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Mesocriconema ornicauda n. sp. and *Ogma floridense* n. sp. (Nematoda: Criconematidae) from Two Florida Habitats[1]

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Abstract: *Mesocriconema ornicauda* n. sp. and *Ogma floridense* n. sp. are described from two native habitats of central and northwestern Florida. *Mesocriconema ornicauda* is closest to *M. annulatiforme* (De Grisse & Loof, 1967) Loof & De Grisse, 1989, but differs by the shorter stylet of the female (43–50 vs. 54–65 μm) and the moderately conoid tail of the male, which is pointed in *M. annulatiforme*. *Ogma floridense* is closest to *O. hungaricum* (Andrassy, 1972) Siddiqi, 1986. Females differ from those of *O. hungaricum* by the first of two labial annuli being wider, whereas they are subequal in *O. hungaricum*. *Ogma floridense* females differ also by entire or bifid cuticular scales, which are consistently divided into two or four projections in *O. hungaricum*, the shorter body (360–471 vs. 480–550 μm), the shorter stylet (87–98 vs. 95–100 μm), and the more anteriorly located excretory pore (Rex = 17–19 vs. 21–23).

Key words: *Mesocriconema annulatiforme*, *M. ornicauda*, Florida, morphology, new species, *Ogma floridense*, *O. hungaricum*, ring nematode, scanning electron microscopy (SEM), taxonomy.

Soil samples collected from two localities in Florida yielded two undescribed species of Criconematidae. Both species are described herein.

Materials and Methods

Specimens used in this study were extracted from soil by Cobb's sieving and decanting method, fixed in hot 4% formaldehyde + 1% propionic acid, and processed to glycerine by Seinhorst's rapid method. Wergin's method (6) was used for the preparation of nematodes for scanning electron microscopy (SEM). These specimens were coated with gold and observed with a JEOL-50A stereoscan at 5–10 kV of accelerating voltage.

Abbreviations used are defined in Siddiqi (5). All measurements are in micrometers (μm) unless otherwise stated.

Systematics

Mesocriconema ornicauda n. sp. (Figs. 1A–I; 2A–I; 3A)

Holotype (female in glycerine): Measurements in Table 1.

Females in glycerine (n = 30): Measurements in Table 1. Body ventrally arcuate, tapering toward both extremities, especially posterior end. Body annuli retrorse, posterior edges smooth (Fig. 2D, E); anastomoses rare (Fig. 2C), maximum number eight. Lip region not set off (Figs. 1B; 2A, B). Four small submedian lobes present, prominent, equally spaced around labial disc (Figs. 1A, 2A). Labial plates present; amphidial apertures oval, lateral to labial disc (Fig. 2A, B). Oral opening I-shaped (Fig. 2A). Stylet moderately robust; knobs anteriorly directed, 8.8 ± 0.8 (7.5–10.6) wide (Fig. 1B). Excretory pore about 100 from anterior end, at level of esophagus base (Fig. 1C). Spermatheca broadly oval, 11–15 × 15–22, filled with spherical sperm 1.5 μm d. Vulva open; anterior lip with two minute, rounded, sometimes pointed lobes (Figs. 1F, 2E). Vagina sigmoid, vagina uterina parallel to body axis, VL > VB. Tail conical with characteristic cuticular irregularities on the three or four terminal annuli (Figs. 1D–H, 2E–I).

Anal opening distinct, pit-like, usually located on eighth annulus from posterior terminus; anal site marked by deep notch (Fig. 2E, F, I).

Male (n = 1): L = 422; width = 20; a = 21; tail = 30; c = 10; R = 189; Rex = 51; Ran = 21.

Body curved in semicircle, tapering to both extremities. Annulation coarse, 2.2 thick. Lateral field with four incisures (Fig.

