5.0$ (4.7); $V = 50-53$ (51); odontostyle = $9-11$ (10) μm ; odontophore = $22-30$ (27) μm .

Male (one paratype): $L = 0.74$ mm; $a = 23$; $b = 3.2$; $c = 8$; $c' = 4.2$; $T = 41$; odontostyle = 11 μm ; odontophore = 25 μm .

Female (holotype): $L = 0.7$ mm; $a = 19$; $b = 5.3$; $c = 7.5$; $c' = 4.8$; $V = 9-51-11$; odontostyle = 11 μm ; odontophore = 27 μm .

DESCRIPTION

Female: Body arcuate, anteriorly tapering only slightly until lip region becomes 55-62% of width at mid-body. Cuticle thick, regular, finely striated; inner radial striae numerous, closely spaced. Lateral hypodermal chord $1/5$ to $1/4$ body-width, with widely spaced, obscure glands and their pores. Amphid small with oval apertures $1/5$ to $1/4$ as long as lip region-width. Lip region elevated, truncate, wider than and continuous with adjacent body, liplets inconspicuous. Stoma walls in lip region thick, tubular. Odontostyle with thick walls and rounded tip, width 35-37% of its length, furcate region very prominent, 25-30% of odontostyle. Base of odontophore with elongate slightly sclerotized flanges, 6-8 μm across, its inner cuticle lining not sclerotized except at junction with the lumen wall of oesophagus, where a small knob-like sclerotized thickening is seen; powerful protractor muscles attached to flanged base. Oesophagus 200-250 (232) μm long; anterior part wide and muscular, sometimes showing slight swelling behind odontophore; enlarged part 100-118 (109) $\mu\text{m} \times 18-20$ μm , 46-52% of entire oesophageal length. Oesophago-intestinal valve rounded. Intestine with thin wall and wide lumen, four to seven cells in circumference. Vulva a transverse slit, not sclerotized. Vagina $2/5$ body-width long. Two branches of reproductive organs symmetrical, opposed. Uterine eggs 57-63 $\mu\text{m} \times 20-22$ μm . Ovaries small, each with up to ten oocytes. Prerectum and rectum each about 1.5 times anal body-width long. Tail dorsally convex conoid in anterior and narrowly elongated to a finely pointed tip being straight or slightly ventrally arcuate in posterior half, usually 90-94 μm or 4.7-4.9 times anal body-width long; protoplasmic core 1.2-1.9 (1.6) times anal body-width long, less than half tail length.

Male: Similar to female in most details; posterior end of body curved through 90°. Oesophagus enlarging at middle. Sperm oval to sausage-shaped, about 3 μm long. Paired supplementary papillae 6 μm in front of cloacal aperture, ventromedian papillae two, at 32 μm and 44 μm anterior to the paired papillae. Spicules dorylaimoid, ventrally arcuate, with tapering ends, distal tip notched. Tail similar to that of female, 92 μm or 4.2 times anal body-width long.

TYPE HABITAT AND LOCALITY

Soil from around roots in primary forest, Andoche region, south of river Caquetá, Amazonas, Colombia.

