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FOUR NEW GENERA AND FOUR NEW SPECIES OF MONONCHS (NEMATODA)

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Abstract

Caputonchus capitatus n. gen., n. sp., *Mulveyellus* n. gen., *Nigronchus parvus* n. gen., n. sp., *Truxonchus* n. gen., *Actus nanurus* n. sp. and *Crassibucca colombica* n. sp. are described. *Truxonchus confundus* n. nom. is proposed as a replacement name for *Anatonchus paralleni* Jairajpuri & Khan, 1982 which is considered nomen nudum. *Mulveyellus antedontus* (Mulvey, 1963) n. comb., *M. antedontoides* (Coetze, 1967) n. comb., *M. jairi* (Lordello, 1959) n. comb. (type-species), *M. longicaudatus* (Baqri, Baqri & Jairajpuri, 1978) n. comb., *M. monhystera* (Cobb, 1971) n. comb. and *M. vorax* (Cobb, 1971) n. comb. are proposed for species previously under *Iotonchus* or *Mononchus. Truxonchus alleni* (Mulvey, 1961) n. comb., *T. dolichurus* (Ditlevsen, 1911) n. comb., *T. mulveyi* (Altherr, 1968) n. comb. and *T. subacutus* (Mulvey, 1961) n. comb. (type-species) are proposed for species previously under *Anatonchus.*

Four new genera and four new species of the order Mononchida are described in this paper. The nematodes were fixed in 3-5% formaldehyde solution, processed through warm lactophenol and mounted in dehydrated glycerin.

Caputonchus n. gen.

Diagnosis. Iotonchinae. Small-size (under 1 mm), almost straight on death. Lip region set off from body by a constriction. Amphid apertures oval, about a quarter of lip region width or less long. Stoma barrel-shaped, broad at base, its wall strongly angular at the base of dorsal tooth. Dorsal tooth located at the anterior end of the metarhabdion pointing ventrally and forwardly. No subventral teeth, denticles or ridges. Oesophageal base tuberculate. Vulva pore-like. Didelphic, amphidelphic. Tail conically pointed; the tip minutely rounded, devoid of spinneret or glands.

Type-species: Caputonchus capitatus n. gen., n. sp.

No other species.

