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Studies on the genus *Aporcelaimellus* Heyns, 1965 (Dorylaimida : Aporcelaimidae) from India

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Summary – Two new species of the genus *Aporcelaimellus* Heyns, 1965 are described and illustrated. *Aporcelaimellus cylindricus* n.sp. has L = 1.63-1.87 mm; c = 46-56; odontostyle = 14 µm; spicules = 41-42 µm; is characterized by having comparatively slender body, distinctly offset lip region, short odontostyle with a large aperture and dorsally convex-conoid tail with pointed tip and is closely related to *A. coomansi* Baqri & Khera, 1975, *A. simplex* (Thorne & Swanger, 1936) Loof & Coomans, 1970, and *A. mamillatus* (Williams, 1959) Heyns, 1965. *A. shamimi* n.sp. has L = 2.52-3.17 µm; c = 44-47; V = 59-61; odontostyle = 21-22 µm; spicules = 66-74 µm; is characterized by having deeply offset lip region, transverse vulva and males with few supplements and is closely related to *A. capitatus* (Thorne & Swanger, 1936) Heyns, 1965 and *A. taylori* Yeates, 1967. Males are described for the first time for *A. coomansi*. Additional data are provided for *A. laevis* Tjepkema, Ferris & Ferris, 1971 and *A. heynsi* Baqri & Jairajpuri, 1968.

Résumé – *Étude du genre* Aporcelaimellus *Heyns, 1965 (Dorylaimida : Aporcelaimidae) en Inde* – Deux nouvelles espèces appartenant au genre *Aporcelaimellus* Heyns, 1965 sont décrites et illustrées. *Aporcelaimellus cylindricus* n.sp. est caractérisée par : L = 1,63-1,87 mm; c = 46-56; V = 56-58; odontostyle court (14 µm); spicules = 41-42 µm; corps mince; ouverture de l'odontostyle large; queue dorsalement convexe-conoïde à extrémité pointue. Cette nouvelle espèce est très proche de *A. coomansi* Baqri & Khera, 1975, *A. simplex* (Thorne & Swanger, 1936) Loof & Coomans, 1970 et *A. mamillatus* (Williams, 1959) Heyns, 1965. *A. shamimi* n.sp. est caractérisé par L = 2,52-17 mm; c = 44-57; V = 59-61; odontostyle = 21-22 µm; spicules = 66-74 µm; région labiale basse mais très en relief, amphides duplex; vulve en fente transversale, mâles à petit nombre de suppléments. Cette nouvelle espèce est très voisine de *A. capitatus* (Thorne & Swanger, 1936) Heyns, 1965 et *A. taylori* Yeates, 1967. Le mâle de *A. coomansi* est décrit pour la première fois. Des informations supplémentaires sont apportées sur *A. laevis* Tjepkema, Ferris & Ferris, 1971 et *A. heynsi* Baqri & Jairajpuri, 1968.

Key words : Taxonomy, soil nematode, *Aporcelaimellus*, Dorylaimida.

Soil samples collected from various localities in India yielded several populations of the genus *Aporcelaimellus* Heyns, 1965. On detailed examination they were found to represent two new and three known species. The known species are *A. laevis* Tjepkema, Ferris & Ferris, 1971; *A. heynsi* Baqri & Jairajpuri, 1968 and *A. coomansi* Baqri & Khera, 1975. The new species have been named *A. cylindricus* n.sp. and *A. shamimi* n.sp. The males were recorded for the first time for *A. coomansi* and are described in the following.

The nematodes were killed in hot 4 % formalin and dehydrated by the slow method. All measurements were taken and observations made on specimens mounted in anhydrous glycerine.

Aporcelaimellus cylindricus n.sp.

(Fig. 1)

Dimensions

Female (Paratypes; n = 2) : L. = 1.63-1.68 mm; a = 41-43; b = 4.1-4.2; c = 47; c′ = 1.2-1.3; V = 56-57; G1 = 13-15; G2 = 13-14; odontostyle = 14 µm; odontophore = 22-24 µm; neck length = 392-399 µm; prerectum = 88-98 µm; rectum = 28-29 µm; tail = 35-36 µm; ABD = 27-29 µm.

