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PRATYLENCHOIDES LATICAUDA N.SP., A NEW ENDOPARASITIC PHYTONEMATODE[1]

Pratylenchoides laticauda *n.sp., een nieuw endoparasitair plantenaaltje*

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A description is given of *Pratylenchoides laticauda* n. sp., found in the Netherlands in roots, chiefly of some Labiatae. It differs from *P. crenicauda* in tail shape and larger body size; the lateral field is marked by six grooves, whereas *P. crenicauda* usually has four. *(P. gadeai* belongs to the genus *Tylenchorhynchus; P. guevarai* and *P. taomasinae* are considered to belong to a separate genus *Zygotylenchus)*. Host plant tests show the following plants to be good hosts: *Mentha piperita* and *Monarda mollis; Pisum sativum* and *Salvia splendens* are probably also hosts.

INTRODUCTION

In the course of routine examinations Mr. M. J. HIJINK of the Plantenziektenkundige Dienst, Wageningen, found in 1964 large numbers of a new *Pratylenchoides* species in roots of Labiatae (*Monarda mollis* L. and *Mentha piperita* L.) from two flower nurseries in the Netherlands. This species is described below and the results are given of some host plant tests.

DESCRIPTION

Pratylenchoides laticauda n.sp. (Fig. 1)

Dimensions (specimens fixed in F.A.A. and mounted in glycerin, via SEINHORST's method):

Females (n = 25): L = 0.86 mm (0.77–0.94); a = 27 (24–31); b = 5.0 (4.4–5.6); b′ (oesophagus measured to caudal end of dorsal gland) = 4.5 (4.1–4.9); c = 17 (14–21); V = 58 (51–61); G_1 = 28 (23–34); G_2 = 28 (23–36); spear = 22–23 μ.

Males (n = 25): L = 0.78 mm (0.70–0.85); a = 30 (27–35); b = 5.7 (5.0–6.7); b′ = 5.2 (4.6–6.0; n = 10); c = 15 (13–18); T = 38 (31–46); spear = 18–22 μ.

Female, holotype: L = 0.90 mm; a = 28; b = 5.6; b′ = 4.9; c = 17; V = $^{29}58^{29}$; spear = 23 μ.

Female. – Body outstretched when killed by gentle heat; cylindroid, tapering only slightly towards both extremities. Cuticle with transverse striae which are 1.6–1.8 μ wide on the middle of the body, 2.0–2.4 μ on the dorsal side of the tail. Lateral field with six grooves; the two central ones originate at level of deirids and end by fusion with the adjacent grooves at a point the location of which varies from just behind the anus to about 1.5 tail lengths anterior to it.

Lip region offset by slight depression, composed of 3–4 annules; roundish, with heavy internal sclerotization. Cross-section shows this sclerotization to be six-radiate, the median prongs being slightly broader than the sublateral ones, and apparently bifurcating distally. There are six lips, each bearing a minute papilla near its apex; there is also an outer circle of eight papillae, two on each

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submedian lip. The amphid apertures are small pores on the lateral lips. Spear robust with well-developed, angular basal knobs which are directed slightly posteriad, their total width being 5.0–5.5 μ. The orifice of the dorsal oesophagal gland lies about 4 μ behind the base of the spear. Median oesophagal bulb oblong (19 × 14 μ), with valves (4 μ long) slightly anterior to its centre. Isthmus twice as long as median bulb. The oesophagal glands surround the oesophago-intestinal junction on all sides; the dorsal gland reaches somewhat farther backward than the ventrosublateral ones. Between the glands there is a rounded projection of the intestine. The nerve ring surrounds the isthmus. The excretory pore is located opposite the posterior half of the isthmus, just over one bulb length behind the posterior margin of the median bulb; in short-necked specimens somewhat farther backward. Hemizonid 4 μ long, located three annules anterior to excretory pore. Deirids conspicuous, located at level of excretory pore.