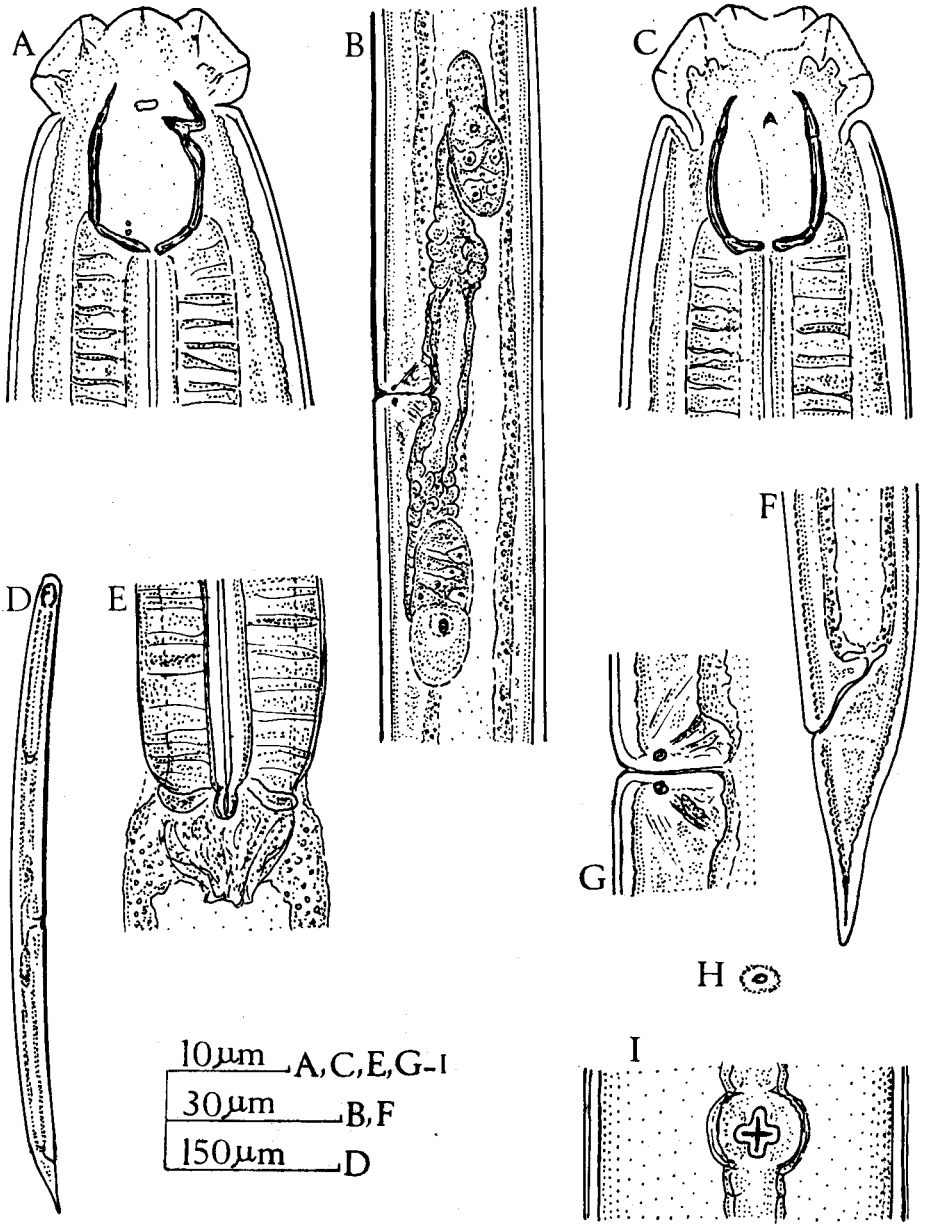

Fig. 1 A-I. *Caputonchus capitatus* n. gen., n. sp. Female. A. Head end, lateral. B. Reproductive organs. C. Head end, ventral. D. Female. E. Base of eosophagus. F. Tail end. G. Vulva and vaginal sclerotization. H & I. Vulva and vagina, ventral.

Caputonchus capitatus n. gen., n. sp.
(Fig. 1, A-I)

Measurements: Holotype ♀: L = 0.56 mm; a = 20; b = 3.5; c = 14.7; c ′ = 2.4; v = $^{9-}55^{-11}$; stoma = 16 X 8 μm.

Paratypes: 4 ♀♀: L = 0.52-0.62 (0.57); a = 19-21 (20); b = 3.4-3.7 (3.5); c = 15-16 (15.4); c′ = 2.4-2.7 (2.5); V = 54-59 (56); stoma = 13-14 μm X 8-9 μm.

Description: Female: Body almost straight, markedly tapering posteriorly. Cuticle smooth; body pores inconspicuous. Lip region trapezoid, offset by a sharp constriction, 19-20 μm wide, 7-8 μm high; papillae distinct. Amphid aperture oval, 3-5 μm long, at base of lip region. Apex of dorsal tooth 8-9 μm and 9-9.5 μm from anterior end of body and from base of stoma respectively. Oesophagus 150-175 (161) μm long, roughly equal to the oesophagus-vulva distance. Oesophageal base tuberculate. Intestine thin-walled, wide lumened. Vulva a small pore. Vagina about a third body-width long; sclerotization appearing as two dots in lateral view (Fig. 1,G). Ovaries reflexed about halfway back to vulva, with 10-15 oocytes. Anus a 10 μm long, posteriorly directed, crescentic slit. Tail conical with tip minutely rounded, 2.4–2.7 times anal body-width long.

Male not known.

Type habitat and locality: Recovered from a sample collected by Dr. D. J. Hunt around roots of grasses in St. Lucia, West Indies.

Type specimens: Holotype and 2 ♀♀ paratypes at Commonwealth Institute of Parasitology (CIP) St. Albans, England. 1 ♀ paratype each at Rothamsted Experimental Station (RES), Harpenden, England, and 1 ♀ at National Nematological Research Centre (NNRC) Karachi, Pakistan.

Relationship and discussion: Among the subfamily Iotonchinae, the new genus *Caputonchus* comes close to *Jensenonchus* Jairajpuri & Khan, 1982 by virtue of its lip region being offset by a constriction and anteriorly placed dorsal tooth which is situated at the anterior end of the metarhabdion, but differs from it in the absence of a longitudinal rib facing the dorsal tooth, comparatively small-sized amphids and the conically pointed tail. Outside Iotonchinae, it resembles the genus *Nigronchus* n. gen. of the Mononchinae in the shape of the lip region and anteriorly located dorsal

tooth but differs in having a broad-based stoma and a tuberculate oesophageal base, the differences considered by several workers to be significant at the subfamily, family or even superfamily level.

