

Nematodes associated with upland rice in South Africa,  
with a description of *Hemicycliophora oryzae* sp. n.  
(Nemata : Criconematoidea)

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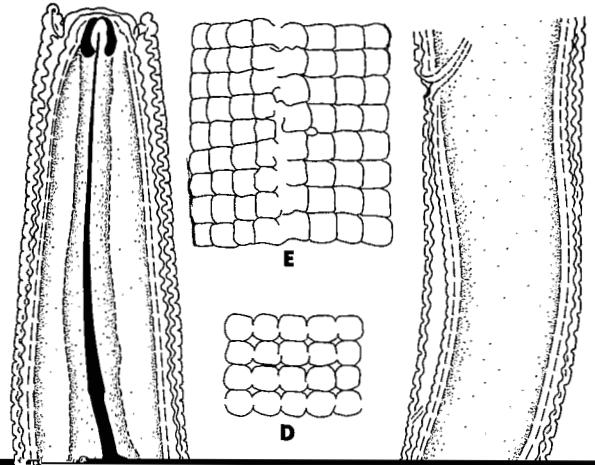
sp. n., *Criconemella obtusicaudata* (Heyns, 1962) Heyns, 1970 and *Rotylenchus unisexus* Sher, 1965 in two soil samples; *Hemicycliophora typica* de Man, 1921, *Criconema corbetti* (De Grisse, 1967) Raski & Luc, 1984, *Brachydorus tenuis* de Guiran & Germani, 1968 and *Trichodorus* sp. in one soil sample. One nematode species, *Pratylenchus zaeae* Graham, 1951, was found in all root samples. The total number of nematodes in the soil samples varied from 6 934 to 8 454 (7 649) nematodes per dm<sup>3</sup> of soil, of which about 1/3 were plant-parasitic nematodes : 347 to 1 040 Criconematoidea, 640 to 1 580 Hoplolaimidae and Dolichodoridae, 160 to 1 120 Trichodoridae. The number of *P. zaeae* in the roots varied from 60 to 660 (345) nematodes per g roots.

Only *P. zaeae* has previously been reported from rice in North America (Atkins, Fielding & Hollis, 1957), South America (Monteiro, 1968; Loof, 1974) and Africa (Oteifa, 1962; Merny, 1970; Samsoen & Geraert, 1975; Fortuner, 1975; Babatola, 1984). *H. oryzae* sp. n., *R. gracilidens*, *B. tenuis* and the *Trichodorus* sp. (a new species to be described later) are new species for South Africa.

It is not known if the plant-parasitic nematode species identified can affect growth of rice plants.

#### DESCRIPTION

*Female* : Body ventrally arcuate. Cuticular sheath closely fitting over whole length of body except on tail. Lateral field not distinct among the cuticular blocks on the first half of the body, but from about middle of body onwards consisting of mostly two rows of blocks with the



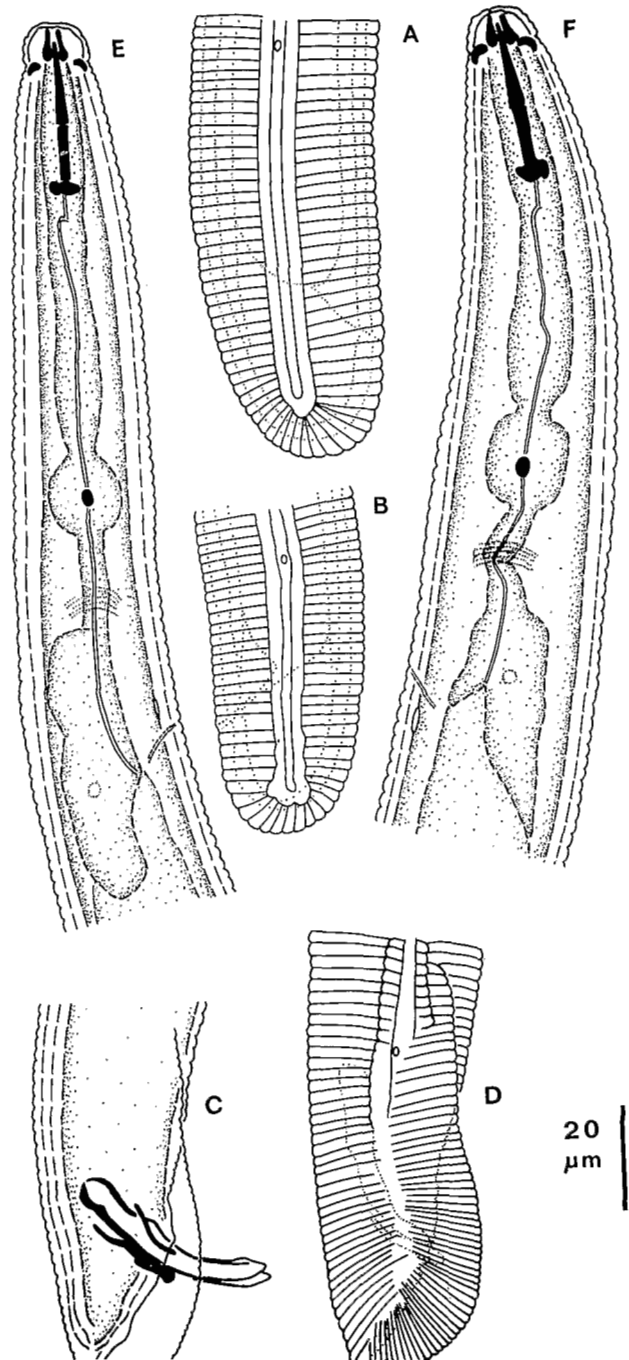
middle line between the blocks irregular or a break in the striae, continuing as such right on to the tail where the lateral field eventually disappears between the surrounding cuticular blocks. Cuticle outside lateral field with 22 to 24 rows of regular blocks appearing almost like the

