

CHILOPLACUS AND MACROLAIMELLUS SPECIES FROM SOUTH WEST AFRICA/ NAMIBIA (NEMATODA: CEPHALOBIDAE)

FARZANA RASHID¹ and J. HEYNS² Rand Afrikaans University, P.O. Box 524, Johannesburg 2000

ABSTRACT

Key words: Cephalobidae, *Chiloplacus*, Namibia, Nematoda, Taxonomy

Four new *Chiloplacus* spp. are described from South West Africa/Namibia, all of which have five incisures in the lateral field. *C. tenuis* n. sp. which is compared with *C. saccatus* Loof, 1971 and *C. quinquesulcus* Ivanova, 1968 is distinguished by deeply bifurcate labial probolae with recurved apical ends, toughing each other. *C. subtenius* n. sp. resembles *C. kralli* Bagaturija, 1973 but differs by having only five instead of six lateral lines, as well as the presence of a postvulval sac. *C. longiuterus* n. sp. differs from *C. bathycolpus* Andrassy, 1967 and *C. quinquesulcus* by the longer postvulval sac, the shape of the spicules (only slightly arcuate ventrally) and the distribution of caudal papillae. *C. magnus* n. sp. differs from *C. propinquus* (De Man, 1921) Thorne, 1937, by having five lateral lines, a large postvulval sac, and presence of males. The male of *Macrolaimellus longicauda* (Rashid, Geraert & Sharma, 1985) Rashid & Geraert, 1987 is described here for the first time.

Uittreksel

CHILOPLACUS- EN MACROLAIMELLUS-SPECIES UIT SUIDWES-AFRIKA/NAMIBIË (NEMATODA: CEPHALOBIDAE)

Vier nuwe *Chiloplacus*-spesies, elk met vyf laterale lyne, word uit Suidwes-Afrika/Namibië beskryf. *C. tenuis* n. sp., wat met *C. saccatus* Loof 1971 en *C. quinquesulcus* Ivanova, 1968 vergelyk word, word gekenmerk deur diep ingekeepte labiale probolae, waarvan die punte teenmekaar raak. *C. subtenius* n. sp. lyk na *C. kralli* Bagaturija, 1973 maar verskil deurdat dit slegs vyf laterale lyne teenoor ses het, asook deur die teenwoordigheid van 'n postvulvale sak. *C. longiuterus* n. sp. verskil van *C. bathycolpus* Andrassy, 1967 en *C. quinquesulcus* deur die teenwoordigheid van 'n langer postvulvale sak, die vorm van die spikulae (minder ventraal geboë) en die rangskikking van die kaudale papille. *C. magnus* n. sp. verskil van *C. propinquus* (De Man, 1921) Thorne, 1937, in die teenwoordigheid van vyf laterale lyne, 'n groot postvulvale sak en deur die aanwesigheid van mannetjies. Die mannetjie van *Macrolaimellus longicauda* (Rashid, Geraert & Sharma, 1985) Rashid & Geraert, 1987 word vir die eerste keer beskryf.

INTRODUCTION

This is the third paper in a series on the Cephalobidae of South West Africa/Namibia. For information on collection and preparation of material, see the first paper in the series (Rashid *et al.*, 1990).

During the present study, four species of *Chiloplacus* Thorne, 1937 were found, all of them with five lateral lines. Of the approximately 24 *Chiloplacus* species recognised by Andrassy (1984) [or 30 species, if one accepts Boström's (1987) synonymy of *Acrobelophis* Andrassy, 1984 with *Chiloplacus*, which we strongly support], only five species have five lateral lines, viz. *C. saccatus* Loof, 1971, *C. quintastratus* Sumenkova & Razzhivin, 1968, *C. quintastratus* Sumenkova & Razzhivin, 1968, *C. quinquesulcus* Ivanova, 1968, and *C. quadricarinatus* (Thorne, 1925) Thorne, 1937. In the original description of the latter species, Thorne (1925) stated that the species had "four wings", implying that it had five lateral lines or incisures demarcating the wings, as also shown in his Fig. 15c. However, the drawing of the tail region (Thorne's Fig. 15d) showed only 4 lines. In 1964 Loof identified specimens from Venezuela as *C. quadricarinatus*, and illustrated the male tail bearing 5 lines (Loof's Fig. 4C). In 1971 Loof studied Thorne's original material, and confirmed the presence of 5 lines (see Loof's 1971 Fig. 3J of the female tail). We therefore do not accept Andrassy's (1984) concept of *C. quadricarinatus* as a species with 4 lateral lines, or his synonymy of *C. quadricarinatus* apud Loof, 1964 and *C. quadricarinatus* apud Zullini, 1978 (described

from Sardinia) with *C. quinquesulcus* Ivanova, 1968. In this connection, see also the detailed discussion by Loof (1971) of the populations from Venezuela and Nigeria, as well as the discussion by Boström (1987) of the five known *Chiloplacus* spp. with five lateral lines. *C. kralli* Bagaturija, 1973 has six lines over the greater part of the body, but one line disappears posteriorly, resulting in only five lines on the tail region.

DESCRIPTIONS

Chiloplacus tenuis n. sp. (Fig. 1A–H and 2A–F)

Measurements

Type material from Etosha Game Reserve

Holotype female: L: 0,60 mm; a=33,1; pharynx=152 µm; b=3,9; tail=27,5 µm; c=22,0; c'=2,3; V=68 %.

Paratype females (n=13): L=0,59 mm (0,54–0,66); a=31,7 (25,0–42,5); pharynx=156 µm (139–167); b=3,7 (3,4–4,4); tail=26,6 µm (23,5–29,5); c=21,2 (19,9–26,5); c'=2,1 (1,9–2,4); V=67,9 % (64,4–70,5).

Paratype males (n=5): L=0,53 mm (0,49–0,57); a=28,2 (18–22); pharynx=147,5 µm (144,5–151); b=3,6 (3,3–3,8); tail=28,6 µm (26–30,5); c=19,0 (16,3–20,7); c'=1,7 (1,6–2,0); T=47,4 % (44–55,3).

Population from Namib Park

Females (n=4): L=0,52 mm (0,49–0,57); a=27,3 (23,5–30,8); pharynx=161 µm (152–168); b=3,2 (3,0–3,5); tail=26 µm (22–30,5); c=20,6 (19,7–22,7); c'=1,9 (1,6–2,3); V=68 % (66,6–69,2).

Males (n=7): L=0,50 mm (0,41–0,59); a=27,0 (20,2–31); pharynx=149 µm (133–156); b=3,3 (3,1–3,8); tail=32,7 µm (26–34,2); c=15,6 (12,3–20,7); c'=1,9 (1,7–2,1); T=45,5 % (38,7–55,3).