Male (Paratypes; n = 2) : L = 1.69-1.87 mm; a = 39-42; b = 4.1-4.8; c = 46-56; c′ = 1.1-1.4; T = 57-58; odontostyle = 14 µm; odontophore = 22-23 µm; neck length = 388-410 µm; spicules = 41-42 µm; lateral guiding pieces = 11-13 µm; ventromedian supplements = 5; prerectum = 145-160 µm; tail = 30-41 µm; ABD = 29 µm.

Holotype (Female) : L = 1.63 mm; a = 39; b = 4.2; c = 46; c′ = 1.3; V = 58; G1 = 15; G2 = 14; odontostyle = 14 µm; odontophore = 22 µm; neck length = 385 µm; prerectum = 91 µm; rectum = 35 µm; tail = 36 µm; ABD = 27 µm.

Description

Adult : Body curved ventrad upon fixation, more so in the posterior half, especially in males. Cuticle marked with transverse striae, 2-3 µm thick at midbody and 5-6 µm on tail. Lateral chords about 1/3 rd of corresponding body width at midbody. Lateral, dorsal and ventral body pores indistinct. Lip region offset by deep constriction, wider than adjoining body, 12-13 µm wide

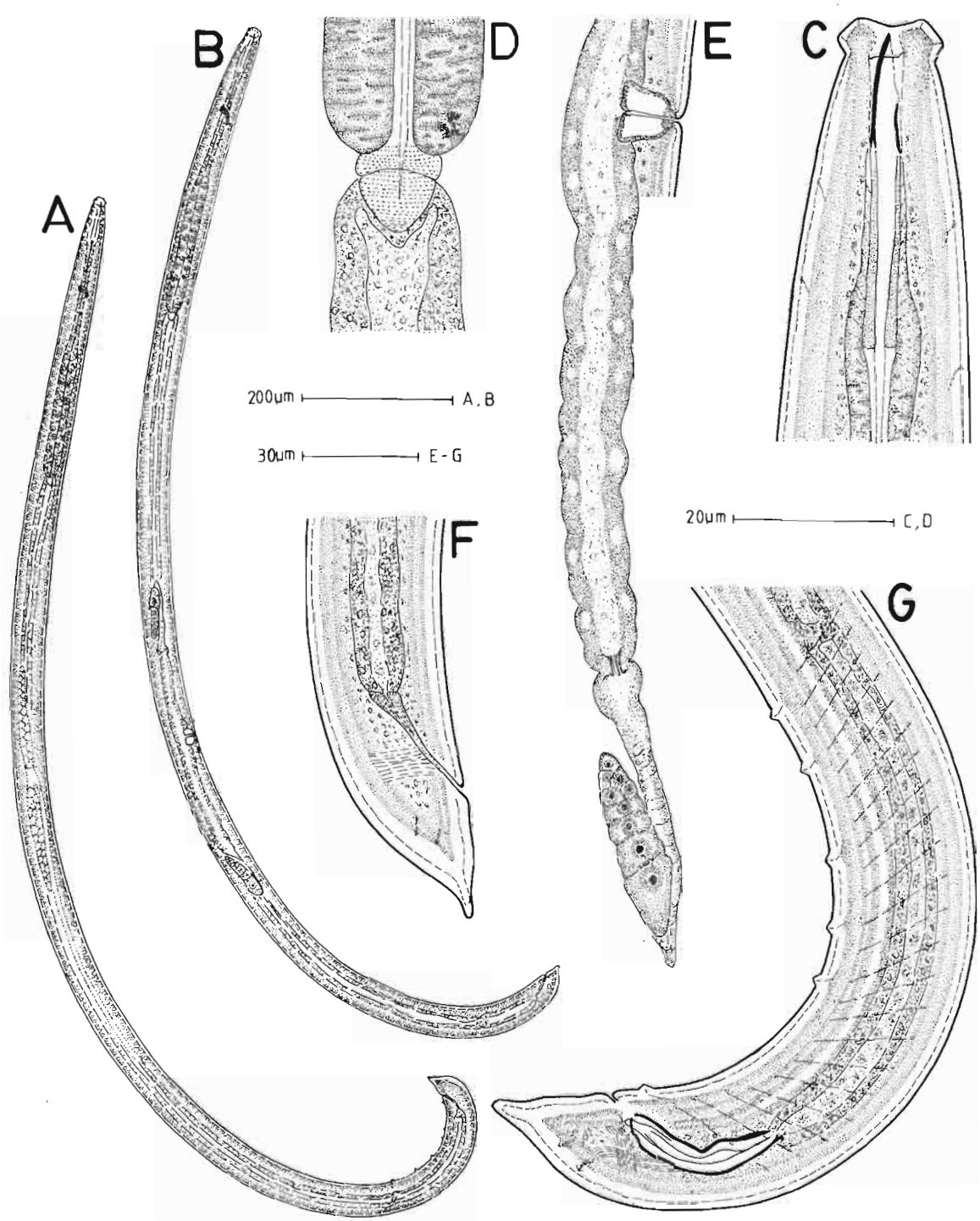

Fig. 1. Aporcelaimellus cylindricus *n.sp. A : Entire male; B : Entire female; C : Anterior region; D : Oesophago-intestinal junction; E. : Female gonad (posterior); F : Female posterior end; G : Male posterior region.*

and 5-6 µm high. Amphids stirrup-shaped, aperture 6-7 µm or about half of the corresponding body width wide. Odontostyle 1.1-1.2 lip region width long with aperture about 55-60 % of its length. Fixed ring single, plicated, at 6-7 µm or about half lip region width from anterior end. Odontophore rod-like, 1.6-1.7 times the odontostyle length. Nerve ring at 120-140 µm from anterior end of body. Oesophageal expansion gradual, expanded portion of oesophagus occupying 48-50 % of the total neck length. Cardia short conoid, 8-10 µm long. Cardiac disc present. Oesophageal gland nuclei and their orifices located as follows : DO = 52-54, DN = 55-57, DO – DN = 3.1-3.8, S1N1 = 61-62, S1N2 = 69-70, S2N = 88-89, S20 = 89-90.

