

Descriptions of Four New Species of Criconematoidea (Tylenchina: Nemata) from Southern Chile

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Abstract: Four new species of Criconematoidea are described from Hoste Island, Chile. *Criconema certesi* n. sp. is distinguished by the fine, spine-like, cuticular extensions on body annuli; projection of annuli into rows of scales on posterior part of body; single, smooth, labial annulus set off by short collar from second (first body) annulus which is about same diameter as first (labial) annulus. Male with prominent caudal alae, slender curved spicules, and four incisures in lateral field. *Ogma terrestris* n. sp. is distinguished by small scales with rounded tips bearing minute, short bristles; scales number 21 at mid-body; and first (labial) annulus rounded, not retrorse, not set off from succeeding annuli, narrower in diameter from second (first body) annulus. *Hemicycliophora macrodorata* n. sp. is distinguished by its large size (L = 1.52 [1.28-1.72] mm); large stylet (146 [127-161] μ m); annuli = 297 (280-315); tail slightly spicate, lateral field with or without interruptions of incisures, occasional anastomoses; and males with U-shaped spicules. *Paratylenchus fueguensis* n. sp. is distinguished by its prominent stylet with large, rounded knobs (4-5 μ m across); cephalic region rounded not at all set off; lateral field with four incisures; lateral vulvar membranes present; and male tail short, strongly curved (almost 180°) ventrad.

Key words: *Criconema certesi* n. sp., *Hemicycliophora macrodorata* n. sp., *Ogma terrestris* n. sp., *Paratylenchus fueguensis* n. sp., taxonomy.

An expedition to southern Chile made by the senior author in January 1983 was primarily a search for *Criconema giardi*. It was successful to that end (15), but a rich variety of other nematodes was also found in the soils of Orange Bay on Hoste Island. Among them were four species of Criconematoidea, one each of four different genera, which are judged to be new species and are described below.

One of the species has special significance because it was abundant and present in many of the samples. It belongs to the same genus as *C. giardi*. The problem was to distinguish both with certainty to avoid every possible doubt as to the identity of *C. giardi*. The abundant specimens of both species made possible double checking of females, males, and juveniles segregated to each species. Molted cuticles, head structures, cuticular ornamentations, stylet proportions, tail characteristics, male lateral field, spicules, and tail shape all contributed to a clear, unambiguous picture of two distinct species. *Criconema giardi* was re-described in detail by Raski et al. (15).

MATERIALS AND METHODS

Specimens were killed in hot water, preserved in 4% formalin, and later transferred to FAA. Dehydration to glycerin followed Cobb's method of 2.5% glycerin in 30% alcohol and then 5% glycerin in 30% alcohol, storage in BPI dishes, and evaporation gradually to glycerin. Final dehydration was in desiccation chambers over CaCl₂. Specimens were then mounted in dehydrated glycerin. En face views and transverse sections were cut by hand and mounted in glycerin-jelly.

SEM studies were made from both formalin-fixed and glycerin-processed specimens. Formalin-fixed specimens were transferred to FAA and then to absolute ethyl alcohol by vapor exchange in a 32 C oven. Specimens then were transferred to a graded series of amyl acetate in absolute alcohol from 30% to absolute amyl acetate. After a 15-second sonication in pure amyl acetate they were processed through critical point drying with CO₂. Specimens were then mounted on aluminum foil stubs and coated with 300 Å of gold sputtered on in several layers. Glycerin processed specimens were first dehydrated in a graded series beginning with 85% glycerin in 30% alcohol to FAA then reprocessed as for above specimens. ISI (International Scientific Instruments) Model 3S-130 DS

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scanning electron microscope (SEM) at 10 kV was used for detailed study of the specimens.

Criconema certesi n. sp.
(Figs. 1–3)

Dimensions

Holotype (female): L = 0.64 mm; a = 12; b = 4.4; c = 22; V = 53.289^- ; stylet = 101 μ m; cone = 84 μ m; excretory pore = 160 μ m; R = 81; R_{exp} = 22; R_v = 11; R_a = 5.

Paratype (female, n = 14): L = 0.66 ± 0.017 (0.56–0.77) mm; a = 13 ± 1.37 (11–15); b (n = 13) = 4.2 ± 0.47 (3.5–5.1); c (n = 12) = 20 ± 2.15 (17–24); V = 90 ± 1.13 (87–92); stylet = 102 ± 4.81 (95–110) μ m; cone = 84 ± 3.92 (77–90) μ m; excretory pore (n = 11) = 181 ± 16.07 (160–207) μ m; R = 82 ± 3.88 (75–88); R_{exp} = 24 ± 2.31 (22–29); R_v = 9.6 ± 0.65 (9–11); R_a = 4.9 ± 0.52 (4–6).

Paratype (male, n = 12): L = 0.55 ± 0.051 (0.46–0.93) mm; a (n = 11) = 20 ± 1.64 (18–24); c = 9.3 ± 0.76 (8–11); excretory pore (n = 6) = 118 ± 10.94 (107–138) μ m; T = 31 ± 5.39 (19–38); spicules (n = 11) = 43 ± 3.69 (36–48) μ m; gubernaculum (n = 11) = 8.5 ± 1.52 (6–11) μ m; caudal alae (n = 10) = 71.8 ± 8.25 (58–83) μ m; tail = 59 ± 7.12 (49–71) μ m.

Paratype (juvenile, n = 2 fourth stage ?): L = 0.50, 0.55 mm; a = 9, 11; b = 3.6, 4.2; stylet = 80, 86 μ m; cone = 65, 71 μ m; gonad = 119, 150 μ m;

Paratype (juvenile, n = 2 third stage ?): L = 0.31, 0.34 mm; a = 11; b = 3.4, 3.5; stylet = 56, 61 μ m; cone = 46, 50 μ m; gonad = 20 μ m.

Description

Female: Body almost straight, curves slightly in posterior half; diameter constant over most of body, narrows from stylet base anteriorly to head and posteriorly from vulva forming conoid tail. Lip region rounded, head annulus smooth, nonretrorse, 21–25 μ m d set off from succeeding annuli by short, perpendicular collar, 12–16 μ m d. Second annulus about same diameter as first. SEM photographs show oral aperture an elongate, narrow slit surrounded by rounded margin set down slightly in oral plate. Oral plate with elongate, straight sides matching adjacent amphid apertures,

then four rounded lobes at each end of amphid apertures and rounded ends dorsad and ventrad. Lips hexaradiate, laterals larger than submedians.

Stylet well developed, knobs 11–14 μ m across. Excretory pore posteriad to esophago-intestinal junction. Vulva two rounded lips projecting about same distance as spines on tail; in ventral view anterior lip a simple lobe. Spermatheca small, rounded, offset, filled with round sperms about 2 μ m d.

No evidence of lateral field. Body annuli smooth in outline except for last 14–18 on posterior end. Regularly spaced undulations produce low, rounded scales becoming more elongate and narrow on each succeeding annulus. Scales arranged in rows at first but alternate on annuli posterior to vulva.

Except for single labial annulus, all body annuli bear fine, cuticular spines; these are irregularly spaced and few in number on some specimens, but most females have continuous fringe on all annuli. Some scales lack spines along sides and in space between scales; spines may be in clumps at distal end of scales and may have tiny, knob-like swellings on tip of spine. Spines also present at terminus with irregular shapes or another clump of fine spines with knob-like tips.

Male: Body distinctly curved ventrad; diameter constant over most of length, narrows gradually at anterior end to rounded, almost hemispherical head. Annuli continue onto head; cephalic sclerotization weak, stylet lacking; esophagus vestigial. Spicules slender, gently curved; gubernaculum simple, slightly curved. Caudal alae with scalloped edge consistent with body annulation, more prominent in anterior part, disappearing in posterior part. Caudal alae begin about one anal body width anterior to cloacal opening near ventral line of lateral field, then extend about $\frac{2}{3}$ length of tail. Lateral field with four incisures, outer two more prominent than inner two. Transverse section shows lateral field protrudes from body contour, indents to form two inner incisures.