Within the genus *Iotonchus* Cobb, 1916, there are several species which have the dorsal tooth located at the anterior end, instead of the posterior end, of the dorsal metarhabdion and the lip region continuous with the body. A new genus, *Mulveyellus,* is proposed here to accommodate them.

Mulveyellus n. gen.

Diagnosis: Iotonchinae. Lip region continuous with body, not offset by a constriction. Stoma large, with dorsal tooth located at the anterior end of the metarhabdion. Oesophageal base tuberculate. Monodelphic-prodelphic or didelphic-amphidelphic. Tail elongate conoid, ventrally arcuate. Caudal glands or spinneret usually absent.

Type-species: *Mulveyellus jairi* (Lordello, 1959) n. comb.
syn. *Mononchus jairi* Lordello, 1959
Iotonchus jairi (Lordello, 1959)
Clark, 1961.

Other species:
Mulveyellus antedontus (Mulvey, 1963) n. comb.
syn. *Iotonchus antedontus* Mulvey, 1963.
M. antedontoides (Coetze, 1967) n. comb.
syn. *Iotonchus antedontoides* Coetze, 1967.
M. longicaudatus (Baqri, Baqri & Jairajpuri, 1978) n. comb.
syn. *Iotonchus longicaudatus* Baqri, Baqri & Jairajpuri, 1978.
M. monhystera (Cobb, 1971) n. comb.
syn. *Mononchus (Mononchus) monhystera* Cobb, 1917; *Mononchus monhystera* Cobb, 1917.
M. vorax (Cobb, 1917) n. comb.
syn. *Mononchus (Mononchus) vorax* Cobb, 1917; *Mononchus vorax* Cobb, 1917;
Iotonchus vorax (Cobb, 1917) Mulvey, 1963.

Relationship: Mulveyellus n. gen. differs from *Jensenonchus* and *Caputonchus* n.gen. in having a lip region not offset from body by a constriction and a ventrally arcuate tail.

The generic name, *Mulveyellus* is a patronym honouring Dr. Roland H. Mulvey for his excellent work on the taxonomy of the mononchs, and the name is masculine in gender.

Nigronchus n. gen.

Diagnosis: Mononchinae. Body small sized (less than 1 mm). Lip region wider than adjacent body and marked off by a sharp constriction; lips and papillae well developed, raised. Amphids small, stirrup-shaped, at base of lip region. Stoma elongate-cylindrical, armed with only the dorsal tooth, situated at the anterior end of the metarhabdion and pointing ventrally and forwardly. Oesophageal base non-tuberculate. Female reproductive system monodelphic, prodelphic. Vulva pore-like. Female tail elongate-filiform, with caudal glands and indistinct terminal pore.

Type-species: Nigronchus parvus n. sp.

No other species.

Nigronchus parvus n. gen., n.sp.
(Fig. 2, A-E)

Measurements: Holotype ♀: L = 0.64 mm; a = 25; b = 3.5; c = 6.4; c' = 7.5; V = $^{14-}$56.

Paratypes: 7 ♀♀: L = 0.60-0.73 (0.66) mm; a = 23-27 (25); b = 3.4-4.4 (3.6); c = 6.3-6.8 (6.5); c' = 6.8-7.5 (7); V = 52-56 (55).

Description: Female: Body straight. Cuticle thin, finely annulated. Lip region wider than adjacent body and offset by a sharp constriction; lips partially separated; papillae raised; amphids small, stirrup-shaped at base of lip region (Fig. 2,B). Stoma (= buccal cavity) excluding cheilostom 14.5-15.0 μm long and 6.5-7.0 μm at widest point, divisible into prostom, mesostom, metastom and telostom, their walls being prorhabdions, mesorhabdions, metarhabdions and telorhabdions, respectively. Stoma rhabdions plain except for a large dorsal tooth at front end of metarhabdion pointing ventrally and forwardly (Fig. 2,A). A pair of foramina (inner and outer) present at each subventral telorhabdion. Foramina is the aperture of a chemo-receptor sense organ, the geusid. Oesophagus a muscular cylinder with indistinct tubercles at base but these are not well developed to make the oesophagus tuberculate. Oesophagointestinal valve large, rounded.