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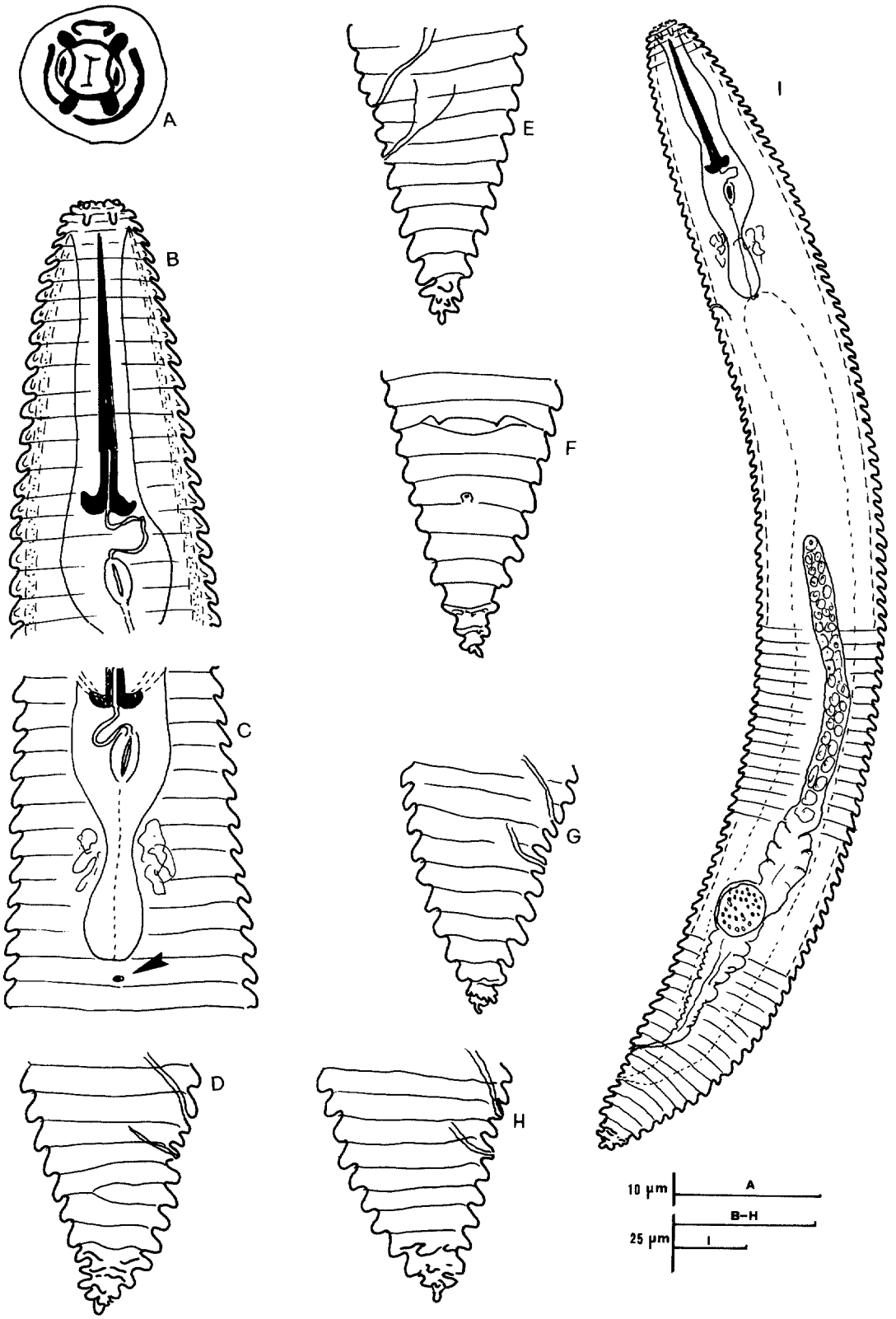

FIG. 1. *Mesocriconema ornicauda* n. sp., female. A) En face view. B) Anterior region. C) Posterior portion of the esophageal region. Note the excretory pore (arrow). D–H) Posterior body region showing tail irregularity. E) Sigmoid vagina. F) Ventral view of vulva showing anterior lip with lobes and anus. I) Entire female.