¹ Instituut voor Dierkunde, Rijksuniversiteit Gent, K.L. Ledeganckstraat 35, 9000 Gent, Belgium

² To whom correspondence should be addressed: Dept. of Zoology, Rand Afrikaans University, P.O. Box 524, Johannesburg 2000, South Africa

Received 27 July 1989; accepted for publication 5 October 1989

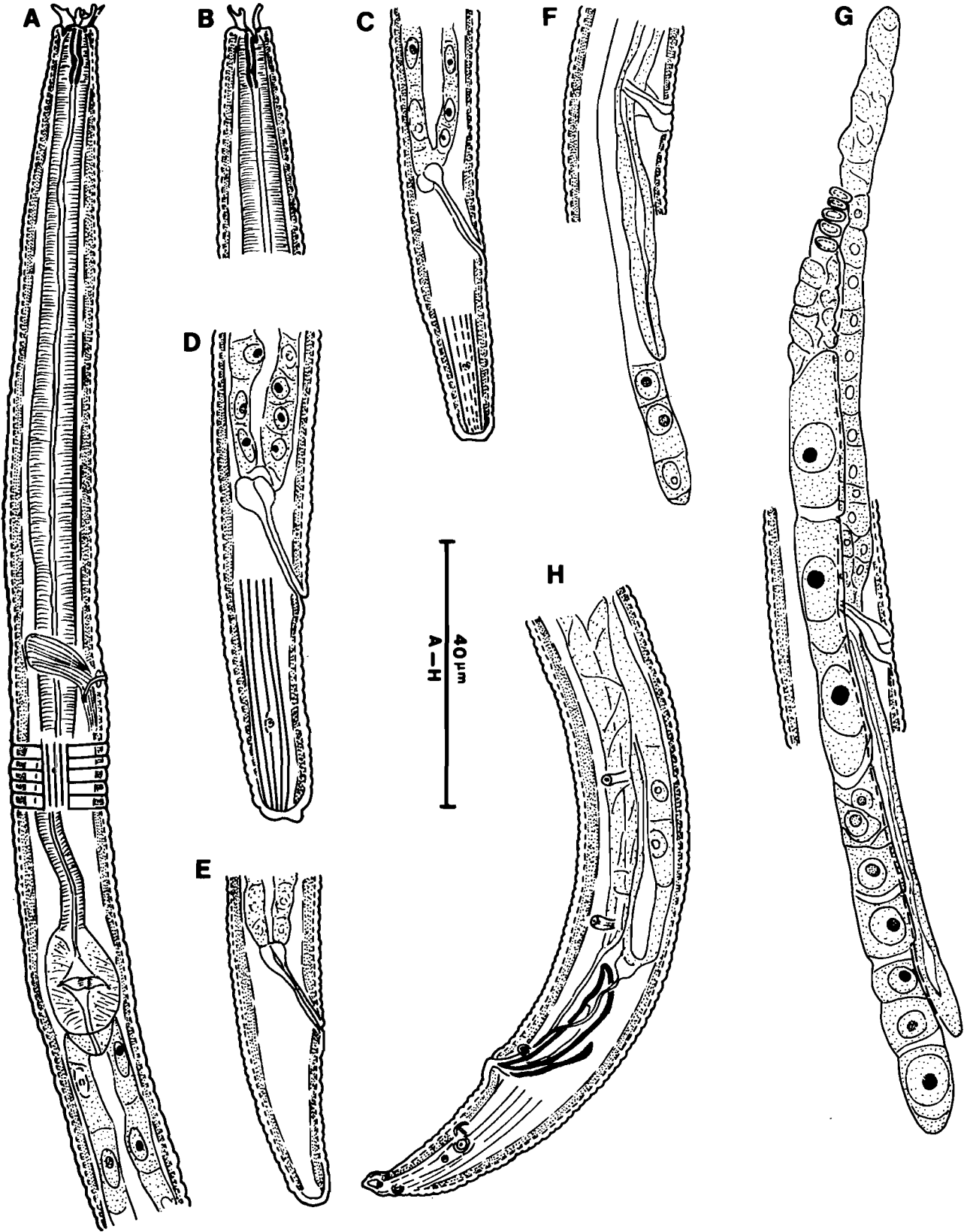


FIG. 1 *C. tenuis* n. sp. A: Female anterior region; B: Male head (lateral). C-E: Female tails, showing variation; F: Vulval region with short postvulval sac; G: Female reproductive system; H: Male posterior region.

Female

Body small, slender slightly to strongly ventrally curved, in one population body “C” shaped. Cuticle 0,7-1 μ m thick, coarsely annulated, with minute irregular longitudinal lines observed with SEM (Fig. 2C and E). Lateral field marked by five incisures, wide, extending up to tail terminus (Fig. 1A, C, D

and 2C, E). Three labial probolae, deeply bifurcate, the apical ends recurved, touching each other to form horeshoe-shaped probolae (Fig. 2A-B). Labial probolae joined at the base by tangential ridges bearing small protuberances (Fig. 2B). Cephalic probolae flap-like, bifurcate, forwardly directed, giving the head a hexagonal shape (Fig. 2A-B).

