

Namaquanema hanki n. gen., n. sp. from South Africa (Nematoda : Dorylaimoidea)

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Summary – *Namaquanema hanki* n. gen., n. sp. is described from South Africa. The new genus, which is placed in the Dorylaimidae, is distinguished by an amalgamated lip region; a stylet without sclerotized odontophore but with short hooked processes at the base of the odontostyle; guiding ring double; tail short in both sexes, dimorphic in type species; female didelphic, with longitudinal vulva sunken deep below body surface; male with numerous contiguous ventromedian supplements and long preectum.

Résumé – *Namaquanema hanki* n. gen., n. sp. provenant d'Afrique du Sud (Nematoda : Dorylaimoidea) – Description est donnée de *Namaquanema hanki* n. gen., n. sp. provenant d'Afrique du Sud. Ce nouveau genre, placé dans les Dorylaimidae, se caractérise par une région labiale compacte, un stylet sans odontophore mais pourvu de procès en forme de crochet à la base de l'odontostyle, un guide du stylet à double anneau, une queue courte chez les deux sexes, et dimorphique chez l'espèce type, une femelle didelphique présentant une vulve en fente longitudinale profondément enfoncée en-dessous de la surface du corps, un mâle pourvu de nombreux suppléments ventro-médians contigus et un long préectum.

Key-words : Nematoda, Dorylaimidae, *Namaquanema*.

During a survey in Namaqualand in the north-western Cape Province eight specimens were found of a new dorylaim species which do not fit any known genus. *Namaquanema hanki* n. gen., n. sp. is therefore proposed for the receipt of these specimens.

For SEM study, glycerine-mounted nematodes were slowly hydrated to distilled water and fixed in 1 % osmium tetroxide (OsO₄). They were critical point dried, sputter coated with gold (30 nm) and viewed with an ISI SS 60 electron microscope at 10 kV.

Namaquanema n. gen.

DIAGNOSIS

Dorylaimidae. Medium-sized dorylaim with amalgamated lip region, axial stylet of moderate length with hooked basal processes but without sclerotized odontophore, basal bulb somewhat more than half neck length, double guiding ring, tail dimorphic in type species, convex-conoid with dorsally directed fingerlike process in female, convex-conoid bluntly rounded in male. Vulva longitudinal, sunken deep below body surface. Didelphic, amphidelphic. Male diorchic with dorylaimoid spicules and lateral guiding pieces. Ventromedian supplements numerous, contiguous. Preectum short in female, long in male, extending well beyond the supplements.

TYPE AND ONLY SPECIES

Namaquanema hanki n. gen., n. sp.

RELATIONSHIPS

On the basis of tail shape alone, this species could equally well have been placed among either the long-tailed dorylaims (Dorylaimidae) or short-tailed dorylaims (Qudsianematidae). Similar short, dimorphic tails are found for example in some *Mesodorylaimus* species, such as *M. aduncus* Andrassy, 1986, *M. procerus* Andrassy, 1986 and *M. recurvus* Andrassy, 1964, as well as in *Laimydorus*, e.g. *L. centrocercus* (de Man, 1880), and it also occurs in *Coomansinema dimorphicauda* Ahmad & Jairajpuri, 1989, a species which its describers placed in the Thornenematidae. On the other hand, an almost similar dimorphic condition is seen in a few *Labronema* species, e.g. *L. digitatum* Sukul, Das & Mitra, 1975 and *L. varicaudatum* (Thorne, 1929). Superficially our species does in fact remind of a *Labronema*. There are, however, very profound differences, viz. absence of lip flaps, amalgamated lip region and most remarkable, absence of a sclerotized odontophore. On the basis of the lip region alone one could consider *Willinema*, a genus of the family Thorniidae, but this genus is opisthodelphic. Also to be considered is *Labronemella*, but here again the lip region is totally different, described as discolaimoid by Andrassy (1985). Identification of our new species with Andrassy's (1976) key to Dorylaimoidea (p. 209) leads to item 4 where the choice is between item 5 (= Dorylaimoididae) and item 6. Although our species fits neither alternative, the more logical choice seems to be item 6. The next choice then is between 7

(tails of both sexes short, maximum three times anal body diameter) vs 12 (at least female tail longer than five times anal body diameter, if shorter, then with sexual dimorphism). Here item 7 seems to be the more logical choice, and this then leads on to item 11 (= Qudsianematidae). If the other alternative (item 12) is taken, this leads to 15 (= Dorylaimidae), where (on page 210) it eventually leads to item 3 (= Laimyodorinae).