Female : Reproductive system amphidelphic. Vulva transverse, slit-like, vagina strongly muscular, 13-14 µm or about 1/3rd of the corresponding body width deep with unsclerotized distal part. Both sexual branches equally developed, ovaries comparatively small, 45-50 µm long with oocytes arranged in a single row except near tip. Oviduct 72-80 µm long, sphincter present at oviduct-uterus junction. Uterus 99-115 µm long. Prerectum 3.0-3.5 anal body diameter long. Rectum 1.0-1.1 anal body diameter long. Tail dorsally convex conoid with digitate tip, and a pair of caudal pores on each side.

Male : Testes paired, opposed, dorylaimoid; sperm spindle-shaped, 5-6 µm long. Spicules dorylaimoid, 1.4 anal body diameter long. Lateral guiding pieces rod-like, about 1/4th of spicule length. Supplements an adanal pair and five slightly irregularly spaced ventromedians. The posteriormost supplement at 61-63 µm from cloacal aperture. Prerectum 5.0-5.5 anal body diameters long. Tail dorsally convex conoid with digitate tip and two or three caudal pores on each side.

TYPE HABITAT AND LOCALITY

Soil around roots of mango *(Mangifera indica)* from near R. E. Factory, Banksankara, Bangalore, Karnataka state, India.

TYPE MATERIAL

Collected in August 1980, *Holotype* female (and a paratype male) on slide *Aporcelaimellus cylindricus* n.sp./1 in the nematode collection of the Department of Zoology, Aligarh Muslim University, Aligarh. *Paratype* female and a male on slide *Aporcelaimellus cylindricus* n.sp./2 in the same collection. A paratype female deposited at Muséum National d'Histoire Naturelle, Laboratoire de Biologie Parasitaire, Protistologie, Helminthologie, Paris, France.

DIAGNOSIS AND RELATIONSHIP

Aporcelaimellus cylindricus n.sp. is characterized by having a medium-sized comparatively slender body, distinctly offset lip region, short odontostyle with a large aperture and dorsally convex-conoid tail with pointed tip.