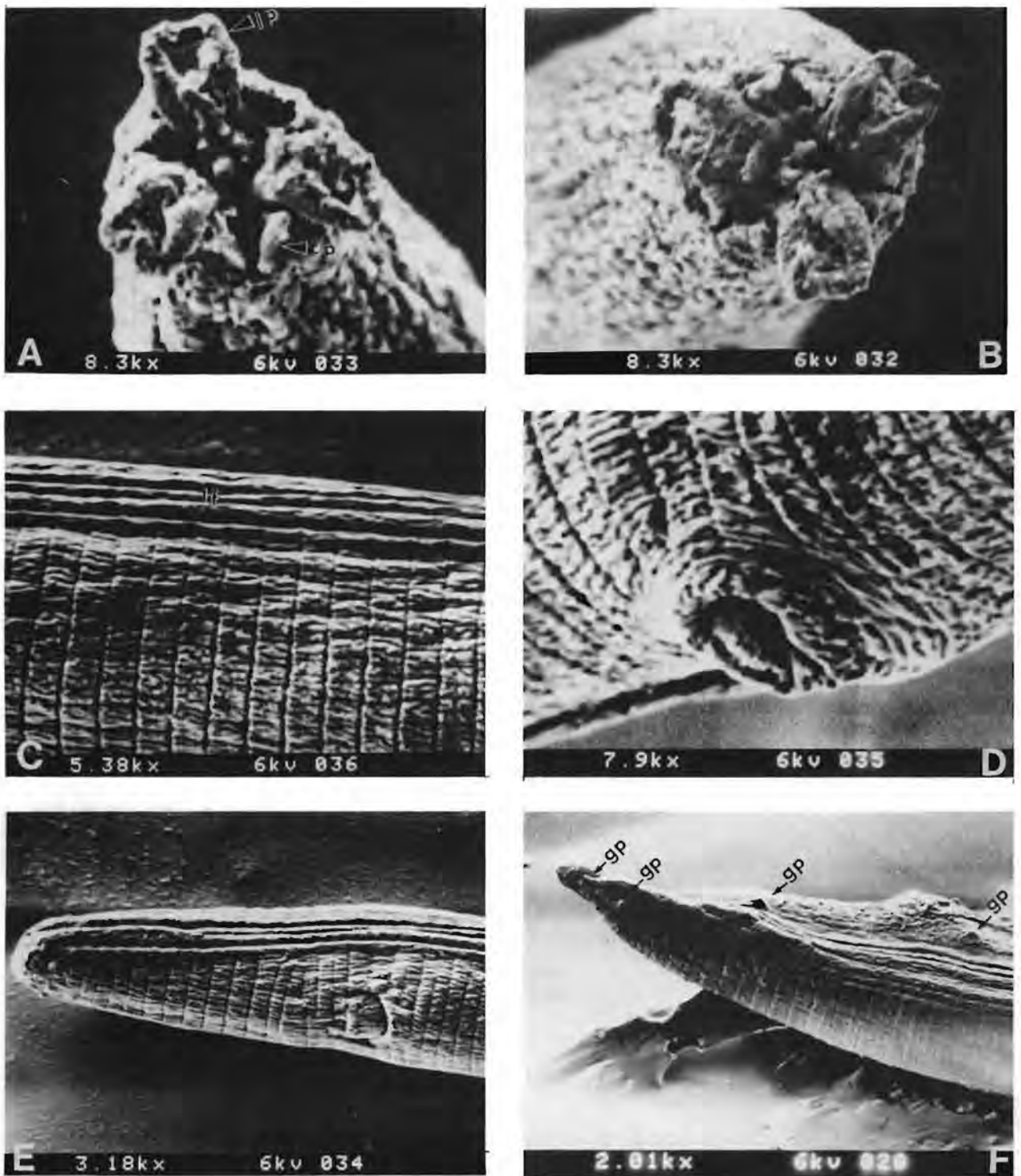


FIG. 2 SEM photomicrographs of *C. tenuis* n. sp. A: Female head, sublateral (8300×). B: Face view of female (8300×); C: Lateral field of female (5380×); D: vulva (7900×); E: Female tail (3180×); F: Male tail (2010×). (1p= labial probolae; cp = cephalic probolae; lf = lateral field; gp = genital papillae)

Stoma sclerotized 9,3 μm (9–10,5) long; cheilorhabdions small, appearing as roundish refractive spots, other rhabdions distinctly demarcated; dorsal metarhabdion with small tooth. Pharynx cylindrical, distinctly separated from isthmus. Basal bulb ovate. Nerve ring 95,6 μm (88–113) from anterior end, varying in position from opposite middle of corpus to corpus-isthmus junction. Excretory pore opening through hemizonid or just anterior to it, 103 μm (93–113) from oral opening, opposite or posterior to nerve ring. Hemizonid distinct. Deirid observed at level of isthmus, between lateral lines (Fig. 1A).

Cardia 3,6 μm (3–6) long, hemispheroid. Intestinal cells distinct, with small nuclei.

Female reproductive system cephaloboid. Vagina about half body diameter long, anteriorly directed. Vulva a wide transverse slit, lips protruding (Fig. 2D). Uterus with 15 pairs of cells. Oviduct with five pairs of cells. Ovary short, straight, no double flexure posterior to vulva. Spermatheca usually empty. Postvulval sac 62,5 μm (40–99) long.

Tail subcylindrical, 11–16 annuli on ventral side, terminus smooth or annulated (Fig. 1C–E and 2E).

phasmid at 54,7 % (46–62) of tail length. Rectum 16,5 μm (12–20) long. Anus an arcuate transverse slit (Fig. 2E).

Male

Similar to female except for sexual characters. Body more curved in posterior region. Monorchic, testis reflexed at anterior end. Spicules 24,5 μm (21,5–30,5) long, cephaloboid. Gubernaculum appearing rod-shaped, 15 μm (12–19) long. Three pairs of preanal ventrolateral papillae, first pair just anterior to cloacal opening, second anterior to proximal end of spicules and third about one anal body diameter anterior to second. Four pairs of caudal papillae, two near terminus, one of which is lateral and the other subdorsal, two anterior to phasmid, of which one is also lateral and the other subventral (Fig. 1H and 2F). Lateral field with five lines ending with four lines on tail region, extending to terminus (Fig. 1H and 2F). Tail conoid, terminus pointed, offset.

Type locality and habitat: Several localities in the Etosha Game Reserve: under grass next to waterhole at Ondangab; under dry grass and *Commiphora pyracanthoides* trees on Tsumasa Hill in Halali Rest Camp; in very dry soil under *Moringa ovalifolia* west of Okaukuejo; in dry sand under grasses and shrubs about 100 m from waterhole at Fisher Pan, collected 21–22 July 1983 by J. Heyns.

Other locality and habitat: In dry sand and gravel on the Welwitschia flats in the Namib Park, collected 27 July 1983 by J. Heyns.

Type specimens: Holotype female on slide 1690, 9 paratype females on slides 1476, 1479, 1665, 1695, 1696, 1698, 1699 and 1700, and 4 paratype males on slides 1479, 1677, 1680 and 1698 deposited in the nematode collection of Rand Afrikaans University, South Africa. Two paratype females deposited in the nematode collection of the Instituut voor Dierkunde, Rijksuniversiteit Gent, Belgium.

Differential diagnosis: *C. tenuis* n. sp. closely resembles *C. saccatus* Loof, 1971 and *C. quinquesulcus* Ivanova, 1968. It is distinguished from *C. saccatus* by smaller body size (0,49–0,66 mm vs 0,56–0,83 mm); by deeply bifurcate labial probolae and by the presence of bifurcate cephalic probolae (labial probolae bifurcate for $\frac{1}{2}$ their length and true cephalic probolae not observed in *C. saccatus*). No males were found for *C. saccatus*. *C. tenuis* n. sp. differs from *C. quinquesulcus* in having a smaller body (0,49–0,66 mm vs 0,60–0,99 mm), longer postvulval sac (more than one body diameter vs less than one body diameter) and by the number and arrangement of preanal and caudal papillae in male (3 preanal papillae, the first adanal, the second anterior to proximal end of spicules and the third at one anal body diameter anterior to the second, plus 4 caudal papillae, two near terminus and two anterior to phasmid in *C. tenuis* n. sp., vs 2 preanal papillae, one anterior to anus and one opposite proximal end of spicules, and 3 caudal papillae, one subdorsal near terminus, and two at same level near phasmid, one lateral and one subventral in *C. quinquesulcus*).

Chiloplacus subtenuis n. sp. (Fig. 3A–H and 4A–F)

Measurements

Type population from Etosha Game Reserve

Holotype female: L=0,70 mm; a=28,3; pharynx=193 μm ; b=3,6; tail=36 μm ; c=19,6; c'=2,1; V=67,3 %.

Paratype females (n=10): L=0,81 mm (0,69–0,94); a=25,5 (19,1–30,2); pharynx=205 μm (192–220); b=3,9 (3,3–4,6); tail=41 μm (36,5–47); c=19,9 (17,3–21,2); c'=2,1 (1,8–2,5); V=67,3 % (65,6–69).

