

STUDIES ON THE RARE NEMATODE GENUS *MYLODISCUS* THORNE, 1939 WITH FIRST REPORT OF ITS MALE

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Summary. *Mylodiscus nanus* Thorne, 1939 is re-described based on specimens collected from various localities in India, Singapore, Japan and Costa Rica. Variations were observed in the shape of the lip region, amphids, guiding ring, cardia, vagina and tail. A single male of this species reported for the first time is characterized by having four well spaced ventromedian supplements, a long slender dorylaimoid spicule measuring 66 μm and a short conoid tail.

Key words: *Mylodiscus nanus*, species re-description, male description.

The genus *Mylodiscus* is represented by the type and only species *M. nanus*, described by Thorne, 1939 based on a single specimen collected from Indonesia. Thorne (l.c.) could not decide the exact position of its stylet and due to the presence of sclerotization in the stomal region, placed the genus into the subfamily Actinolaiminae. Jairajpuri (1965) placed this genus under Aetholaiminae (Nygolaimidae), but he desired additional information regarding the genus, essential to clear the discrepancies. Later, Coomans and Loof (1978) re-described this species based on several females and juveniles collected from Brazil. They found that the stylet was axial in position, hence it was shifted to the family Discolaimidae. Dhanachand and Jairajpuri (1980) described this species from Manipur, India; Ahmad and Araki (2003) from Japan and Shaheen and Ahmad (2004) from Costa Rica.

Recently, we collected several populations of *Mylodiscus* from north-eastern India. Some specimens were also recovered from samples collected in Singapore. On detailed study, they were all found to represent the type and only known species, *M. nanus*. A single male was also recovered from a sample collected from Arunachal Pradesh, India. Since all earlier descriptions of this species are based on females only, it was thought necessary to re-describe it giving additional information on variability in females and a description of the male.

MATERIALS AND METHODS

The nematodes were extracted from soil samples by Cobb's sieving and decantation and modified Baerman's funnel techniques. Nematodes obtained in clear water

were killed and fixed in hot 4% formalin, dehydrated to glycerine by a slow method and mounted on slides in anhydrous glycerine. Measurements were done using an ocular micrometer and drawings were made using a drawing tube attached to the microscope.

DESCRIPTION

MYLODISCUS NANUS

Thorne, 1939

(Figs. 1 and 2)

Measurements. See Table 1.

Female. Body ventrally curved upon fixation, tapering towards both extremities, more so towards the posterior. Cuticle finely striated, 2-4 μm thick at mid body and 4-9 μm on tail. Lateral chord about one-eighth to one-sixth of the corresponding body width at mid body. Lateral, dorsal and ventral body pores indistinct.

Lip region offset by constriction with inner bowl-shaped sclerotised lining with thickened bottom and radiating ridges, about three times as wide as high and one-fourth to one-third of body width at neck base. Amphids cup- or funnel-shaped, their aperture about half of the lip region width. Odontostyle slender, about as long as lip region width, its aperture about one-third to slightly less than half of its length. Guide ring single or weak 'double', located at about 0.5-0.8 times the lip region width from anterior end. Odontophore about twice the odontostyle length. Nerve ring at 29-35% of neck length from anterior end. Pharyngeal expansion abrupt; expanded part occupying about 41-48% of total neck length. Cardia rounded or conoid, about one-fourth to one-seventh of corresponding body width long. Pharyngeal gland nuclei located as follows (After Andrassy, 1998): $D = 65-71\%$; $AS_1 = 25-32\%$; $AS_2 = 38-43\%$; $PS_1 = 63-67\%$; $PS_2 = 69-71\%$.