Tail forms an evenly curved, conoid shape except for final few microns which may appear irregular, partly deformed.

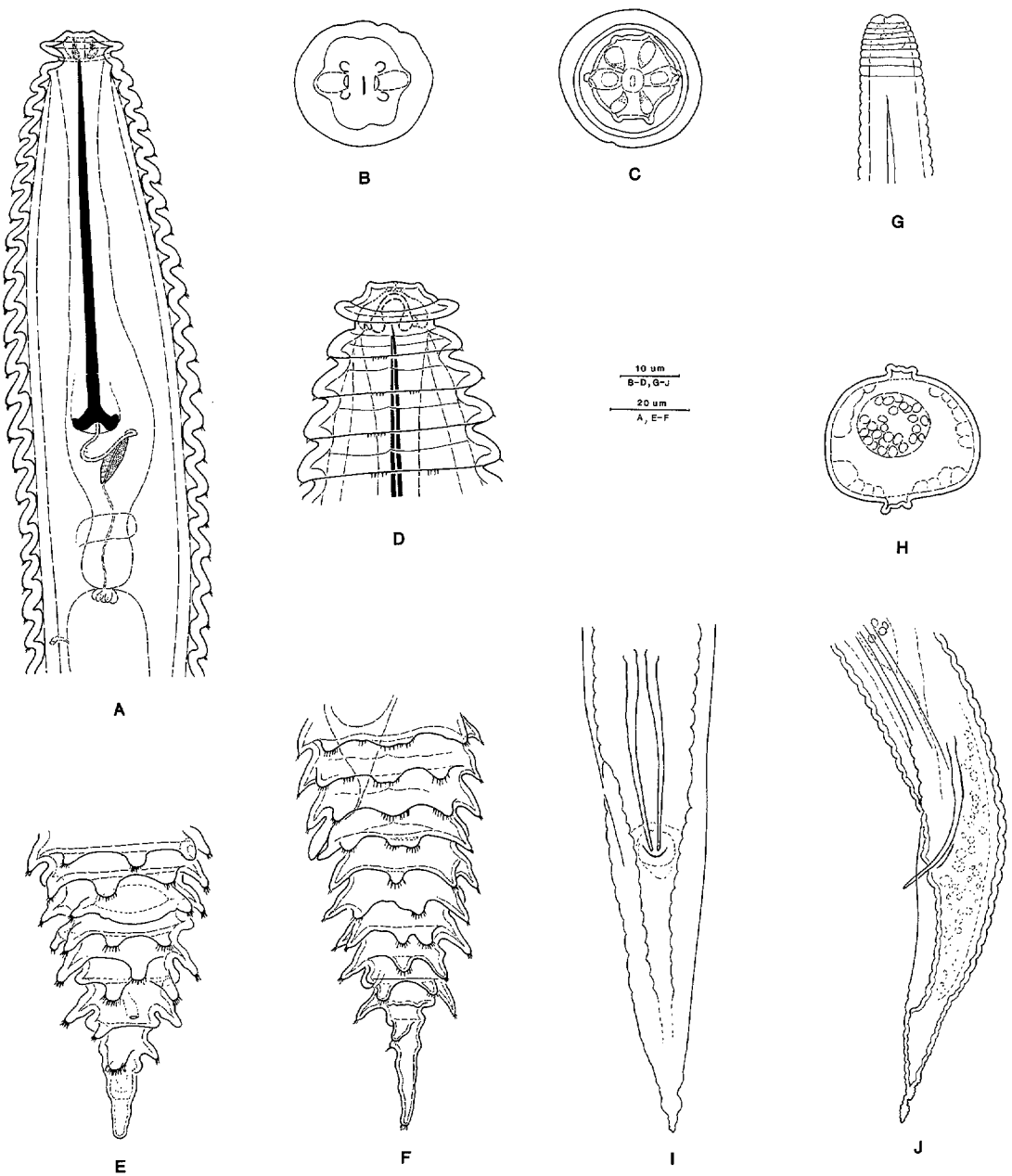


FIG. 1. *Criconema certesi* n. sp. A-F) Female. A) Esophageal region. B) En face view. C) En face slightly posteriad to B. D) Cephalic region. E) Tail, ventral view. F) Tail, lateral view. G-J) Male. G) Cephalic region showing beginning of lateral field. H) Transverse section about mid-body. I) Tail, ventral view. J) Tail, lateral view.

Body annuli coarse, averaging $3.3\text{--}4.9\text{ }\mu\text{m}$ wide.

Juveniles: Head with low rounded lips; first labial annulus thin, nonretrorse, almost cupped anteriad, smooth; slightly set off from second labial annulus which is

about same size as first but retrorse as with all succeeding annuli. Rows of scales mostly arranged in longitudinal lines, increasing in length and numbers to about 14 at mid-body and bearing minute spines at tips. Scales diminish in numbers but increase in

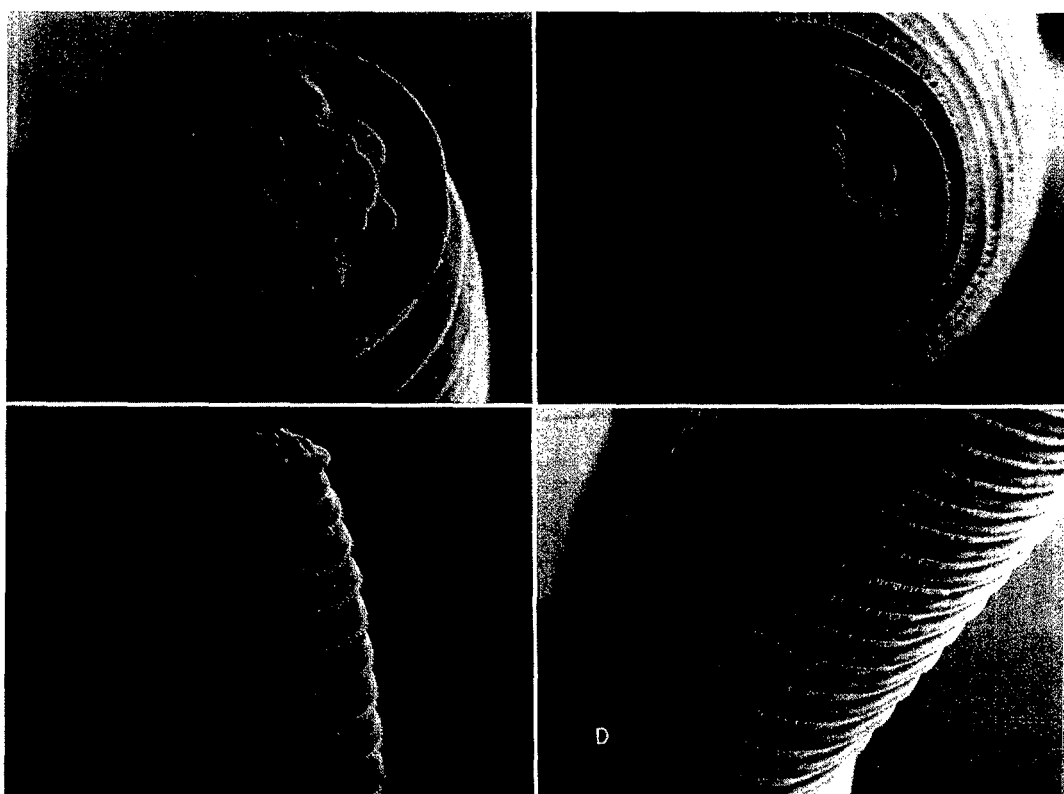


FIG. 2. *Criconema certesi* n. sp. Female. A, B) En face views of two different specimens. C) Cephalic region, submedian view. D) Mid-body, lateral view. Bar on A, B = 5 μ m; C, D = 10 μ m.

length on tail and disappear on last 4–5 annuli which narrow, giving a spicate outline. Spines present on one or two irregular margins of third-to-last annulus and on tip of tail. Stylet knobs 8–9 μ m across on third (?) stage, 9–11 μ m across on fourth (?) stage.