Paratype males (n=4): L=0,74 mm (0,70–0,81); a=32,1 (27,2–34,6); pharynx=192 μm (183–202); b=3,8 (3,7–4,0); tail=45,6 μm (41–48); c=16,3 (15,0–17,2); c'=2,1 (2,1–2,2); T=44,2 % (42,7–45,7).

Female

Body slightly ventrally curved, but more strongly curved posterior to vulva. Cuticle 1 μm thick, coarsely annulated, divided into blocks by longitudinal striae observed only with SEM (Fig. 4A, B, D–F). Lateral field wide, with five incisures, reaching up to tail end (Fig. 3G, H and 4F). Three labial probolae, slender, bifurcate about one third their length, apical tine recurved, variable in length (Fig. 4A, B). Six cephalic probolae, plate-like; lateral ones bifurcate, sharply pointed, cephalic margin smooth or serrate (Fig. 4A–C). Stoma 10,5 μm (10–11) long, with distinct rhabdions; dorsal metarhabdion with small tooth. Pharynx cylindroid, isthmus short, leading to spheroid basal bulb. Nerve ring 135 μm (118–150,5) from head end, its position varying from opposite middle to posterior end of corpus. Excretory pore just anterior to or at level of hemizonid, 135 μm (117–150,5) from oral opening, anterior or posterior of nerve ring. Hemizonid distinct. Deirid observed slightly anterior to corpus-isthmus junction (Fig. 3A). Cardia hemispheroid, 4,2 μm (4–4,5) long. Intestine with distinct nuclei.

Female reproductive system cephaloboid. Vagina oblique, anteriorly directed, walls thick, unsclerotized. Vulva a transverse slit, lips protruding or non-protruding; body constricted behind vulva. Uterus with thirteen pairs of cells. Oviduct with four pairs of cells. Ovary short, without double flexure behind vulva. Spermatheca usually empty. Postuterine sac variable in length, 86,6 μm (35–111) long (Fig. 3C–E).

Tail subcylindroid, with 13–19 annuli on ventral side, terminus usually rounded or somewhat truncate and indented in the middle (Fig. 3G, H and 4F). Phasmid at 54,5 % (46,6–60) of tail length (Fig. 3G–H and 4F). Rectum 23 μm (20–29,5) long. Anus an arcuate transverse slit (Fig. 4E).

Male

Similar to female except for sexual characters. Spicules cephaloboid, 32 μm (29,5–34) long. Gubernaculum appearing rod-like, 18,3 μm (13,5–21) long, more than half the length of the spicules. Three pairs of ventrolateral papillae, first just anterior to anus, second anterior to the proximal end of spicules and third about one anal body diameter anterior to second pair (Fig. 3F). Four pairs of caudal papillae: one pair laterally at terminus, and another pair subdorsal near terminus; two pairs anterior to phasmid, viz. one pair lateral and another pair subventral. Lateral field marked by five incisures, fading behind phasmid. Rectum 33,5 μm (32,5–36) long. Tail conoid, with finely rounded terminus.

Type locality and habitat: Etosha Game Reserve: under dry grass next to waterhole at Ondangab, collected 22 July 1983 by J. Heyns.

Type specimens: Holotype female on slide 1482, 5 paratype females on slides 1480, 1482, 1489, 1491 and 1493 and 2 paratype males on slide 1484, deposited in the nematode collection of the Rand Afrikaans University, South Africa. Two paratype

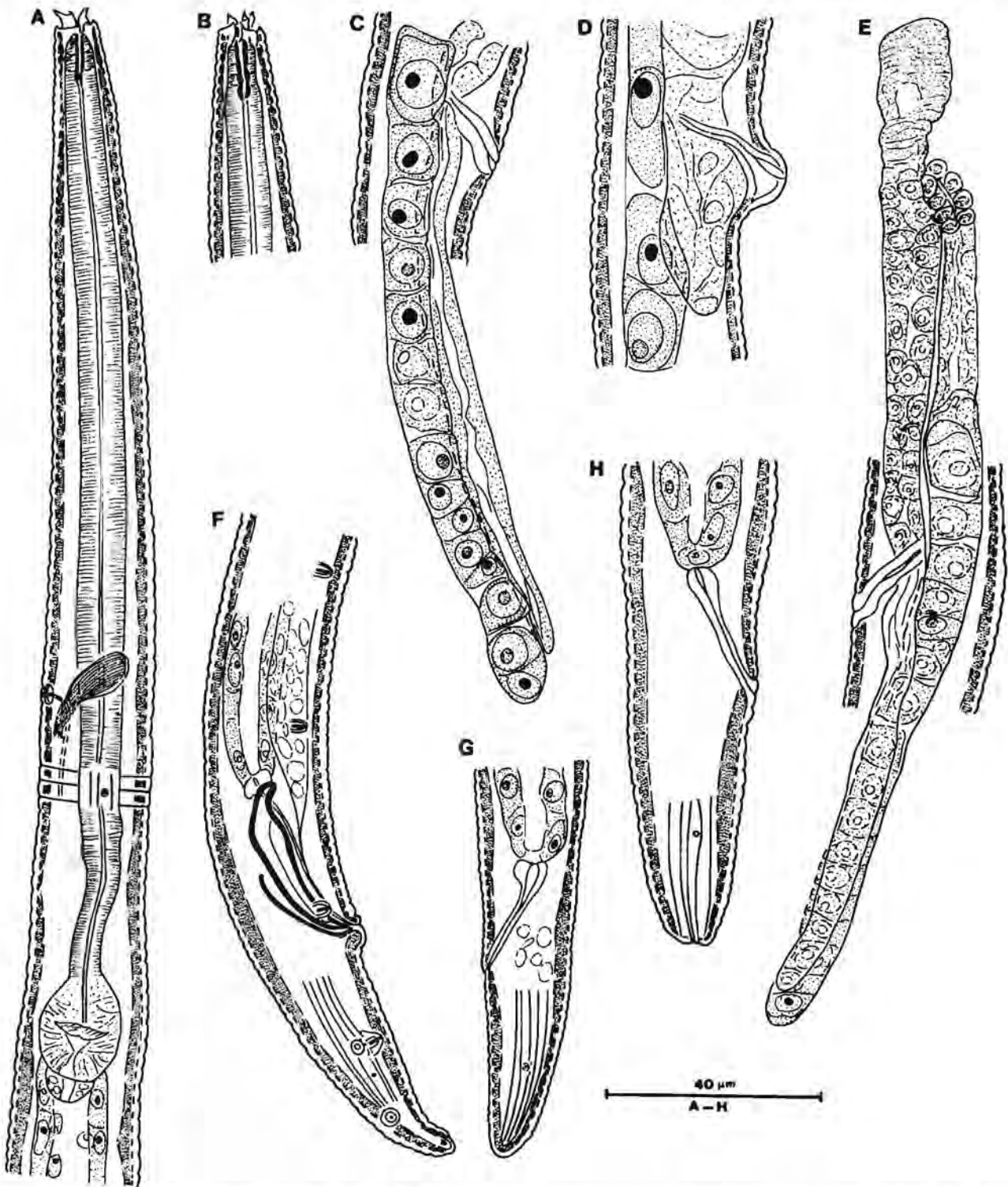


FIG. 3 *C. subtenuis* n. sp. A: Female anterior region; B: Male head; C and D: Vulval region showing variation in postvulval sac; E: Female reproductive system; F: Male tail region; G and H: Female tails.

females and one male deposited in the nematode collection of the Instituut voor Dierkunde, Rijksuniversiteit Gent, Belgium.

