

HELICOTYLENCHUS MACROSTYLUS N. SP. (HOPLOLAIMIDAE: NEMATODA) FROM FRENCH GUIANA WITH NOTES ON THREE KNOWN SPECIES

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ABSTRACT

Marais, M., and P. Quénéhervé. 1996. *Helicotylenchus macrostylus* n. sp. (Hoplolaimidae: Nematoda) from French Guiana with notes on three known species. *Nematropica* 26:39-45.

Helicotylenchus macrostylus n. sp. is characterized by body length (853-1 150 μm in females and 811-964 μm in males), stylet length (42-45 μm in females), tail length (13-24 μm in females and 20-27 μm in males), and posterior position of the excretory pore (179-211 μm from front in females). *Helicotylenchus dihystrera* (Cobb, 1893) Sher, 1961, *H. erythrinae* (Zimmermann, 1904) Golden, 1956, and *H. pseudorobustus* (Steiner, 1914) Golden, 1956 are new records for French Guiana. Morphometric data are given for these 3 species.

Key words: French Guiana, geographic distribution, *Helicotylenchus*, nematodes, taxonomy.

RESUMEN

Marais, M. y P. Quénéhervé. 1996. *Helicotylenchus macrostylus* n. sp. (Hoplolaimidae: Nematoda) de la Guinea Francesa con notas de tres especies ya conocidas. *Nematropica* 26:39-45.

Helicotylenchus macrostylus n. sp. se caracteriza por la longitud de su cuerpo (853-1 150 μm en las hembras y 811-964 μm en los machos), longitud del estilete (42-45 μm en hembras), longitud de la cola (13-24 μm en hembras y 20-27 μm en machos), y la posición posterior del poro excretor (179-211 μm desde el frente de las hembras). *H. dihystrera* (Cobb, 1893) Sher, 1961, *H. erythrinae* (Zimmerman, 1904) Golden, 1956, y *H. pseudorobustus* (Steiner, 1914) Golden, 1956 constituyen nuevos reportes para la Guinea Francesa. Se dan datos morfométricos de estas tres especies.

Palabras clave: distribución geográfica, Guinea Francesa, *Helicotylenchus*, nematodos, taxonomía.

INTRODUCTION

During collection trips by the second author to various areas in French Guiana, a variety of habitats and host plants were sampled, including primary tropical rain forest and dune vegetation. A number of *Helicotylenchus* species were identified, including specimens of an undescribed species. *Helicotylenchus dihystrera* (Cobb, 1893) Sher, 1961, *H. erythrinae* (Zimmermann, 1904) Golden, 1956, and *H. pseudorobustus* (Steiner, 1914) Golden, 1966 are new records for French Guiana, but all

were previously reported from other areas in South America (Cadet *et al.*, 1994; Fortuner *et al.*, 1984; Maas, 1970; Stanton *et al.*, 1989). Morphological data on these 3 species are provided from French Guiana, and *Helicotylenchus macrostylus* n. sp. is described in this report.

MATERIAL AND METHODS

Specimens were extracted from the soil using the elutriation technique (Seinhorst, 1962), killed in water by gradual application of heat, fixed and preserved in TAF,

and mounted in anhydrous glycerin on aluminum slides according to the slow method (Goodey, 1957).

SYSTEMATICS

Helicotylenchus macrostylus n. sp (Fig. 1 A-H)

Measurements

Holotype females: L = 1009 μm ; a = 28.9; b = 4.8; b' = 4.7; c = 51.0; c' = 0.9; o = 44; V = 64; OV1 = 19; OV2 = 15; stylet = 42 μm .

Paratype females (n = 11): L = 1021 \pm 43.0 (948-1129) μm ; a = 24.5 \pm 3.2 (20.4-28.9); b = 4.9 \pm 0.1 (4.8-5.0); b' = 4.7 \pm 0.2 (4.2-4.9); c = 57.6 \pm 10.5 (43.9-71.3) c' = 0.7 \pm 0.1 (0.6-0.9); o = 43 \pm 4.3 (35-48); V = 64 \pm 0.9 (63-65); OV1 = 26 \pm 8.0 (17-37); OV2 = 22 \pm 7.8 (15-34); stylet = 42 \pm 1.0 (42-45) μm .

