

Makatinus heynsi n. sp. (Dorylaimida : Aporcelaimidae) from Goa, India.

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Summary — *Makatinus heynsi* n. sp. is described and illustrated. It is characterized by : L. = 1.96-2.42 mm; a = 37-43; b = 4-5; c = 82-110; V = 46-52; odontostyle = 21-25 μ m; odontophore = 33-38 μ m; spicules = 57-67 μ m. *M. heynsi* n. sp. differs from the other species in having a shorter body and a transverse vulva.

Résumé — *Makatinus heynsi* n. sp. (Dorylaimida : Aporcelaimidae) provenant de Goa, Inde — *Makatinus heynsi* n. sp. est décrit et figuré. Il est caractérisé par : L. = 1,96-2,42 mm; a = 37-43; b = 4-5; c = 82-110; V = 46-52; odontostyle = 21-25 μ m; odontophore = 33-38 μ m; spicules = 57-67 μ m. *M. heynsi* n. sp. diffère des autres espèces du genre par un corps plus court et la vulve en fente transversale.

Key-words : *Makatinus*.

A soil sample collected from around the roots of paddy near Mangeshi temple, Goa, yielded a large number of specimens of an unknown dorylaim nematode. Because of the presence of a thick cuticle with fine punctations, a large odontostyle with aperture about 50 % of its length, unsclerotized (plicated) guiding ring and two pairs of adanal supplements, it fits best in the genus *Makatinus* Heyns, 1965 (Aporcelaimidae : Dorylaimoidea). The present species has a transverse vulva instead of a longitudinal one reported in the three known species. However, the presence of a transverse or longitudinal vulva in members of the same genus is common in Dorylaimoidea (*Mesodorylaimus*, *Eudorylaimus*, etc.). The shape of lip region and odontostyle and the arrangement of supplements is similar to *Makatinus* especially *M. punctatus* Heyns, 1965, the type species. Hence the present species is placed in the genus *Makatinus* and described as *M. heynsi* n. sp.

The genus *Makatinus* differs from *Aporcelaimus* Thorne & Swanger, 1936 mainly in having an amalgamated lip region (except in *M. macropunctatus*), punctate cuticle, longitudinal vulva, absence of cardiac disc and the presence of two adanal pairs of supplements (except in *M. macropunctatus*). The present species though having a transverse vulva cannot be accommodated in *Aporcelaimus* because of the shape of lip region, punctations on cuticle, absence of cardiac disc and the nature of adanal supplements (lip region distinctly set off, cuticle with criss-cross lines, cardiac disc present and a single pair of adanal supplements in *Aporcelaimus*).

All three known species of *Makatinus*, viz., *M. punctatus* Heyns, 1965, *M. capensis* Heyns, 1965, and *M. macropunctatus* Heyns, 1967 have been reported from South Africa. *M. heynsi* n. sp. represents the first species being reported from outside Africa.

Materials and methods

Specimens for light microscopy were killed and fixed in hot 4 % formalin, dehydrated by the slow method and mounted in glycerin. Measurements were made with an ocular micrometer. For SEM, formalin fixed specimens were washed in buffer, post-fixed in osmium tetroxide, dehydrated in an alcohol series and critical point dried in CO₂. Dried specimens were mounted on aluminium stubs and coated with 30 nm gold and observed on a Hitachi S 2300 SEM at 15 kV.

Makatinus heynsi * n. sp. (Fig. 1 & 2)

DIMENSIONS

Female (Paratypes; n = 10). L = 1.96-2.42 (2.25) mm; a = 37-43 (39); b = 4.0-5.0 (4.5); c = 82-110 (92); c' = 0.62-0.72 (0.67); V = 46-52 (50); G₁ = 11-14 (13); G₂ = 9-14 (12); odontostyle = 21-25 (23) μ m; odontophore = 33-38 (37) μ m; oesophagus = 472-518 (499) μ m; prerectum = 114-156 (130) μ m; rectum = 32-40 (36) μ m; tail = 22-28 (25) μ m; ABD = 35-41 (37) μ m.