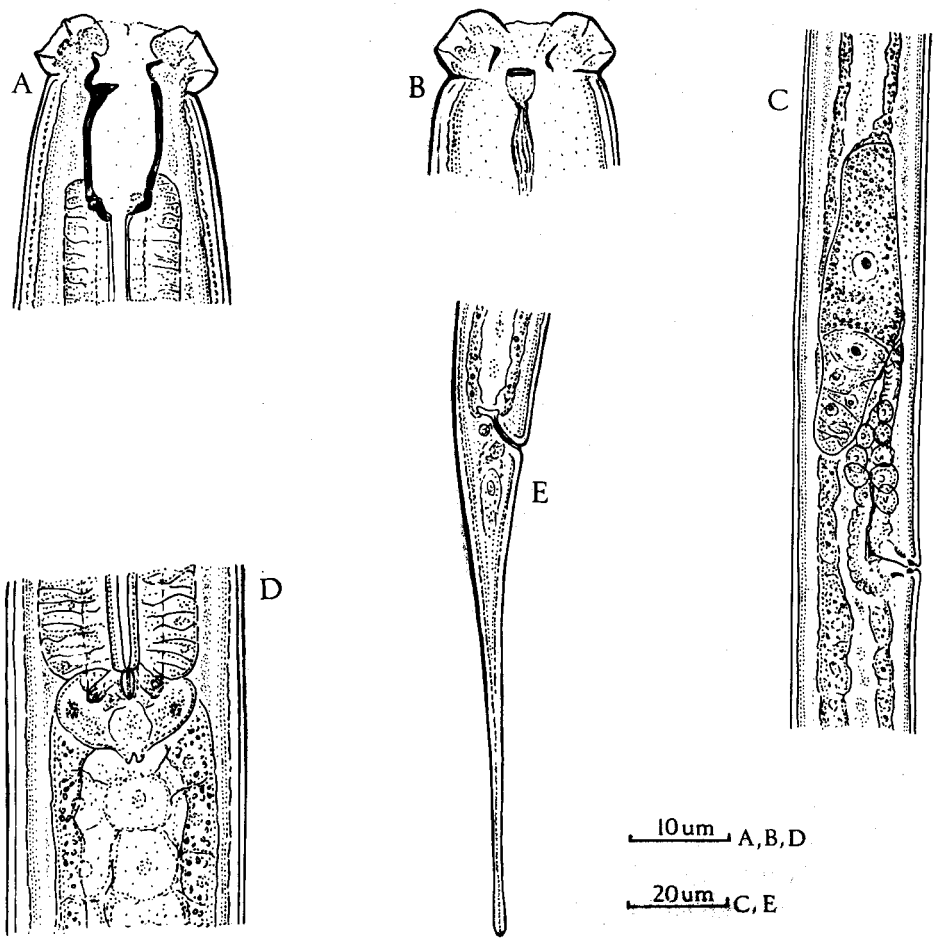

Fig. 2, A-E. *Nigronchus parvus* n. gen., n. sp. Female. A & B. Head ends. C. Reproductive organs. D. Base of oesophagus. E. Tail.

Vulva a small pore. Vagina about one-third body width long; sclerotization near vulva appearing as small rods in lateral view (Fig. 2,C). Monodelphic, prodelphic. Uterine chamber three-fourth body width long, may form a rudimentary postvulval sac less than one quarter body width long. A short (under one body width long) columellar part of uterus with 24 cells is connected to ovary by a short oviduct. Ovary about 10 oocytes, reflexed back to uterine region. Intestine wide-lumened; 4-6 cells in circumference. Rectum shorter than anal body width; rectal glands present. Anus a large transverse slit. Tail conoid in anterior third then gradually tapering to appear filiform (Fig. 2,E); terminus minutely round, lacking spinneret but rudiments of a spinneret seen at the tip of some tails. Male not found.

Type habitat and locality: Bush soil, near Ibadan, Nigeria.

Type specimens: Collected by Dr. F. E. Caveness in 1974. Holotype ♀ and 4♀♀ paratypes at C I P, St. Albans, England; 1 ♀ paratype each at RES. Harpenden, England; Landbouwhogeschool, Wageningen, Holland; NNRC, Karachi, Pakistan and U S D A Nematode Collection, Beltsville, Maryland, USA.

Relationship and discussion: Nigronchus n. gen. comes close to *Mononchus* Bastian, 1865 and *Margaronchulus* Andrassy, 1972. From the former it differs in having well developed and offset lip region and a single prodelphic reproductive branch and from the latter in lacking the single transverse row of denticles anterior to the dorsal tooth. The generic name is derived from prefix of Nigeria and suffix of *Mononchus.*

Margaronchulus was placed by Andrassy (1972) in the family Mylonchulidae Jairajpuri, 1969. Although *Nigronchus,* a typical member of Mononchidae, is closely related to *Margaronchulus,* the latter genus, due to its few denticles on the mesorhabdions and a more conoid base of the stoma, has been placed in the Mylonchulidae. It is suggested here that Mylonchulidae be recognized as a subfamily of the family Mononchidae.