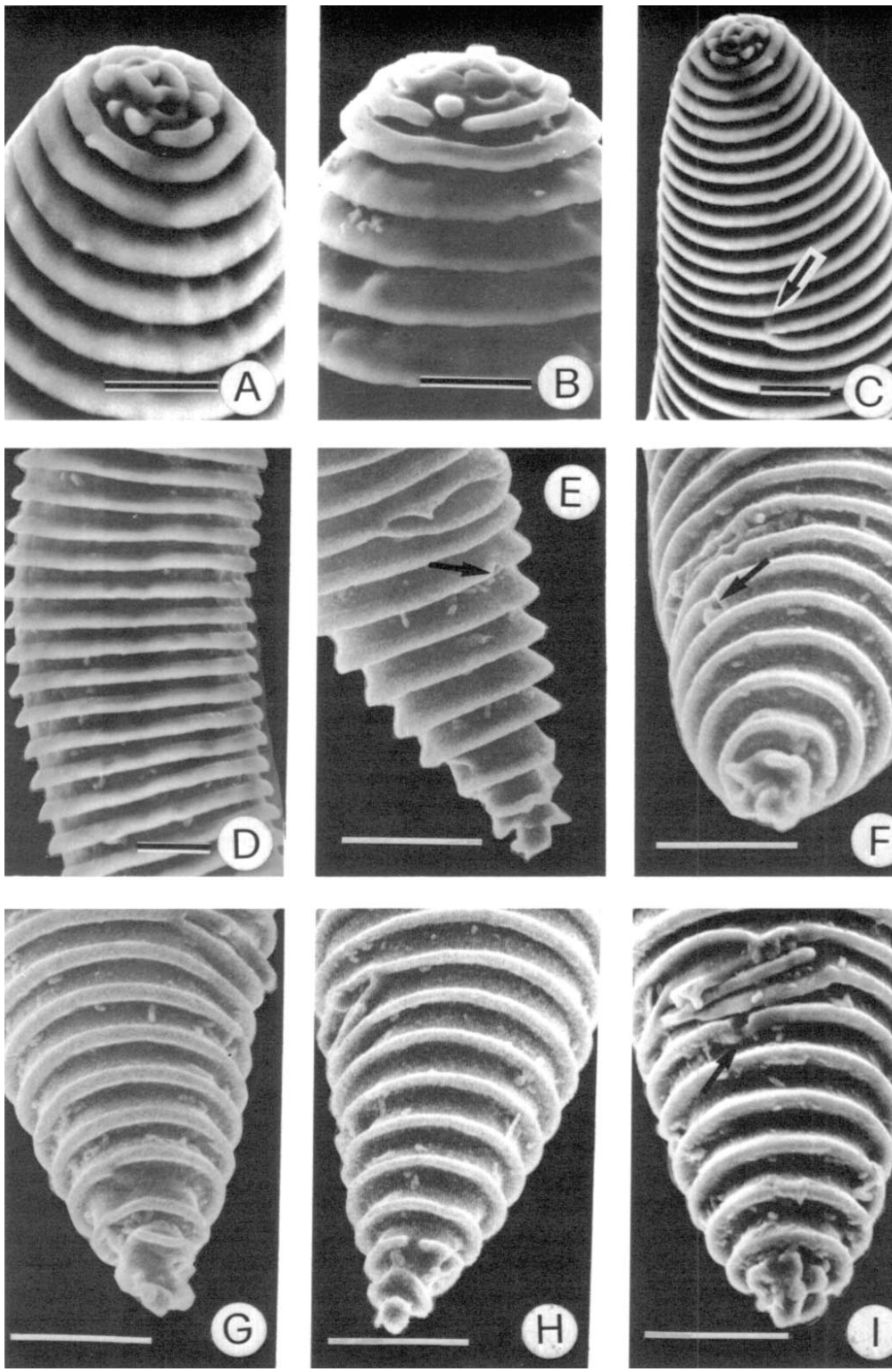

FIG. 2. SEM micrographs of *Mesocriconema ornicauda* n. sp. Scale bars = 10 μm. A, B) Different views of anterior body region. C) Anastomosed annuli (arrow). D) Midbody annuli. E–I) Different views of posterior body region. Note the characteristic irregularities of the three or four terminal body annuli and the projections of the vulva's anterior lip in E and F. Arrows in E, F, and I indicate anal notch.

