

Descriptions of Three New Species of *Chronogaster* Cobb, 1913 (Nematoda: Leptolaimidae)

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Abstract. Three new species of *Chronogaster* Cobb are described; two from Mexico and one from Poland. *C. jankiewiczzi* sp. n. is distinguished by its short cephalic sensilla (1.6–3.2 μm), tail tip with a terminal, hook-like and ventrally curved mucro, two subdorsal spines almost the half length of mucro, absence of lateral longitudinal lines, and lack of vacuolated lateral glandular bodies. *C. mexicana* sp. n. is distinguished by sharply pointed tip of tail without mucro or spines, absence of lateral lines, and the presence of vacuolated lateral glandular bodies. *C. polonica* sp. n. is distinguished by its tail terminus with ventral claw-like mucro and distinctly swollen 4–6 terminal tail annules, absence of lateral lines, and presence of vacuolated lateral glandular bodies.

Key words: taxonomy, new species, Nematoda, Leptolaimidae, *Chronogaster*.

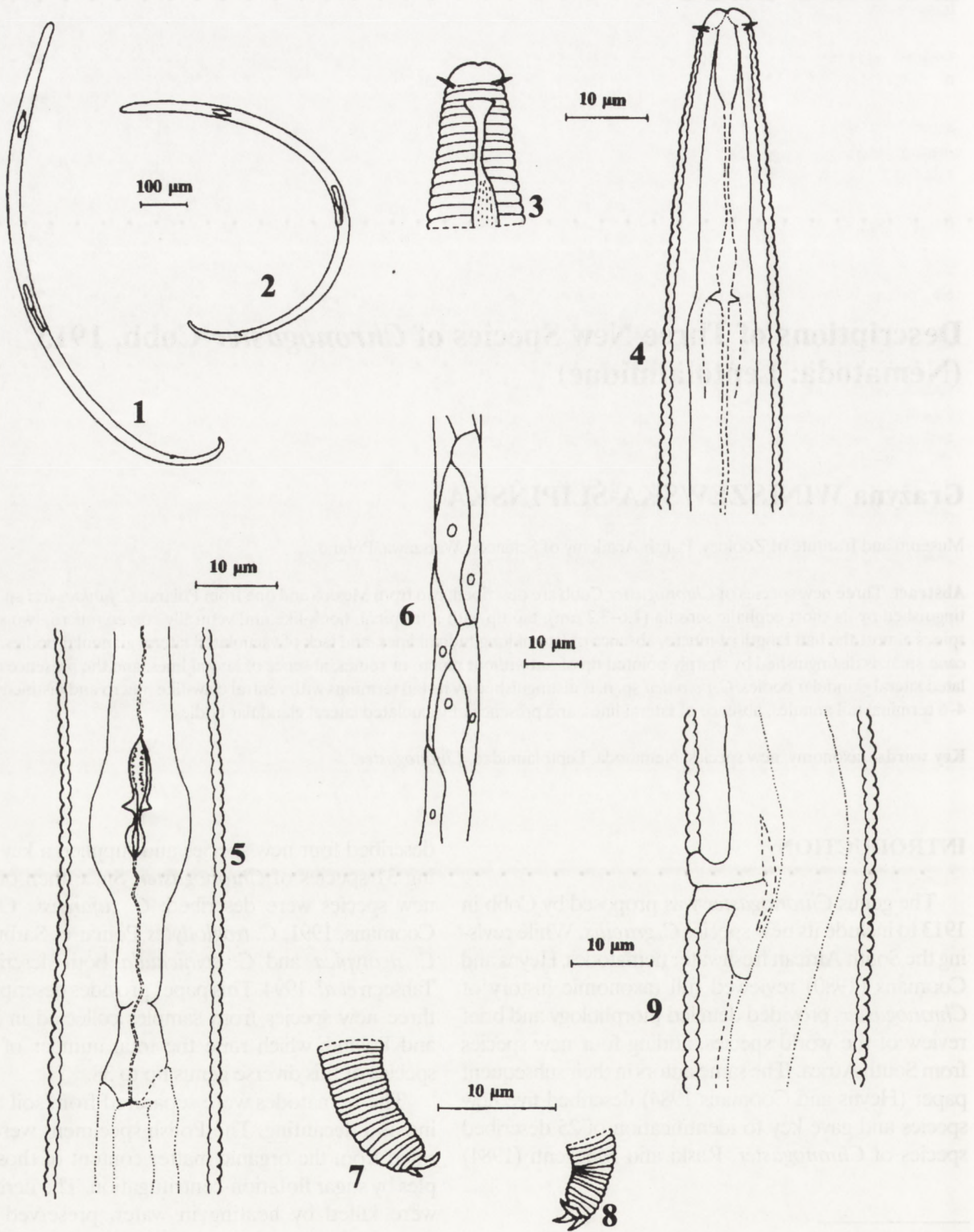
INTRODUCTION

The genus *Chronogaster* was proposed by Cobb in 1913 to include its new species *C. gracilis*. While revising the South African freshwater nematodes, Heyns and Coomans (1980) reviewed full taxonomic history of *Chronogaster*, provided detailed morphology and brief review of the world species, adding four new species from South Africa. The same authors in their subsequent paper (Heyns and Coomans 1984) described five new species and gave key to identification of 25 described species of *Chronogaster*. Raski and Maggenti (1984)

described four new species and supplied a key including 31 species of *Chronogaster*. Since then only four new species were described: *C. zujarensis* Oca a et Coomans, 1991, *C. troglodytes* Poinar et Sarbu, 1994, *C. neotypica* and *C. spinicauda* both described by Tahseen *et al.* 1994. This paper provides descriptions of three new species from samples collected in Mexico and Poland, which raise the total number of known species of this diverse genus up to 38.

The nematodes were separated from soil by sieving and decanting. The Polish specimens were separated from the organic matter content of those samples by sugar flotation-centrifugation. The nematodes were killed by heating in water, preserved in 4% formaldehyde and stored for varying periods of time. They were processed to glycerine by the methanol modification of the Seinhorst method.