Type locality and habitat. Moist soil with high organic content under thick tundra at Orange Bay, Hardy Peninsula, Hoste Island, Chile. A total of 12 samples were taken, within a radius of about 1 km, and each of the four new species described herein were found in one or more of 8 out of the 12. Twenty-two plant species were identified in the eight samples as follows:

- 1) *Pernettya mucronata* Gaudich. ex G. Don (Ericaceae)
- 2) *Chiliotrichium diffusum* P. Dusen (Compositae)
- 3) *Nothofagus betuloides* Blume (Fagaceae)
- 4) *Drimys winteri* Forst. (Magnoliaceae)
- 5) *Empetrum rubrum* Vahl (Empetraceae)
- 6) *Blechnum penna-marina* (Poir.) Kuhn (Blechnaceae)
- 7) *Perezia magellanica* Lag. (Compositae)
- 8) *Caltha appendiculata* Pers. (Ranunculaceae)
- 9) *Donatia fascicularis* Forst. (Stylidiaceae)
- 10) *Berberis ilicifolia* Forst. (Berberidaceae)
- 11) *Azorella* sp. (Umbelliferae)
- 12) *Schoenus andinus* H. Pfeiff (or *antarcticus*/P. Dusen ?) (Cyperaceae)
- 13) *Lebetanthus myricnites myzsinites* Macl. (Epacridaceae)
- 14) *Apium australe* Thou. (Umbelliferae)
- 15) *Marsippospermon grandiflorum* Hooker (Juncaceae)
- 16) *Astelia pumila* R. Br. (Liliaceae)
- 17) *Gunnera lobata* Hooker (Haloragaceae)
- 18) *Mysteola nummularia* Berg (Myrtaceae)
- 19) *Acaena pumila* Vahl (Rosaceae)
- 20) cf. *Schizeilema ranunculus* Domin. (Umbelliferae)
- 21) *Gaultheria* cf. *antarctica* Hooker (Ericaceae)
- 22) cf. *Tetronicium magellanicus* Willd. (Naiadaceae)

Criconema certesi n. sp. was one of the

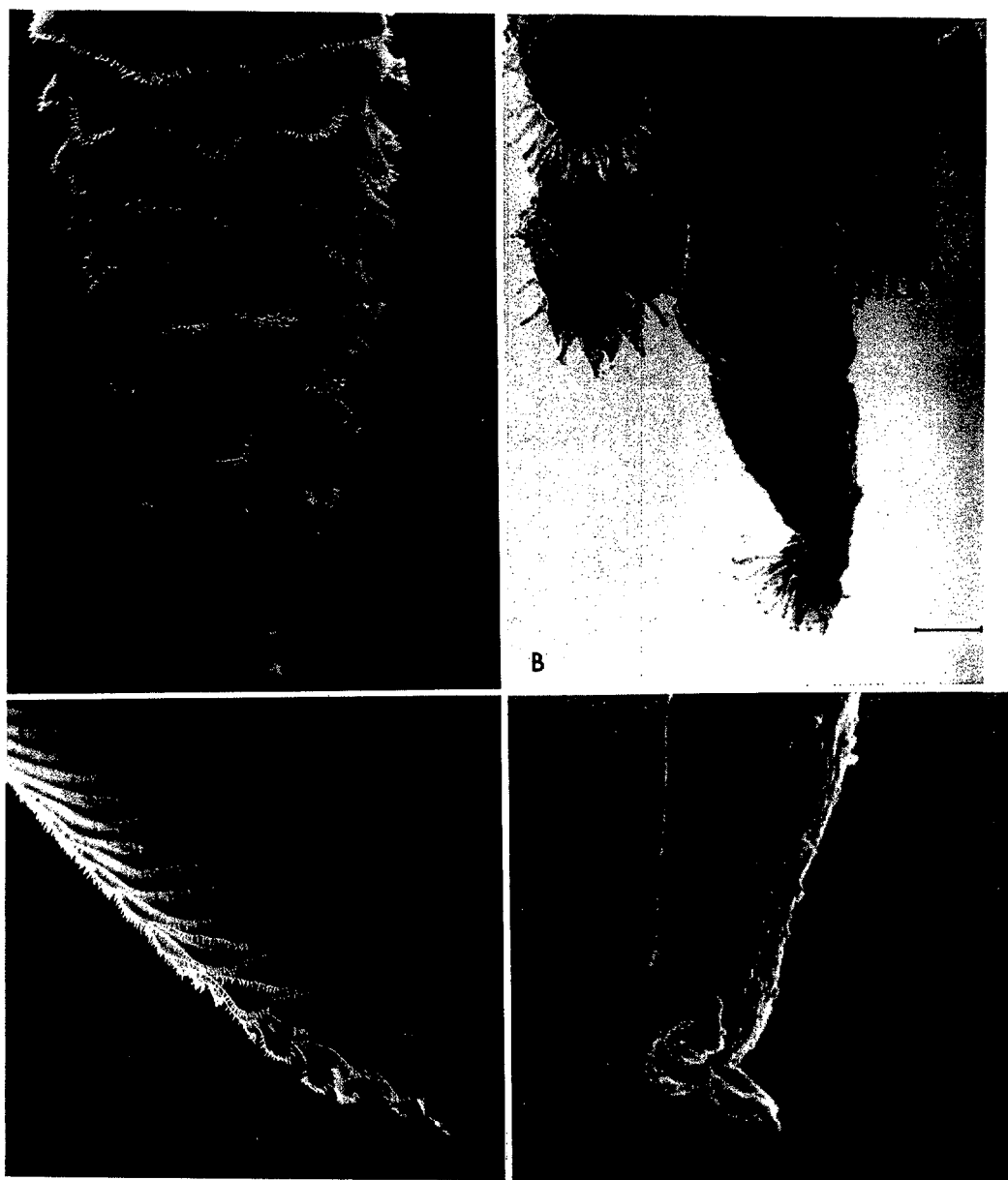


FIG. 3. *Criconema certesi* n. sp. Female. A) Tail, ventral view. B) Body scales and terminus. C) Posterior end of body, ventral view. D) Terminus. Bar on A, C = 10 μ m; B, D = 2 μ m.

most common species encountered, being present in seven of the eight samples. Plant species identified in those samples included #1-7, 9-18 of the above list.

Holotype: Female, Catalogue Slide Number 2213, University of California Nematode Collection (UCNC), Davis, California, collected 19 January 1983 by D. J. Raski.

Paratype: 94 females, 13 males, 18 juveniles. Same data as holotype, deposited

as follows: 66 females, 6 males, 18 juveniles, UCNC, Davis, California; 4 females, 1 male at each of the following: USDA Nematode Collection, Beltsville, Maryland; Nematology Department, Rothamsted Experimental Station, Harpenden, Herts., U.K.; Agricultural University, Wageningen, The Netherlands; National Nematode Collection, Indian Agricultural Research Institute, New Delhi, India; Mu-

séum national d'Histoire naturelle, Laboratoire des Vers, Paris, France; Instituut voor Dierkunde, Laboratoire voor Morfologie, Gent, Belgium; Departamento de Vegetal Sanidad, University of Chile, Santiago, Chile.

Diagnosis

The major distinguishing characteristics of *Criconema certesi* n. sp. are body of female with minute, cuticular spines on posterior edge of all annuli except first (labial) annulus; annuli with cuticular scales on posterior part of body; head with one annulus same diameter as next (first body) annulus, separated by short collar, each succeeding annulus larger; tail uniformly conoid, last 3–4 rudimentary annules smooth, minute spines on terminus. Male with four lines in lateral field, slightly raised from body contour seen in transverse section; spicules slender, gently curved ventrad, caudal alae present.

Relationships

Criconema certesi n. sp. is related to those species of *Criconema* bearing spines or scales on posterior part of body—*C. spinicaudatum* (Raski & Pinochet, 1976) (16), *C. spicatum* (Ebsary, 1981) (7), *C. victoriae* (Heyns, 1970) (8) and *C. corbetti* (De Grisse, 1967) (6)—but is distinguished from all by the minute bristle-like, cuticular spines present on posterior edge of the annuli.