In the body size and tail shape the new species closely resembles *A. coomansi* Baqri & Khera, 1973 and *A. simplex* (Thorne & Swanger, 1936) Loof & Coomans, 1970 but differs from both in having shorter odontostyle with slightly smaller aperture and more digitate tail. It further differs from *A. coomansi* in having shorter odontophore, higher c value, shorter spicules and in the number of ventromedian supplements (odontostyle = 17-18 µm, odontophore = 28-29 µm, spicules = 49-52 µm and only two ventromedian supplements in *A. coomansi*). From *A. simplex* it further differs in having posteriorly located vulva and higher c value (odontostyle 22 µm with aperture 75 %, V = 45 and c = 32 in *A. simplex*).

In the shape of tail the new species bears close resemblance with *A. mamillatus* (Williams, 1959) Heyns, 1965 but differs from it in having slender body, shorter odontostyle, comparatively posterior vulva, slightly longer tail and lower number of ventromedian supplements (a = 20-30, odontostyle = 20-27 µm, c = 49-72, V = 45-54 and twelve ventromedian supplements in *A. mamillatus*).

***Aporcelaimellus shamimi* n.sp.**

(Fig. 2)

DIMENSIONS

Female (Paratypes; n = 2) : L = 2.78-2.81 mm; a = 35-41; b = 4.4-4.6; c = 45-57; c′ = 1.3-1.4; V = 59-60; G1 = 11-13; G2 = 12; odontostyle = 20-21 µm; odontophore = 33-34 µm; neck length = 602-626 µm; prerectum = 146-180 µm; rectum = 40-42 µm; tail = 49-63 µm; ABD = 38-46 µm.

Male (Paratypes; n = 3) : L = 2.52-3.17(2.93) mm; a = 37-42(40); b = 4.7-5.3(4.9); c = 44-50(48); c′ = 1.1-1.3; T = 60-61(60); odontostyle = 20-21 µm; odontophore = 34-36(35) µm; neck length = 469-661 (586) µm; spicules = 66-74(70) µm; lateral guiding pieces = 16-17 µm; ventromedian supplements = 6-8; prerectum = 205-220 µm; tail = 57-63(61) µm; ABD = 45-55(51) µm.

Holotype (Female) : L = 2.78 mm; a = 43; b = 3.9; c = 46; c′ = 1.6; V = 61; G1 =13; G2 = 12; odontostyle = 21 µm; odontophore = 34 µm; neck length = 714 µm; prerectum = 181 µm; rectum = 42 µm; tail = 61 µm; ABD = 38 µm

DESCRIPTION

Adult : Body curved ventrad upon fixation, more so in posterior half, especially in males. Cuticle marked with transverse striae, 5-7 µm thick at midbody and 8-10 µm at tail. Lateral chords about 1/4th-1/3rd of the corresponding body width at midbody. Dorsal and ventral body pores distinct, spaced irregularly, 7-8 dorsal and 16-18 ventral in the oesophageal region. Lip region offset by deep constriction, wider than the adjoining body, 20-