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Figs 1–9. *Chronogaster jankiewiczzi* sp. n., 1–2: entire female, 3: surface view of head showing amphid, 4: anterior end, 5: base of pharynx, 6: lateral chord, 7–8: tail terminus, 9: vulval region.

DESCRIPTIONS

Chronogaster jankiewiczzi sp. n.

Figs 1–9

Measurements:

HOLOTYPE (female): L = 1.13 mm; a = 47; b = 4.7; c = 9.9; c' = 7.5; V = 55; V' = 61; pharynx = 242 μm ; tail = 114 μm ;

PARATYPE females (n = 9): L = 1.08 ± 0.05 (1.03–1.20) mm; a = 46 ± 2.4 (42–50); b = 4.6 ± 0.1 (4.5–4.8); c = 9.9 ± 0.4 (9.2–10.6); c' = 7.4 ± 0.5 (6.8–8.2); V = 55 ± 0.5 (54–56); V' = 62 ± 0.6 (61–63); pharynx = 234 ± 9.7 (220–249) μm ; tail = 110 ± 6.1 (102–124) μm ;

Female. Body of relaxed nematode J to C shaped, more strongly curved ventrad posteriorly. Cuticle 1.6–2.4 μm thick. Striae deep, width of annules 1.7 (1.5–2.0) μm at middle of body. Lateral chord of adults and juveniles with three rows of elongated cells. Lateral fields apparently not marked externally, no vacuolated lateral glandular bodies. Crystalloids small and sparse. Cephalic sensilla slender and almost perpendicular to body axis, 2.7 (1.6–3.2) μm long, 0.4 (0.2–0.6) of corresponding body width. Amphidial apertures slit-like, 4.2 (4.0–4.8) μm wide, near half of corresponding body width, located on the second annule behind the lip region or 1.6 (4.0–4.8) μm from anterior end. Lip region rounded, unstriated, 7.1 (6.4–7.2) μm wide, and 1.8 (1.6–2.4) μm high. Stoma cylindroid, 2.4–3.2 μm wide and 8–12 μm long (in one female 16.8 μm). Distance from base of stoma to radial tubules 19.9 (17.6–24.0) μm (in one female 12.8 μm). Nerve ring 112 (107–120) μm from anterior end, encircling pharynx at 48 (46–49) % of the neck length from anterior extremity. Excretory pore 127 (120–137) μm from anterior end, it is 54 (53–56) % of pharynx length. Subterminal bulb 19 (18–21) \times 12 (10–14) μm . Denticulate chamber with distinctly thickened walls located in the anterior half of bulb; denticles in longitudinal rows of 7–9 each. Post-bulbar extension 10.4 (8–12) μm long; cardia 14.5 (9.6–16.8) μm long. Rectum wide, ventrally curved 21 (18.4–22.4) μm or 1.4 (1.3–1.6) the anal body diameter long. Tail elongate-conoid, bent ventrad with rounded terminus. Tail tip provided with terminal, hook-like and ventrally curved mucro (1.6–3.2 μm long), at the base of which they are two subdorsal spines almost the half length of mucro.