Differential diagnosis: *C. subtenuis* n. sp. is close to *C. tenuis* n. sp., but can be differentiated by having labial probolae bifurcate $\frac{1}{3}$ of their length, flap-like, and only lateral cephalic probolae bifurcate vs labial probolae deeply bifurcate, horseshoe-shaped and all cephalic probolae bifurcate; longer spicules (29,5–34 vs 21,5–30,5), longer body (0,69–0,94 mm vs 0,49–0,66 mm) and in the arrange-

ment of caudal papillae (4 pairs, two near terminus and two closer to phasmid in *C. tenuis* vs one at terminus, one subdorsal slightly anterior to terminus and two anterior to phasmid). The new species also resembles *C. kralli* Bagaturija, 1973 and *C. quintastriatus* Sumenkova & Razzhivin, 1968, but it differs from both species in having a distinct postvulval sac, not seen in either of the other two species, in a different "b" value (3,3–4,6 vs 5,0–5,2) and by the presence of males. It further differs from *C. kralli* by the presence of five lateral lines, vs six lines in *C. kralli* (but only five lines on the tail). *C. subtenuis* n. sp.

Population from Namib Park

Females (n=4): L=0,64 mm (0,57–0,73); a=18,1 (16,8–18,9); pharynx=156 µm (137–171); b=4,1 (3,5–4,7); tail=34,5 µm (30,5–40); c=19,0 (17,7–21,4); c'=1,6 (1,4–1,9); V=68 % (67,4–69,5).

Males (n=3): L=0,71 mm (0,67–0,77); a=24,6 (22,9–25,5); pharynx=154 µm (151–160); b=4,6 (4,4–4,8); tail=45,5 µm (38–50); c=15,9 (13,9–17,8); c'=1,7 (1,6–2,1); T=72 % (67–76).

Female

Body slightly to strongly ventrally curved. Cuticle about 1 µm thick, coarsely annulated. Lateral field starting with three lines diverging into five lines just before deirid, at about the level of the excretory pore, ending with four lines on the tail region, with only two lines extending up to the terminus (Fig. 5D, E, G, I, and 6D). Three labial probolae, low, plate-like, not bifurcate. Cephalic probolae deeply bifurcate, flap-like with pointed projection forwardly directed. Stoma 12 µm (10,5–14) long, rhabdions distinctly demarcated, dorsal metarhabdion with tooth. Pharynx short, widest at about middle and narrowing towards isthmus. Isthmus very short; corpus-isthmus junction distinct. Basal bulb spherical. Nerve ring 115 µm (89–142) from anterior end, its position varying from around corpus-isthmus junction to base of isthmus (Fig. 5G, H). Excretory pore 128 µm (89–157) from oral opening, varying in position from opposite isthmus to basal bulb, opening through hemizonid or just anterior to it (Fig. 5G, H). Hemizonid distinct. Deirid observed between lateral lines, varying in position from level of isthmus to basal bulb. Cardia hemispheroid, 6 µm (4–8) long. Intestine with distinct nuclei. Several cells observed in circumference of intestine along its entire length.

Female reproductive system cephaloboid. Vagina anteriorly or posteriorly curved, less than half body diameter long. Vulval lips only slightly protruding. Uterus unusually long, 4½ to 6 times the corresponding body diameter, with 36–44 pairs of cells (Fig. 5B). Oviduct with three to four pairs of cells. Ovary with or without double flexure posterior to vulva, oocytes and oogonia arranged in multiple rows (Fig. 5A–C). Spermatheca small to large, usually filled with sperm cells. Postuterine sac 80 µm (61–111) long; in some females a gland-like structure observed at level of postuterine sac (Fig. 5B). Tail conoid with 13–20 ventral annuli, terminus truncate, smooth with thick cuticle. Tail constricted before terminal annulus. Phasmid located at 57 % (41–66) of tail length.

Male

Similar to female except for sexual characters. Monorchic, testis anteriorly reflexed. Spicules cephaloboid, only slightly ventrally arcuate, 39,3 µm (29,5–51) long. Gubernaculum appearing rod-shaped with hooked distal end, 25,3 µm (18,2–35) long. Four pairs of caudal papillae, one pair lateral at tail tip, one subdorsal near tail tip, and two pairs close together anterior to phasmid, the one pair lateral and the other subventral. Three pairs of ventrolateral papillae, first adanal, second slightly anterior to proximal end of spicules and third from one to two anal body diameters anterior to second one. Lateral field with five crenate incisures, ending with four lines on tail region, extending to terminus. Tail conoid, ventrally arcuate, terminus finely rounded. Anal lips prominently protruding, the posterior one rounded. Rectum 42 µm (33,5–57) long.

Type locality and habitat: Namib Desert: In moist sand in the dry course of the river about 40 km east of Gobabeb en route to waterhole in Kuiseb River. On sand dunes, about 40 km east of Gobabeb, under *Stipagrostis* grass. Under grass on sand dunes, 8 km from Gobabeb, south of Kuiseb River, collected July 1986 by J. Heyns and A. Coomans.

Other locality and habitat: Namib Park: In dry sand on the Welwitschia Flats, collected 27 July 1983 by J. Heyns.

Type specimens: Holotype female on slide 4390, 14 paratype females and 20 paratype males on slides 4391–4401 and 4462, deposited in the nematode collection of the Rand Afrikaans University, South Africa. Three paratype females and 3 paratype males deposited in the nematode collection of the Instituut voor Dierkunde, Rijksuniversiteit Gent, Belgium.

Differential diagnosis: *C. longiuterus* n. sp. can be distinguished from other *Chiloplacus* species in having low non-bifurcate labial probolae, a more posterior position of the excretory pore and nerve ring, and a long uterus. The new species closely resembles *C. bathycolpus* Andr ssy, 1967 and *C. quinquesulcus* Ivanova, 1968. It can be differentiated from *C. bathycolpus* by having five incisures in the lateral field vs six, a longer postvulval sac, and by the shape of the spicules (proximal end very narrow in *C. bathycolpus*) and in a different arrangement of caudal papillae. The new species differs from *C. quinquesulcus* by having low, non-bifurcate labial probolae and deeply bifurcate and pointed cephalic probolae vs labial probolae bifurcate for ¼ of their length and low, rounded cephalic probolae, a postvulval sac of more than one body width vs a short postvulval sac of less than one body width, and by having three preanal and four postanal papillae vs two preanal and three postanal papillae. Other related species are *C. propinquus* (De Man, 1921) Thorne, 1937; *C. symmetricus* (Thorne, 1925) Thorne, 1937 and *C. quadricarinatus* (Thorne, 1925) Thorne, 1937. *C. longiuterus* n. sp. is distinguished from the first two species by having five incisures in the lateral field vs two incisures, by labial probolae not bifurcate vs labial probolae bifurcate for ¼ to ½ of their length, by the longer postvulval sac and four caudal papillae in male vs five caudal papillae in *C. symmetricus*. No males are known for *C. propinquus* and *C. quadricarinatus*.