Paratype males (n = 10): L = 865 \pm 43.0 (811-949) μm ; a = 32.4 \pm 3.3 (28.7-38.3); b = 5.2; b' = 4.9 \pm 0.2 (4.5-5.2); c = 40.9 \pm 2.5 (37.0-45.5); c' = 1.1 \pm 0.1 (1.0-1.3); o = 47 \pm 3.7 (42-51); stylet = 34 \pm 1.3 (32-36) μm ; spicule = 33 \pm 1.2 (31-33) μm ; gubernaculum = 11 \pm 0.5 (6-7) μm .

Other population females (n = 12): L = 1012 \pm 78.0 (853-1150); a = 24.1 \pm 1.8 (22.2-27.9); b = 4.5 \pm 0.3 (4.1-4.8); b' = 4.5 \pm 0.3 (4.0-5.0); c = 51.4 \pm 10.9 (39.6-78.0); c' = 0.8 \pm 0.1 (0.7-0.9); o = 40 \pm 3.4 (36-47); V = 64 \pm 1.1 (62-67); OV1 = 16 \pm 1.3 (15-17); OV2 = 16 \pm 1.3 (15-18); stylet = 43 \pm 1.3 (42-46) μm .

Other population males (n = 5): L = 887 \pm 57.3 (813-964) μm ; a = 29.6 \pm 2.4 (26.9-31.9); b = 5.4 \pm 0.2 (5.2-5.5); b' = 4.8 \pm 0.2 (4.5-5.0); c = 35.7 \pm 3.8 (32.2-41.9); c' = 1.3 \pm 0.1 (1.2-1.5); o = 43 \pm 4.3 (41-48); stylet = 34 \pm 1.6 (33-37) μm ; spicule = 32 \pm 0.5 (31-32) μm ; gubernaculum = 12 \pm 1.1 (11-13) μm .

DESCRIPTION

Females: Body posture ranging from an open circle in 38% to a spiral in 62% of the specimens. Lip region flattened anteriorly with 7 to 8 annules. Lip region 8.9 \pm 0.7 (8-10) μm wide and 4.6 \pm 0.5 (4-6) μm high. Labial disc not visible in lateral view, rounded in an *en face* view. Labial framework well developed, extending 4 to 6 annules posterior from basal plate. Cephalids not visible. Metenchium slightly longer than telenchium (m = 50-54%). Stylet knobs rounded posteriorly and anterior faces varying from flattened in 35% to slightly indented in 65% of specimens, 7.9 \pm 0.8 (7-10) μm wide and 3.9 \pm 0.6 (3-5) μm high. Median bulb oblong to rounded, 16 \pm 1.3 (13-18) μm long and 11 \pm 2.2 (7-18) μm wide. Length of oesophagus 222 \pm 15.8 (200-269) μm . Two specimens with a dorsal overlap of oesophageal lobes over intestine, and the rest with a ventral overlap. Excretory pore situated from opposite posterior part of isthmus to opposite posterior part of oesophageal lobes, 192 \pm 7.0 (179-211) μm from anterior end. Hemizonid 2 to 3 annules long, situated from 7 to 19 annules anterior to excretory pore. Hemizonion one annule long situated from 7 annules anterior to one annule posterior of excretory pore. Width of annules at midbody 2.0 \pm 0.4 (1.4-2.9) μm . Body width at midbody 42 \pm 4.4 (35-50) μm and at excretory pore 26 \pm 2.5 (21-32) μm . Spermatheca oblong to rounded, filled with small rounded sperm. Posterior gonoduct reflexed in 2 specimens. Lateral field 9.4 \pm 1.1 (8-12) μm wide, areolated opposite oesophageal region; ending of inner lines on tail in a m-shaped pattern in 66%, a u-shaped pattern in 17% and a μ -shaped pattern in 17% of the specimens. One specimen from *Eperua grandiflora* (Aubl.) Betham with incomplete areolations on