Vagina with thickened walls, 7.7 (6.4–8.8) μm or 0.3 body width long. Gonad lying to the right of the intestine. Posterior uterine branch 8.5 (5.6–11.2) μm long or 0.4 (0.3–0.5) vulval body diameter in length.

Male. Not found.

Type locality and habitat

Mexico, state Guerrero, Jose Azuela, the water-side, collected by L. S. Jankiewicz, 22 February 1984.

Type specimens

Holotype female and paratypes (11 females and 21 juveniles) on permanent mounts in glycerine deposited at the nematode collection of the Muzeum i Instytut Zoologii PAN.

Diagnosis

C. jankiewiczzi sp. n. is distinguished by its short cephalic sensilla (1.6–3.2 μm), tail tip with terminal, hook-like and ventrally curved mucro and two subdorsal spines almost the half length of mucro, presence of slit-like amphid aperture and absence of lateral longitudinal lines, lack of vacuolated lateral glandular bodies.

This species is most similar to *C. andrassyi* Loof et Jairajpuri, 1965, *C. citri* Khan et Nanjappa, 1972, *C. serrulata* Loof, 1973, *C. indica* Bajaj et Bhatti, 1979, *C. multispinata* Heyns et Coomans, 1980, *C. africana* Heyns et Coomans, 1980, *C. multispinataoides* Heyns et Coomans, 1984 and *C. zujarensis* Ocaña et Coomans, 1991 in having tail tip with mucro and spines, presence of slit-like amphid aperture and absence of lateral longitudinal lines and vacuolated lateral glandular bodies.

C. jankiewiczzi differs from all of these species in having distinctly shorter cephalic sensilla, the shape of mucro and number or situation of spines.

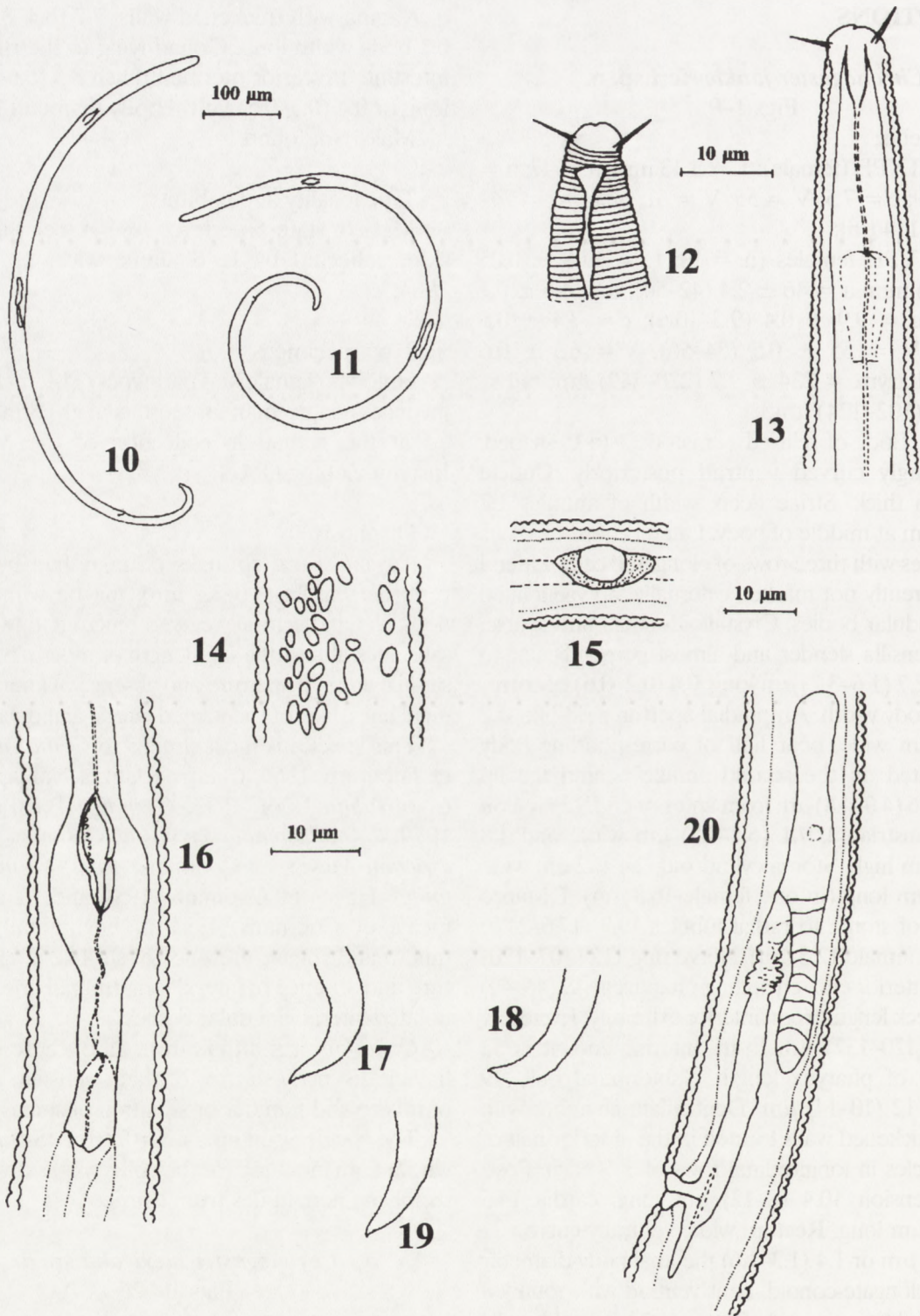
The species is named after Prof. L. S. Jankiewicz, whom I am indebted for the collecting, extracting and supplying nematodes from Mexico.