In those samples where *C. certesi* n. sp. and *C. giardi* (Certes, 1889) (4) were present as mixtures, a casual examination might confuse the two species, especially as to juveniles and males. Closer study showed they are quite distinct: Females of *C. certesi* n. sp. bear cuticular, scale-like, annular projections on posterior part of body and minute spine-like projections over all the body on posterior edge of annuli and scales except the single head annulus; the scales and spines are absent in *C. giardi*. Males of *C. certesi* have four longitudinal lines compared to three in *C. giardi*. Also, the male tail of *C. certesi* n. sp. has more prominent caudal alae and smoothly arched outline, whereas in *C. giardi* caudal alae are small and tail shape bent ventrad then dorsad in roughly S-shaped outline.

This species is named in honor of A. Certes who described and named the first

criconematid, *Criconema giardi* (Certes, 1889) Micoletzky, 1925 (12) collected in this same locality on Hoste Island, Chile.

Ogma terrestris n. sp.
(Figs. 4, 5)

Dimensions

Holotype (female): L = 0.46 mm; a = 17; b = 4.4; c = 15; V = 6788^- ; stylet = 65 μ m; cone = 56 μ m; R = 99; R_{exp} = 28; R_v = 14; R_a = 9; excretory pore = 120 μ m.

Paratype (female, n = 14): L = 0.51 ± 0.047 (0.42–0.59) mm; a = 15 ± 1.38 (13–17); b = 4.7 ± 0.49 (4.1–5.4); c (n = 10) = 18.3 ± 2.77 (14–22); V (n = 13) = $48(38-68)88 \pm 1.37$ (86–90); stylet = 64 ± 2.10 (60–80) μ m; cone = 53 ± 1.71 (49–56) μ m; R = 96 ± 3.01 (91–102); R_{exp} (n = 10) = 26 ± 1.52 (23–28); R_v = 14 ± 1.27 (12–16); R_a = 9 ± 1.11 (7–10); excretory pore (n = 10) = 129 ± 12.36 (114–153) μ m.

Juvenile (fourth stage ?, n = 3): L = 0.35 (0.33–0.38) mm; a = 11–14; b = 3.8; stylet = 52 μ m; cone = 37–43 μ m; R = 99–103; R_{exp} = 29–31; excretory pore = 94 μ m.

Description

Female: Body gently curved ventrad; narrowing slightly from stylet base anteriad. Cephalic end with rounded lip region, a single annulus nonretrorse and set off from body annuli by short vertical collar. SEM photographs show labial region six-lobed; oral aperture a simple slit slightly longer than amphidial apertures located adjacent to oral plate. Oral plate oval with single crease marking off double ridges dorsad and ventrad. Lip annulus and first body annulus smooth; second body and succeeding annuli have undulating outline with a few low rounded projections becoming longer, forming scales, reaching maximum number of 21 at mid-body. Scales rounded distally with numerous tiny cuticular projections producing roughened or ragged margin. Cephalic sclerotization densely developed, prominent. Stylet knobs 7–9 μ m wide. Excretory pore 1–4 annuli posterior to esophagus.

Vulva two rounded lips protruding equally about same distance as body scales when seen in outline from lateral view; anterior lip wide, smooth. Vagina heavily sclerotized, angled slightly anteriad. Sper-

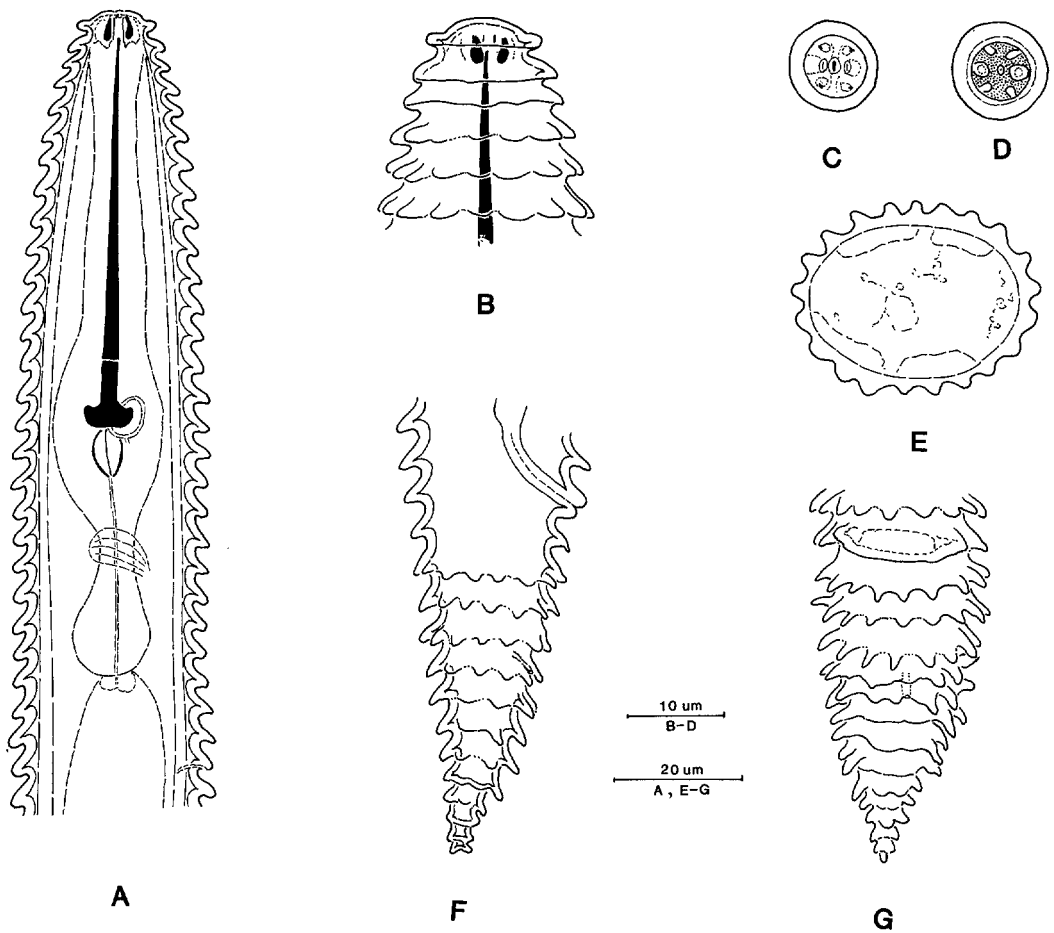


FIG. 4. *Ogma terrestris* n. sp. Female. A) Esophageal region. B) Cephalic region showing beginning of scales. C) En face view. D) En face slightly posteriad to B. E) Transverse section about mid-body. F) Tail, lateral view. G) Tail, ventral view.

matheca rounded, offset ventrad, filled with round sperms about $1\text{ }\mu\text{m}$ d. Tail narrows regularly to conoid outline, last annulus (terminus) variously shaped.

Juvenile: Similar in general outline to female but differs in head region which appears to have two annuli; first nonretrorse but thin, narrow, closer to lips than first annulus of female. Second annulus similar to succeeding body annuli, retrorse, scarcely or not set off from first annulus. Second and third annuli without scales but bear many minute refractive dots (cuticular projections). First low, rounded scales begin on fourth annulus increasing in length and number to 18–19 at mid-body (count made from lateral view focusing through specimen, so exact number difficult to ascertain).

Type locality and habitat: Moist soil with high organic content under thick tundra at Orange Bay, Hardy Peninsula, Hoste Island, Chile. *Ogma terrestris* n. sp. was found in three samples from which plant species #1–3, 5, 8–12, 17–22 (see list under *Criconeema certesi* n. sp.) were identified.

Holotype: Female, Catalogue Slide Number 2212, UCNC, Davis, collected 19 January 1983 by D. J. Raski.