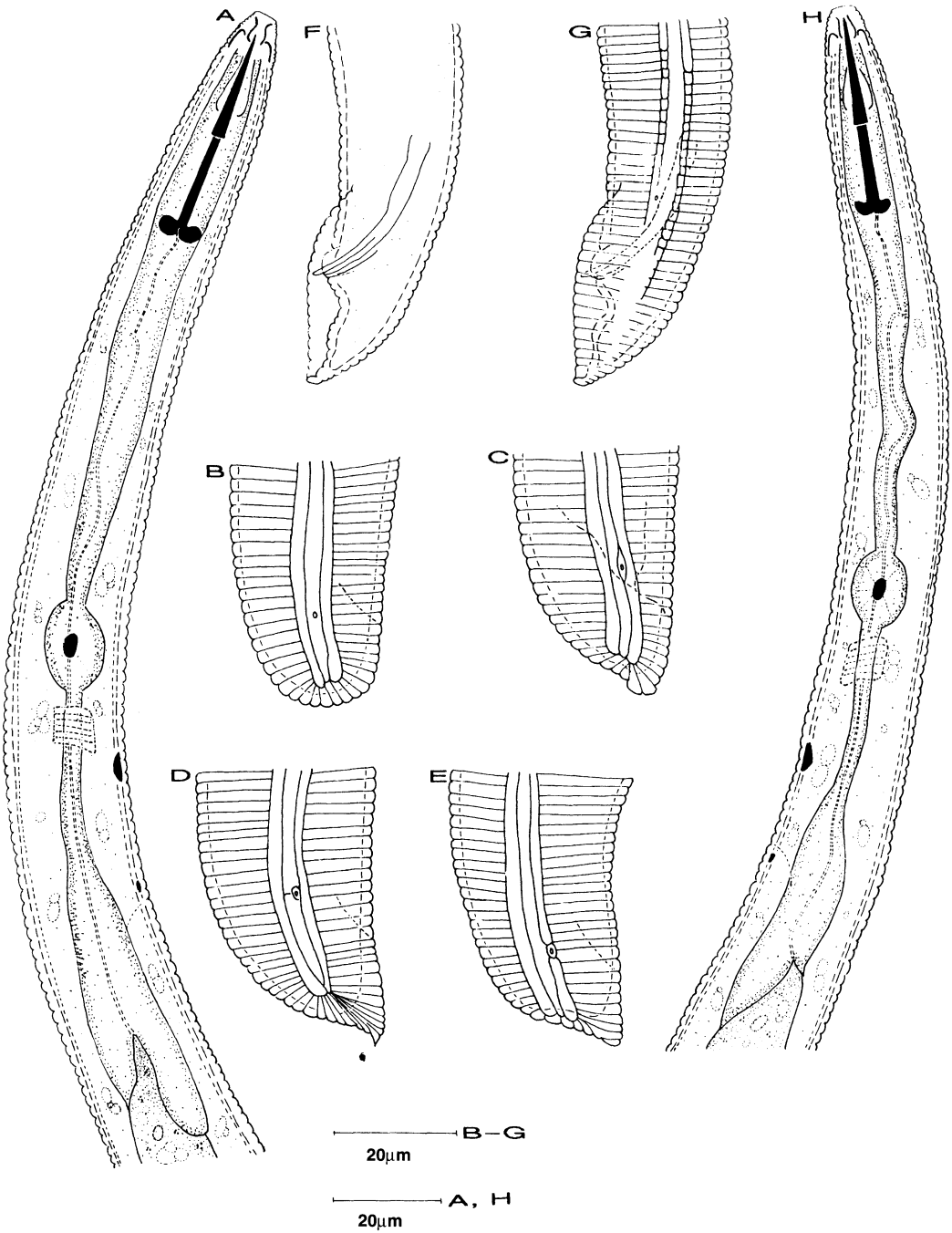


Fig. 1. *Helicotylenchus macrostylus* n. sp. A. Oesophageal region, holotype female. B-E. Female tails. F. Male tail, internal view. G. Male tail, external view. H. Oesophageal region, male.

tail. Epiptygma folded into the vagina in all specimens. No intestinal overlap over rectum. Phasmid situated from 5 annules posterior to 7 annules anterior to anus; position of phasmid in lateral field variable (Fig. 1 B-E). Tail with 7 to 11 annules, 19 ± 3.2 (13-24) μm long, shape varying from asymmetrical with rounded end to often having a small projection.

