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MORPHOLOGICAL CHARACTERISTICS OF
NEOLOBOCRICONEMA CATARACTICUM ANDRASSY

by

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The genus *Neolobocriconema* proposed by Mehta and Raski, 1971 was confirmed as valid by Loof and De Grisse, 1973, Khan *et al.*, 1976, Andrassy, 1979 and Hashim, 1984. It includes seven valid species.

In November 1986, during a plant parasitic nematode survey in Brazil, a large population of a *Neolobocriconema* species was extracted from the rhizosphere of mango (*Mangifera indica* L.) at Campo Grande in the State of Rio de Janeiro. Morphological studies on several specimens showed that the population was conspecific with *N. cataracticum* which was collected and described by Andrassy (1979) from the rain forest in the Iguaçú National Park, Brazil. The original description is based on a restricted number of specimens. The present study amplifies and extends the known range of morphometric variability. Specimens have been distributed to several plant-parasitic nematode collections.

The specimens were extracted by the decanting and sieving method. They were killed and fixed in hot aqueous solution of 4% formaldehyde, dehydrated slowly in an ethanol saturated chamber, mounted in dehydrated glycerin and measured and photographed under a light microscope. After fixation several specimens were transferred to Os O₄ solution for 12 h, infiltrated with Spurr's resin, coated with gold and examined with a SEM at 10 kV accelerating voltage (De Grisse, 1973).

Description and illustration (Table I; Figs. 1, 2)

Small c-shaped body with 39-45 annuli. Annuli 10-13 μm thick, 53-70 μm wide at mid-body. They are ornamented by fine longitudinal incisures