Truxonchus n. gen.

Diagnosis: Anatonchidae. Stoma with three retrorse teeth in adults, one dorsal and two subventral, located behind the middle of the metarhabdions. Didelphic. Oesophageal base tuberculate. Spinneret or terminal caudal pore absent in type-species but may be present. Tail generally elongate-conoid to filiform.

Type-species: Truxonchus subacutus (Mulvey, 1961) n. comb.
syn. *Anatonchus subacutus* Mulvey, 1961
Other species: Truxonchus alleni (Mulvey, 1961) n. comb.
syn. *Anatonchus alleni* Mulvey, 1961
T. dolichurus (Ditlevsen, 1911) n. comb.
syn. *Mononchus dolichurus* Ditlevsen, 1911
A. dolichurus (Ditlevsen, 1911) Andrassy, 1958
T. confundus n. nom.
syn. *Anatonchus* sp., near *alleni* of Mulvey, 1961; *A. paralleni* Jairajpuri & Khan, 1982 which is a *nomen nudum* because it was not differentiated from the related species as required by the

I.C.Z.N. Article 13(a). *T. confundus* n.nom. is differentiated here with other species in the following key and is proposed here to replace the name *A. paralleni* Jairajpuri & Khan, 1982.

T. mulveyi (Altherr, 1968) n.comb.
syn. *Anatonchus mulveyi* Altherr, 1968

Relationship: Truxonchus n. gen. differs from *Anatonchus* Cobb, 1916 (Andrássy, 1958) in having the three teeth located in the posterior half of the metarhabdions – a condition regarded here as more primitive than that found in *Anatonchus* sensu stricto, since the development of the species of *Anatonchus* shows a gradual anterior migration of the supra-basal teeth.

Key to species of *Truxonchus*
(based on females)

1. Body length over 5 mm; stoma about 100 µm long. . . *T. dolichurus* (Ditlevsen)
   Body length under 5 mm; stoma less than 80 µm long 2

2. Tail cylindroid, less than two anal body-widths long . . . . . .*T. mulveyi* (Altherr)
   Tail elongate-conoid, more than four anal body-widths long 3

3. Terminal caudal pore absent. . . . . .*T. subacutus* (Mulvey)
   Terminal caudal pore present 4

4. Body length 4.0-4.8 mm stoma 75-80 µm long, 52-58 µm wide *T. confundus* n. nom.
   Body length 2.5-3.5 mm; stoma 50-58 µm long, 35-50 µm wide *T. alleni* (Mulvey)

Actus nanurus n. sp.
(Fig. 3, A-0)

Measurements: 10 ♀♀ Paratypes: L = 0.9-1.1 (0.97) mm; a = 22-28 (25); b = 3.2-4.3 (3.6); c = 33-57 (45); c' = 0.8-1.3 (1); V = 60-66 (64); stoma = 27-29 X 11-13 µm.

Holotype ♀: L = 0.96 mm; a = 24; b 3.3; c = 38; c' = 1; V = $^{8-}64^{-8}$; stoma = 27 X 11 µm.