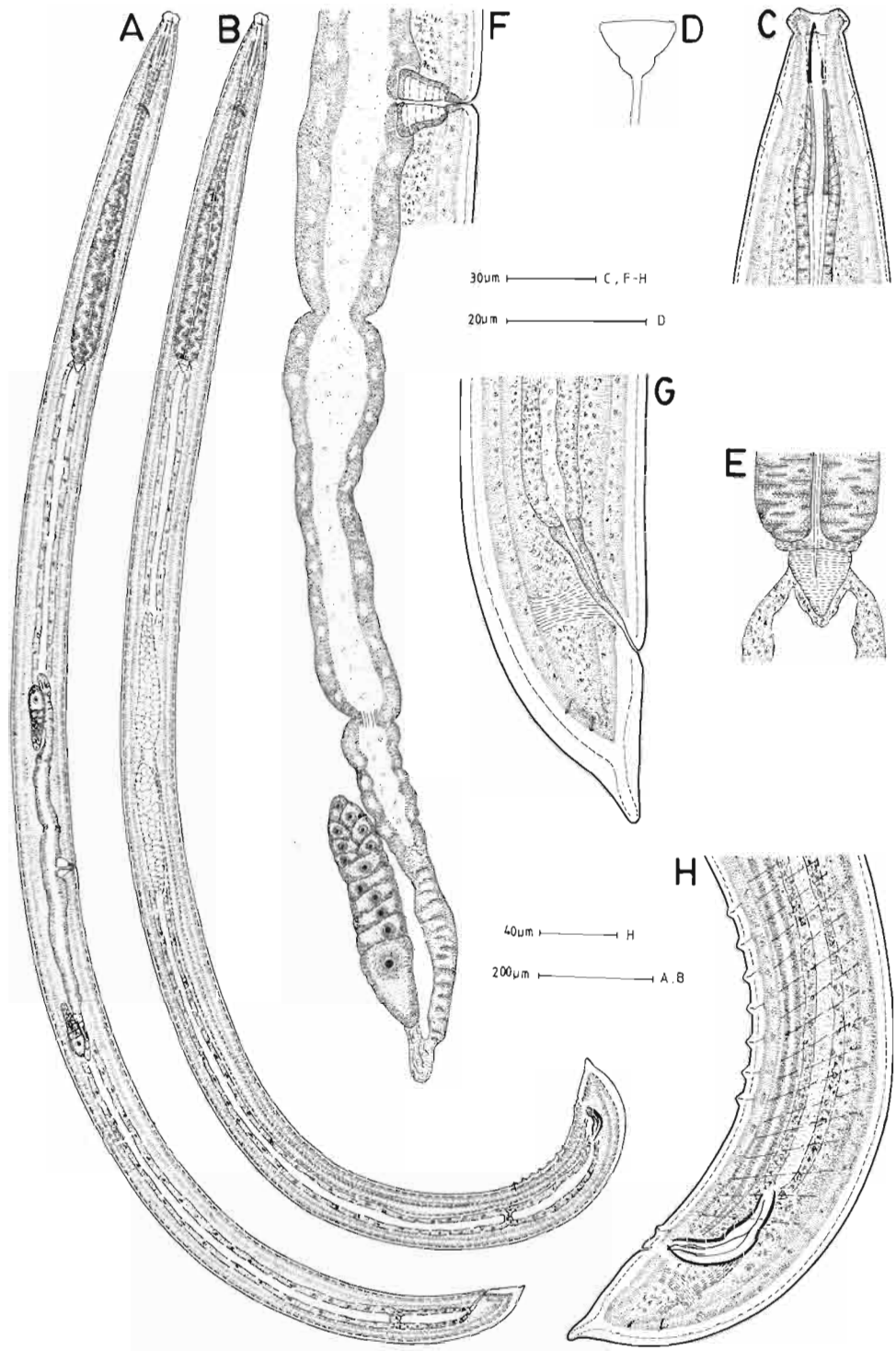

Fig. 2. Aporcelaimellus shamimi *n.sp. A : Entire female; B : Entire male; C : Anterior region; D : Amphid; E : Oesophago-intestinal junction; F : Female gonad (posterior); G : Female posterior end; H : Male posterior region.*

22 µm wide and 6-7 µm high. Amphids stirrup-shaped, aperture 9-11 µm or about half of the corresponding body width wide. Odontostyle about one lip region width long with aperture about 60 % of its length. Guiding ring single, plicated, at 9-10 µm or about half lip region width from anterior end. Odontophore rod-like, 1.6-1.7 times the odontostyle length. Nerve ring at 154-186 µm from anterior end of body. Oesophageal expansion gradual, expanded portion of oesophagus occupying 52-60 % of the total neck length. Cardia short conoid, 13-14 µm long. Cardiac disc present. Oesophageal gland nuclei and their orifices located as follows : DO = 42-45, DN = 46-48, DO – DN = 3.5-4.0, S1N1 = 60-63, S1N2 = 69-73, S2N = 87-90, S20 = 88-91.