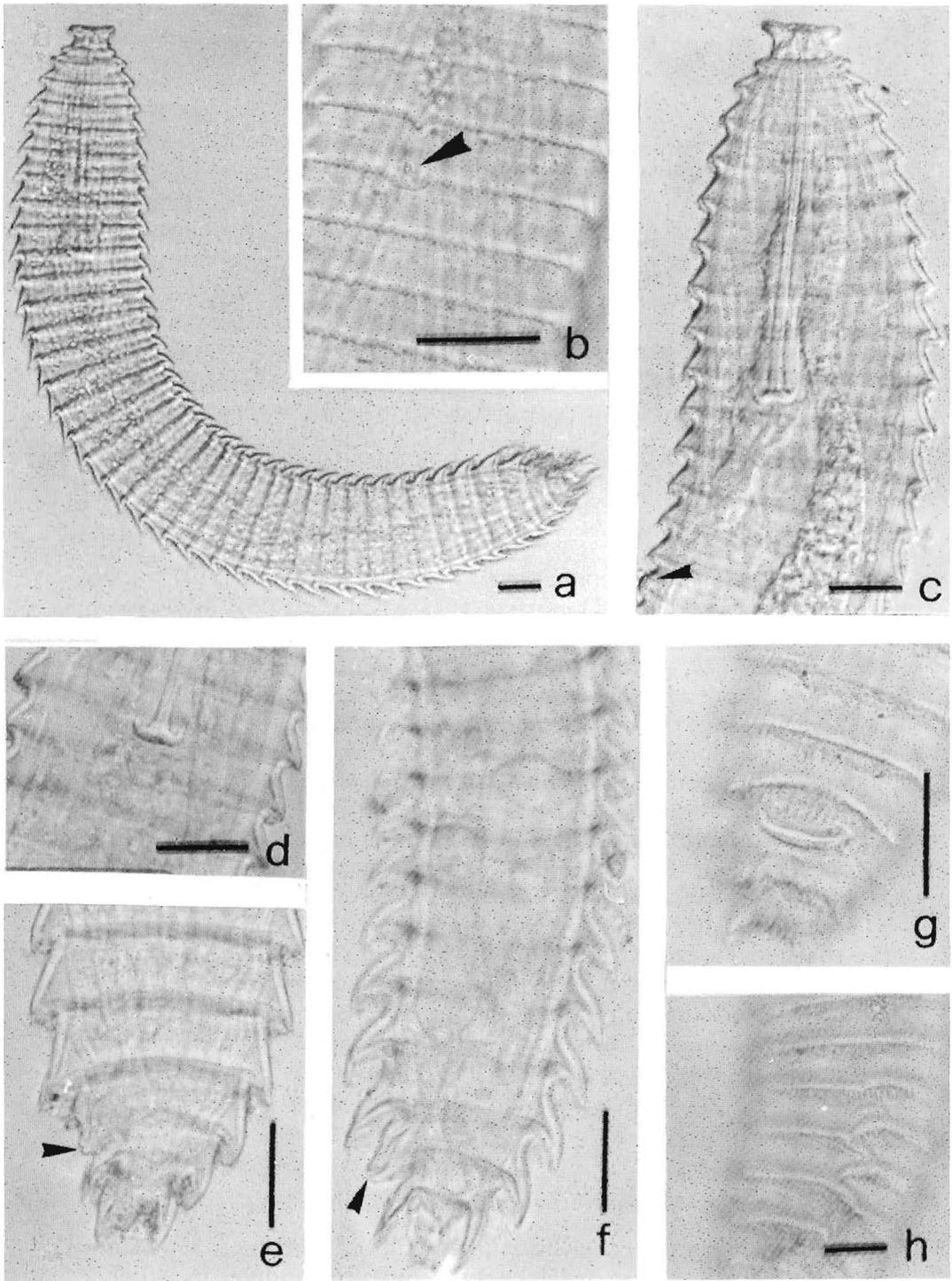


Fig. 1 - Light microscope photomicrographs of *Neolobocriconema cataracticum*. a) Entire female; b) Excretory pore (arrowed) in ventral view; c) Anterior body portion showing the excretory pore (arrowed) position, the shape of stylet knobs and the long ovary, overlapping the stylet; d) Anchor shaped stylet knobs; e, f) Posterior body portion: note the posteriorly positioned vulva (arrowed); g) Vulval area in ventral view; h) Terminal body portion showing anastomosed annuli. (Scale bar = 20 μ m).