Paratype: 23 females, 3 juveniles. Same data as holotype, deposited as follows: 16 females, 3 juveniles, UCNC, Davis, California; 1 female at each of the following: USDA Nematode Collection, Beltsville, Maryland; Nematology Department, Rothamsted Experimental Station, Harpenden, Herts., U.K.; Agricultural University, Wageningen, The Netherlands;

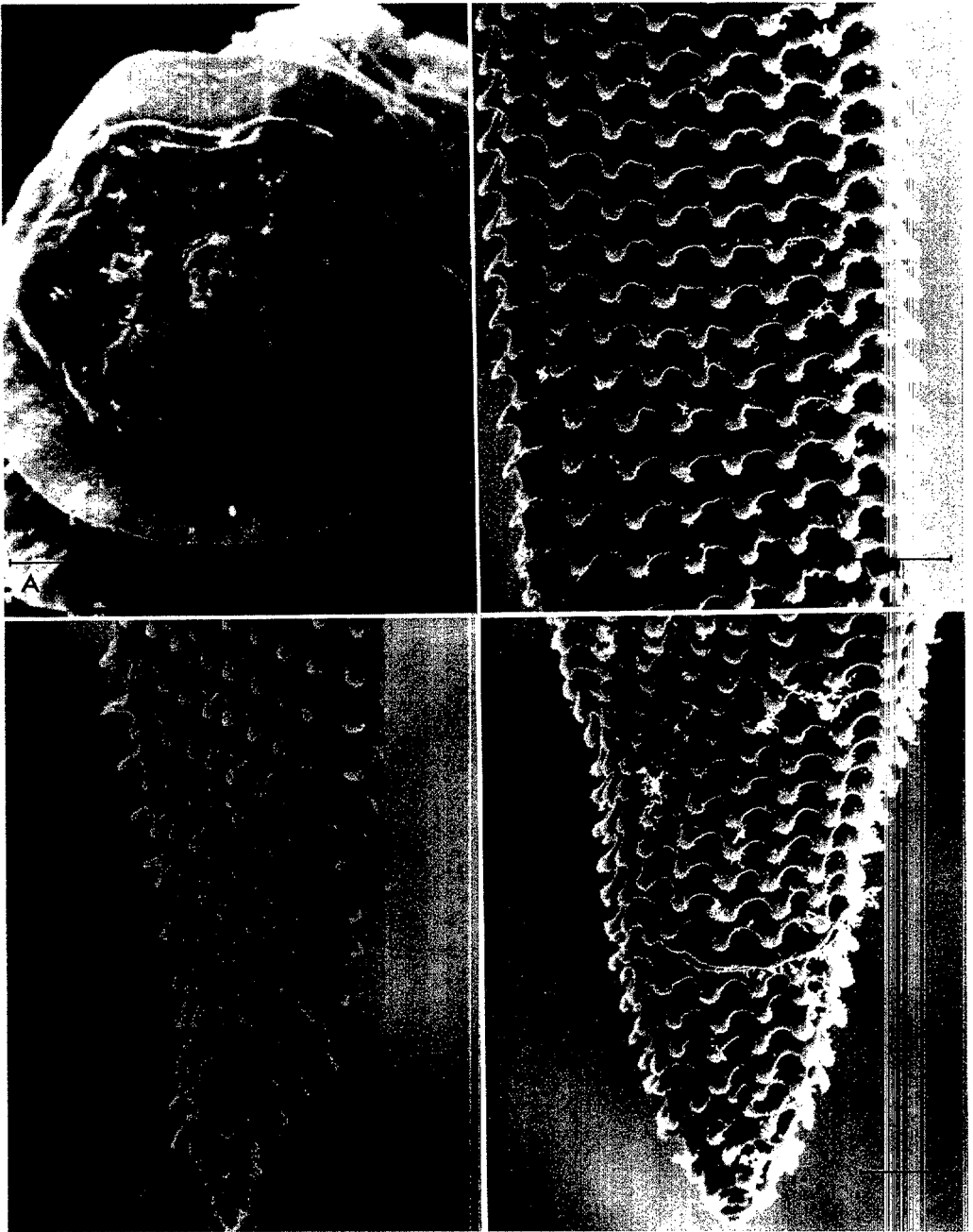


FIG. 5. *Ogma terrestris* n. sp. A) En face view. B) Mid-body. C) Tail, submedian view. D) Tail, ventral view. Bar on A = 2 μ m; B–D = 10 μ m.

National Nematode Collection, Indian Agricultural Research Institute, New Delhi, India; Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France; Instituut voor Dierkunde, Laboratoire voor Morfologie, Gent, Belgium; Departamen-

to de Vegetal Sanidad, University of Chile, Santiago, Chile.

Diagnosis

The distinguishing characteristics of *Ogma terrestris* n. sp. are: Body annuli bear-

ing up to 21 cuticular scales beginning at third (second body) annulus as low undulating projections few in number, increasing to mid-body, decreasing in number to conoid tail, some small scales present up to third- or fourth-to-last annulus before terminus. Scales bearing minute, cuticular spines around the rounded ends of each scale. Head annulus single, not set off, smooth, rounded, not cupped forward or retrorse, smaller in diameter than second (first body) annulus. Annuli = 96 (91–102), stylet = 64 (60–68) μm .

Relationships

Ogma terrestris n. sp. is related to those species bearing single cuticular scales arranged around the circumference of the annuli, usually regularly in rows, including *O. cobbi* Micoletzky, 1925 (12), *O. duodevigintilineatum* (Andrássy, 1968) (1), *O. murayi* (Southern, 1914) (17) and *O. insulicum* (Choi & Geraert, 1975) (5), but differs in the higher number of rows of scales (7–18 for these four species). *O. latens* (Mehta & Raski, 1970) (10) has similar characteristic scales, but these number up to 27 at mid-body and are sometimes bifurcate. The above five species have smooth scales, whereas *O. terrestris* n. sp. has minute spines around the rounded tips of the scales.

Hemicycliophora macrodorata n. sp. (Figs. 6, 7)

Dimensions

Holotype (female): L = 1.69 mm; a = 33; b = 6.2; c = 10.2; V = 84; stylet = 166 μm ; cone = 129 μm ; knob width = 12 μm ; excretory pore = 287 μm ; esophagus = 270 μm ; tail = 166 μm ; R = 282, R_{v-a} = 20.

Paratype (female, n = 9): L (n = 7) = 1.52 ± 0.140 (1.28–1.72) mm; a (n = 4) = 28 ± 3.44 (24–33); b (n = 4) = 6.0 ± 0.33 (5.6–6.4); c (n = 4) = 9.7 ± 0.61 (8.8–10.3); V (n = 5) = 84.6 ± 1.11 (83.9–86.6); stylet = 146 ± 11.00 (127–161) μm ; cone = 121 ± 9.29 (104–134) μm ; knob width = 10.8 ± 0.87 (10–12) μm ; excretory pore (n = 7) = 255 ± 19.07 (236–291) μm ; esophagus (n = 6) = 236 ± 31.47 (176–270) μm ; tail (n = 5) = 158 ± 12.69 (142–175) μm ; R = 297 ± 12.15 (280–315); R_{v-a} = 19 ± 5.13 (11–28).

Paratype (male, n = 4): L = 1.13 ± 0.186

(0.94–1.38) mm; a (n = 3) = 32.3 ± 5.37 (27.9–38.3); c = 5.1 ± 0.59 (4.2–5.4); excretory pore = 176 ± 35.76 (145–227) μm ; tail = 193 ± 56.67 (127–262) μm ; spicules = 81 ± 3.57 (77–85) μm ; gubernaculum = 21 ± 2.94 (18–25) μm ; T = 29–36; caudal alae = 137 ± 24.55 (101–157) μm .

Description

Female: Body gently curved ventrad; most of body almost cylindrical narrowing slightly to a rounded cephalic region. Head with three annuli, oral plate prominent, slightly concave. SEM photographs show oral plate a large, doughnut-shaped cuticular projection with slightly depressed edges dorsad and ventrad. Amphid apertures large, close to oral plate. Cephalic sclerotization massive, extending as far as fourth or fifth annulus. Stylet well developed, knobs directed posteriad, 10–12 μm across. Dorsal gland orifice 11–14 μm posterior to knobs. Excretory pore on outer cuticle at level of posterior bulb or at esophago-intestinal junction, on inner cuticle about 1–4 annuli posterior to junction.