At least one species presently placed in *Laimydorus* has a similar short dimorphic tail, viz. *L. centrocercus* (de Man, 1880), which was placed in *Eudorylaimus* by Andrassy (1959), in *Mesodorylaimus* by Geraert (1966) as well as by Khera (1970), but which Siddiqi (1969), correctly in our opinion, transferred to his new genus *Laimydorus*. This species also has a double guiding ring, long prerectum in the male, and numerous contiguous ventromedian supplements.

The position of oesophageal gland nuclei and their openings also has to be considered in establishing the relationship of the new genus. Both DO and DN are further anterior (at 44-48% and 46-50% respectively) in our genus than in most *Mesodorylaimus* species (cf. Loof & Coomans, 1970). Naturally Loof and Coomans (1970) did not consider *Laimydorus*, since this genus had not been established at the time of their study, but presumably the situation here is on the whole similar to that in *Mesodorylaimus*. The same difference exists between our genus and *Labronema*, except for *L. ferox* Thorne, 1939, for which Loof and Coomans (1970) cite DO and DN at 40% and 43% respectively.

From the foregoing discussion it is clear that our species does not fit any existing genus in either the Qudsianematidae or Dorylaimidae, and therefore we propose the new genus *Namaquanema* for its reception. It seems to come closest to *Laimydorus*, and is thus provisionally regarded as belonging to the Laimyodorinae.

*Namaquanema hanki** n. sp.

(Figs 1-3)

MEASUREMENTS

Female (n = 4, holotype and three paratypes): L = 2.91 (2.70-3.06) mm; a = 40.3 (37-42); b = 5.0 (4.6-5.4); c = 68 (64-73); c' = 0.98 (0.90-1.08); V = 48.9 (47.6-49.9).

Paratype males (n = 4): L = 3.12 (2.89-3.33) mm; a = 44.5 (43-46); b = 5.4 (5.2-5.5); c = 108 (100-116); c' = 0.78 (0.71-0.86).

Holotype (female): L = 3.06 mm; a = 42; b = 5.4; c = 73; c' = 0.90; V = 49.3.

* This species is named after Professor Hank Swanepoel, Chairman of the Department of Zoology, in recognition of his support and encouragement over many years, as well as his invaluable help with translation of Russian papers.