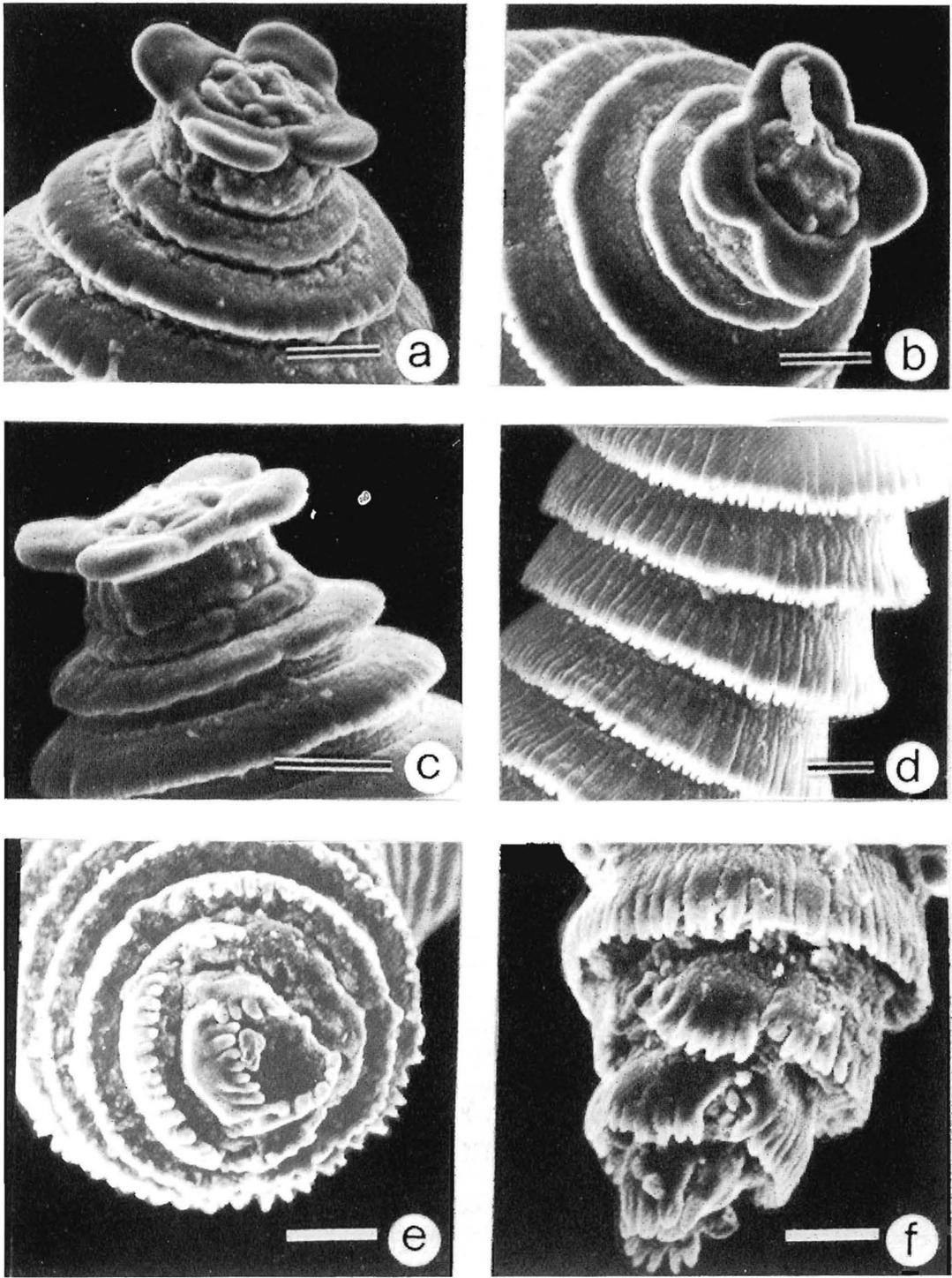


Fig. 2 - SEM photomicrographs of *Neolobocriconema cataracticum*. a, b, c). Different views of head region; c) Cuticular ornamentation of body annuli at mid-body; e, f) Terminal body portion showing cuticular lobes. (Scale bar = 10 μ m)

Table I - *Morphometrical characteristics of Neolobocriconema cataracticum.*

Character	Range		Mean	Standard Deviation
	Min	Max		
Body length in μm	366	514	446	29.4
Body width in μm	51	70	63	5.1
Stylet length in μm	85	107	98	5.5
Stylet length as % of body length	19	25	22	1.6
Stylet length as % of oesophagus	66	75	71	2.4
Stylet knobs width in μm	11	13	12	0.7
Disc-like head width in μm	19	22	21	0.8
Annuli thickness at mid-body in μm	10	13	11	0.9
Excretory pore head end in μm	130	163	150	5.9
Ex. pore from ant. end as % of body length	30	38	33	1.7
Oesophagus total length in μm	120	148	137	6.0
V%	94	96	95	0.4
Ratios: a	6.2	8.6	7.1	0.6
b	2.5	3.5	3.2	0.2
c	33	45	39	2.6
Vulva-terminus distance in μm	18	24	21	1.7
R	39	45	42	1.3
Rst	10	12	11	0.6
Roes	13	16	14	0.7
Rex	15	17	16	0.5

and numerous spine-like irregular lobes. First 5-8 annuli are without appendages. At the posterior body portion the finger spine-like cuticular lobes are usually long, twice their width.

Anastomoses very rare involving 2-3 annuli and usually confined at the posterior body portion. Anterior end disc-shaped, well separated from the remainder of the body by a distinct neck-like structure (De Grisse and Maas, 1970) with a distinct basal collar. Diameter of the disc (lateral view) 19-22 μm . SEM end-on view shows that the disc is the second body annulus and has two deep indentations (dorsal and ventral) and two shallow lateral ones. Inside the disc is the first annulus with four distinct sub-median lobes and squarer labial disc bearing the centrally located I-like oral opening and the slit-like amphidial apertures. Behind the «neck» all annuli are retrorse. Oesophagus typical for the genus. Excretory pore on the 15th-16th annulus always posterior to the base of the oesophagus. Vula closed on

the 3rd annulus from terminus with smooth vulval lips. Genital tube typical of the genus very long usually overlapping half of the stylet length with empty spermatheca. Anus between the last two annuli. Post-vulval body portion 18-24 μm long.