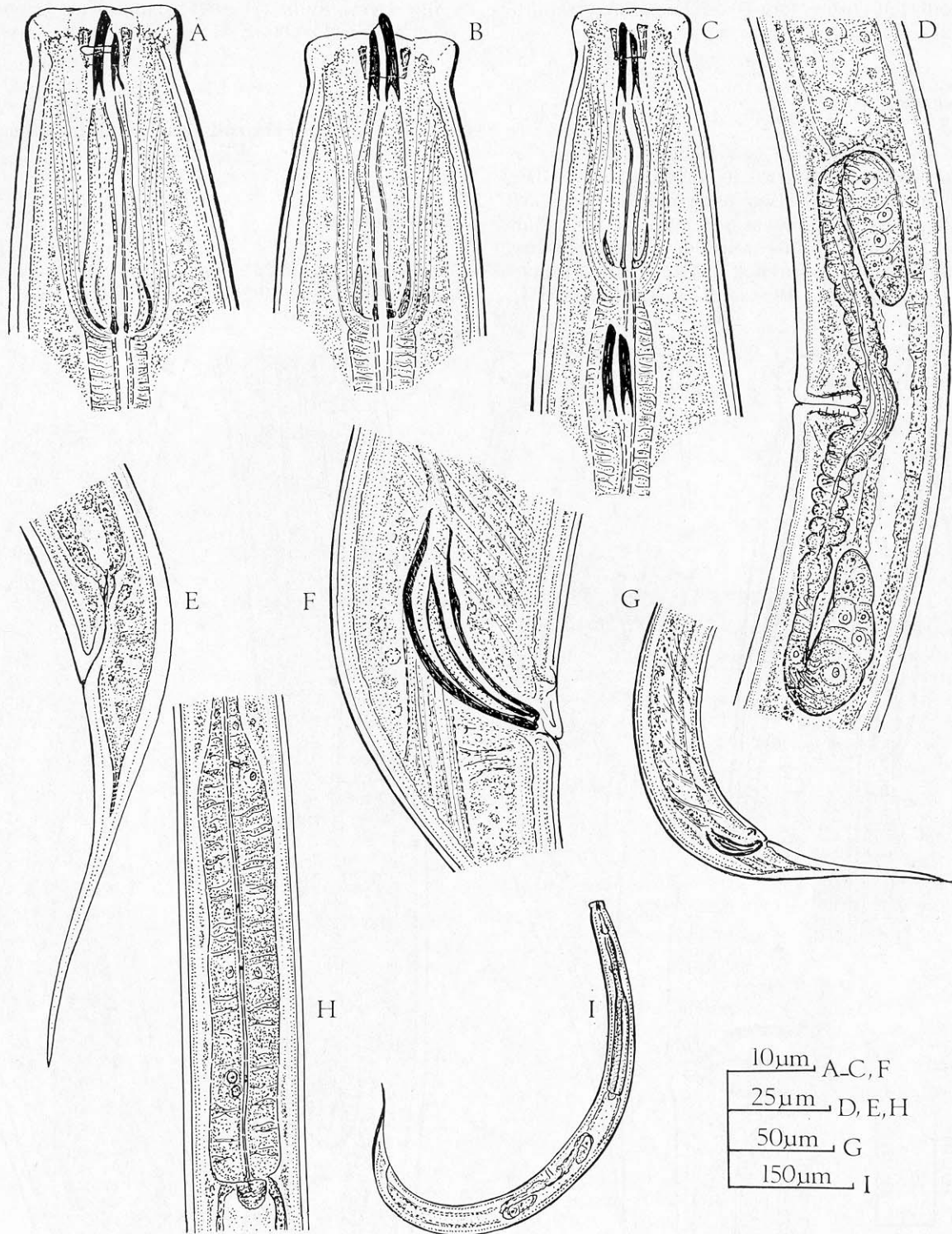


Fig. 1, A-I : *Pachydorylaimus furcatus* gen. n., sp. n. A-C : Head ends ; D : Reproductive organs ; E & G : Tail ends ; F : Spicular region ; H : Oesophageal region ; I : Entire female ; C : Juvenile ; F & G : Male, remainder female ; A, E & I : Holotype.

Also collected from forest soil near Araracuara, Amazonas.

New Delhi, India ; USDA Nematology Laboratory, Beltsville, Maryland, U.S.A.