Chiloplacus magnus n. sp. (Fig. 7C–H)*Measurements*

Holotype female: L = 0,76 mm; a = 31,3; pharynx = 216 µm; b = 3,5; tail = 36 µm; c = 21,3; c' = 2,0; V = 68 %.

Paratype females (n = 2): L = 0,88–1,27; a = 34,3; pharynx = 273–296 µm; b = 2,9–4,6; tail = 37–43 µm; c = 23,7–29,3; c' = 1,6; V = 66,8 %.

Paratype males (n = 2): L = 0,89–1,12; a = 33,9–34,5; pharynx = 241–256 µm; b = 3,7–4,3; tail = 40–51 µm; c = 21,8–22,3; c' = 1,5–1,7; T = 67 %.

Female

Body ventrally arcuate. Cuticle 1,2 µm thick, coarsely annulated. Lateral field wide, with five incisures, beginning with three lines, then diverging into five lines at about middle of corpus, extending to tail terminus. (Fig. 7D, E, G). Three labial probolae, plate-like, bifurcate for one third of their length. Cephalic borders curved inward, with pointed bifur-

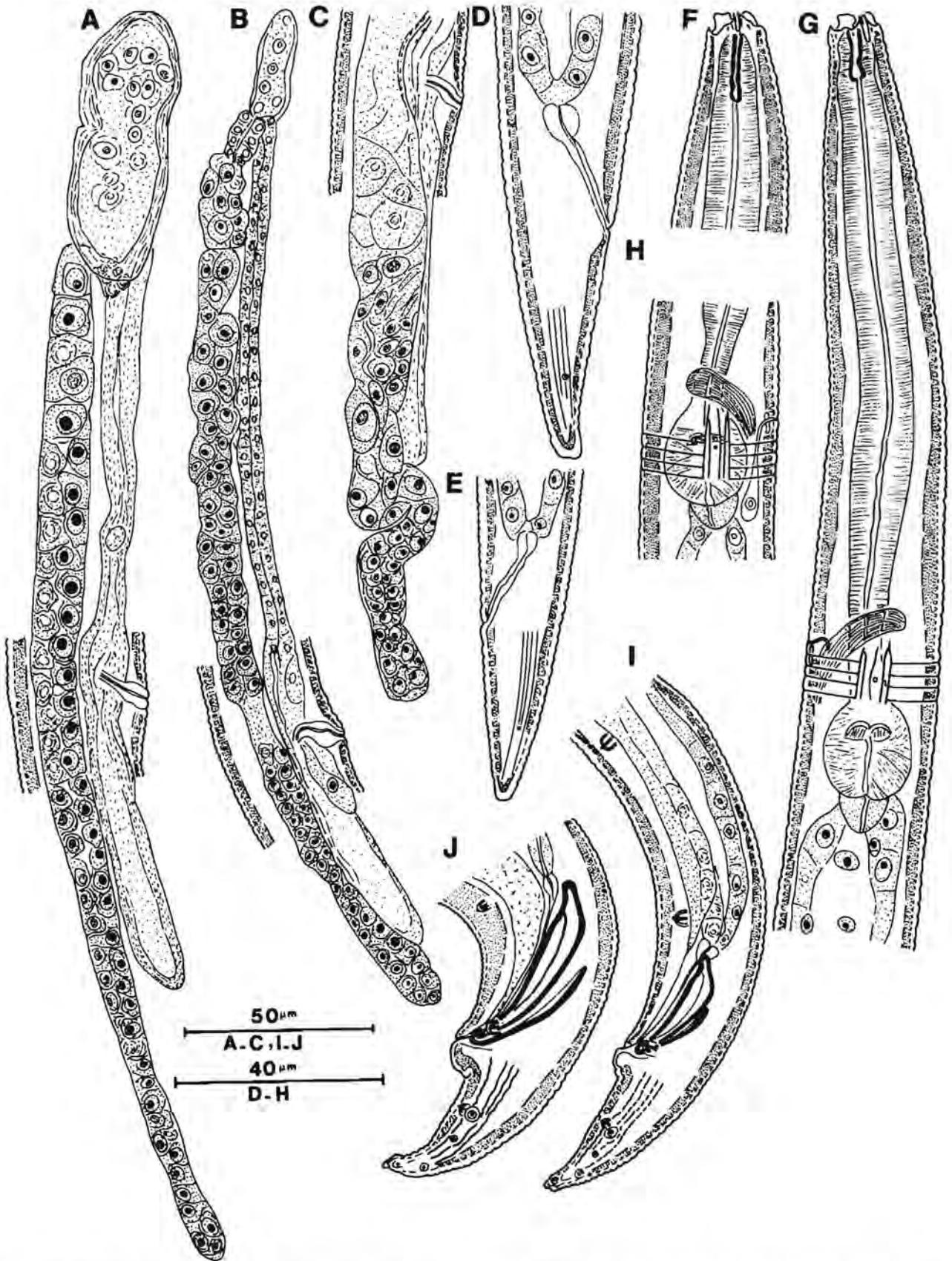


FIG. 5. *C. longiuterus* n. sp. A-C: Female reproductive system (showing variation in ovary and postovular sac); D and E: Female tail; F: Male head; G and H: Female pharyngeal region; I and J: Male tails (showing variation in spicule length).

cate probolae (Fig. 7F, G). Stoma, 10.5–11 µm long, sclerotized. Cheilorhabdions small, appearing as refractive dots, other rhabdions distinctly demarcated; dorsal metarhabdion with small tooth. Pharynx cylindrical, isthmus short, basal bulb ovate.

Nerve ring 124–134 µm from head end, encircling metacarpus. Excretory pore 143 µm from anterior end, posterior to nerve ring, opening through hemizonid (Fig. 7G) (not observed in paratype females). Deirid located anterior to corpus-isthmus junction.