Deposition of specimens

27 females at Istituto Nematologia Agraria, C.N.R., Bari, Italy and 3 each at: USDA, Nematode collection, Beltsville, Maryland, USA; Nem. Dept. Rothamsted Exp. Station, Harpenden, England; Plantenziektenkundige Dienst, Wageningen, The Netherlands; Canadian National Collection of Nematodes, Ottawa, Canada; National Nematode Collection, Indian Agric. Res. Institute, New Delhi, India; Museum National d'Histoire naturelle, Lab. des Vers, Paris, France; Division of Nematology, University of California, Davis, California, USA; German Nematode Collection, Institut für Nematologie, Münster, W. Germany.

Discussion

The genus *Neolobocriconema* was erected by Mehta and Raski, 1971 to contain the type species of the genus *N. laterale* (Khan *et* Siddiqi, 1963) Mehta *et* Raski, 1971 and *N. serratum* (Khan *et* Siddiqi, 1963) Mehta *et* Raski, 1971. Additional species were described later or transferred to *Neolobocriconema*. To date, in the nematology literature, there are 3 keys available (Andrassy, 1979; Ebsary, 1981; Hashim, 1984) to species of *Neolobocriconema* that distinguish the 7 nominal species of the genus: *N. braziliense* (Raski *et* Pinochet, 1975) Hashim, 1984; *N. insulicum* Choi *et* Geraert, 1975; *N. serratum* (Khan *et* Siddiqi, 1963) Mehta *et* Raski, 1971; *N. laterale* (Khan *et* Siddiqi, 1963) Mehta *et* Raski, 1971; *N. cataracticum* Andrassy, 1979; *N. olearum* Hashim, 1984 and *N. aberans* (Jairajpuri *et* Siddiqi, 1963) Andrassy, 1979.

Most of the morphometrical characters of our population of *N. cataracticum* agree well with those given by Andrassy, 1979 in the original description although the body length of our specimens tends to be longer (53% of the specimens over 0.45 mm). *N. cataracticum* can easily be distinguished from all the other species by its distinct quadrilobate (*Discocriconemella*-like) head, the presence of submedian lobes, the characteristic ornamentation of the body annuli, the long stylet and the posterior ($R = 3$) position of the vulva. The species has also been recently reported from the State of Minas Gerais, Brazil (Campos, 1987).

S U M M A R Y

The original description of *Neolobocriconema cataracticum* Andrassy is amplified and supplemented with observations by light microscope and scanning electron microscope. Particular consideration was given to amplifying details of the peculiar head and cuticular structures. The morphometrical descriptive characteristics of a population of *N. cataracticum* from the State of Rio de Janeiro extend the known range of variability for this species.

LITERATURE CITED

- ANDRASSY I., 1979 - Revision of the subfamily Criconematinae Taylor, 1936 (Nematoda). *Opusc. Zool. Budapest*, 15: 11-57.
- CAMPOS V.P., 1987 - Ocorencia de Fitonematoides em Minas Gerais. Resumos: XI Congresso Brasileiro de Nematologia, Viçosa, 16-20 Feb. 1987, p. 36.
- DE GRISSE A., 1973 - A method for preparing nematodes and other soft tissues for SEM. *Meded. Fac. Landbwet. RijkSuniv. Gent*, 38: 1685-1703.
- DE GRISSE A. T. and MAAS P.W., 1970 - *Macroposthonia longistyleta* n.sp. and *Discocriconemella surinamensis* n.sp. from Surinam (Nematoda: Criconematidae). *Nematologica*, 16: 123-132.
- EBSARY B.A., 1981 - Generic revision of Criconematidae (Nematoda): *Nothocriconema* and related genera with proposals for *Nothocriconemella* n. gen. and *Paracriconema* n.gen. *Can. J. Zool.*, 59: 1227-1236.
- HASHIM Z., 1984 - Re-diagnosis and a key to species of *Neolobocriconema* Mehta & Raski, 1971 (Nematoda: Tylenchida), with a description of *N. olearum* n.sp. from Jordan. *System. Parasitology*, 6: 69-73.
- KHAN E., CHAWLA M.C. and SAHA M., 1976 - Criconematoidea (Nematoda: Tylenchida) from India, with descriptions of nine new species, two new genera and a family. *Indian J. Nematol.*, 5: 70-100.
- LOOF P.A.A. and DE GRISSE A., 1973 - Interrelationships of the genera of Criconematidae (Nematoda: Tylenchida). *Meded. Fac. Landbwet RijkSuniv. Gent*, 38: 1303-1328.

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