DESCRIPTION

Adult: Heat relaxed body only slightly ventrally curved, with only posterior end of male slightly more strongly curved. Lips amalgamated; lip region 17.6 (17-19) μm wide, evenly rounded, but flattened anteriorly; narrower than adjoining neck. Cuticle appears smooth under LM, but fine transverse striae can be seen with SEM; 6 μm thick on anterior part of neck, 4.5-6 μm at midbody, and 10.5-13 μm dorsally on female tail, 7-9 μm on male tail. Cuticle appearing (under LM) to consist of three main layers, with the thin outer layer of equal thickness throughout, the two inner layers slightly thickened towards both extremities. Anteriorly the division between the two thick inner layers disappears at about two lip region widths from the anterior end, and posteriorly it disappears towards the middle of the tail. Lateral body pores obscure, except on anterior part of neck where a single lateral row can be seen, which diverges into two rows towards the middle of the neck. Ventral body pores apparently present over entire length of body, but distinct only in neck region. Under LM several distinct midventral papillae can be seen on either side of the vulva, but strangely enough these can not be distinguished on the SEM photo. Two, three or four indistinct dorsal pores can be seen on the anterior part of the neck. Mouth opening small, hexangular, without liplets or flaps. Odontostyle in both sexes 19.9 (19-22) μm long and 2-2.5 μm broad; aperture 6-7 μm long. Odontostyle with the usual forked appearance basally (due to the presence of a basal collar; see Swart oped, reaching more than halfway across body. Uterus sclerotized odontophore. In fact, the collar itself seems to extend posteriorly to form a hooked process, especially visible in a dorso-ventral view. Anterior part of lumen of oesophagus (i.e. the part enclosed by the weak probulbus, where odontophore occurs in most dorylaims), thinwalled and irregularly twisted. Guiding ring double, with the posterior, stronger ring situated 9.5-10.5 μm from anterior end. Amphid funnel-shaped, the aperture 9-10 μm wide, i.e. slightly more than half the lip region width, situated 6-7 μm from the anterior end; posterior edge of aperture appearing minutely serrated under LM (but not seen with SEM). Anterior part of oesophagus relatively broad, narrowing only slightly about three lip region widths from anterior body end to form a weak probulbus. Basal bulb measured from beginning of expansion constituting about 60% of neck length. Total neck length (anterior body end to posterior end of basal bulb) 575 (547-611) μm . Oesophageal gland nuclei and their outlets mostly difficult to discern, except S_2O_2 rather prominent, situated 10.9 (9.9-11.9) μm from base of bulb. Position of nuclei and outlets as follows (n varies from 2 to 6; DO, DN and $\text{S}_2\text{O}_2 = 6$): DO = 44.2-48.4; DN = 46.6-50.4; DO-DN = 1.7-2.4; $\text{S}_1\text{O}_1 = 67.8-70.6$; $\text{S}_1\text{O}_2 = 70.0-71.2$; $\text{S}_1\text{-N}_1$ and $\text{S}_1\text{N}_2 = 67.4-68.9$; $\text{S}_2\text{O}_1 = 86.3-87.2$; $\text{S}_2\text{O}_2 = 88.5-90.1$; S_2N_1 and $\text{S}_2\text{N}_2 = 85.0-$