The females of this new species can be distinguished from the females of *H. typica* de Man, 1921, which also have blocks on the cuticula, by their greater body length (993-1189  $\mu\text{m}$  vs 549-986  $\mu\text{m}$  in *H. typica* from South Africa reported by van den Berg, 1981), greater stylet

## DESCRIPTION

*Female*: Body ventrally curved into an open C. Lip region rounded,  $12 \mu\text{m} \pm 1$  (10.5-14.0) wide and  $7.5 \mu\text{m} \pm 0.5$  (6.5-9.0) high, set off with four annules. Labial framework very well developed, outer margins reaching posteriorly 1 to 1.5 annules from basal plate. Stylet knobs flattened or very slightly concave anteriorly,  $7 \mu\text{m} \pm 0.5$  (6.0-7.5) wide and  $3 \mu\text{m} \pm 0.5$  (3.0-3.5) high. Metenchium varying from slightly shorter to slightly longer than telenchium ( $m = 49-52\%$ ). Dorsal oesophageal gland opening  $4 \mu\text{m} \pm 0.5$  (3.5-5.5) from base of stylet knobs. Median bulb rounded,  $17.5 \mu\text{m} \pm 1$  (16.5-20.0) long and  $15 \mu\text{m} \pm 1$  (14.0-16.5) wide. Length of oesophagus  $91 \mu\text{m} \pm 4.5$  (84-97) from anterior end to middle of median bulb and  $69 \mu\text{m} \pm 4.5$  (61-79) from middle of median bulb to basal margin of oesophageal lobe. Length of oesophageal overlap over intestine  $22.5 \mu\text{m} \pm 5.5$  (16-31). Position of excretory pore varying from opposite posterior part of isthmus to opposite posterior part of oesophageal lobe,  $135 \mu\text{m} \pm 6$  (125-142) from anterior end of body. Hemizonid 1.5 to 2 annules long, situated opposite excretory pore or 2 annules posterior to it. Hemizonion not seen. Anterior and posterior cephalids seen in two specimens only, situated three and nine or ten annules from base of lip region. Body width at mid-body  $38 \mu\text{m} \pm 3.5$  (31.5-44.0) and at excretory pore  $34.5 \mu\text{m} \pm 2$  (31-38). Width of annules at mid-body  $2.5 \mu\text{m} \pm 0.5$  (2-3). Lateral field  $9 \mu\text{m} \pm 0.5$  (8.0-10.5) wide, areolated indistinctly opposite oesophageal area but not on the rest of the body or tail. No irregular longitudinal lines observed on cuticle outside lateral field. Ovaries not clearly seen due to granules in the body cavity; spermatheca seen in three specimens only, round, filled with roundish sperm. Epiptygma double. Intestinal overlap over rectum varies from no overlap to quite a long overlap. Caudalid not seen. Phasmids situated from 12 to 24 annules anterior to anus. Tail rounded, with 10 to 18 annules,  $23 \mu\text{m} \pm 4.5$  (19-33) long.

*Male*: Similar to female. Lip region  $12 \mu\text{m} \pm 0.5$  (11.5-12.5) wide and  $7.5 \mu\text{m} \pm 0.5$  (6.5-8.0) high. Stylet knobs  $5.5 \mu\text{m} \pm 0.5$  (5.0-6.5) wide and  $3 \mu\text{m} \pm 0.5$  (2.5-3.5) high. Metenchium varying from slightly shorter to longer than telenchium ( $m = 49-57\%$ ). Dorsal oesophageal gland opening  $3 \mu\text{m} \pm 1$  (2.0-4.5) from base of stylet knobs. Median bulb  $16 \mu\text{m} \pm 1.5$  (14.5-17.5) long and  $13.5 \mu\text{m} \pm 1.5$  (12-15) wide. Anterior part of oesophagus  $85 \mu\text{m} \pm 4$  (77-93) from anterior end of body to middle of median bulb and posterior part of



opposite or slightly posterior to the excretory pore. Hemizonion not seen. Width at mid-body  $33.5 \mu\text{m} \pm 1$  (31.5-35.5) and at excretory pore  $29 \mu\text{m} \pm 1.5$  (27-31). Width of annules at mid-body  $2 \mu\text{m} \pm 0.5$  (2-3). Lateral field  $8.5 \mu\text{m} \pm 0.5$  (7.5-9.0) wide, areolated opposite cesophageal area and slightly areolated at posterior ending on bursa. Cuticle outside lateral field with no longitudinal markings. Phasmids situated about one to two cloacal body widths anterior to cloaca. Tail  $31 \mu\text{m} \pm 2$  (28-34) long.