Males: General morphology as in female. Body posture ranging from 6-shaped in 20% to C-shaped in 80% of the specimens. Lip region flattened anteriorly with 6 to 7 annules, 7.7 ± 0.5 (7-9) μm wide and 4.5 ± 0.4 (4-5) μm high. Labial framework well developed, extending 3 to 4 annules posterior from basal plate. Metenchium slightly longer than telenchium ($m = 50-56\%$). Stylet knobs 5.5 ± 1.4 (3-9) μm wide and 2.8 ± 0.4 (2-3) μm high with anterior face of all specimens indented. Length of oesophagus 177 ± 7.0 (163-188) μm . Excretory pore situated from opposite anterior part to middle of oesophageal lobes, 150 ± 5.3 (140-161) μm from anterior end. Hemizonid 2 to 3 annules long, situated from 5 to 11 annules anterior to excretory pore. Hemizonion one annule long, situated from one annule anterior to 5 annules posterior of excretory pore. Width of annules at midbody 1.8 ± 0.2 (1.4-2.2) μm . Body width at midbody 28 ± 2.4 (23-33) μm and at excretory pore 21 ± 1.3 (18-23) μm . Lateral field 6.4 ± 0.8 (5-8) μm wide. Phasmid approximately one body width anterior to cloaca. Tail 23 ± 2.3 (20-27) μm long with a finger-like tip; mucro observed in one of the specimens.

Type material: Holotype female and one paratype female (slide 29209), 8 female and 9 male paratypes (slides 29210-29215) and 20 females and 10 males (slides 30913-30920) in National Collection of Nematodes, Plant Protection Research Institute, Pretoria; 2 female and 2 male paratypes in

Museum National d'Histoire Naturelle, Paris, France.

Type locality and habitat: The type material was collected from the rhizosphere of seedling *Dicorynia guianensis* Amshoff in a primary tropical rain forest near Paracou, 110 km west of Cayenne on the Atlantic coast ($5^{\circ} 20' \text{N}$, $52^{\circ} 50' \text{W}$) during March 1994 by P. Quénéhervé.

Other locality: The material was collected from the rhizosphere of seedling *Eperua grandiflora* (Aubl.) Betham in a primary tropical rain forest near Paracou, 110 km west of Cayenne on the Atlantic coast ($5^{\circ} 20' \text{N}$, $52^{\circ} 50' \text{W}$) during March 1995 by P. Quénéhervé.

DIFFERENTIAL DIAGNOSIS

Helicotylenchus macrostylus n. sp. is characterized by its distinct body length, stylet length, tail length, and posterior position of the excretory pore.

Helicotylenchus macrostylus n. sp. most closely resembles *H. coomansi* Sharafati-Ali & Loof, 1975 in having a very long stylet. According to Fortuner (1984), *H. coomansi* has the longest stylet of all previously described *Helicotylenchus* species. *Helicotylenchus macrostylus* n. sp. females differ from *H. coomansi* as follows: shorter body (853-1150 μm vs 1170-1300 μm), smaller a value (20.4-28.9 vs 35-40), smaller b value (4.0-5.0 vs 6.5-7.3), longer stylet (42-45 μm vs 39-42 μm), a more posterior position of excretory pore (179-211 μm vs 150-172 μm^*), vulva position (63-67% vs 58-60%) and phasmid position (5 annules posterior to 4 annules anterior to anus vs 5 to 8 annules anterior to anus), shorter tail (13-24 μm vs 26-29 μm^*) and having a rounded annulated tail tip often with a ventral projection vs hemispherical with a subventral unstriated area of more than 3 annules wide (Sharafati-Ali and Loof, 1975). The

*Calculated from paratypes.

Table 1. Morphometric data on *Helicotylenchus dihystera*, *H. erythrinae*, and *H. pseudorobustus* from French Guiana.