Chronogaster mexicana sp. n.

Figs 10–20

Measurements:

HOLOTYPE (female): L = 1.12 mm; a = 61; b = 5.2; c = 8.7; c' = 10.7; V = 49; V' = 56; pharynx = 214 μm ; tail = 129 μm ;



Figs 10–20. *Chronogaster mexicana* sp. n., 10–11: entire female, 12: surface view of head showing amphid, 13: anterior end, 14: crystalloid bodies, 15: vacuolar glandular body, 16: base of pharynx, 17–19: tail terminus, 20: female reproductive system.

PARATYPE females (n = 5): L = 1.02 ± 0.1 (0.96–1.12) mm; a = 58 ± 3.4 (52–61); b = 4.9 ± 0.3 (4.7–5.2); c = 8.5 ± 0.8 (7.0–9.6); c' = 10.5 ± 1.0 (9.1–11.7); V = 50 ± 2.4 (46–53); V' = 57 ± 2.5 (54–60); pharynx = 210 ± 12.0 (190–224) μm; tail = 122 ± 8.8 (111–136) μm;

Other population from Mexico

Female (n = 5) (Playa Azul): L = 0.97 ± 0.03 (0.92–0.99) mm; a = 61 ± 3.3 (56–65); b = 4.9 ± 0.1 (4.7–5.0); c = 6.5 ± 0.3 (6.2–6.9); c' = 12.9 ± 1.0 (11.3–13.6); V = 49 ± 2.0 (47–52); V' = 57 ± 2.0 (56–61); pharynx = 199 ± 9.6 (189–211) μm; tail = 148 ± 3.7 (144–153) μm;