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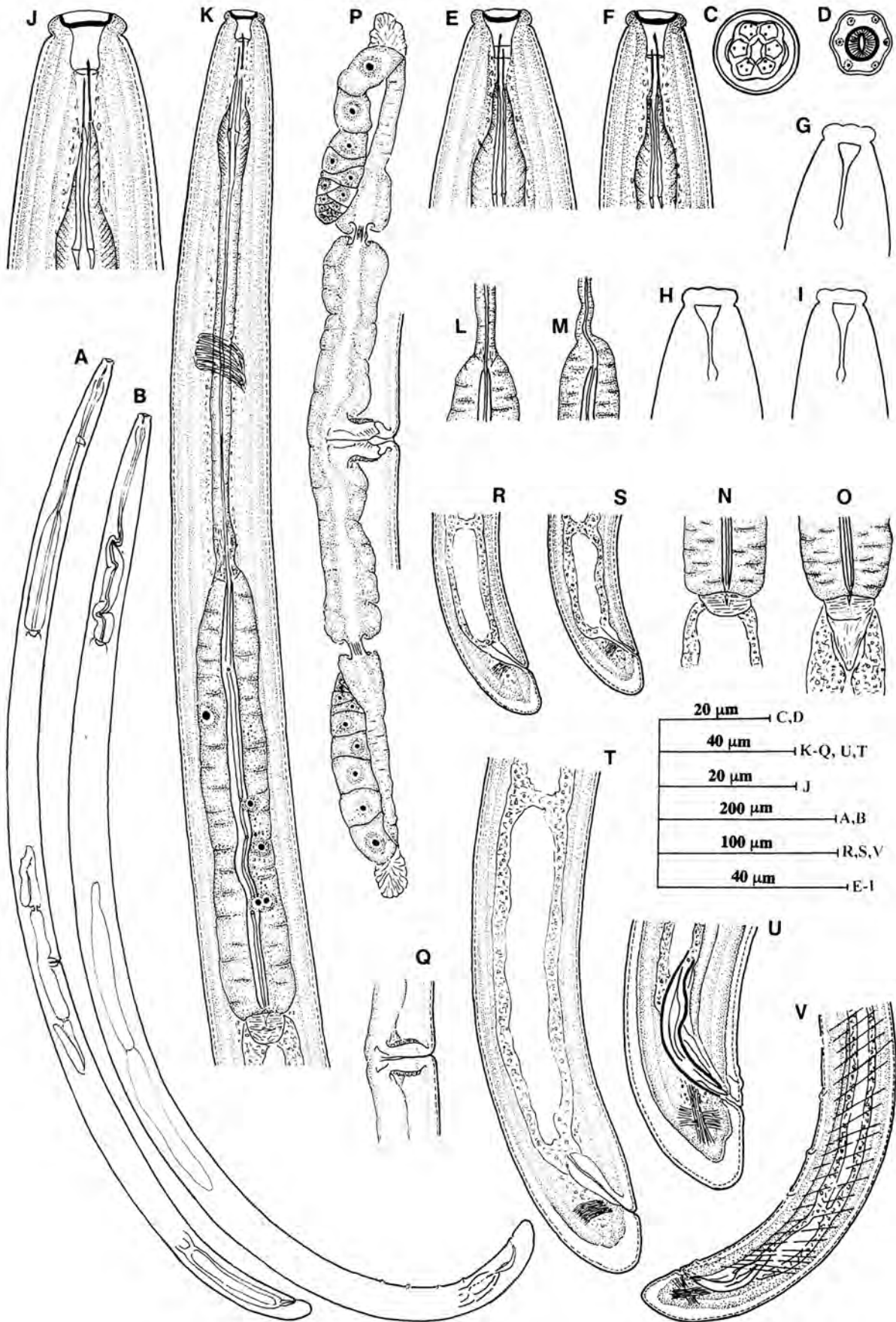


Fig. 1. *Mylodiscus nanus* Thorne, 1939. A: entire female; B: entire male; C-D: *en face* view; E, F and J: anterior regions; G-I: anterior regions showing amphid; K: pharyngeal region; L-M: pharyngeal expansion; N-O: pharyngo-intestinal junction; P: female genital system; Q: vulval region; R-T: female posterior region; U: male posterior end; V: male posterior region.