Vulva a transverse slit. Vagina half body width deep. Gonads paired, opposed and outstretched; each with a quadrangular spermatheca, which is not wider than the other parts of the gonad, and filled with sperm. Oocytes in a single row except for a short zone near the blind ends of the gonads. Dimensions of six intra-uterine eggs: 68–80 × 20–26 μ; no uterus was found to contain more than one egg.

Tail about 2.5 anal body diameters long; cylindroid to slightly clavate, the tip broadly and lowly rounded, with coarse and irregular striae; on the tip the inner layer of the cuticle is strongly thickened. Phasmids distinct, located behind the middle of the tail.

Male. – Generally agreeing with female. Lip region narrower, higher and more conoid. Median oesophageal bulb conspicuously narrower than in the female (18 × 7–8 μ). One gonad, outstretched anteriorly. Tail conoid, ventrally contracted just before the tip; from there curved to ventral side, with rounded tip. The bursa envelops the tail completely. Phasmids behind middle of tail. Spicules curved, cephalated proximally, pointed distally; 24–28 μ long. Gubernaculum linear, slightly curved proximally, 7–8 μ long.

Holotype: Female on slide WT 611. Paratypes: 24 females, 4 females with *en face* view, 25 males and 3 males with *en face* view, on slides WT 611–642. All types in the Nematode Collection of the Plantenziektenkundige Dienst, Wageningen, The Netherlands.

Type habitat: Roots of *Monarda mollis* L. Type locality: Huis ter Heide, The Netherlands.

Found also in roots of *Mentha piperita* L. at Oude Mirdum; and in soil near roots of hawthorn, Wageningen; near roots of strawberry, Afferden; and near roots of privet and alder, Middenmeer.

SYSTEMATICS

At the moment there is some uncertainty about the boundaries of the genus *Pratylenchoides*. TARJAN & WEISCHER (1965) have synonymized the genus *Zygotylenchus* Siddiqi, 1963 (syn. *Mesotylus* de Guiran, 1964) with *Pratylenchoides*. We are of the opinion, however, that these two genera are distinct, *Zygotylenchus* being characterized by a ventral or ventrolateral overlap of the oesophagal glands and by the non-globular shape of the oesophago-intestinal valve; perhaps also by the smooth female tail tip. In *Pratylenchoides* the oeso-