Vulva lips rounded, projecting a short distance beyond margin of body shape. Connection to outer cuticle sometimes angled anteriad; vagina heavily sclerotized, also angled anteriad. Uterus quadricolumellar; spermatheca rounded, offset ventrad, filled with rounded sperms about 1 μm d. Body diameter (measured at inner cuticle) markedly smaller posterior than anterior to vulva, then maintains width for about 60–70% of distance from vulva to terminus, then narrows markedly, especially in last 15–20% producing a spicate outline. Annuli average 5.3–7.1 μm wide, becoming very fine but visible almost to terminus. Lateral field has mostly interruptions of transverse incisures, some incisures not broken or interrupted; occasional anastomosis. Annuli with fine, irregular longitudinal markings.

Male: Body curves gently ventrad; widest at mid-body, narrows very gradually anteriad to rounded anterior end, gradually narrows also posteriad but more abruptly at beginning of caudal alae, then indents markedly near spicular sheath and more so posteriad to caudal alae forming a slender

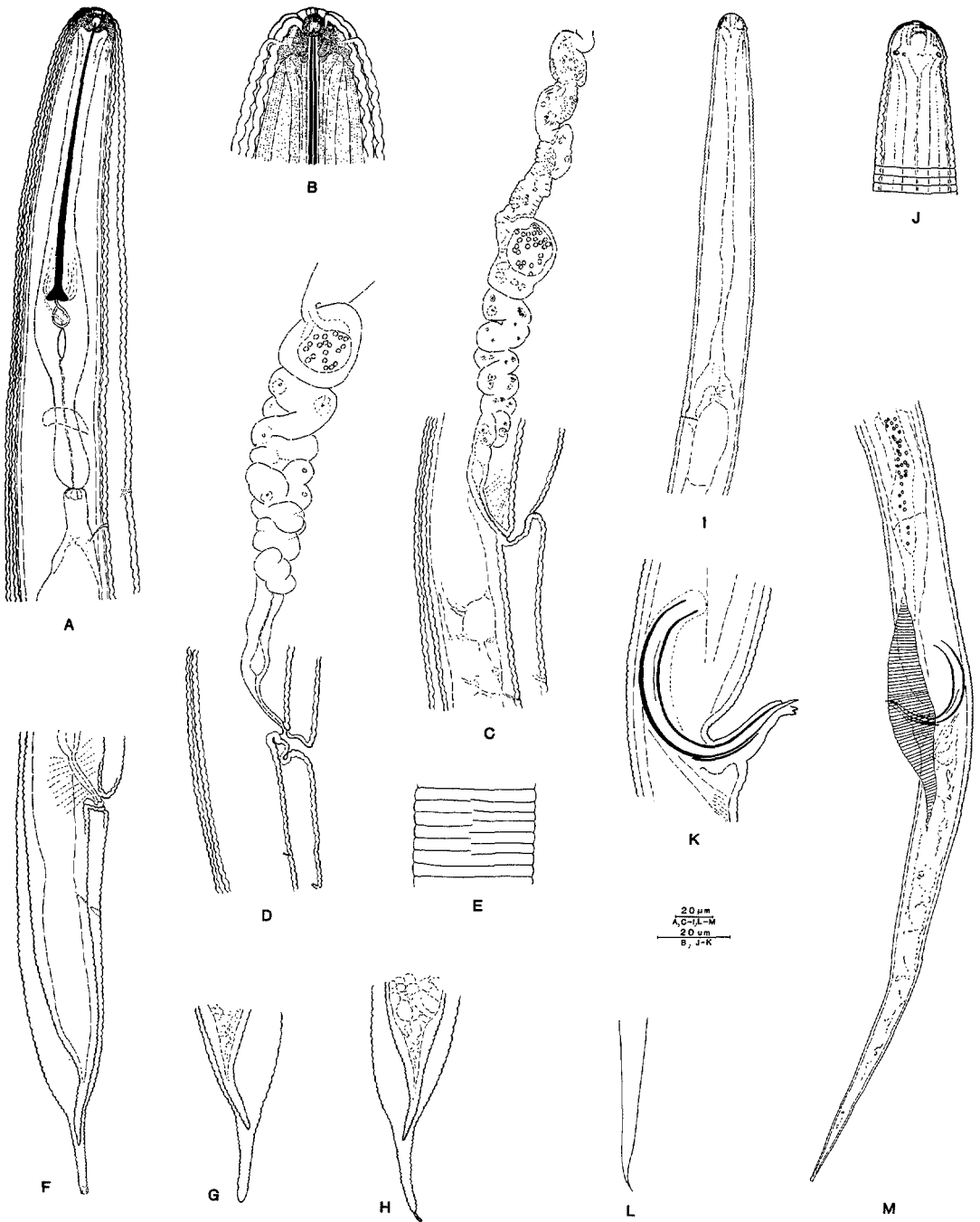


FIG. 6. *Hemicycliophora macrodorata* n. sp. A-H) Female. A) Esophageal region. B) Cephalic region. C, D) Vulvar region and part of gonad. E) Lateral surface view mid-body showing lateral field area. F-H) Variations in tail shape. I-M) Male. I) Esophageal region. J) Cephalic region. K) Spicule and gubernaculum. L) Tail near terminus. M) Tail.

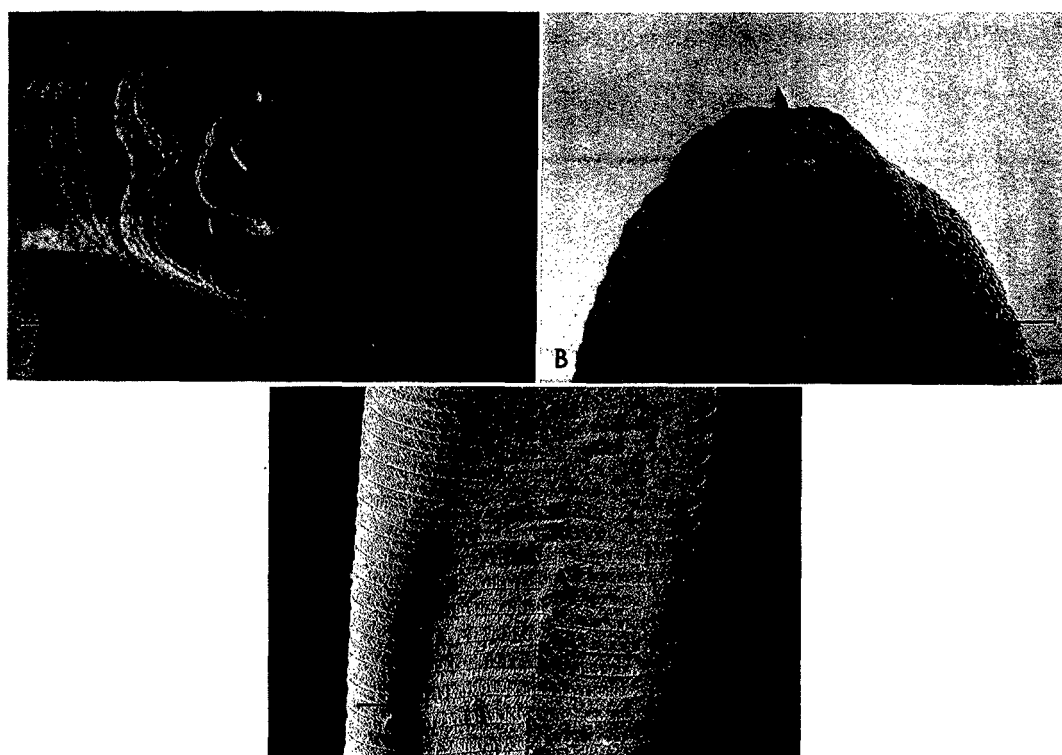


FIG. 7. *Hemicycliophora macrodorata* n. sp. Female. A) En face view. B) Cephalic region, lateral view. C) Lateral view about mid-body. Bar on A-C = 10 μ m.

elongate, conoid tail. Body annuli average 0.75–2.0 μ m; visible up to cephalic region. Head smooth, set off by slight concave projection of base then sloping sides to rounded anterior end. Sclerotization minimal, stylet lacking, esophagus vestigial. Caudal alae 101–157 μ m long, longer anteriad (68–93 μ m) to anal exit from body (not measured from tip to spicular sheath) than posteriad (33–65 μ m). Caudal alae prominently annulated giving finely scalloped outer edge and marked with transverse striae extending to lateral field. Spicules form about 180° curvature, tip gently curves posteriad. Lateral field not clear, may be single faint line where annuli meet.