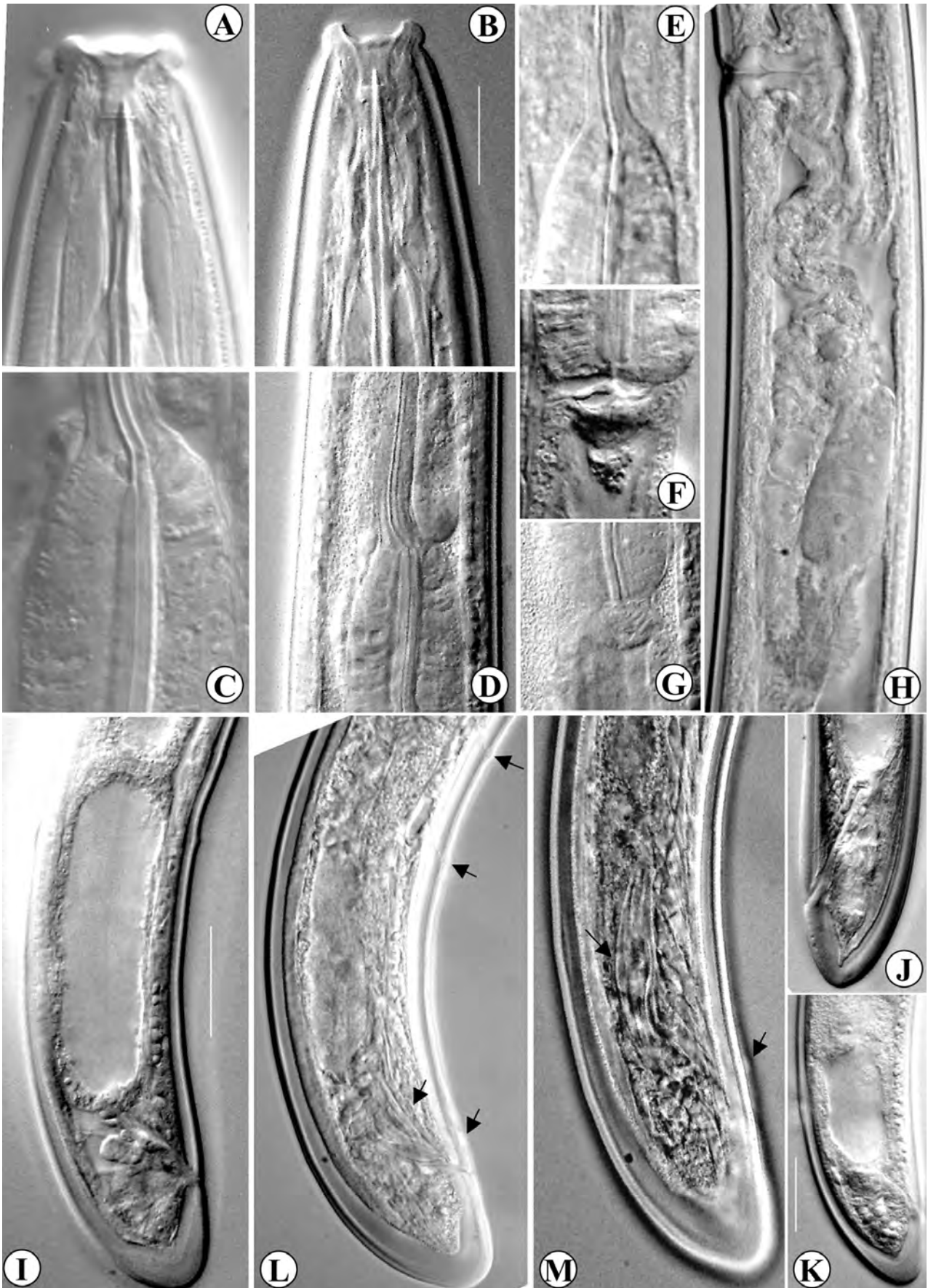


Fig. 2. *Mylodiscus nanus* Thorne 1939. A-B: anterior region; C-E: pharyngeal expansion; F-G: pharyngo-intestinal junction; H: female genital system (posterior); I: female posterior region; J-K: female posterior end; L-M: male posterior region showing supplements and spicule (scale bar A-C 10 μm; D-I, L, M 20 μm; J, K 20 μm).