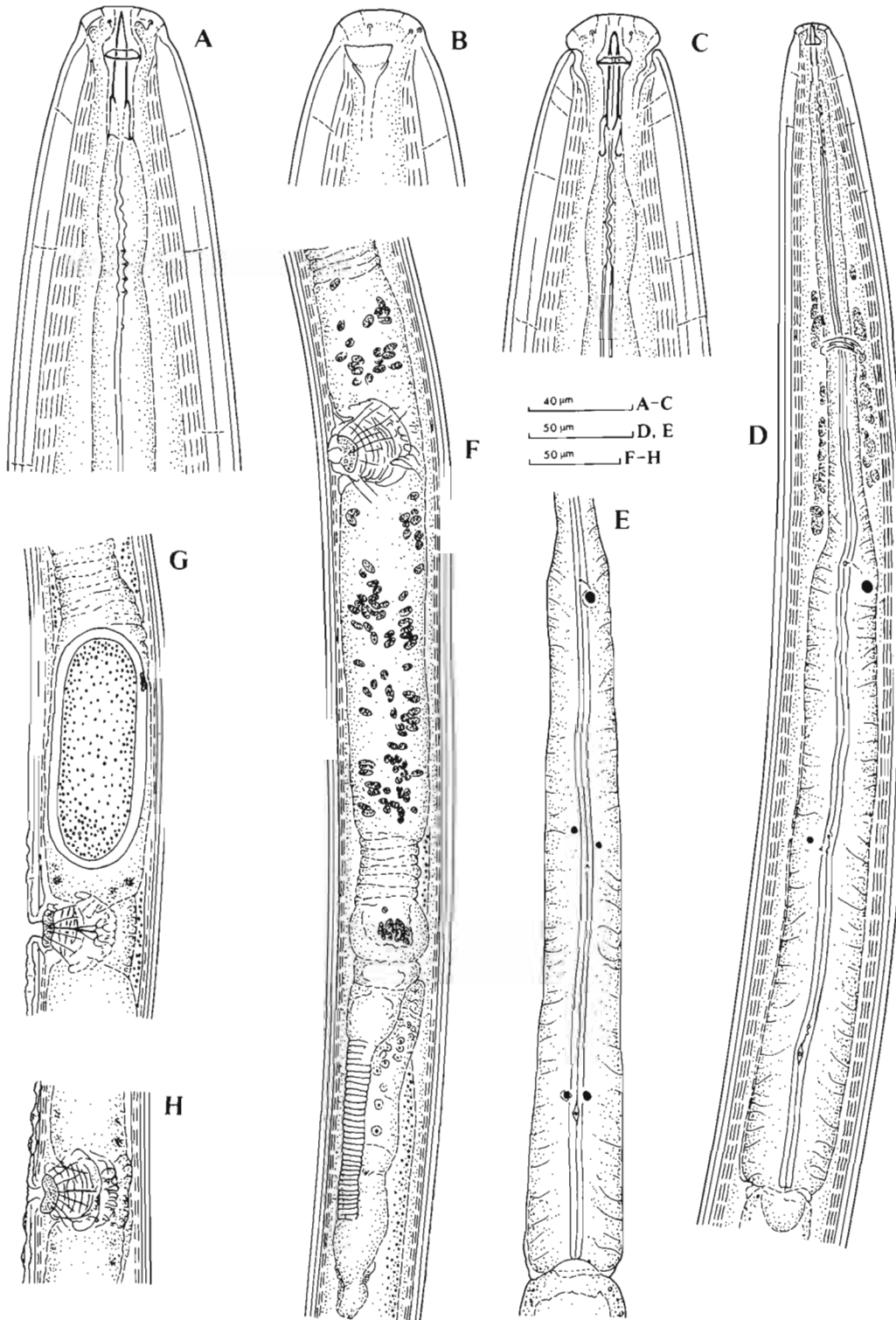


Fig. 1. *Namaquanema hanki* n. gen., n. sp. A: Anterior part of holotype female; B: Surface view of head of holotype; C: Dorso-ventral view of head region; D: Anterior body region; E: Basal bulb of another specimen; F: Posterior branch of reproductive system of holotype female; G, H: Vulval region in two paratypes.