Juvenile: Similar to adult female, except tail of younger stages more evenly conoid, not spicate as in adult.

Type locality and habitat: Moist soil with high organic content under thick tundra at Orange Bay, Hardy Peninsula, Hoste Island, Chile. *Hemicycliophora macrodorata* n. sp. was found in one sample from which

plant species #8, 10, 17–22 (see list under *Criconea certesi* n. sp.) were identified.

Holotype: Female, Catalogue Slide Number 2210, UCNC, Davis, collected 19 January 1983 by D. J. Raski.

Paratype: 8 females, 4 males, 23 juveniles. Same data as holotype, deposited in UCNC, Davis, California.

Diagnosis

Hemicycliophora macrodorata n. sp. has the following distinguishing characteristics: Large size (L = 1.52 [1.28–1.72] mm); stylet = 146 (127–161) μ m; annuli = 297 (280–315); tail = 158 (142–175) μ m, slightly spicate in shape, narrowing near terminus; massive sclerotization in head; extra cuticle loosely fitting, vulva lips protrude slightly; lateral field as simple interruptions of transverse incisures, present or absent, occasional anastomosis; male with strongly curved spicules, forming open “U-shape”; caudal alae prominently marked with annuli.

Relationships

Hemicycliophora macrodorata n. sp. is most closely related to *H. mettléri* (Jenkins & Reed, 1964) (9) and *H. italiae* (Brzeski & Ivanova, 1978) (3) based on females only (males are not known for the latter two). *H. macrodorata* n. sp. differs from *H. mettléri* by its fewer body annuli (385–455 for *H. mettléri*); also v–a distance is shorter for *H. macrodorata* n. sp. (about 28% of distance from vulva to terminus for *H. macrodorata* n. sp., 50% for *H. mettléri*). *H. macrodorata* n. sp. differs from *H. italiae* by its greater length (0.94–1.28 mm for *H. italiae*); larger stylet (100–116 μm for *H. italiae*); and by annulation which becomes finer and finer almost to terminus (disappears on tail end of *H. italiae*).

Paratylenchus fueguensis n. sp.
(Figs. 8, 9)

Dimensions

Holotype (female): L = 0.43 mm; a = 25; b = 4.6; c = 13; V = $^{42}80^-$; stylet = 24 μm ; cone = 15 μm ; excretory pore = ?; esophagus = 94 μm ; tail = 32 μm .

Paratype (female, n = 11): L = 0.41 ± 0.031 (0.36–0.46) mm; a = 27 ± 3.02 (24–34); b = 4.4 ± 0.21 (4.0–4.7); c = 12 ± 0.95 (10–13); V = $^{38(27-51)}80 \pm 1.52$ (78–84); stylet = 25 ± 3.05 (21–29) μm ; cone = 16 ± 2.37 (13–20) μm ; excretory pore = 86 ± 4.15 (78–91) μm ; esophagus = 79 ± 17.05 (58–100) μm ; tail = 28 ± 6.87 (19–38) μm .

Paratype (male, n = 2): L = 0.39, 0.43 mm; a = 32; b = 4.9, 5.4; c = 13, 15; spicules = 24, 25 μm ; gubernaculum = 4 μm ; T = 30, 33; tail = 29 μm .

Paratype (juvenile, third stage ?): L = 0.29 mm; a = 24; b = 3.2; stylet = 22 μm ; cone = 14 μm ; excretory pore = 73 μm ; esophagus = 89 μm .

Description

Female: Body almost straight to mid-body, then curves gently ventrad to vulva, and curves more strongly to terminus producing 180° hook shape. Greatest width in region anteriad to vulva, tapers gradually anteriad to rounded cephalic region, slightly depressed at oral aperture. SEM photographs show plain labial plate generally oval in outline, almost straight on

lateral margins. No evidence of submedian lobes. Amphidial apertures narrow oval slits about as long as oral plate which has raised outer margins parallel with amphidial apertures and a second, raised, curved, inner margin; then extension of oral plate toward oral aperture, leaving a very narrow slit for oral aperture. Cephalic region about twice as wide as high; sclerotization not prominent. Stylet knobs 4–5 μm across, rounded. Dorsal gland orifice about 3–5 μm posterior to knobs. Procorpus enlarges gradually to large median bulb which almost fills body cavity. Valvular apparatus 5–7 μm long, prominent. Excretory pore just behind hemizonid, about half body width posteriad to esophagus end. In other paratypes, excretory pore slightly anterior to esophago–intestinal junction. Vulva a simple slit; lateral membranes prominent. Vaginal walls sclerotized, curved anteriad; uterus quadricolumellar; spermatheca offset, rounded, filled with round sperms about 1 μm d. Tail conoid with bent irregular shape in last 5–6 μm ending in finely rounded tip. Other paratypes with regularly conoid shape to terminus.

Annuli average about 1.2–1.6 μm wide, clearly visible on tail up to final 3–4 μm of terminus. Lateral field with three equal bands formed from four longitudinal lines. Anteriad annuli on cephalic region too fine to see with light microscope but definitely annulated up to labial plate as seen by SEM.

Male: Body open “C-shape,” slender, almost cylindrical, only slightly wider for a short distance at mid-body. Body narrows slightly anteriad to rounded cephalic region. Stylet lacking, esophagus vestigial. Spicules slender, only slightly curved, and more so in terminal quarter of length. Spicular sheath present. Tail short, conical, strongly bent, almost 180°. Gubernaculum simple, rod-shaped.

Body annuli prominent, 1.1–1.4 μm wide, visible on tail almost to terminus. Final 5–6 μm of tail irregular, ending in very finely rounded tip. Second specimen has tail with regular conoid shape but similar strongly curved outline. Lateral field with three faint bands set off by four longitudinal lines. Body annuli clearly visible up to cephalic region.

Juvenile: Similar to adult female; stylet prominent in what is apparently third stage.