2 Juvenile I-stage: L = 0.39 mm; a = 20-21; b = 2.6-2.8; c = 20-23; c' = 1.5; stoma = 16 X 6-7 µm.

2 Juveniles II-stage: L = 0.47-0.49 mm; a = 24-26. b = 2.7-2.9; c = 24-25; c' = 1.4; stoma = 16-18 X 6.5 – 7 µm.

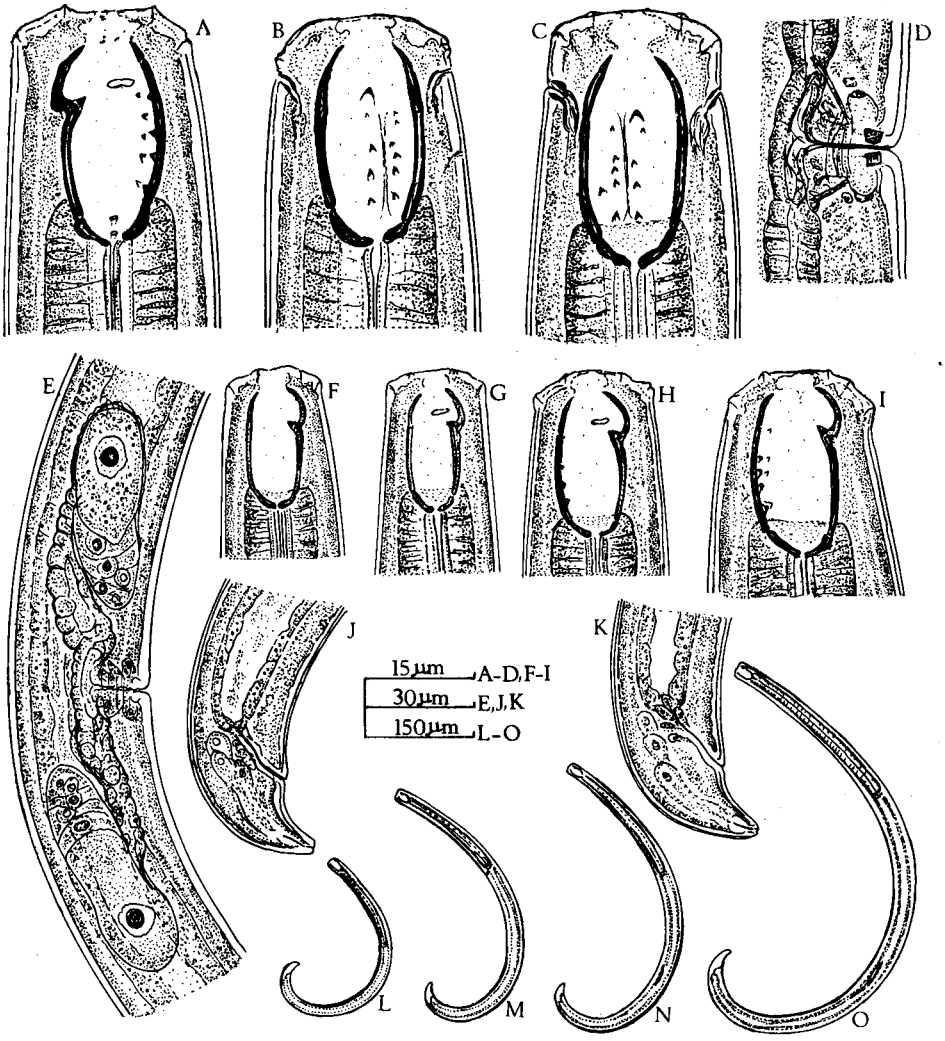

Fig. 3. A-O. *Actus nanurus* n. sp. A-E, J & K. Female, remainder juveniles. A. Head end lateral. B & C. Head end, ventral. D. Vulval region. E. Reproductive organs. F, G, H & I. Head ends of I–, II–, III– and IV-stage juveniles. J & K. Tail ends. L, M, N & O. I–, II–, III– & IV-stage juveniles.

2 Juveniles III-stage: L = 0.56 mm; a = 23-24; b = 2.8-2.9; c = 24-26; c' = 1.4-1.5; stoma = 19-20 X 8-8.5 µm.

2 Juveniles IV-stage: L = 0.71-0.83 mm; a = 26-27; b = 3.2-3.3; c = 32-37; c' = 1.2-1.3; stoma = 23-23.5 X 10 µm.

Description: Female: Body ventrally arcuate to C-shaped. Cuticle smooth; subdorsal body pores 2-5 in oesophageal region, 4-13 between oesophagus

and vulva and 5-7 in postvulval region; subventral pores 2-10 in pre– and 1-6 in postvulval region. Lip region continuous with body contour, papillae raised. Amphid apertures transversely oval, 3-3.5 μm long, 8-10 μm from anterior end of body, 2-5 μm anterior to tip of dorsal tooth. Stoma barrel-shaped. Dorsal tooth 3-4 μm high, its tip 12-14 (13) μm from anterior end of body. Two irregular rows of latero-subventral denticles present on the metarhabdions, 4-6 (usually 5) in each row decreasing in size from posterior to anterior. Pro-, meso-, meta- and telorhabdions measuring 3-4 μm, 4-7 μm, 15-17 μm and 5-7 μm, respectively. Five (1 dorsal, 2 subventral pairs) geusids present in telostom. Oesophagus cylindrical, 210-310 (280) μm long, base poorly tuberculate. Nerve ring 89-97 (91) μm from anterior end. A pair of closely spaced endolids at 83-86 μm from anterior end; another pair of slightly spaced endolids 62-65 μm behind the first pair; a third endolid seen just anterior to the orifice of dorsal gland which lies 118-121 μm anterior to the base of oesophagus. Posterior and anterior subventral glands at 10-12 μm and 86-88 μm from base of oesophagus. Excretory pore 118-122 (120) μm from anterior end.