TYPE SPECIMENS

Holotype female and two female paratypes at Commonwealth Institute of Parasitology (CIP), St. Albans, England ; two female paratypes each at Rothamsted Experimental Station (RES), Harpenden, England ; Laboratoire des Vers, Muséum national d'Histoire naturelle (MnHn), Paris, France ; Indian Agricultural Research Institute (IARI),

Pachydorylaimus pachyvulvus sp. n. (Fig. 2, A-F)

MEASUREMENTS

Females (paratype ; $n = 10$) : L = 0.62-0.77 (0.67) mm ; a = 19-23 (21) ; b = 3.0-3.6 (3.3) ; c =

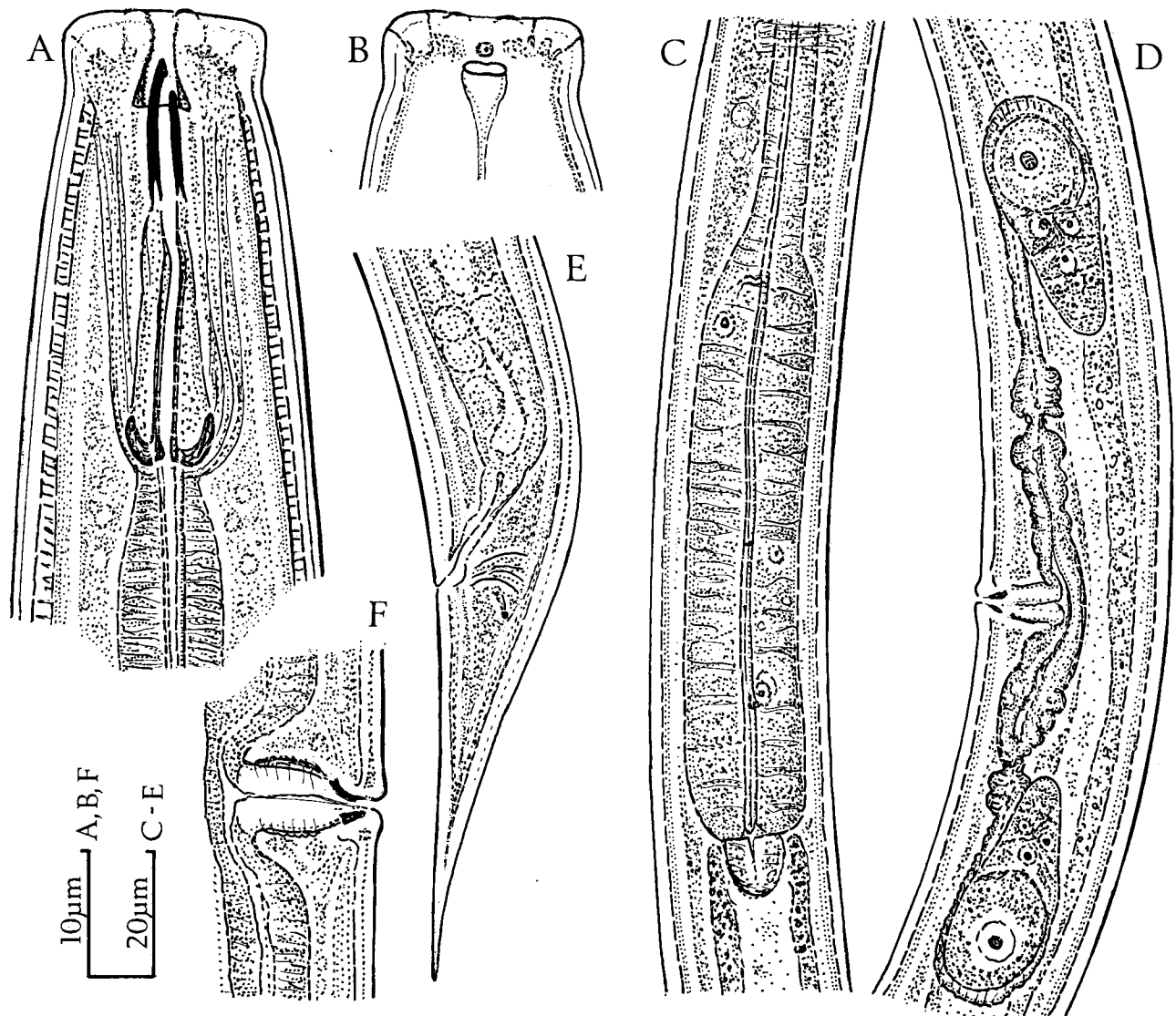


Fig. 2, A-F : *Pachydorylaimus pachyvulvus* sp. n. holotype female. A & B : Head ends ; C : Oesophageal region ; D : Reproductive organs ; E : Tail end ; F : Vulval region.