Female : Reproductive system amphidelphic. Vulva a transverse slit. Vagina 30-33 µm or about 35-38 % of the corresponding body width deep with unsclerotized distal part. Both the sexual branches equally developed. Ovaries 66-70 µm long with oocytes arranged in a single row except near tip. Oviduct 105-135 µm long, sphincter present at oviduct-uterus junction. Uterus 202-215 µm long. Prerectum 3.8-3.9 anal body diameters long. Rectum about one anal body diameter long. Tail short conoid, tip bluntly rounded bent dorsally with one pair of caudal pores on each side.

Male : Testes paired, opposed, dorylaimoid. Sperm spindle-shaped, 5-6 µm long. Spicules dorylaimoid, comparatively slender, 1.3-1.4 anal body diameters long. Lateral guiding pieces about 1/4th of the spicules length. Supplements an adanal pair and six to eight regularly spaced ventromedians. The posteriormost supplement 92-98 µm from cloacal aperture, others 12-17 µm apart. Copulatory muscles extending beyond the range of supplements. Prerectum 4-5 anal body diameter long, terminating beyond the range of supplements. Tail convex conoid with bluntly rounded tip and 2-3 pairs of caudal pores on each side.

TYPE HABITAT AND LOCALITY

Soil around the roots of citrus (*Citrus sinensis* L.) from Botanical garden, Madras, Tamil Nadu, India.

TYPE MATERIAL

Collected in August 1980. *Holotype* female (and a paratype male) on slide *Aporcelaimellus shamimi* n.sp./1 in the nematode collection of the Department of Zoology, Aligarh Muslim University, Aligarh. *Paratype* female and a male on slide *Aporcelaimellus shamimi* n.sp./2 in the same collection. A paratype female and a male deposited at Muséum National d'Histoire Naturelle, Laboratoire de Biologie Parasitaire, Protistologie, Helminthologie, Paris, France.

DIAGNOSIS AND RELATIONSHIP

Aporcelaimellus shamimi n.sp. is characterized by having a large body, deeply offset but comparatively low lip region, large odontostyle, transverse vulva and males with few supplements.

The new species is closely related to *A. capitatus* (Thorne & Swanger, 1936) Heyns, 1965 and *A. taylori* Yeates, 1967 in the tail shape but differs from both in having longer body, comparatively lower lip region and longer odontostyle. It further differs from *A. capitatus* in having larger odontostyle aperture, longer prerectum and spicules (L = 2.5 mm, one and one-third times the lip region width with aperture about 50 %, prerectum about three anal body diameter long and terminating well within the range of supplements and spicules as long as tail in *A. capitatus*). From *A. taylori* the new species further differs in the presence of cardiac disc, posterior vulva, longer spicules, lesser number of ventromedian supplements and nature of copulatory muscles (L = 2.1-2.25 mm, odontostyle = 18-19 µm, cardiac disc absent, V = 50, spicules = 60-64 µm, eleven or twelve ventromedian supplements and copulatory muscles not extending as far as supplements in *A. taylori*).

The new species also bears a resemblance with *A. indicus* Baqri & Jairajpuri, 1968 but differs from it in having longer body, in the shape of lip region, longer odontostyle, c value and in the presence of males (L = 2.40-2.45 mm, lip region offset by depression, odontostyle = 16 µm and c = 41-43 in *A. indicus*).

Aporcelaimellus coomansi Baqri & Khera, 1975
(Fig. 3)

DIMENSIONS

Females (n = 4) : L = 1.88-2.27(209) mm; a = 38-51 (46); b = 4.3-4.8(4.5); c = 32-53(47); c′ = 1.4-2.1 (1.6); V = 55-58(57); G1 = 14-24(18); G2 = 12-25 (18); odontostyle = 16-17(17) µm; odontophore = 28-30(29) µm; neck length = 426-479(454) µm; prerectum = 87-105(98) µm; rectum = 29-34(32) µm; tail = 39-59(46) µm; ABD = 31-34 µm.