Characters	<i>H. dihystera</i> Females	<i>H. erythrinae</i>		<i>H. pseudorobustus</i> Females
		Females	Males	
n	24	22	4	23
L	630±60.5 (527-754)	569±70.8 (440-667)	579 (552-620)	607±54.7 (483-695)
a	24.1±3.5 (18.1-33.3)	25.7±3.1 (19.5-31.4)	30.1 (27.3-33.5)	26.8±3.7 (21.4-35.5)
b	4.9±0.6 (4.2-6.0)	4.8±0.4 (4.0-5.3)	5.3	4.7±0.3 (4.3-5.0)
b'	4.4±0.4 (3.9-5.0)	4.3±0.4 (3.5-4.9)	4.4 (4.2-4.7)	4.2±0.3 (3.4-4.7)
c	39.0±4.2 (33.2-46.9)	29.9±4.0 (23.3-38.3)	30 (27.6-31.9)	32.8±4.1 (25.0-41.5)
c'	1.0±0.1 (0.9-1.2)	1.5±0.2 (1.2-1.8)	1.8 (1.7-1.9)	1.3±0.1 (1.1-1.6)
Dorsal gland opening	12±1.6 (8-14)	11±1.9 (10-15)	12 (11.6-12.3)	12±1.7 (10-17)
o (%)	47±5.4 (37-56)	48±7.0 (36-63)	57 (53-60)	48±6.2 (38-64)
V (%)	64±1.6 (61-66)	63±1.6 (60-66)	—	65±1.9 (62-67)
OV1 (%)	25±1.7 (22-27)	23±1.1 (22-25)	—	22±2.6 (17-24)
OV2 (%)	22±2.7 (18-26)	22±2.8 (19-26)	—	20±2.8 (16-23)
Stylet length	26±1.1 (23-28)	23±1.5 (21-27)	21 (20-23)	26±1.3 (23-37)
m (%)	48±1.9 (42-50)	48±1.6 (46-53)	48	45±1.8 (40-47)
Excretory pore from front	109±9.2 (88-120)	97±11.5 (88-115)	98 (95-101)	106±8.5 (91-126)
Oesophagus length	178±11.8 (161-200)	159±14.2 (130-180)	132 (124-140)	160±16.9 (128-191)
Annule width	1.6±0.3 (0.7-2.2)	1.4±0.3 (1.1-1.8)	1.5 (1.4-1.8)	1.3±0.3 (0.7-2.0)
Tail length	16±1.3 (13-18)	19±3.1 (15-26)	19 (17-21)	19±2.4 (14-23)
Spicule length	—	—	19 (18-21)	—

All measurements in μm and are means \pm S.E., with ranges in parentheses.

Table 1. (Continued) Morphometric data on *Helicotylenchus dihystrera*, *H. erythrinae*, and *H. pseudorobustus* from French Guiana.

Characters	<i>H. dihystrera</i> Females	<i>H. erythrinae</i>		<i>H. pseudorobustus</i> Females
		Females	Males	
Position of phasmids	3 to 17 annules anterior to anus	4 annules posterior to 8 annules anterior to anus	—	One annule posterior to 12 annules anterior to anus
Lip annules	4-7	4-6	5-6	4-6
Tail annules	7-13	8-17	—	7-15

All measurements in μm and are means \pm S.E., with ranges in parentheses.

males differs from *H. coomansi* males as follows: shorter body (811-964 μm vs 1190-1260 μm), smaller b value (5.2-5.5 vs 7-8), larger c value (37.0-45.5 vs 33-35), smaller c' value (1.0-1.5 vs 2.0), shorter spicules (31-33 μm vs 34-36 μm) and shorter tail (20-27 μm vs 41 μm^*).

Helicotylenchus dihystrera (Cobb, 1893) Sher, 1961

Populations from grasses, *Spilanthus oleracea* L. and black pepper (*Piper nigrum* L.) were identified as *H. dihystrera*. The measurements of these specimens are similar to those of the topotypes given by Sher (1966) and also fit the morphological and morphometric characteristics of the species as described by Fortuner *et al.* (1981). Measurements are presented in Table 1.

Helicotylenchus erythrinae (Zimmermann, 1904) Golden, 1956

Three populations collected from the rhizosphere of *Coccoloba* sp. and *Spilanthus oleracea* L. are regarded as belonging to *H. erythrinae*, because their characteristics correspond to those attributed to the species by Sher (1966), Zavaleta-Mejía and Sosa Moss (1979) and Van den Berg and Spaull (1985). The females of the present populations differ from the topotypes in having a larger o value, 23-63 vs 33-44 (Sher, 1966) but agree with specimens

from Mexico in o value (41.6-63) (Zavaleta-Mejía and Sosa-Moss, 1979). Measurements are given in Table 1.

Helicotylenchus pseudorobustus (Steiner, 1914) Golden, 1956

Two populations collected from perennial grasses were identified as *H. pseudorobustus*. The Guianese specimens fit the description of *H. pseudorobustus* by Sher (1966) but differ in the shorter body (483-694 μm vs 600-820 μm), smaller a value (38-64 vs 32-46) and slightly smaller stylet (23-27 μm vs 26-30 μm). This variation in stylet length range was also reported by Fortuner *et al.* (1984). The position of the phasmid differs also from that reported by Sher (1966), i.e. one annule posterior to 12 annules anterior to anus vs 2 to 7 annules anterior to anus. This wide range was also observed in populations from South Africa (Marais and Buckley, 1992). Measurements of the Guianese specimens are provided in Table 1.

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