Genital system amphidelphic; both the sexual branches almost equally developed. Ovaries reflexed, measuring 49-237 μm (anterior) and 45-137 μm (posterior) with oocytes arranged in a single row except near tip. Oviduct joining ovary subterminally, measuring 55-130 μm (anterior) and 56-125 μm (posterior). Sphincter present at oviduct-uterus junction. Uterus 45-71 μm (anterior) and 45-125 μm (posterior). Vulva transverse. Vagina without sclerotization, extending inwards about one-third to half of corresponding body width deep. *Pars proximalis vaginae* 10-16 μm long with straight walls encircled by circular musculature; *pars refringens vaginae* absent; *pars distalis vaginae* 3-6 μm with curved walls. Pre-rectum about 2-4 anal body widths long. Rectum about as long as anal body width. Tail 0.5-0.8 times anal body width long, dorsally convex-conoid with broadly rounded terminus, its hyaline portion irregular in shape. Two caudal pores on each side.

Male. In general morphology, similar to females except in its posterior region more curved ventrally because of the presence of twenty-one well-developed copulatory muscles. Four well spaced ventromedian supplements besides an adanal pair. Spicules dorylaimoid, slender, about twice as long as cloacal body width. Lateral guiding pieces about one-fifth of spicule length. Pre-rectum about twice as long as anal body width. Rectum slightly longer than one anal body width. Tail similar to that of female.

Habitats and localities

1. Soil around the roots of forest trees, Kaziranga National Park, district Naogaon, Assam, India.
2. Soil around the roots of forest trees near Abotany statue, Itanagar, Arunachal Pradesh, India.
3. Soil around the roots of forest trees from Kent ridge Park, near National University of Singapore, Singapore.

Other material examined

1. One female from soil around roots of forest trees from Teshirogi, Tsukuba city, Japan (described by Ahmad and Araki, 2003).
2. Two females from Barbilla National Park, Costa Rica (described by Shaheen and Ahmad, 2004).

DISCUSSION

Thorne (1939) described this species based on a single female from Indonesia. Coomans and Loof (1978) provided a detailed description of this species collected from several localities in Brazil. They (l.c.) transferred *M. nanus* from Nygolaimidae to Discolaimidae based on the close relationship of *Myiodiscus* with *Discolaimus* Cobb, 1913 and related genera. The shape of the lip region, nature of pharynx and pharyngeal glands of *Myiodiscus* are characteristically similar to discolaimids.

They also concluded that *Myiodiscus* is an intermediate form between *Discolaimus* and *Carcharolaimus* Thorne, 1939. It is quite probable that Carcharolaimidae with forms like *Carcharolaimus*, *Carcharoides* Thorne, 1967 and *Caribenema* Thorne, 1967, etc. evolved from discolaimid-like ancestors with *Myiodiscus* and *Myiodiscooides* Lordello, 1963 as intermediate forms. Although Jairajpuri and Ahmad (1992) grouped carcharolaimids under the superfamily Actinolaimoidea, we are of the opinion that carcharolaimids be placed with discolaimids as a subfamily Carcharolaiminae under Discolaimidae, and Actinolaimidae as a family close to Dorylaimidae as originally conceived by Coomans and Loof (1978) and Baqri *et al.* (1975).

Measurements and description of the present population conform well with earlier descriptions. However, slight variations were recorded in amphid shape (cup- or funnel-shaped); guide ring (single or weak 'double'); cardia (rounded or conoid). The vagina may be slender or wide and the hyaline portion of the tail also shows variations. *Myiodiscus nanus* seems to be widely distributed in north-eastern India and south-east Asian countries. Originally described from Indonesia, it is also found in Japan and Singapore. Since north-eastern India and these south east Asian countries are part of the same biogeographic region, there is every possibility that this species will also be found in other countries of this region, such as China, Malaysia, Thailand, etc. Interestingly, this species has never been found in samples collected from other parts of India.

In the New World, the record of this species from Brazil and Costa Rica again gives an indication of probable wide distribution of this species in South and Central America. The distribution in both Old and New Worlds may be attributed to similar climatic conditions in these two regions. There is no record of this species from Europe, North America and Oceania.

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