Males (n = 2) : L = 2.21-2.33 mm; a = 45-47; b = 4.6-4.8; c = 53-57; c′ = 1.2-1.3; T = 55-56; odontostyle = 17-18 µm; odontophore = 28-32 µm; neck length = 453-497 µm; spicules = 49-52 µm; lateral guiding pieces = 16 µm; two ventromedian supplements; prerectum = 168-180 µm; tail = 41-42 µm; ABD = 31-34 µm

DESCRIPTION

Adult : Body curved ventrad upon fixation. Cuticle marked with fine transverse striae, 2-3 µm thick at midbody and 5-7 µm on tail. Lateral chords about 1/5-1/4th of the body width at midbody. Dorsal and ventral body pores spaced regularly, 5-7 dorsal and 10-13 ventral in the oesophageal region. Lip region offset by deep constriction, wider than the adjoining body, 14-16 µm wide and 6 µm high. Amphids stirrup-shaped, aperture 8-9 µm or slightly more than half of the corresponding body width wide. Odontostyle 1.1-1.2 lip region widths

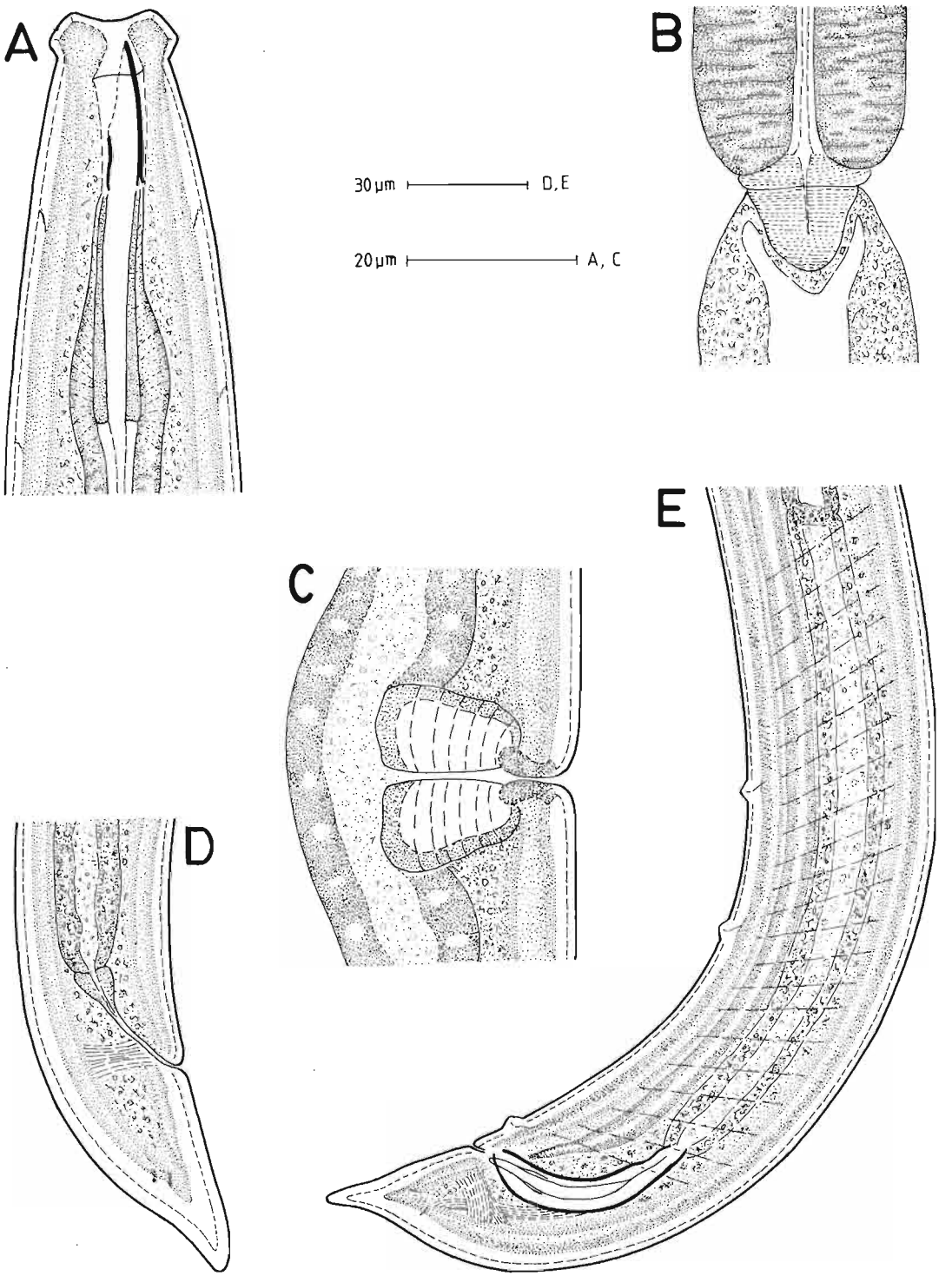

Fig. 3. Aporcelaimellus coomansi *Baqri & Khera, 1975. A : Anterior region; B : Oesophago-intestinal junction; C : Vulval region; D : Female posterior end; E : Male posterior region.*

long, its aperture 10-11 µm or about 61-65 % of odontostyle length. Guiding ring at 7-8 µm or about half lip region width from anterior end. Odontophore rod-like, 1.6-1.8 times the odontostyle length. Nerve ring at 132-140 µm from anterior end of body. Oesophageal expansion gradual, expanded portion of oesophagus occupying 45-52 % of total neck length. Cardia short, hemispheroid. Cardiac disc present.

Male : Testes paired, opposed, dorylaimoid. Sperms spindle-shaped, 5-6 µm long. Spicules dorylaimoid, 1.5-1.6 anal body widths long. Lateral guiding pieces about 1/3rd of the spicules length. Supplements : an adanal pair and only two ventromedians, the posterior supplement 88-90 µm from cloacal aperture, others 30-33 µm apart. Prerectum 5.1-5.4 anal body widths long, extending much beyond the range of supplements. Copulatory muscles extending upto prerectum-intestine junction. Tail dorsally convex-conoid with blunt terminus, 41-42 µm long. Caudal pores 2-3 on each side.