Female. Body of relaxed nematode in form of an open C, more strongly curved ventrad posteriorly. Cuticle 0.8–1.2 μm thick. Striae deep, width of annules 1.9 (1.8–2.1) μm at middle of body. Lateral fields apparently not marked externally. Crystalloids numerous, measuring 1.6–6.4 × 0.8–2.4 μm. Vacuolated lateral glandular bodies present on the left and right side of body between end of pharynx and anus, they are 11.2–19.2 μm long and 4.8–7.2 μm wide. In nine females the number of the glands varied from six to twelve. Vacuolated glandular bodies in the juveniles similar to these of adults. In twelve juveniles the number of these glands varied from four to seven. Cephalic sensilla straight, slender and directed slightly forward, 6.5 (4.8–8.0) μm long, 1.0 (0.8–1.3) of corresponding body width. Amphidial apertures slit-like, 3.2 (2.4–4.0) μm wide, near half of corresponding body width, located on the second or third annule behind the lip region or 4.2 (4.0–4.8) μm from anterior end. Lip region rounded, unstriated, 6.1 (5.6–6.4) μm wide and 1.6 μm high. Stoma funnel-shaped, 2.2 (1.6–2.4) μm wide and 6.6 (5.6–8.0) μm long. Distance from base of stoma to radial tubules 16.5 (15.4–17.8) μm. Nerve ring 103 (96–108) μm from anterior end, encircling pharynx at 49 (48–51) % of the neck length from anterior extremity. Excretory pore, seen in 5 females, 119 (115–122) μm from anterior end, it is 56 (54–57) % of pharynx length. Subterminal bulb ovate, 19.9 (18–24) × 11.6 (11–13) μm. Denticulate chamber with distinctly thickened walls located in the anterior half of bulb, denticles arranged in longitudinal rows of 7–11 each. Post-bulbar extension 9.0 (6.4–12.8) μm long; cardia 10.8 (8.0–13.6) μm long. Rectum 18.5 (16.8–21.6) μm

or 1.6 (1.4–2.1) the anal body diameter long. Tail elongate-conoid tapers gradually, its posterior $\frac{2}{3}$ bent ventrad. Tail tip sharply pointed without mucro or spines.

Vagina with thickened walls, 6.3 (4.8–7.2) μm or 0.3 body width long, perpendicular to the body axis. Gonad lying to the right of the intestine. Posterior uterine branch 8.5 (5.6–12.0) μm long or 0.5 (0.3–0.8) vulval body diameter in length.

Male. Not found.

Type locality and habitat

Mexico, state Guerrero, Jose Azuela, the water-side, collected by L. S. Jankiewicz, 22 February 1984.

Other locality

Mexico, state Michoacán, Playa Azul, swamp near seaside, collected by L. S. Jankiewicz in 1984.

Type specimens

Holotype female and paratypes (6 females and 13 juveniles) on permanent mounts in glycerine deposited at the nematode collection of the Muzeum i Instytut Zoologii PAN.

Diagnosis

C. mexicana sp. n. is distinguished by sharply pointed tip of tail without mucro and spines, presence of slit-like amphid aperture, vacuolated lateral glandular bodies and crystalloids, absence of lateral longitudinal lines.