10-13 (11.5); $c' = 2.1-3.3$ (3); $V = 52-54$ (53); odontostyle = 11.0-12.5 (11.8) μm ; odontophore = 19-22 (21) μm .

Female (holotype) : $L = 0.67$ mm; $a = 21.6$; $b = 3.3$; $c = 10$; $c' = 3.1$; $V = 12-53-10$; odontostyle = 11 μm ; odontophore = 21 μm .

DESCRIPTION

Female : Body arcuate; maximum width 31-38 (33) μm . Cuticle thick; inner cuticle with distinct radial striae. Lateral hypodermal cords one-fourth as wide as body. Lip region offset by sudden expansion, anteriorly truncate, lips amalgamated, small inner liplets present around oral opening. Amphids small, aperture oval, just under one-quarter of lip region-width long. Walls of stoma moderately thick, conoid, posteriorly forming a single stylet guiding ring a little behind base of lip region. Odontostyle strongly sclerotized, with prominent furcate base and aperture about one-fifth of odontostyle length. Odontophore wide, with three sausage-shaped basal flanges. Total stylet about twice lip region width. Oesophagus muscular, enlarging gradually in posterior 38-45 percent; enlarged part 90-95 μm by 18-20 μm ; gland orifices as illustrated. Oesophago-intestinal valve large, heart-shaped to rounded.

Vulva transverse, with slightly raised lips and with sclerotized inner cuticle (hence the species name). Vagina thick-walled extending half-way into body. Reproductive organs amphidelphic. Ovaries short, with about ten oocytes. Uterine eggs 57-63 $\mu\text{m} \times 21-24$ μm . Prerectum and rectum about one anal body-width long. Tail elongate-conoid to a sharp point, 56-66 (61) μm long; protoplasmic core 2.1-2.5 (2.3) times anal body width long, three-fourths to two-thirds of total length.

Male : Not found.

TYPE HABITAT AND LOCALITY

Forest soil near Araracuara, Amazonas, Colombia. Also collected from forest soil in Andoche region, Amazonas.

TYPE SPECIMENS

Holotype female and two paratype females at CIP, St. Albans; two paratype females each at RES, Harpenden; MnHn, Paris; IARI, New Delhi; USDA, Beltsville.

RELATIONSHIP

Pachydorylaimus pachyvulvus sp. n. differs from *P. furcatus* sp. n. in having perioral liplets, well marked sausage-shaped basal flanges of the odontophore, sclerotization at the vulva and shorter tail having longer protoplasmic tail core being more than half the tail.

Pachydorylaimus Longicaudatus sp. n.

(Fig. 3, A-F)

MEASUREMENTS

Female (paratype; $n = 6$) : $L = 0.54-0.66$ (0.59) mm; $a = 23-26$ (24.5); $b = 3.0-3.6$ (3.2); $c = 5.2-6.1$ (5.6); $c' = 6-8$ (7); $V = 46-50$ (48.5); odontostyle = 7.5-10.0 (8.5) μm ; odontophore = 16-17 (16.5) μm .

Female (holotype) : $L = 0.56$ mm; $a = 24$; $b = 3$; $c = 5.9$; $c' = 7$; $V = 11-50-10$; odontostyle = 8 μm ; odontophore = 17 μm .