Male (Paratypes; n = 5). L = 2.04-2.29 (2.16) mm; a = 39-43 (41); b = 4.3-4.8 (4.5); c = 71-90 (78); c' = 0.62-0.80 (0.70); T = 45-57 (52); odontostyle = 20-23 (22) μ m; odontophore = 35-38 (37) μ m; oesophagus = 462-501 (476) μ m; spicules = 57-67 (64) μ m; lateral guiding pieces = 14-15 (15) μ m; ventromedian supplements = 9-11 (11); prerectum = 157-172 (160) μ m; tail = 26-30 (28) μ m; ABD = 35-39 (37) μ m.

Holotype (female). L = 2.17 mm; a = 41; b = 4.1; c = 85; c' = 0.62; V = 52; G₁ = 13; G₂ = 12;

* Named after Prof. J. Heyns in recognition of his work on aporcelaimid nematodes.

odontostyle = 25 µm; odontophore = 36 µm; oesophagus = 518 µm; prerectum = 126 µm; rectum = 35 µm; tail = 26 µm; ABD = 41 µm.

DESCRIPTION

Female : Body ventrally curved upon fixation, tapering anteriorly from base of oesophagus. Cuticle finely striated, its thickness 3-5 µm at midbody and 5-6 µm at tail. Each stria 0.7 µm apart, bearing fine punctations. Punctations distinct towards extremities, more so in the posterior region. Radial striae absent. Lateral chords about one fourth of body width at midbody. Lateral, dorsal and ventral papillae distinct under SEM. Lip region set off by a slight depression, 15-16 µm wide and 5-6 µm high. Oral aperture a dorso-ventral slit surrounded by six closely amalgamated equal-sized lips. Labial papillae arranged in a 6 + 4 + 6 pattern. Amphids stirrup shaped, their apertures 10-11 µm or about two thirds of the corresponding body width. Odontostyle 1.4-1.7 lip region widths long, its aperture about half of its length. Guiding ring at 10-12 µm or about 0.7-0.8 lip region widths from anterior end. Odontophore simple, rod-like, 1.4-1.8 times the odontostyle length. Nerve ring at 152-183 µm from anterior end of body. Oesophageal expansion gradual, expanded part occupying 44-45 % of total oesophageal length. Cardia elongate conoid, 15-18 µm long. Oesophageal gland nuclei and their orifices located as follows :

DO = 50-52 S₁N₁ = 68-70 S₂N = 86-87
 DN = 54-55 S₁N₂ = 75-76 S₂O = 88-89
 DO-DN = 3-4

Reproductive system amphidelphic. Vulva a transverse slit, 8-9 µm wide, vagina 28-30 µm or about half of corresponding body width. Two triangular, strongly cuticularized pieces present at the vulva-vagina junction. Both sexual branches equally developed. Prerectum about 3-4 anal body widths long. Rectum about one anal body width long. Anus a short transverse slit about 8 µm wide. Tail short, hemispheroid, 0.6-0.7 anal body widths long with a pair of caudal papillae on each side.

Male : Similar to females in general morphology except for a more curved posterior region. Spicules dorylaimoid, 1.6-1.8 anal body widths long. Lateral guiding pieces about one fourth of spicule length. Supplements poorly developed, arranged in a demarcated midventral area. Ventromedians 9-11 in number, regularly spaced. Adanals consisting of two pairs about 7 µm apart. Six or seven ventrolateral papillae on both sides of the supplement region. Prerectum about four anal body widths long. Anus crescent-shaped, about 8 µm wide, with a slightly swollen posterior lip. Tail short conoid with a bluntly rounded terminus, about 0.6-0.7 anal body widths long with three caudal papillae on each side.