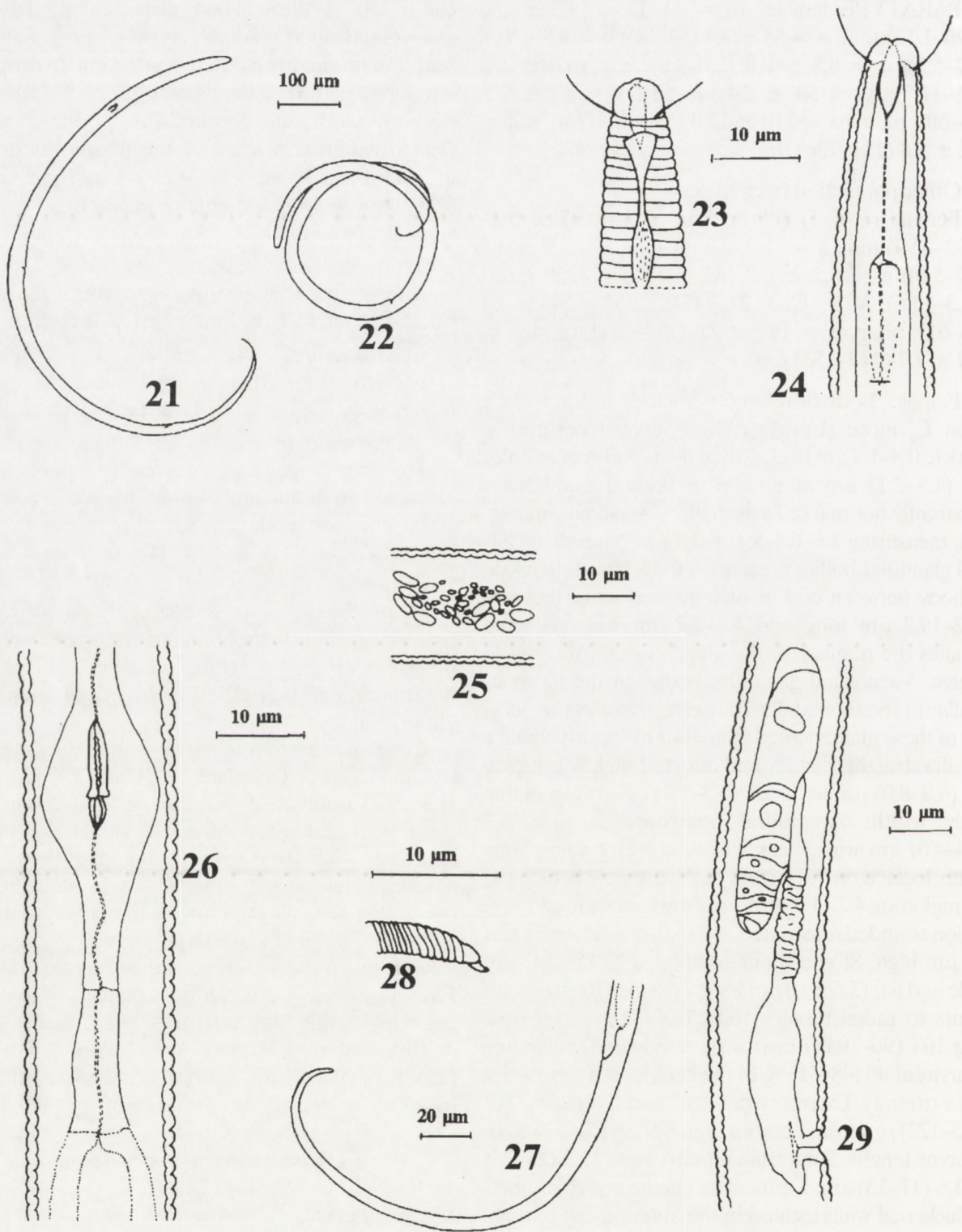
C. mexicana sp. n. is most similar to *C. rotundicauda* Heyns et Coomans, 1984 and *C. glandifera* Heyns et Coomans, 1980 in having tail terminus without mucro and spines, presence of slit-like amphid aperture, vacuolated lateral glandular bodies and absence of lateral longitudinal lines. It differs from *C. rotundicauda* in the structure of the tail terminus; the tail tip of *C. mexicana* is sharply pointed whereas in *C. rotundicauda* the tail terminus is bluntly rounded. From *C. glandifera* it can be separated by a shorter cephalic sensilla (4.8–8.0 μm vs 9.0–12.5 μm), shorter distance from base of stoma to radial tubules (15–18 vs 20–24 μm), shorter post-bulbar extension (6–13 vs 16–19 μm) and presence of crystalloids.

Chronogaster polonica sp. n.

Figs 21–29

Measurements:

HOLOTYPE (female): L = 1.18 mm; a = 67; b = 4.5; c = 5.2; c' = 20; V = 47; V' = 58; pharynx = 262 μm; tail = 228 μm;



Figs 21–29. *Chronogaster polonica* sp. n., 21–22: entire female, 23: surface view of head showing amphid, 24: anterior end, 25: crystalloid bodies, 26: base of pharynx, 27: tail, 28: tail terminus, 29: female reproductive system.

PARATYPE females (n = 27): L = 1.17 ± 0.05 (1.05–1.25) mm; a = 66 ± 3.4 (58–75); b = 4.5 ± 0.1 (4.2–4.8); c = 5.0 ± 0.2 (4.7–5.3); c' = 21.5 ± 1.4 (17.7–24.2); V = 46 ± 0.9 (43–47); V' = 57 ± 0.9 (55–58); pharynx = 258 ± 9.1 (235–272) μm ; tail = 234 ± 9.9 (208–252) μm ;

Other populations from Poland

Female (n = 5) (Góry Świętokrzyskie): L = 1.11 ± 0.1 (1.00–1.16) mm; a = 60 ± 4.2 (55–66); b = 4.7 ± 0.2 (4.4–4.9); c = 4.9 ± 0.1 (4.8–5.0); c' = 20.0 ± 1.2 (18.1–21.4); V = 46 ± 0.8 (45–47); V' = 58 ± 0.1 (56–59); pharynx = 240 ± 10.2 (228–256) μm ; tail = 227 ± 15.4 (202–240) μm ;