DESCRIPTION

Female : Body arcuate ventrally but tail tip bent dorsally; maximum width 23-25 (24) μm . Cuticle smooth, with fine radial striae; lateral hypodermal chords about 1/4 body-width. Lip region expanded, anteriorly truncate, offset from body by a depression, 11-12 μm wide. Amphid apertures about one-fourth as long as lip region-width. Odontostyle moderately thickened, with small aperture and furcate base. Odontophore with sclerotized basal flanges. Stylet guiding ring about half lip region width from anterior end. Oesophagus 175-190 (181) μm long, enlarged part 44-50 % of its length. Oesophago-intestinal valve conoid-rounded. Vulva transverse. Vagina about half body width long, not sclerotized. Ovaries reflexed, with 4-7 oocytes. Prerectum about two anal body-width, long. Rectum just over one anal body-width long. Tail elongate-tapering, 94-110 μm long, terminal hyaline portion 62-72 (66) μm long being over half the total tail length.

Male : Not found.

TYPE HABITAT AND LOCALITY

Soil around plant roots in primary rain forest, Vincente, south of river Caquetá, Amazonas, Colombia. Also collected in Andoche region near Vincente.

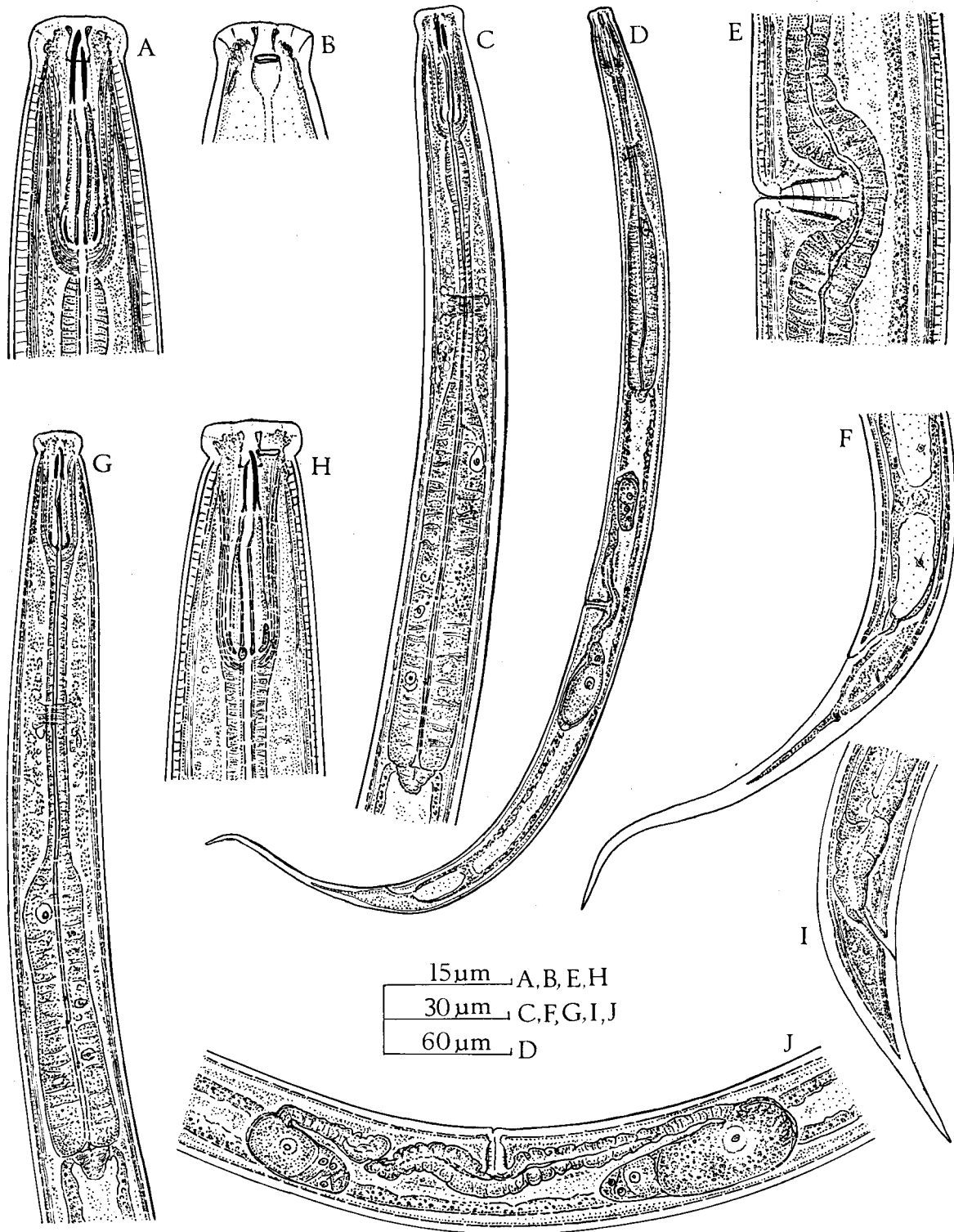


Fig. 3. A-F : *Pachydorylaimus longicaudatus* sp. n. G-J. *Pachydorylaimus notabenus* sp. n. A, B & H : Head ends ; C & G : Oesophageal regions ; D : Entire female ; E : Vulval region ; F & I : Tail ends ; J : Reproductive organs. All holotype females.

TYPE SPECIMENS

Holotype female and two paratype females at CIP, St. Albans; one paratype female each at RES, Harpenden; MnHn, Paris; IARI, New Delhi; USDA, Beltsville.

RELATIONSHIP

Pachydorylaimus longicaudatus sp. n. has the longest female tail of all the nominal species of the genus. *P. furcatus* sp. n. has a comparable tail but that is of a different shape.