TYPE MATERIAL

Holotype : Female (and a paratype male) on slide

Makatinus heynsi n. sp./1 in the nematode collection of the Department of Zoology, Aligarh Muslim University, Aligarh.

Paratypes : Ten females and four males on slides *M. heynsi* n. sp./2-8; in the same collection. A paratype female and a male deposited at Muséum National d'Histoire Naturelle, Laboratoire des Vers, Paris, France.

TYPE HABITAT AND LOCALITY

Soil around roots of paddy, *Oryza sativa* L., from Mangeshi, Goa, India. Collected in April, 1982.

DIAGNOSIS AND RELATIONSHIP

Makatinus heynsi n. sp. differs from all the known species of *Makatinus* Heyns, 1965 in having a smaller body and a small transverse slit-like vulva.

It further differs from *M. punctatus* in having a slightly shorter odontostyle, anteriorly located vulva, differently shaped tail, smaller spicules and smaller number of ventromedian supplements (L = 2.4-3.1 mm; odontostyle = 25-27 µm; V = 56-59; spicules = 75-80 µm; ventromedian supplements = 21-23; vulva longitudinal and tail convex-conoid with a prominent hyaline tip in *M. punctatus*). From *M. macropunctatus* Heyns, 1967 it differs in shape of lip region, in having weaker cuticular punctations, a smaller c value, smaller spicules and in the arrangement of ventromedian supplements (L = 3.19 mm; cuticular punctations prominent; c = 133; spicules = 76-80 µm; lip region offset by a constriction, lips not closely amalgamated and adanal supplements a single pair in *M. macropunctatus*).

Key to species of *Makatinus* Heyns, 1965

1. — Lip region offset by a deep constriction; lips conspicuously separated; punctations prominent (♀ : L = 3.19 mm; a = 38; b = 4.3; c = 133; V = 54.5; ♂ : L = 2.76-2.80 mm; a = 39-42; b = 3.8-4.1; c = 91-118; odontostyle = 26 µm; spicules = 76-80 µm; supplements = 10 + 2) *macropunctatus* Heyns, 1967
 — Lip region offset by a depression or slight constriction, lips amalgamated; punctations weak 2
2. — Vulva transverse (♀ : L = 1.9-2.4 mm; a = 37-43; b = 4.0-5.0; c = 82-110; V = 46-52; ♂ : L = 2.0-2.3 mm; a = 39-43; b = 4.3-4.8; c = 71-90; odontostyle = 21-25 µm; spicules = 57-67 µm; supplements = 9-11 + 2 + 2) *heynsi* n. sp.
 — Vulva longitudinal 3
3. — Tail convex-conoid with digitate tip; vulva post-equatorial (♀ : L = 2.4-3.1 mm; a = 36-42; b = 4.2-4.4; c = 84-92; V = 56-59; ♂ : L = 2.8-3.6 mm; a = 40-45; b = 4.7-4.9; c = 89-91; odontostyle = 25-27 µm; spicules = 75-80 µm; supplements = 19 + 2 + 2) *punctatus* Heyns, 1965
 — Tail short, bluntly rounded; vulva median (♀ : L =