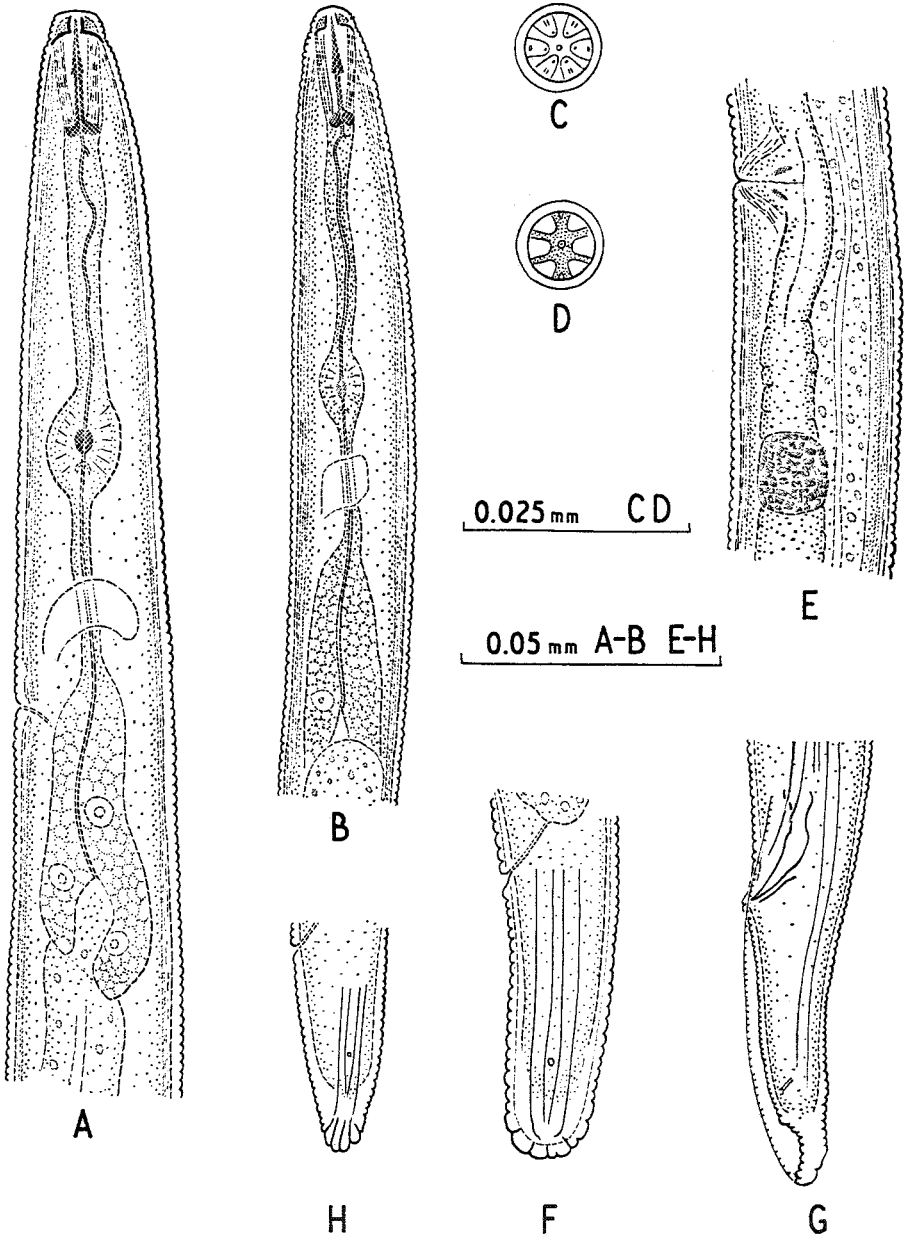

FIG. 1. A-G: *Pratylenchoides laticauda* n. sp. A: Female, oesophagal region; B: male, oesophagal region showing compression often found in mounted males; C: female, *en face* view; D: female, basal plate of labial framework; E: female, vulvar region; F: female, tail; G: male, tail. H: *P. crenicauda*, tail of a female collected by T. GOODEY from turf, Winches Farm, October 25, 1939.

phagal overlap is dorsal or dorsolateral, usually short, and the junction is somewhat club-shaped (distinct in all well-mounted specimens); eventually the coarsely annulated female tail tip might also prove diagnostic. Further differences are: in *Pratylenchoides* the median oesophagal bulb shows a distinct sexual dimorphism, not found in *Zygotylenchus*; the deirid is conspicuous in *Pratylenchoides*, whereas in *Zygotylenchus* it has not yet been detected. On account of the structure of the oesophagal glands and the junction, and of the female tail tip, the two species of *Zygotylenchus*, viz. *Z. guevarai* (Tobar, 1963) comb. nov. (syn. *Z. browni* Siddiqi, 1963 and *Mesotylus gallicus* de Guiran, 1964) and *Z. taomasinae* (de Guiran, 1964) comb. nov. are easily distinguished from *P. laticauda*.

From *P. crenicauda* Winslow, 1958, the type of the genus, our new species differs chiefly in the shape of the female tail, which is conoid with deeply lobed tip in *P. crenicauda*. Also *P. laticauda* appears to be larger than *P. crenicauda*: in 50 females of *laticauda* we found body length 0.80 mm (0.67–0.94), whereas in 50 females of *crenicauda* it was 0.61 mm (0.52–0.78). *P. laticauda* has six lateral lines; in *P. crenicauda* there are, according to literature, four. However, among the type specimens of *crenicauda* examined by us a few were found which on the middle of the body also had six over a short distance. Furthermore GOODEY (1940) remarked that the oesophagus of the male of *Anguillulina obtusa* (= *P. crenicauda*) was similar to that of the female, but we found that in this species, as in *P. laticauda*, the median bulb in the male is conspicuously narrower than in the female.

