

Description of *Makatinus siddiqii*, New Species (Dorylaimida: Aporcelaimidae: Aporcelaiminae) From Paschim Medinipur, West Bengal, India with Key to its World Species

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Abstract.- *Makatinus siddiqii* described from Paschim Medinipur, West Bengal, India is distinguished from all species of *Makatinus* in general and its closest ally *M. punctatus* Heyns in particular on the basis of short and comparatively robust body, robust odontostyle with aperture of about one-half length, a thin cardiac disc, short tongue-shaped cardia and in the absence of male. A key to all ten world species of *Makatinus* is presented here including new species, which appears to be the second record of the genus *Makatinus* from India in the existing literature.

Key words *Makatinus siddiqii* new species, India, Dorylaimida, Aporcelaiminae.

INTRODUCTION

The genus *Makatinus* was established by Heyns (1965) and he described two species, *M. capensis* and *M. punctatus*. Jairajpuri and Ahmad (1992) listed three species under this genus: *M. capensis* Heyns, 1965, *M. macropunctatus* Heyns, 1967 and *M. punctatus* Heyns, 1965. Jiménez Guirado (1994) made a short survey of the genus and listed five species: *M. aquaticus* Jiménez Guirado, 1994, *M. capensis* Heyns, 1965, *M. goodeyi* Jiménez Guirado, 1994 (= *Dorylaimus tritici* apud Thorne and Swanger, 1936), *M. heynsi* Ahmad and Ahmad, 1992 and *M. punctatus* Heyns, 1965 under it. He shifted *M. macropunctatus* Heyns, 1967 to the genus *Aporcelaimellus* and proposed *M. crassiformis* (Kreis, 1924) to be regard as *species inquirenda*. Andrassy (2002) redescribed *M. aquaticus* Jiménez Guirado, 1994 and opined to add three more species: *M. crassiformis* (Kreis, 1924) Andrassy, 1986, *M. minor* (Loos, 1945) Ahmad, 1997 and *M. simus* (Andrassy, 1958) Andrassy 2002 with the five species, listed by Jiménez Guirado (1994). Shaheen and Ahmad (2004) described *M. macrostylus* from Costa Rica.

Here we have described our new species *M. siddiqii* on the basis of those characters that are diagnostic in the genus *Makatinus* and are helpful in the identification of species such as short robust body, cuticle with distinct punctations, slightly set off labial portion by a shallow constriction with amalgamated lips, robust odontostyle with aperture of about one-half length, a thin cardiac disc, short tongue-shaped cardia, longitudinal sclerotized vulva and tail with small peg-like or hyaline tail-tip. Ahmad and Ahmad (1992) described *M. heynsi* from Goa which was the first record of the genus *Makatinus* from India. This present species is appears to be the second record of the genus from India.

MATERIALS AND METHODS

Nematodes were collected from rhizospheric soil sample of banana plantation (*Musa paradisiaca* L. cv. Kanthali) at Dumuria village under Sankrail block of Paschim Medinipur district, West Bengal, India. Soil sample (250 gm) was taken by the first author on 19.12. 2004 from a small area of 10 cm x 10 cm up to the depth of 20 cm, at a distance of 25 cm from the main bole of the orchard. The specimens were extracted from soil by Cobb's sieving technique (Cobb, 1918) and decanting method followed by Modified Baermann's funnel

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technique (Christie and Perry, 1951); processed by Seinhorst's slow dehydration method (Seinhorst, 1959); mounted on slides in anhydrous glycerin and sealed. Measurements were taken with the help of an ocular micrometer using Olympus research microscope with drawing-tube attachment, model no. BX 41. Dimensions were presented in accordance with De Man's formula (De Man, 1884). Positions of the oesophageal gland nuclei were presented according to Andrassy's formula (Andrassy, 1998). Diagrams were drawn with the help of a camera lucida.

Makatinus siddiqii, new species
(Table I, Fig. 1)