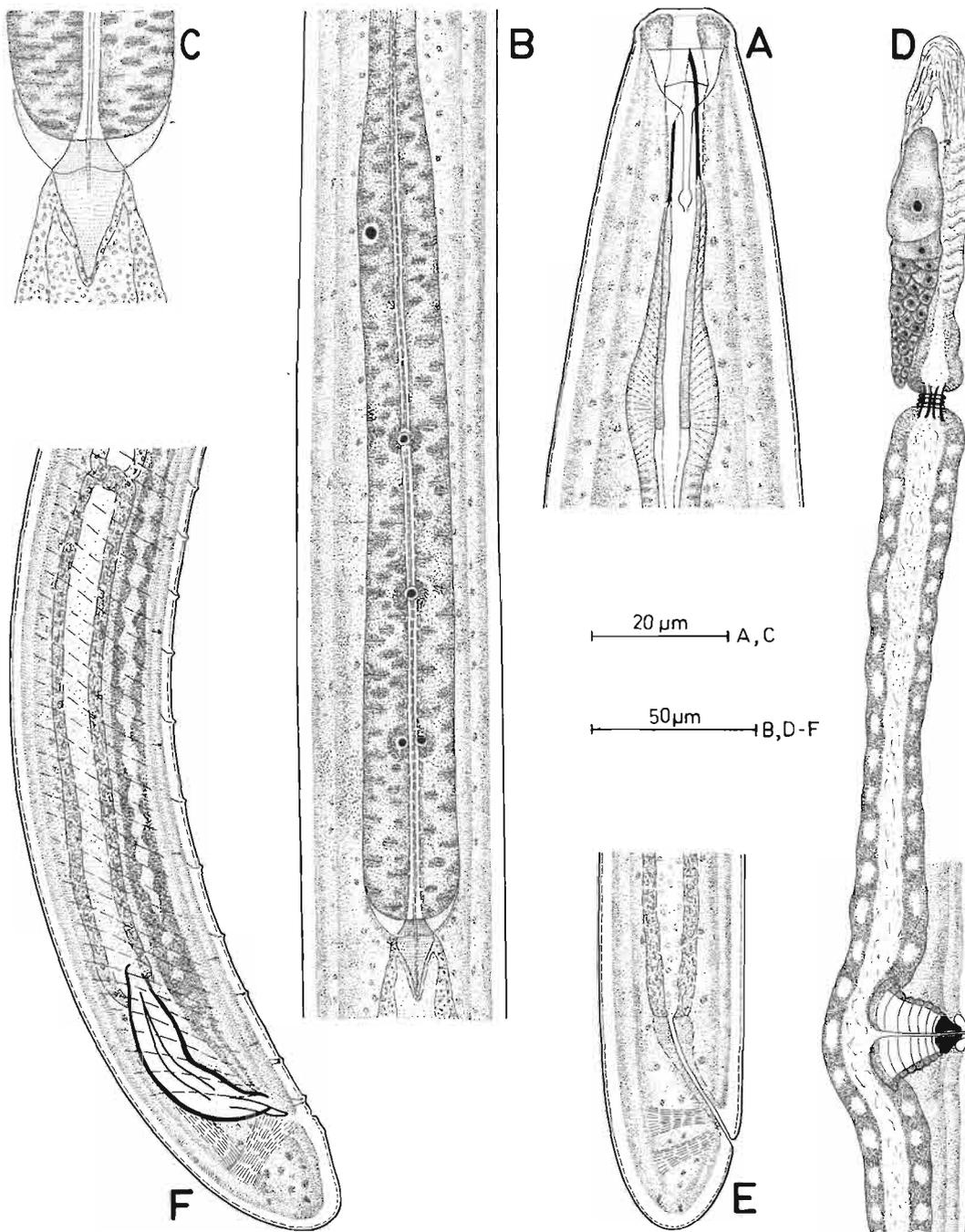


Fig. 1. *Makatinus heynsi* n. sp. A : Anterior region; B : Expanded part of oesophagus; C : Oesophago-intestinal junction; D : Female gonad (anterior branch); E : Female posterior region; F : Male posterior region.

3.6-3.7 mm; a = 32-34; b = 4.4-5.0; c = 103-107; V = 48-50; odontostyle = 25-27 μm; males not known)
 *capensis* Heyns, 1965