***Pachydorylaimus notabenus* sp. n.**

(Fig. 3, G-J)

MEASUREMENTS

Females (paratype; $n = 10$): L = 0.49-0.56 (0.53) mm; a = 19-24 (21); b = 2.8-3.4 (3.1); c = 10-14 (11.4); c' = 2.7-3.5 (3); V = 51-58 (55); odontostyle = 7.5-9.5 (8) μm ; odontophore = 17-21 (18) μm .

Female (holotype): L = 0.5 mm; a = 20; b = 2.8; c = 10.5; c' = 3; V = ¹⁴54.6-¹²; odontostyle = 7.5 μm ; odontophore = 17 μm .

DESCRIPTION

Female: Body ventrally curved; maximum width 23-27 (25) μm . Cuticle finely striated; lateral hypodermal chords about one-fourth as wide as body-width. Lip region offset by sudden expansion, anteriorly truncate, 11-14 (12.5) μm wide. Amphid aperture about one-fourth lip region width long. Odontostyle moderately sclerotized, about two-third lip region width long; base furcate. Odontophore typical of the genus with sclerotized basal flanges. Oesophagus 160-185 (172) μm long; enlarged part 70-82 (74) μm long, 13-18 μm (15.5) μm wide, 40-46 (42) % of total oesophageal length. Oesophago-intestinal valve conoid-rounded. Vulval lips narrow, slightly protruding. Vagina two-fifth to half body-width long, not sclerotized. Reproductive system didelphic, amphidelphic; ovaries with 5-8 oocytes. Uterine egg 59-60 μm long by 20 μm wide. Prerectum 1.5-2 times anal body-width long. Tail conoid with tip pointed, 42-54 (46) μm long; protoplasmic core 1.2-1.8 (1.5) times anal body-width long.

Male: Not found.

TYPE HABITAT AND LOCALITY

Soil around plant roots in primary rain forest, Andoche, Amazonas, Colombia. Also collected in Vincente and Roja regions, near Andoche.

TYPE SPECIMENS

Holotype female and two paratype females at CIP, St. Albans; two paratype females each at RES, Harpenden; MnHn, Paris; IARI, New Delhi; USDA, Beltsville.