#### DISCUSSION

The specimens from North Natal come very close to *R. goodeyi* Loof & Oostenbrink, 1958, *R. laurentinus* Scognamiglio & Talame, 1972 and *R. usitatus* van den Berg & Heyns, 1974.

When comparing the specimens from North Natal with redescriptions of *R. goodeyi* by Coomans (1962) and Sher (1965) the following differences were noticed: larger body length of females and males (0.95-1.32 mm vs 0.69-1.06 mm in *R. goodeyi*), absence of irregular longitudinal lines on the cuticle outside the lateral field (longitudinal markings opposite the cesophageal region and opposite the anterior part of the intestine in *R. goodeyi*), phasmids in females situated more anteriorly (12-24 annules anterior to anus vs 1-11 annules in *R. goodeyi*), longer tail in females (19-33  $\mu\text{m}$  vs 11-22  $\mu\text{m}$  in *R. goodeyi*), longer spicule, gubernaculum and capitulum length (35.5-41.0  $\mu\text{m}$ , 17.5-19.0  $\mu\text{m}$  and 10.5-12  $\mu\text{m}$  vs 29-34  $\mu\text{m}$ , 12-16  $\mu\text{m}$  and 7-10  $\mu\text{m}$ , respectively). These differences, however, are not regarded as sufficient to erect a new species and the specimens from North Natal are therefore regarded as conspecific with *R. gracilidens*.

capitulum length (35.5-41.0  $\mu\text{m}$ , 17.5-19.0  $\mu\text{m}$  and 10.5-12  $\mu\text{m}$  in the North Natal specimens vs 29-34  $\mu\text{m}$ , 12-16  $\mu\text{m}$  and 7-10  $\mu\text{m}$ , respectively). These differences, however, are not regarded as sufficient to erect a new species and the specimens from North Natal are therefore regarded as conspecific with *R. gracilidens*.

#### *Brachydorus tenuis* de Guiran & Germani, 1968 (Fig. 3)

#### MEASUREMENTS

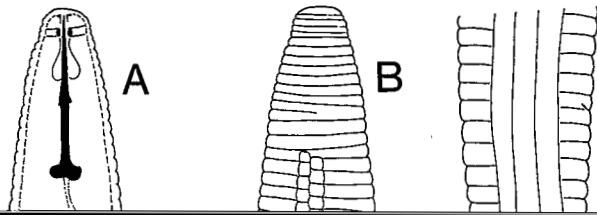
*Females* (n = 4) : L = 1.09 mm (1.04-1.12); a = 39.7 (38.5-41.4); b = 6.9 (6.3-7.3); c = 10.2 (10-10.3); V = 51.5 % (48.5-53.5); G<sub>1</sub> = 24.6 % (22-29.2); G<sub>2</sub> = 22.1 % (18-26.9); stylet = 22.5  $\mu\text{m}$  (22-24).

*Males* (n = 3) : L = 0.94 mm (0.88-0.98); a = 35.2 (33.8-36.4); b = 6 (5.7-6.3); c = 37.3 (31.5-40.8); T = 59.1 % (51.2-63.4); stylet = 21.5  $\mu\text{m}$  (21-22); spicules = 27.5  $\mu\text{m}$  (27-28); gubernaculum = 11.5  $\mu\text{m}$  (10.5-12).

#### DESCRIPTION

*Female* : Head slightly set off from body, 7.5-8  $\mu\text{m}$  in diameter, 4-4.5  $\mu\text{m}$  high, bearing four to five fine annules.

Cephalic framework strongly sclerotized. Amphidial



massive, slightly curved. Tail narrowing abruptly behind cloacal opening, terminus rounded. Bursa trilobed, bearing fine annulations, 1-1.5  $\mu\text{m}$  wide. Phasmids pore-like, situated about half the distance from anus to tail tip.

#### DISCUSSION

The present specimens agree in most details with the original description except that the head shows four to

soil about roots of arecanut palm in Kerala State, India. *J. Nematol.*, 13 : 401-404.

SAUER, M. R. (1958). *Hoplolaimus gracilidens*, *Radopholus inaequalis* and *Radopholus neosimilis*, three new Tylenchs native to Victoria, Australia. *Nematologica*, 3 : 97-107.

LOOF, P. A. A. (1964). Freelifving and plant-parasitic nema-