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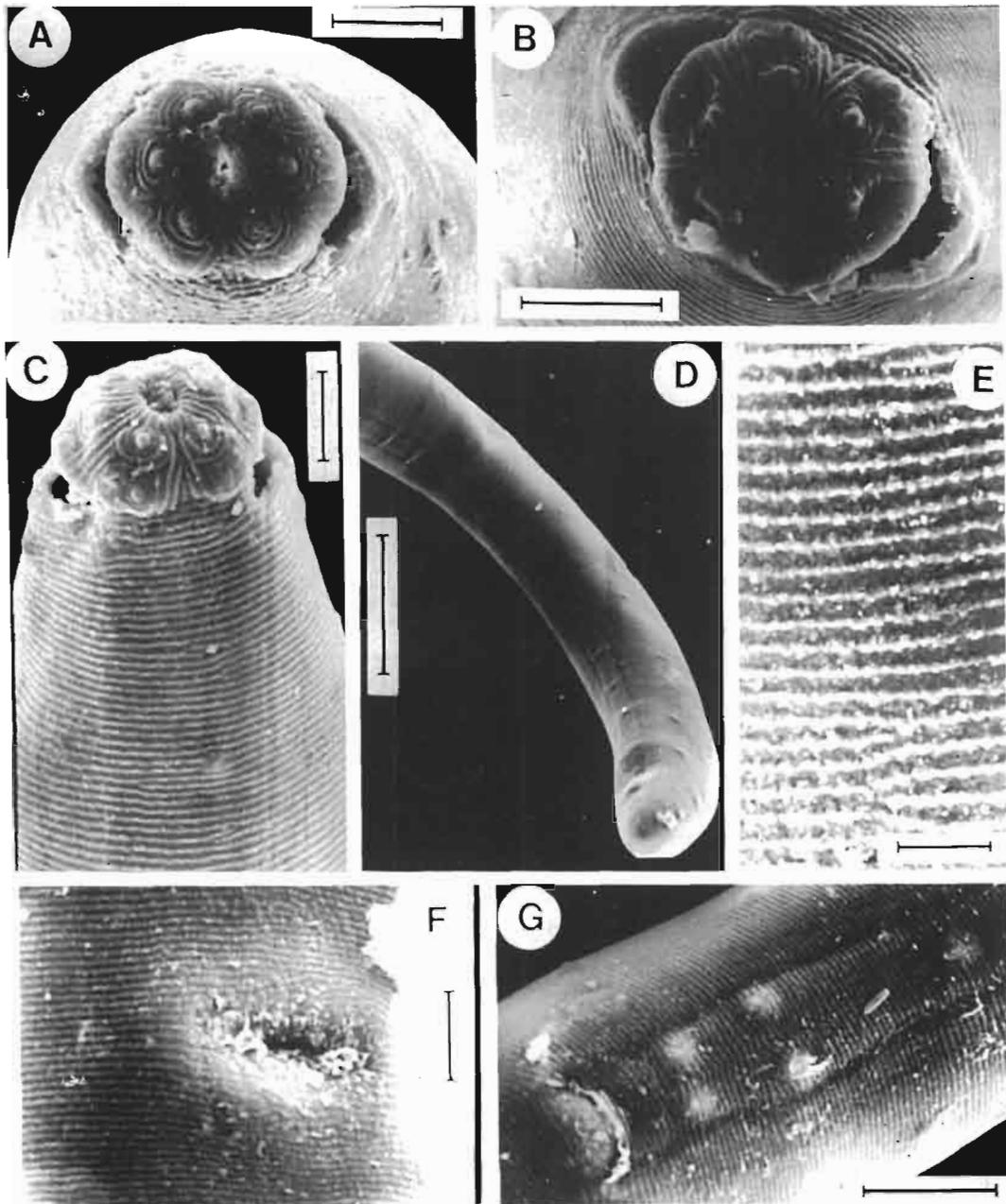


Fig. 2. *Makatinus heynsi* n. sp. A, B : Face views; C : Anterior end; D : Male posterior region showing supplements; E : Body striations showing punctations; F : Vulva; G : Male cloacal region showing adanal supplements and first ventromedian supplements, situated in a demarcated midventral area. (Bar is equal to 5 μm in A, B, C, D, F; 2 μm in E and 10 μm in G.)

References

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