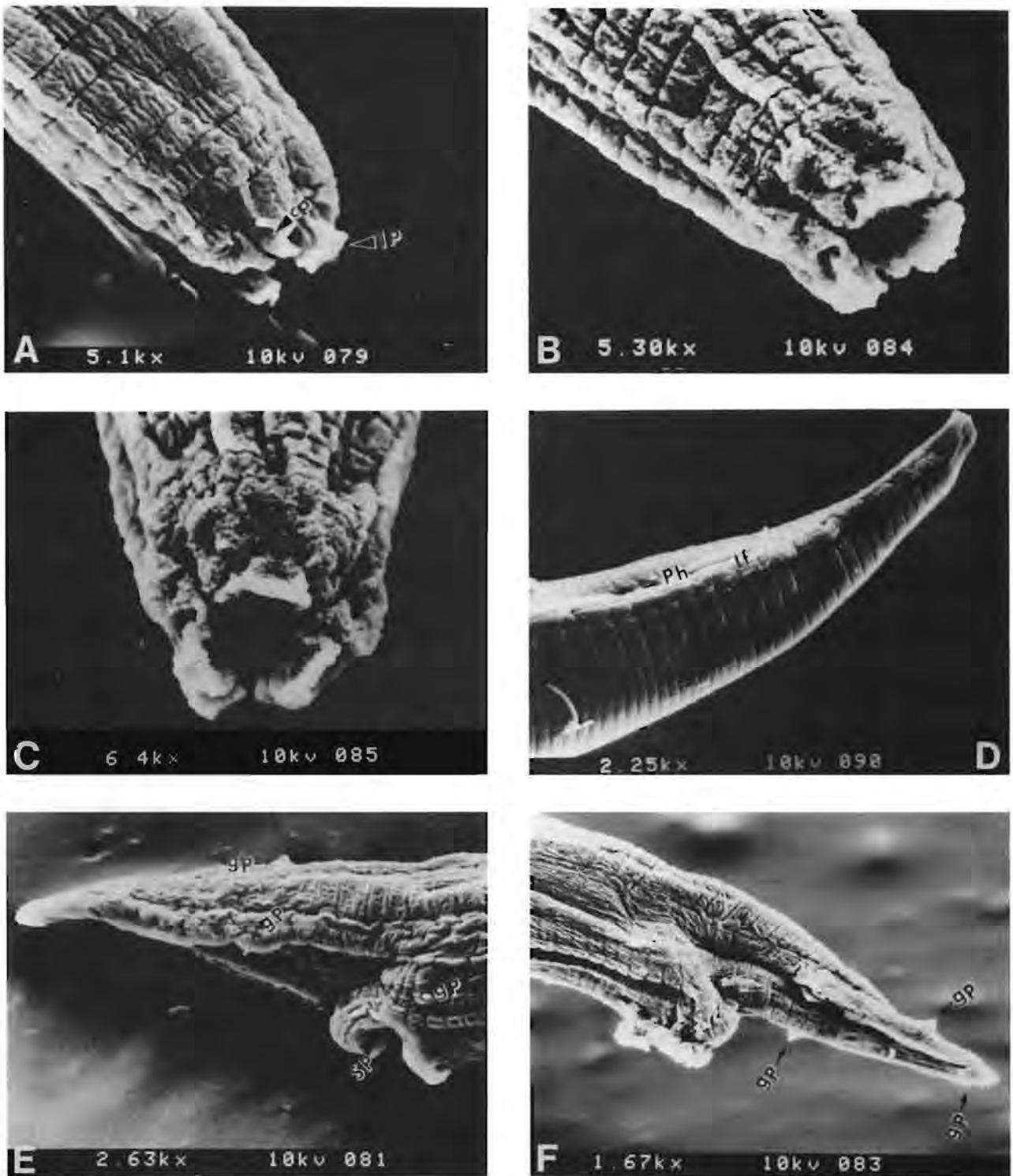


FIG. 6 SEM photomicrographs of *C. longiuterus* n. sp. A: Female head (lateral) (5100×); B: Male head (lateral) (5300×); C: Male head (face view) (6400×); D: Female tail (2250×); E and F: Male tails (lateral) (2630× and 1670×). (1p = labial probolae; cp = cephalic probolae; lf = lateral field; ph = phasmid; sp = spicules; gp = genital papillae).

Cardia conoid, 4,5 µm long. Intestine with distinct nuclei.

Female reproductive system cephaloboid. Vagina about half body width long, anteriorly directed. Vulval lips protruding. Uterus with 12 pairs of cells, arranged in double row. Oviduct with four pairs of cells. Ovary short, straight, without double flexure posterior to vulva. Spermatheca small, with sperm cells. Postuterine sac large, 103 µm (68–135) long.

Tail subcylindroid with conoid to broadly rounded smooth terminus, 10–15 annuli on ventral side (Fig.

7D, E). Phasmid at 48,5–51 % of tail length. Rectum 20,5–21,2 µm long.

Male

Similar to female except for sexual characters. Monorchic, testis anteriorly reflexed. Excretory pore situated from anterior to posterior of nerve ring at the same level as the hemizonid. Spicules 36,5–39 µm long, cephaloboid. Gubernaculum appearing rodshaped, with hooked distal end, 20,5 µm long. Three pairs of pre-anal subventral papillae, first adanal, second opposite proximal end of spicules