Recently ARIAS, JIMÉNEZ & LÓPEZ (1965) described a new species *P. gadeai*. Examination of two type specimens (one male, one female) has convinced us that this species belongs to *Tylenchorhynchus*; this was already indicated by the illustrations of the lip region, the glandular region of the oesophagus and the male tail. The specimens could not be identified with certainty with any known species; they come closest to *T. parvus* Allen, 1955, and *T. huesingi* Paetzold, 1958, but in the description more than one species may have been involved. The excretory pore lies behind the median bulb.

BIOLOGICAL OBSERVATIONS

P. laticauda was found first on two Labiatae, viz. *Monarda mollis* L. at Huis ter Heide, and *Mentha piperita* L. at Oude Mirdum. The species lives endoparasitically, producing root lesions similar to those evoked by *Pratylenchus* species. Nematodes and developing eggs were found in the cortical tissues of young lateral roots.

A host plant test was set up with 10 Labiatae and 10 species from other families; each plant species was tested thrice. The plants were put in pots containing 50 nematodes per 300 ml of soil, so that the total initial infestation of each plant species was 150. After three months we found 423 nematodes in *Mentha* and 275 in *Monarda*; in both cases the greater part of the nematodes were found in the roots. The number recovered from *Pisum sativum* L. was 109 and from *Salvia splendens* Ker. 60; again the majority came from the roots. So these two plants may also be hosts. From the other plant species 0–25 nematodes were recovered, of which only a few were in the roots, so that these plants are probably non-hosts or poor hosts. These sixteen species were: Labiatae: *Ajuga reptans* L., *Lamium maculatum* L., *Brunella grandiflora* (L.) Jacq., *Physostegia*

virginiana (L.) Benth. 'Summersnow', *Stachys olympicus* Poir., *Betonica macrantha* Koch and *Nepeta mussinii* Spreng.; Compositae: *Zinnia elegans* Jacq., *Tagetes patula* L., *Helenium* hybr., *Cichorium endivia* L.; Gramineae: *Avena sativa* L., *Lolium perenne* L.; Solanaceae: *Solanum tuberosum* L.; Chenopodiaceae: *Beta vulgaris* L. var. *alba.*; Papilionaceae: *Trifolium repens* L.

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SAMENVATTING

Een nieuw endoparasitair aaltje wordt beschreven, *Pratylenchoides laticauda* n.sp., dat in grote aantallen werd aangetroffen in wortels van *Monarda mollis* en *Mentha piperita.* De soort gelijkt in algemene organisatie op *P. crenicauda* Winslow, 1958; de staart van het wijfje is echter cylindrisch, niet kegelvormig (fig. 1 F, H), het zijveld telt 6 lengtestrepen en de gemiddelde lichaamslengte is groter. In beide soorten is de mediane oesofagusbulbus bij het mannetje duidelijk smaller dan bij het wijfje; de oesofagusklieren overlappen de middendarm over een korte afstand, aan de dorsale zijde verder dan aan de ventrale; het tussen de klieren gelegen vooreind van de middendarm is iets knotsvormig. Bij *P. guevarai* Tobar, 1963, en *P. tcomasinae* (de Guiran, 1964) ligt de overlapping der oesofagusklieren ventraal en is doorgaans groter, terwijl de mediane bulbus geen sexueel dimorfisme vertoont. Om deze en andere redenen worden laatstgenoemde twee soorten geacht tot het genus *Zygotylenchus* Siddiqi, 1963, te behoren. *P. gadeai* Arias, Jiménez & López, 1965, tenslotte behoort tot *Tylenchorhynchus*, zoals door typenonderzoek kon worden vastgesteld.

Proeven leerden, dat behalve de genoemde Labiaten waarschijnlijk ook *Pisum sativum* en *Salvia splendens* waardplanten van *P. laticauda* zijn.

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