Vulva depressed. Vaginal sclerotization appearing squarish in lateral optical section (Fig. 3,D). Two reproductive branches symmetrical, ovaries reflexed, with less than 10 oocytes (Fig. 3,E). Rectum 19-28 μm long. Tail dorsally convex-conoid to a subdigitate end bearing prominent spinneret and terminal pore; 18-33 (25) μm long; with caudal glands near anal region.

Male not found.

Juveniles: Body arcuate. Lip region, shape of stoma and tail as in female. Subventral teeth absent in I-and II-stage juveniles (Fig. 3, F & G). Although length of tail increases slightly from 20 μm to 23 μm c' ratio decreases from 1.5 to 1.2 in I to IV-stage juveniles.

Type habitat and locality: Collected from soil around roots of coconut tree in Rotuma Island, Fiji.

Type specimens: Recovered from a sample collected by Mr. K. J. Orton-Williams in 1976; 4♀♀ at C I P, St. Albans, England. 2♀♀ paratypes each at RES, Harpenden, England: NNRC, Karachi, Pakistan and USDA Nematode Collection, Beltsville, Maryland, USA.

Relationship and discussion: Only two other species of *Actus* are known. The following key differentiates the three species.

Key to species of *Actus*

1. Body 0.83-0.85 mm long; amphid apertures opposite the tip of the dorsal tooth. . . . . *A. minutus* (Mulvey, 1963) Baqri & Jairajpuri, 1973 (syn. *Sporonchulus minutus* Mulvey, 1963).
   Body over 0.85 mm long; amphids anterior to the tip of the dorsal tooth. 2

2. Female tail 51-61 μm long; c = 17-20; c' = 1.8-2.4 . . . . . *A. salvadoricus* Baqri & Jairajpuri, 1973.
   Female tail 18-33 μm long; c = 33-57; c' = 0.9-1.3 . . . . . *A. nanurus* n. sp.

Baqri & Jairajpuri (1973) placed *Actus* under Mononchidae near the genus *Prionchulus* and subsequently Jairajpuri & Khan (1982) placed it under Prionchulinae. They argued against placing *Actus* near *Sporonchulus* Cobb, 1917 under Sporonchulinae of the family Mylonchulidae, although the difference between the two genera is in the number and arrangement of the subventral denticles only (note that the type-species, *A. minutus* was originally described as a species of *Sporonchulus*). The subventral rows of denticles in *Actus* are irregular and one or two denticles may lie away from the row (Fig. 3,C). I consider *Actus* and *Sporonchulus* to belong to the subfamily Mononchinae.

Crassibucca colombica n. sp.
(Fig. 4,A-E)

Measurements: Holotype ♀: L = 1.35 mm; a = 36; b = 3.6; c = 11.5; c' = 4.5; V = $^{16-}$70.5; stoma = 38 X 15 μm.

Paratype ♀: L = 1.32 mm; a = 38; b = 3.7; c = 12; c' = 4.6; V = 69; stoma = 32 X 14 μm.

Description: Female: Body strongly curved ventrally, maximum width 35-37.5 μm. Cuticle thick, finely striated; lateral chords about two-fifth body width. Lip region offset, with prominent lips and papillae, wider than adjacent body. Amphids small, aperture oval, 10 μm from anterior end, anterior to apex of dorsal tooth. Stoma elongate, conoid at base, thick heavily sclerotized walls. Dorsal tooth on a prominent elevation of stoma wall, reaching median longitudinal axis of stoma, pointing ventrally and forwardly. Anterior pair of subventral teeth facing apex of dorsal tooth, smaller than posterior subventral teeth which lie a little anterior to the base of metastom (Fig. 4,A). Base of oesophagus poorly tuberculate (Fig. 4,C). Intestine with wide lumen and fine granules in cells. Vulva apparently a small transverse slit. Vagina directed forward and having conspicuously muscular walls, about half body width long. Reproductive system prodel-