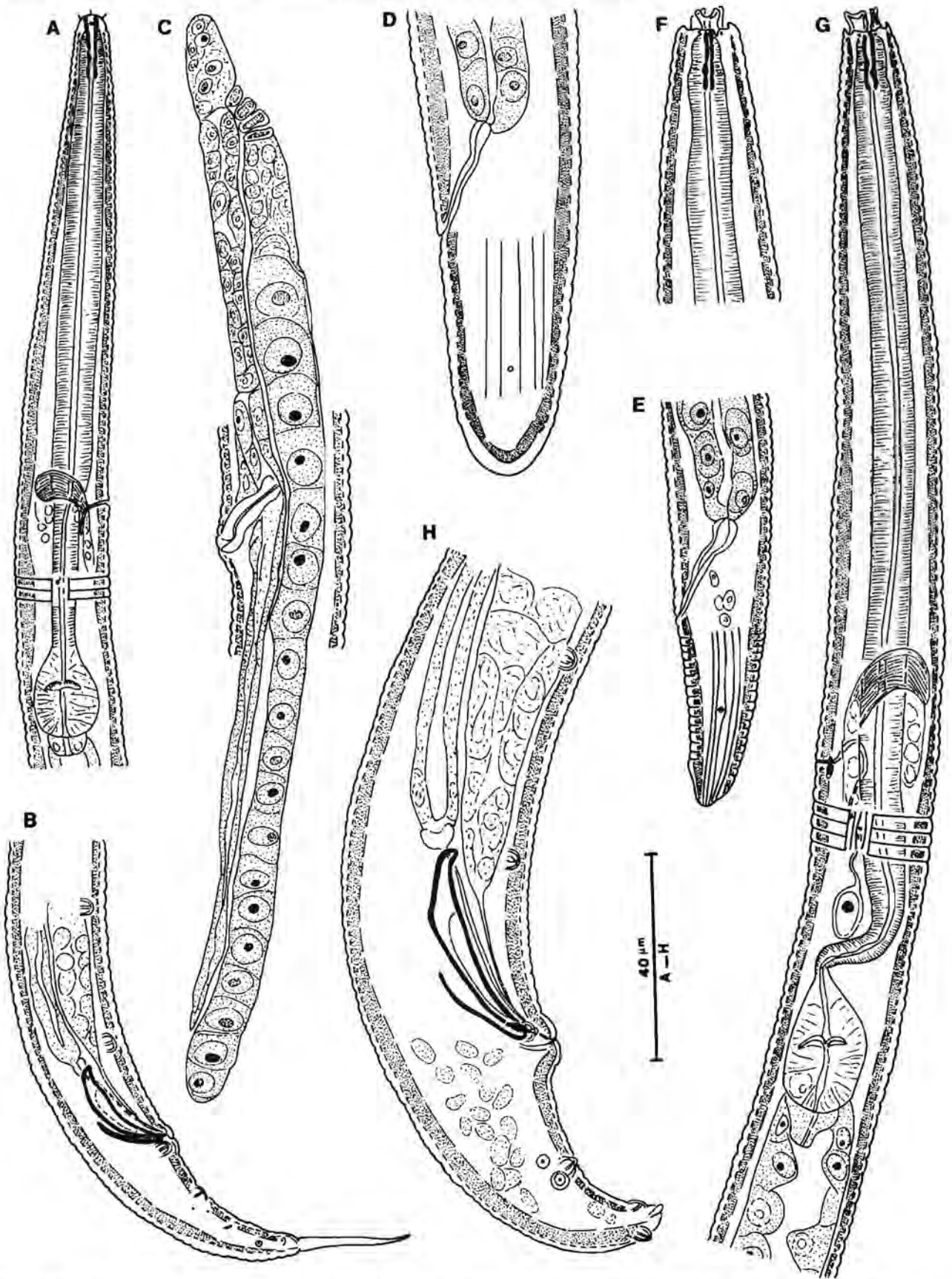


FIG. 7 *Macrolaimellus longicauda* (Rashid, Geraert & Sharma, 1985) Rashid & Geraert, 1987 A: Male pharyngeal region; B: Male posterior region; C: *magnus* n. sp. C: Female reproductive system; D and E: Female tails; F: Male head; G: Female anterior region; H: Male posterior region.

and third about one anal body width anterior to second pair. Five pairs of caudal papillae, three closer to terminus and two near phasmid. Tail ventrally curved, terminus rounded. Rectum 44 µm long.

Type locality and habitat: Caprivi: Near Bokale waterhole, in sandy soil under an *Acacia* tree, collected 4 October 1986 by M. Hutsebaut. Namib Desert: under grass on sand dune, 8 km from Gobabeb, south of Kuiseb River, collected July 1986 by J. Heyns and A. Coomans.

Type specimens: Holotype female on slide 3319, two paratype females on slides 4387 and 4389 and two paratype males on slides 4388 and 4389 deposited in the collection of the Rand Afrikaans University, South Africa.

Differential diagnosis

C. magnus n. sp. closely resembles *C. propinquus* (Thorne, 1925) Thorne, 1937 and *C. quadricarinatus* (Thorne, 1925) Thorne, 1937. It is distinguished from *C. propinquus* by having five incisures vs two and by a longer postvulval sac (postvulval sac short or absent in *C. propinquus*) and from *C. quadricarinatus* by a larger "a" value (31,3–34,3 vs 19–28), a larger "c" value (21,3–29,3 vs 17–22) and by a longer postvulval sac (68,5–135 µm vs 40–50 µm). Males are unknown in *C. propinquus*.

***Macrolaimellus longicauda* (Rashid, Geraert & Sharma, 1985) Rashid & Gereart, 1987 (Fig. 7A–B)**

Measurements

Male (n = 1): L = 0,58; a = 29,2; pharynx = 142 µm; b = 4,1; tail = 35 µm; c = 16,7; c' = 2,1; T = 54 %.

Male

Body ventrally arcuate upon fixation. Cuticle 1 µm thick, distinctly annulated. Lateral field marked by two incisures, fading away just anterior to tail region. Head button-like, slightly offset from adjoining neck. Lips amalgamated, each with a setiform papilla. Amphid small, round, located at base of lateral lip. Stoma sclerotized, 13 µm long, cheilorhabdions large, other rhabdions distinctly demarcated, dorsal metarhabdion with tooth. Pharynx cylindrical, distinctly separated from isthmus. Basal bulb ovate with well-developed crescentic valve. Nerve ring 94 µm from head end surrounding corpus-isthmus junction. Excretory pore 96 µm from

anterior end, opposite nerve ring. Hemizonid not seen. Deirid at level of isthmus (Fig. 7A). Cardia hemispherical, 4,5 µm long.

Monorchic, testis reflexed at anterior end. Spicules 22 µm long, cephaloboid. Gubernaculum appearing rod-shaped, hooked distally, 13,5 µm long. Three pairs of subventral papillae, first adanal, second slightly anterior to proximal end of spicules and third about two anal body diameters anterior to second one. Five pairs of caudal papillae, three lateral, two subventral. Phasmid at middle of tail. Tail conoid, ventrally curved with a long mucro, measuring 20,5 µm (Fig. 7B). Rectum 23,5 µm long.

Locality and habitat: Etosha Game Reserve: under *Moringa ovalifolia* tree, west of Okaukuejo, in very dry soil, collected 23 July 1983 by J. Heyns.

Discussion

The morphology of the single male from South West Africa agrees well with the description of the females from Brazil as given by Rashid *et al.* (1985). Since the male of *M. iucundus* Andrassy, 1966 is unknown, this is the first description of a male of the genus *Macrolaimellus*.

ACKNOWLEDGEMENT

The authors are indebted to Mrs F. de Cuyper for translating Russian text, and to the Foundation for Research Development, South Africa, for financial support.

REFERENCES

ANDRASSY, I. 1984. Klasse Nematoda. G. Fischer Verlag, Stuttgart, 509 pp.
 BOSTRÖM, S. 1987. A scanning electron microscope study of some species of terrestrial nematodes from Spitzbergen. *Nematologica* 33: 366–374.
 LOOF, P. A. A. 1964. Free-living and plant parasitic nematodes from Venezuela. *Nematologica* 10: 201–300.
 LOOF, P. A. A. 1971. Free-living and plant parasitic nematodes from Spitzbergen, collected by Mr H. van Rossen. *Mededelingen Landbouwhogeschool Wageningen* 71: 1–86.
 RASHID, F., GERAERT, E. & SHARMA, R. D. 1985. Morphology taxonomy and morphometry of some Cephalobidae (Nematoda: Rhabditida) from Brazil with descriptions of two new genera and four new species. *Nematologica* 30 (1984): 251–299.
 RASHID, F., HEYNS, J. & COOMANS, A. 1990. *Paracrobeles* and *Acrobeles* species from South West Africa/Namibia with description of a new *Acrobeles* species (Nematoda: Cephalobidae). *Phytophylactica* 22: 41–49.
 THORNE, G. 1925. The genus *Acrobeles* Von Linstow, 1877. *Transactions of the American Microscopical Society* 44: 171–210.