HABITAT AND LOCALITY

Soil around the roots of wild tree (unidentified) from Silent Valley, Malaparum, Kerala State, India.

REMARKS

The females of the present population conform well with those described by Baqri and Khera (1975) except for having slightly longer and more slender body and shorter tail. The males are being reported here for the first time. The males differ from all known species of *Aporcelaimellus* in having only two ventromedian supplements.

Aporcelaimellus laevis Tjepkema, Ferris & Ferris, 1971

DIMENSIONS

Females (n = 10) : L = 1.52-1.82(1.65) mm; a = 32-39(35); b = 3.8-4.5(4.2); c = 54-63(61); c′ = 0.8-1.0 (0.9); V = 53-59(56); G1 = 7-14(11); G2 = 8-12(10); lip region width = 14-15 µm; lip region height = 5-6 µm; odontostyle = 15-16 µm; odontophoe = 26-34 (28) µm; neck length = 376-437(396) µm; prerectum = 76-152(110) µm; rectum = 30-38(33) µm; tail = 23-30(27) µm; ABD = 27-34(30) µm.

HABITAT AND LOCALITY

Soil around roots of grasses from Victoria gate, University campus, Aligarh, India.

Aporcelaimellus heynsi Baqri & Jairajpuri, 1968

DIMENSIONS

Females (n = 5) : L = 1.22-1.30(1.27) mm; a = 31-33 (32); b = 4.4-4.6(4.5); c = 32-41(37); c′ = 1.2-1.6 (1.4); V = 51-54(52); G1 = 7-12(9); G2 = 7-13(10); lip region width = 11-12 µm; lip region height = 5-6 µm; odontostyle = 14-15 µm; odontophore = 18-21(19) µm; neck length = 273-281(276) µm; prerectum = 46-72(60) µm; rectum = 21-25(23) µm; tail = 31-38(34) µm; ABD = 23-27(25) µm

HABITAT AND LOCALITY

Soil around roots of grasses from near Victoria gate, University campus, Aligarh, India.

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