RELATIONSHIP

In having a small female tail, *Pachydorylaimus notabenus* sp. n. comes close to *P. pachyvulvus* n. sp. from which it differs in having a smaller body and odontostyle, unsclerotized vulva and smaller protoplasmic core of the female tail which measures less than two anal body-widths long.

***Tylenchodorus* gen. n.**

DIAGNOSIS

Qudsianematinae, Small-sized (under 0.5 mm in type-species). Cuticle with fine transverse and radial striae, lacking fixation folds. Lateral hypodermal glands and their pores not distinct, widely spaced. Lip region offset by a constriction; lips slightly raised, with distinct papillae. Amphids stirrup-shaped, aperture about half lip region-width long in type-species. Odontostyle cylindroid, with aperture about a third of spear length and a smooth non-furcate base. Odontophore with three, prominent, round basal knobs. Oesophagus gradually enlarging behind its middle; oesophago-intestinal valve rounded. Vulva transverse. Vagina sclerotized near vulva. Didelphic, amphidelphic. Tail conoid.

TYPE AND ONLY SPECIES

Tylenchodorus tylosus gen. n., sp. n.

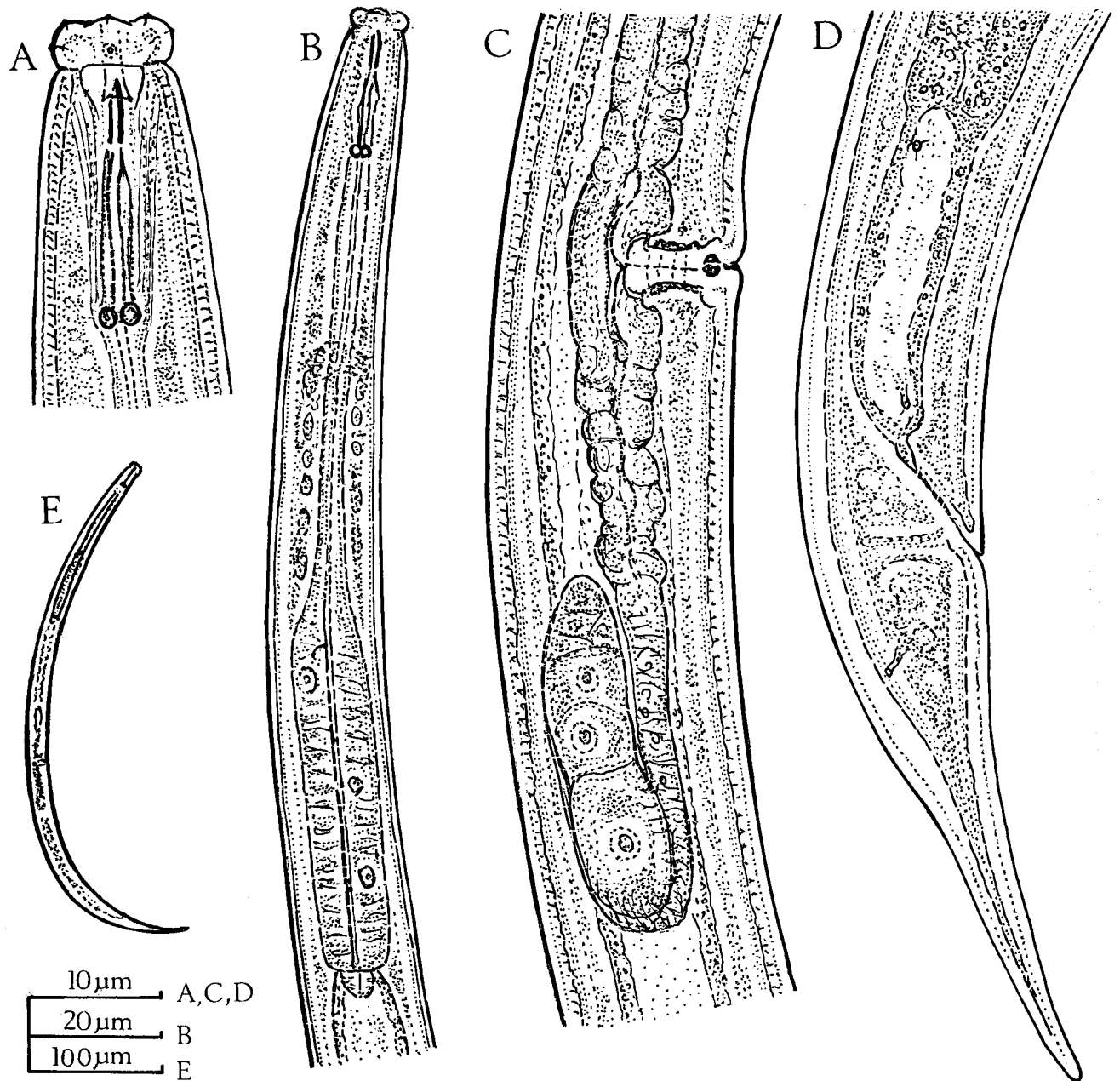


Fig. 4, A-E : *Tylenchodorus tylosus* gen. n., sp. n., holotype female. A : Head end ; B : Oesophageal region ; C : Posterior branch of reproductive organs ; D : Tail end ; E : Entire female.

RELATIONSHIP

Tylenchodorus gen. n. is unique amongst the members of the family Qudsianematidae in having round knobs at the base of the odontophore. It

comes close to *Pachydorylaimus* gen. n. but differs in having a differently shaped lip region, a less sclerotized odontostyle with smooth base, odontophore provided with round basal knobs and broader amphids with slit-like apertures.

Tylenchodorus tylosus sp. n.
(Fig. 4, A-E)

MEASUREMENTS

Females (paratype; $n = 8$) : L = 0.40-0.46 (0.43) mm ; a = 19-24 (21) ; b = 2.9-3.1 (3) ; c = 10-12 (11.6) ; c' = 3.0-3.4 (3.2) ; V = 52-55 (53) ; odontostyle = 6.5-7.5 (7) μm ; odontophore = 12-14 (13) μm .