Female (n = 1) (Łomna Las): L = 1.29 mm; a = 64; b = 5.0; c = 4.9; c' = 21.8; V = 44; V' = 55; pharynx = 258 μm ; tail = 262 μm ;

Female. Body of relaxed nematode in form of an open C, more strongly curved ventrad posteriorly, sometimes assuming a spiral shape. Cuticle 1.2–1.6 μm thick. Striae deep, width of annules 2.1 (1.6–2.5) μm at middle of body. Lateral fields apparently not marked externally. Crystalloids numerous, measuring 2.0–4.8 \times 1.0–2.4 μm . Laterally in the body they are vacuolated lateral glandular bodies; their shape, size, number and location are similar to that of *C. mexicana*. Cephalic sensilla slender, curved slightly forward, 8.9 (8.0–10.4) μm long, 1.6 (1.4–2.0) of corresponding body width. Amphidial apertures slit-like, 3.9 (3.2–4.8) μm wide, near of corresponding body width, located on the second annule behind the lip region or 5.2 (4.8–5.6) μm from anterior end. Lip region rounded, unstriated 5.6 (4.8–6.4) μm wide and 1.8 (1.6–2.4) μm high. Stoma cylindroid, 1.6 μm wide and 7.8 (5.6–8.8) μm long. Distance from base of stoma to radial tubules 17.0 (14.0–19.8) μm . Nerve ring 112 (100–120) μm from anterior end, encircling pharynx at 44 (41–47) % of the neck length from anterior extremity. Excretory pore, seen only in 8 females, 124 (115–131) μm from anterior end, it is 48 (47–50) % of pharynx length. Subterminal bulb 20.6 (18–24) \times 12.4 (11–14) μm . Denticulate chamber with slightly thickened walls, located in the anterior half of bulb; denticles arranged in longitudinal rows of 7–9 each. Post-bulbar extension 18.8 (9.6–24.0) μm long; cardia 11.2 (8.0–17.6) μm long. Rectum straight and slender,

18.6 (12.0–21.6) μm or 1.7 (1.4–2.0) the anal body diameter long. Tail long, narrowing gradually, bent ventrad with a rounded terminus. Tail tip with a single, ventral mucro (0.8–1.6 μm long) which is bent dorsad, assuming claw-like shape. 4–6 terminal tail annules distinctly swollen.

Vagina with thickened walls, perpendicular to body axis, 4.5 (3.2–7.2) μm long. Gonad lying to the right of the intestine, in one female situated on the left side. Posterior uterine branch 8.2 (5.6–12.0) μm long or 0.5 (0.3–0.7) vulval body diameter in length. Intrauterine egg measuring 54 \times 17 μm .

Male. Not found.

Type locality and habitat

Poland, Konarzyny, peat soil, collected by A. T. Skwierz, 15 May 1980.

Other localities

Poland, Łomna Las, soil around roots of *Betula*, May 1980; Poland, Góry Świętokrzyskie, soil, *Caricetum rostrate*, October 1982.

Type specimens

Holotype female and paratypes (16 females and 2 juveniles) on permanent mounts in glycerine deposited at the nematode collection of the Muzeum i Instytut Zoologii PAN; two females at United States Department of Agriculture Nematode Collection, Beltsville, U.S.A.; one female at each of the following collections: Biosystematics Research Institute, Ottawa, Canada; Randse Afrikaanse Universiteit, Johannesburg, South Africa; Eötvös Loránd University, Budapest, Hungary; Nematology Department of Agricultural University, Wageningen, The Netherlands; Instituut voor Dierkunde, Universiteit Gent, Belgium; Biological Research Center, Cluj-Napoca, Romania.

Diagnosis

C. polonica sp. n. is distinct by its tail tip provided with ventral, claw-like mucro and distinctly swollen 4–6 terminal tail annules, presence of slit-like amphid aperture, vacuolated lateral glandular bodies and crystalloids, absence of lateral longitudinal lines.

C. polonica sp. n. is very similar to *C. spicata* Heyns et Coomans, 1984 and *C. cameroonensis* Heyns et Coomans, 1984 in having tail tip provided with mucro, presence of slit-like amphid aperture,

vacuolated lateral glandular bodies and crystalloids, absence of lateral longitudinal lines. *C. polonica* differs from these species in having distinctly swollen 4–6 terminal tail annules and shape of mucro (ventral claw-like mucro compared with almost straight dorsal mucro).

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