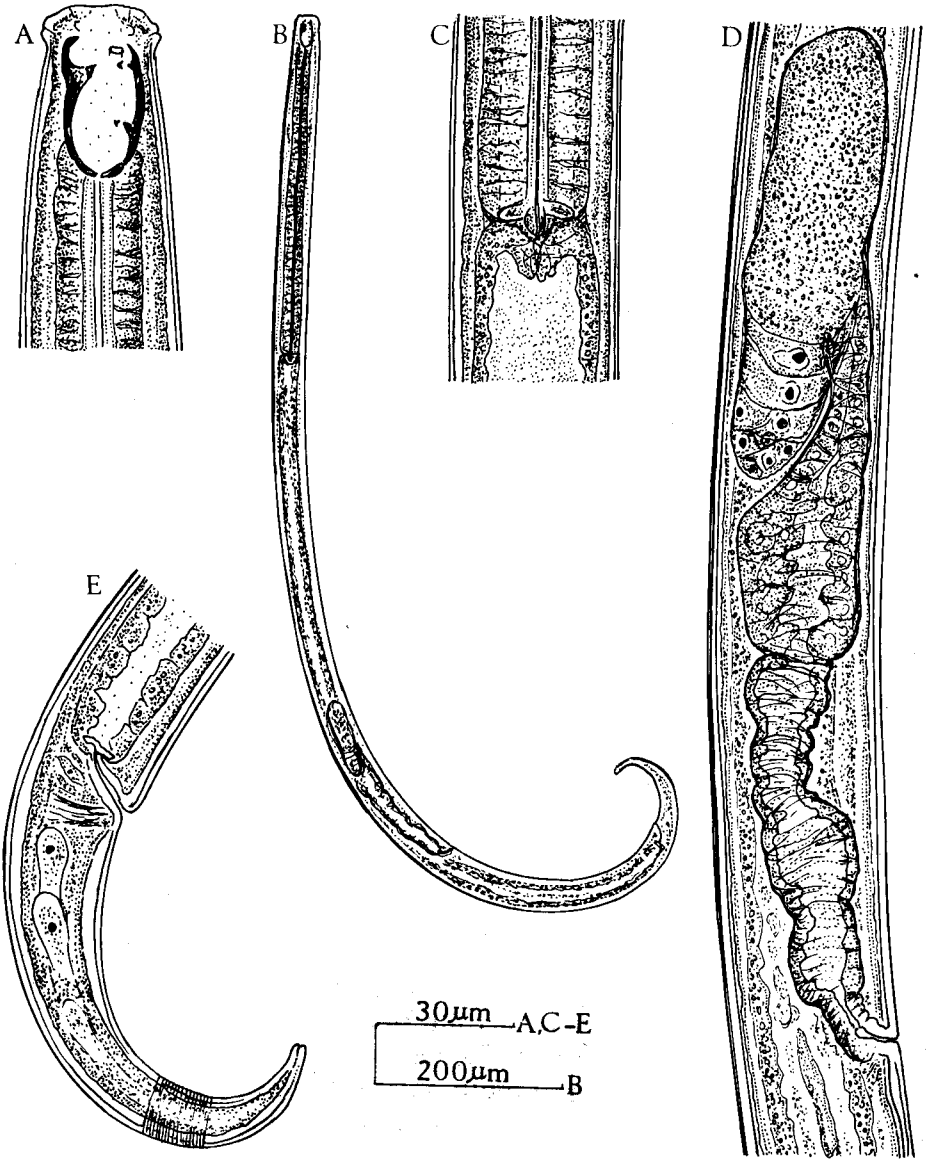

Fig. 4, A-E. *Crassibucca colombica* n. sp. Female. A. Head end. B. Female. C. Base of oesophagus. D. Reproductive organs. E. Tail end.

phic with no trace of posterior branch, well developed. Uterus with large chambers. Oviduct joining ovary near its middle; latter reflexed, with 9-15 oocytes (Fig. 4,D). Rectum prominent, three quarters anal body width long. Tail curved through 90°, regularly tapering to a small rounded tip bearing a minute pore; about four and a half times anal body width long; three caudal glands lie at tandem in anterior half of the tail (Fig. 4,E).

Type habitat and locality: Soil around roots of plants in rain forest near Araracuara, Amazonas, Colombia.

Type specimens: Collected by Ms. Kate Williamson during the Colombian Amazonas Expedition, 1977. At CIP, St. Albans, England.

Relationship: Crassibucca colombica n. sp. comes close to *C. penicula* Mulvey & Jensen, 1967 but differs in having dorsal tooth much larger than the posterior subventrals, distinct caudal glands and pore and longer tail (52-72 (60) μm long c = 15.8-18.3 (17) and c' less than 3 in *C. penicula).*

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