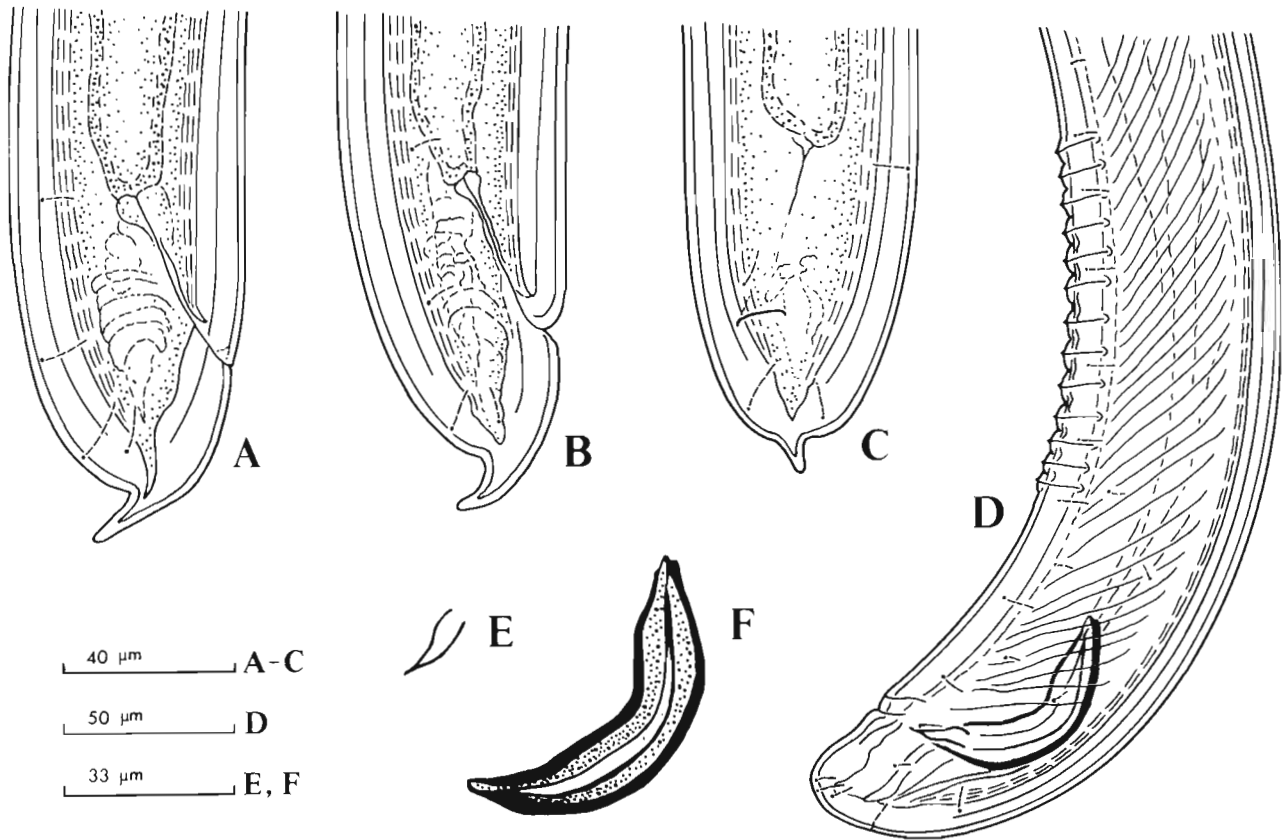


Fig. 2. *Namaquanema hanki* n. gen., n. sp. A : Tail of holotype female; B, C : Tails of two paratype females; D : Posterior region of male; E : Lateral guiding piece; F : Spicule.

87.6. Cardia hemispherical. Prerectum 195–267 μm long in female, i.e. four to five times corresponding body diameter; longer in male, 360–410 μm , or six and a half to seven and a half times body diameter, beginning well in front of the supplements. Rectum 41–49 μm long in female, i.e. about equal to anal body diameter. Female tail 42–44 μm long, almost hemispherical, but with a conspicuous dorsally directed terminal fingerlike process. Male tail bluntly rounded, 28.5–31 μm long.

Female : Vulva situated in a profoundly sunken, diamond-shaped area. Vulva itself a short longitudinal slit. Without vulval sclerotization, but vulva-vagina junction surrounded by a stippled area. Vagina strongly developed, reaching more than halfway across body. Uterus broad, without differentiated ovejector. Distal part of uterus with a more strongly muscular area, leading to a weakly differentiated *pars dilatata*. Sphincter between uterus and oviduct. *Pars dilatata oviductus* apparently differentiated into two parts. Rest of oviduct with a series of about 30 discoid cells. Ovary reflexed with tip at about level of sphincter. Two uterine eggs observed, measuring $117 \times 51 \mu\text{m}$ and $134 \times 52 \mu\text{m}$ (egg shell included); egg shell 4.5–7 μm thick.

Male : Spicules typically dorylaimoid, strong, with well-developed inner strengthening, the area between the outer rim and inner strengthening with a stippled appearance; 65–70 μm long measured along the curved median line. Lateral guiding pieces sigmoid, with the distal end sharply pointed; 10–14 μm long. Supplements consisting of an adanal pair and a series of thirteen to fifteen contiguous ventromedian ones, the series beginning about one half body diameter anterior to the spicules. All supplements situated on a midventral ridge bordered by two deep grooves. In the SEM photo it appears as if there could be a second pair of supplements somewhat anterior to the adanal pair, but their presence could not be confirmed under LM. Eight or nine subventral papillae occur in the posterior region of the male, while some lateroventral pores are also visible, both under LM and SEM. Testes two, opposed, outstretched. Mature sperm cells in testes ovoid, measuring $11\text{--}12 \times 3.5\text{--}5 \mu\text{m}$; sperm cells appearing more oblong in uteri of female measuring $7\text{--}9 \times 2\text{--}2.5 \mu\text{m}$. Copulatory muscles strong, extending for a short distance beyond the anteriormost supplement. Ejaculatory glands (six?) reaching beyond anteriormost supplement, but not as far as prerectum-intestine junction.