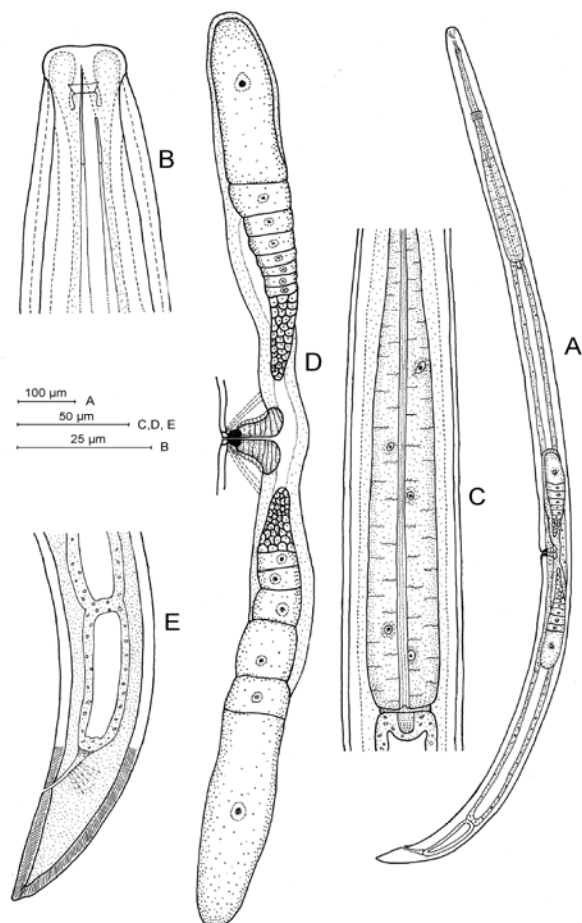


Fig. 1. *Makatinus siddiqii*, new species: A, entire female; B, anterior region; C, expanded part of pharynx; D, female reproductive system; E, female posterior region.

Measurements in Table I.

Table I.- Measurements of *Makatinus siddiqii* n. sp. (all measurements in μm except L in mm)

Morphometric characters	Holotype female	Paratype females (n=8)	Mean \pm SD
L	1.9	1.5-1.9	1.7 \pm 0.1
a	33.9	30.8-33.9	32.4 \pm 1.0
b	3.9	3.3-3.9	3.6 \pm 0.2
c	40.7	39.0-40.7	39.9 \pm 0.6
c'	1.4	1.3-1.4	1.3 \pm 0.0
V	57.6	55.6-66.9	60.2 \pm 4.1
V'	59.3	59.1-68.6	63.3 \pm 3.1
G ₁	21.7	21.7-25.6	23.8 \pm 1.3
G ₂	23.7	23.7-28.0	25.7 \pm 1.4
Height of lip region	6.1	4.9-6.1	5.5 \pm 0.4
Width of lip region	14.7	13.4-14.7	14.0 \pm 0.4
Odontostyle length	20.0	18.1-20.0	19.1 \pm 0.6
Stylet aperture	10.2	9.8-10.2	10.0 \pm 0.1
Odontophore length	32.0	29.6-32.0	30.9 \pm 0.8
Neck length	490.1	477.7-490.1	484.6 \pm 4.6
Glandularium	162.3	158.8-162.3	160.5 \pm 1.2
Nerve ring from anterior end	166.2	162.4-166.2	164.4 \pm 1.2
Length of cardia	8.2	6.8-8.2	7.5 \pm 0.4
Width of cardia	4.7	3.9-4.7	4.3 \pm 0.2
Vulva from anterior end	1102.5	1065.7-1102.5	1084.1 \pm 12.0
Anterior gonad	416.5	408.5-416.5	412.7 \pm 3.0
Posterior gonad	453.2	446.1-453.2	449.8 \pm 2.5
Body width at neck base	52.4	47.7-52.4	50.2 \pm 1.6
Body width at vulva	56.3	51.5-56.3	54.2 \pm 1.7
Body width at anus	34.3	31.1-34.3	32.5 \pm 1.1
Prerectum	63.7	54.5-63.7	58.4 \pm 3.3
Rectum	47.7	39.2-47.7	41.6 \pm 3.1
Tail length	46.9	38.7-46.9	40.9 \pm 2.2

Description

Female

Medium-sized nematode, robust body, slightly curved ventrally upon fixation. Cuticle consisting of two distinct layers, with prominent punctations arranged in definite rows, more prominent towards both the extremities; with 3-4 μm thick in the neck region and 7-8 μm at tail. Lateral hypodermal chords 11-12 μm wide. Dorsal

median pores 7-9 in the neck region and 2-3 in the posterior region of body. Ventromedian pores 14-16 in the neck region, 7-8 between neck base and vulva, 4-5 between vulva and anus. Lateral body pores irregularly arranged along entire body.

Labial region set off by a shallow constriction, lips amalgamated. Amphids cup shaped, aperture occupying about as wide as half of the corresponding body diameter. Odontostyle wide, 1.3-1.4 times lip region widths long; aperture occupying about half of its length. Guiding ring thin, 0.7-0.8 times lip region widths from anterior extremity. Odontophore rod-like, 1.4-1.5 times the odontostyle length. Nerve ring at about 30% of neck length from anterior end. Oesophagus gradually widening at 45-47% of its length. Glandularium occupying about 33% of neck length. Cardia short, tongue-shaped; a thin cardiac disc present. Pharyngeal gland nuclei located as follows: D=324.3-327.7%; AS₁=23.4-24.8%; AS₂=37.5-39.1%; PS₁=73.9-75.3%; PS₂=81.3-82.9%.