Female (holotype) : L = 0.44 mm ; a = 24 ; b = 2.9 ; c = 11 ; c' = 3.3 ; V = 13-55-12 ; odontostyle = 6.5 μm ; odontophore = 12.5 μm .

DESCRIPTION

Female : Body arcuate, maximum width 18-22 μm . Cuticle moderately thick, inner and outer cuticles both with fine radial striae. Lateral hypodermal chords indistinct, about 1/4 as wide as body. Lip region broadly rounded, offset by a deep constriction ; labial papillae raised. Amphids large, stirrup-shaped, with slit-like aperture about half lip region-width long. Odontostyle about two-thirds lip region-width long, with moderately thick walls, distinct lumen and wide aperture about one-third of its total length. Odontophore with round offset knobs at base, lumen slightly angular anterior to middle. Total stylet length about twice lip region-width. Stylet guiding ring single, a little behind base of lip region, stoma walls not sclerotized. Oesophagus muscular, gradually enlarges in posterior 35-40 %. Orifice of glands as illustrated. Oesophago-intestinal valve rounded. Vulva a closed slit, with slightly protuberant lips. Vagina extending half-way across body, anterior sclerotization appearing as a ball-like structure. Both branches of reproductive system

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well developed. Uteri without sperm. Ovaries reflexed with less than ten oocytes. Intestine with thin wall and wide lumen. Prerectum about twice length of rectum ; latter about anal body-width long. Tail at first dorsally convex-conoid then elongate-conoid to a finely rounded tip.

Male : Not found.

TYPE HABITAT AND LOCALITY

Forest soil in Andoche region, Amazonas, Colombia.

TYPE SPECIMENS

Holotype female and four paratype females at CIP, St. Albans ; one paratype female each at : RES, Harpenden ; MnHn, Paris ; IARI, New Delhi ; USDA, Beltsville.

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