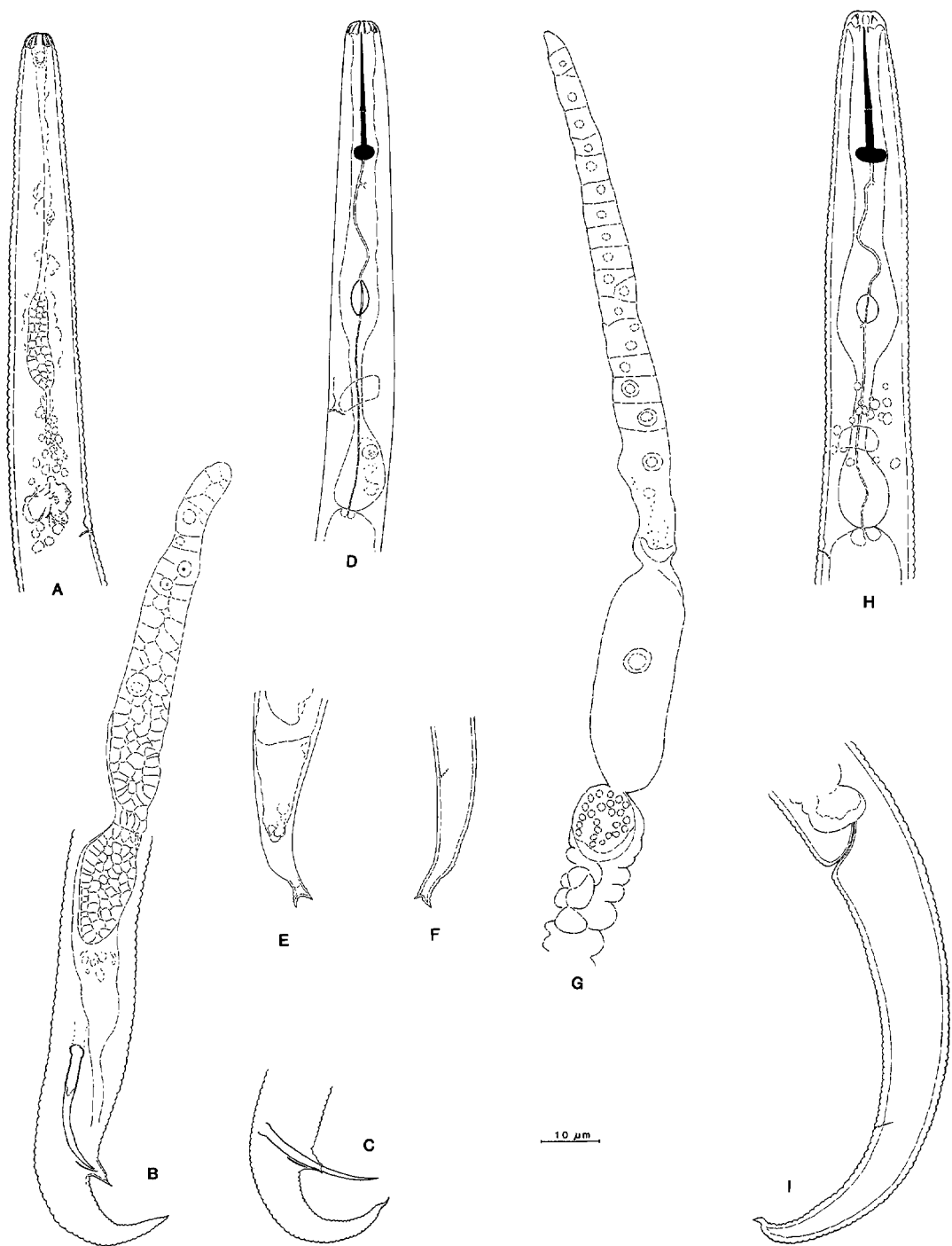


FIG. 8. *Paratylenchus fueguensis* n. sp. A-C) Male. A) Esophageal region. B) Tail and gonad. C) Tail. D-F) Juvenile. D) Esophageal region. E, F) Tail shape. G-I) Female. G) Gonad. H) Esophageal region. I) Tail.

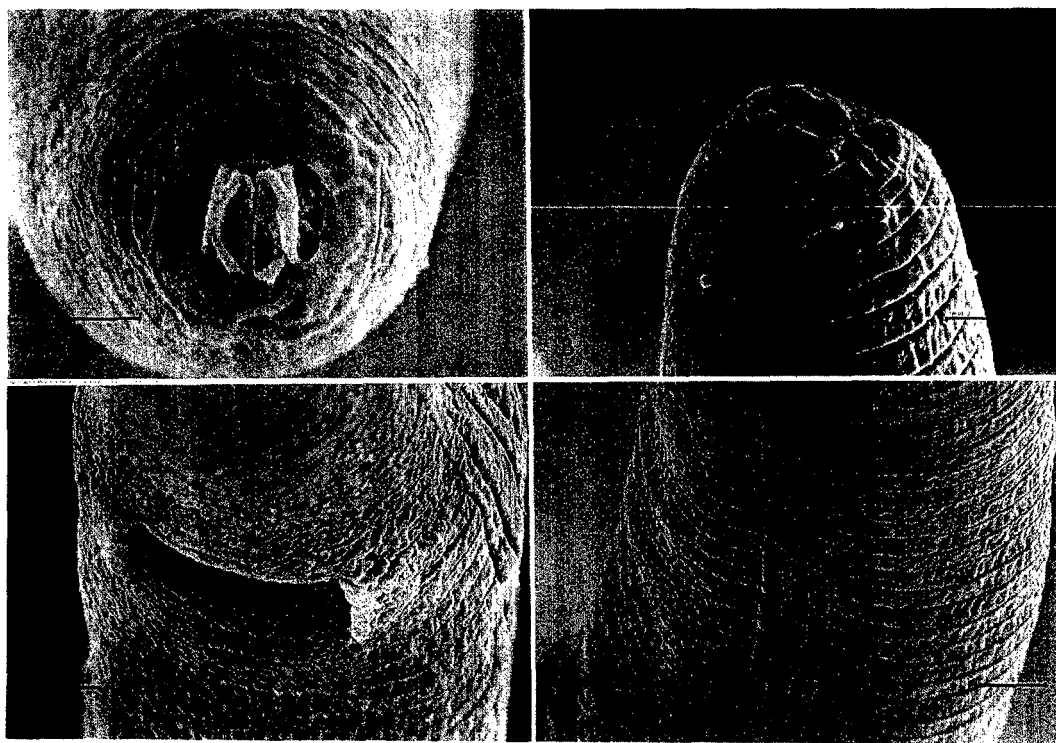


FIG. 9. *Paratylenchus fueguensis* n. sp. Female. A) En face view. B) Cephalic region, lateral view. C) Vulva. D) Lateral field, mid-body. Bar on A-D = 2 μ m.

Excretory pore just behind hemizonid, at level of nerve ring. Tail differs from adult in having bifurcate terminus with ragged margin.

Type locality and habitat: Moist soil with high organic content under thick tundra at Orange Bay, Hardy Peninsula, Hoste Island, Chile. *Paratylenchus fueguensis* n. sp. was found in two samples from which plant species #2, 3, 8–12, 17–22 (see list under *Criconema certesi* n. sp.) were identified.

Holotype: Female, Catalogue Slide Number 2211, UCNC, Davis, collected 19 January 1983 by D. J. Raski.

Paratype: 9 females, 2 males, 2 juveniles. Same data as holotype, deposited in UCNC, Davis, California.

Diagnosis

Paratylenchus fueguensis n. sp. has the following distinguishing characteristics: prominent stylet with especially large, rounded knobs (4–5 μ m across); cephalic region rounded, not at all set off and without labial projections; submedian lobes ab-

sent; lateral field with three equal, narrow bands (four lines); lateral vulval membranes present; annuli clearly present over entire body length; tail conoid, narrowing to very finely rounded tip (irregularly bent terminus on some); male tail short, strongly curved ventrad almost reaching 180°.

Relationships

Paratylenchus fueguensis n. sp. is most closely related to *P. bukowinensis* (Micoletzky, 1922) (11) and *P. lepidus* (Raski, 1975) (14). It differs from *P. bukowinensis* by lack of male stylet (present in *P. bukowinensis*) (2) and male tail strongly bent ventrad with finely conoid terminus (straight or curved dorsad in *P. bukowinensis*; also terminus more obtusely conoid). It also differs in the development of stylet knobs, rounded, 4–5 μ m across (smaller, backwardly directed in *P. bukowinensis*). It differs from *P. lepidus* by the male tail shape (as described by Pinochet & Raski [13]) in being strongly curved ventrad with finely conoid terminus (straight with rounded terminus in *P. lep-*

idus); also male is longer ($L = 0.39\text{--}0.43$ vs. 0.30 mm for *P. lepidus*); spicules larger ($24\text{--}25\ \mu\text{m}$ vs. $17\ \mu\text{m}$ for *P. lepidus*). Also female tail tapers to a finely conoid almost acute terminus (tail more bluntly rounded in *P. lepidus*).

It is quite possible morphological differences detectable only by SEM can give further insights into these relationships. Clearly there are major differences between the cephalic structures of *P. neoamblycephalus* Geraert, 1965 as shown by Raski, 1975 (14) and of *P. fueguensis* n. sp. illustrated here.

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