Reproductive system amphidelphic; posterior genital branch larger than the anterior one. Vulva longitudinal, strongly sclerotized. Vagina extending about half of the adjacent body width. *Pars distalis vaginae* 6-7 µm long; *pars refringens vaginae* large disc like area with sclerotized margins, measuring 15-17 µm in length and 30-35 µm wide. Ovaries reflexed; anterior ovary (182.8-196.0 µm) smaller than the posterior one (201.3-208.2 µm). Oocytes arranged in a single row; no mature egg.

Prerectum 1.8-2.0 times anal body width long. Rectum 1.2-1.3 times anal body width long. Tail conoid, about 1.2-1.4 times anal body width long; with small peg-like tail-tip. Somatic muscle bands in tail very strong.

Male

Not found.

Differential diagnosis and relationships

Makatinus siddiqii n. sp. is characterized by having medium sized robust body (L=1.59-1.91 mm; a=30.8-33.9); slightly set off labial portion by a shallow constriction with amalgamated lips; 18.1-20.8 µm long robust odontostyle with aperture of about one-half length; short tongue-shaped cardia with a thin cardiac disc; longitudinal sclerotized

vulva and 40.7-46.9 µm long tail with small peg-like tail-tip.

The proposed new species comes close to *M. punctatus* Heyns, 1965 in having offset lip region with slight constriction, posterior position of vulva (V=56-59 in *M. punctatus*), vulva heavily sclerotized and tail with a hyaline tip. But differs in having short and comparatively robust body (vs. L=2.40-3.17 mm; a= 36-42) and short odontostyle (vs. odontostyle 25-27 µm). Cardia tongue-shaped in the present species but it is more or less triangular in shape in *M. punctatus*. Male present in *M. punctatus* but absent in the present species.

Type material

Specimens are deposited with the National Zoological Collections of the Zoological Survey of India, Kolkata, West Bengal, India, under the Registration No. WN 1259 (Holotype) and WN 1260 (Paratypes).

Etymology

The proposed new species was named after Mohammad Rafiq Siddiqi, stalwart nematologist of the world.

KEY TO THE TEN WORLD SPECIES OF MAKATINUS HEYNS

1. Female tail mammillate, tail tip peg-like 2
- Tail terminus broadly rounded, tail tip without peg-like 4
2. Vulva heavily sclerotized..... 3
- Vulva not sclerotized
..... *M. sinus* Andrassy
3. Female 2.4-3.2 mm; stylet long, 25-27 µm
..... *M. punctatus* Heyns
- Female 1.59-1.91 mm; stylet small, 18-20 µm
..... *M. siddiqii* n.sp.
4. Large species, well over 3 mm (female: 3.6-3.8 mm; male: unknown) 5
- Smaller species, well under 3 mm..... 6
5. Cuticle with distinct punctuations; continuous lip region; longer odontostyle (38-40 µm)
..... *M. macrostylus* Shaheen and Ahmad
- Punctuations very weak; lip region offset; smaller odontostyle (25-27µm) *M. capensis* Heyns
6. Ventromedial supplements 15-17 in number 7
- Ventromedial supplements 8-12 in number 8
7. Female tail shorter than half an anal body diameter

- (female: 2.4-2.7 mm; male: 1.9-2.1 mm, PO 15-17)
 *M. crassiformis* (Kreis) Andrassy
- Female tail distinctly longer than half an anal body diameter (female: 1.9-2.3 mm; male: 2.0-2.6 mm, PO 15-17) *M. aquaticus* Jiménez Guirado
8. Ventromedial supplements all before the spicule (female unknown; male: 2.2 mm, PO 9-12)
 *M. goodeyi* (Thorne and Swanger) Jiménez Guirado
- Posterior ventromedial supplements within the range of specula (closely related, may be identical species) 9
9. Stylet 21-25 µm; specula about 60 µm long (female: 2.0-2.4 mm; male: 2.0-2.3 mm, PO 9-11)
 *M. heynsi* Ahmad and Ahmad
- Stylet 25-32 µm; spicula 50 µm long (female: 1.9-2.2 mm; male: 1.8-2.3 mm, PO 8-9)
 *M. minor* (Loos) Ahmad

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