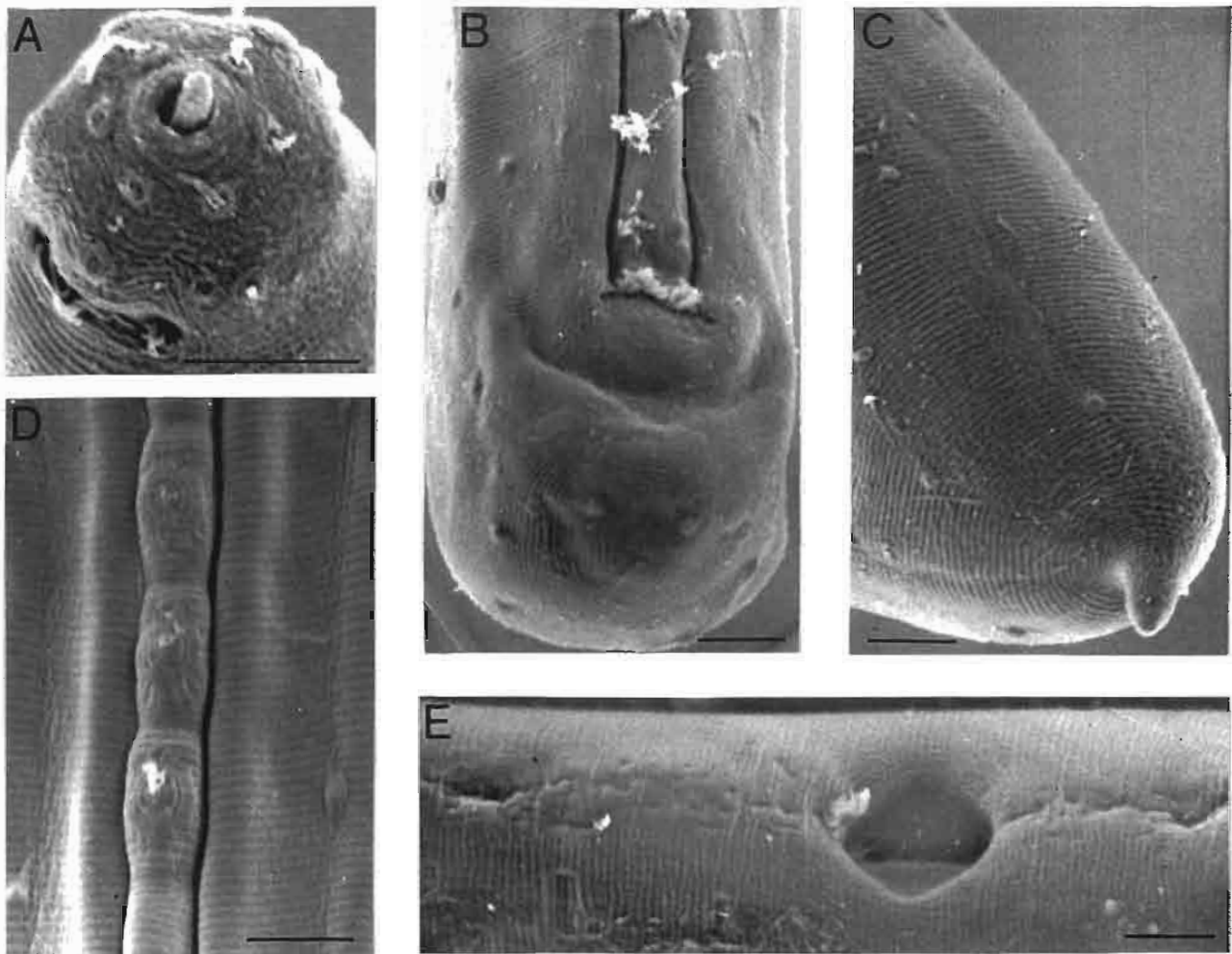


Fig. 3. *Namaquanema hanki* n. gen., n. sp. A : En-face view of female; B : Male tail; C : Female tail; D : Supplements; E : Vulval area (Bar equals 10 μ m).

TYPE LOCALITY AND HABITAT

Soil from the bank of a small stream in Langkloof, between Garies and Wolfhoek in Namaqualand, north-western Cape Province, South Africa. Collected August 1987.

TYPE SPECIMENS

Holotype the left hand specimen on slide RAU 3531, two female paratypes on the same slide, and three male paratypes on slide RAU 3532, in the collection of the Department of Zoology, Rand Afrikaans University, Johannesburg.

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