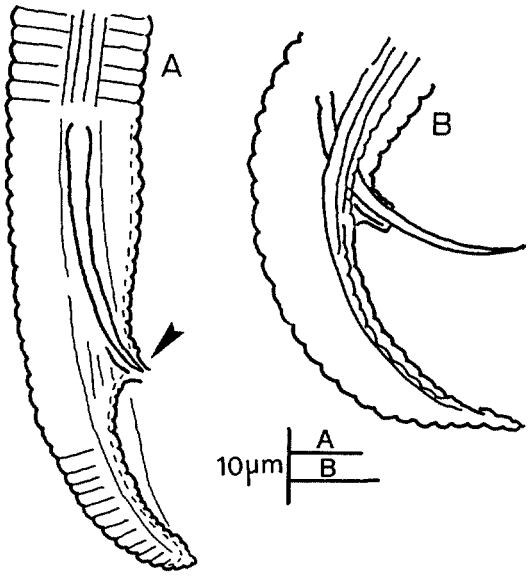

FIG. 3. *Mesocriconema ornicauda* n. sp. and *M. annulatiforme* males. A) Posterior body portion of *M. ornicauda*. Arrow indicates cloacal tubus. B) Posterior body portion of *M. annulatiforme*. Note the moderately conoid tail of *M. ornicauda* (A) compared with the sharply pointed tail of *M. annulatiforme* (B).

3A). Excretory pore 98 from anterior end. Spicules slender, 34 long, slightly curved, cephalated proximally, pointed distally (Fig. 3A). Cloacal tubus distinct (Fig. 3A). Gubernaculum linear, slightly curved, 5 long. Tail moderately conoid (Fig. 3A).

Type host and locality

Specimens collected on 9 September 1988 from soil about the roots of *Panicum rigidulum* Bosc. ex Needs growing on the east bank of the Ichetucknee River 213 meters south of Highway 17, Columbia County, Florida.

Type specimens

Female holotype, slide V-108-90-1, and 38 paratypes have been deposited in the Nematode Collection of the Istituto di Nematologia Agraria del Consiglio Nazionale delle Richerche, Bari, Italy. One glass slide containing three females has been sent to each of the following institutions: Nematode Collection of the Bureau of Nematology, Division of Plant Industry, Gainesville, Florida; Nematode Collection, Nematology Department, Rothamsted Experimental Station, Harpenden, Herts, England; Collection nationale des Nématodes, Laboratoire des Vers, Muséum national d'Histoire naturelle, Paris, France; Nematode Collection of the Landbouwhogeschool, Wageningen, The Netherlands; United States Department of Agriculture Nematode Collection, Beltsville, Maryland; University of California Davis Nematode Collection, University of California, Davis.

TABLE 1. Morphometrics of holotype and 30 female paratypes of *Mesocriconema ornicauda* n. sp. from Florida.

Morphological characters†	Holotype	Range	Average	Standard deviation
		Measurements in µm		
Body length	440	366–465	423	23.5
Body width	42	38–49	44	3.0
Esophagus length	95	87–103	96	4.3
Excretory pore anterior end distance	99	85–116	100	6.7
Stylet length	45	43–50	47	1.8
Stylet knobs width	10.0	7.5–10.6	8.8	0.8
Tail length	25	18–30	26	2.9
		Annulus numbers		
R (ventral side)	103	92–111	100	5.0
Rst	16	14–17	16	0.9
Roes	26	24–30	26	1.5
Rex	27	24–33	27	2.0
Ran	7	6–9	7	0.8
		Percentages		
V	91	88–93	91	1.1
St%L	10	10–13	11	0.7
St%esoph	46	46–55	49	2.2
		Ratios		
a	10.4	18.4–10.8	9.6	0.6
b	4.6	3.8–4.7	4.3	0.2
c	18.0	14–23	17	2.1
VL/VB	1.3	1.1–1.6	1.3	0.14
VL/St	0.9	0.6–0.9	0.7	0.10

† Abbreviations defined in Siddiqi (5).

Diagnosis

Mesocriconema ornicauda n. sp. is characterized by having 1) four prominent submedian lobes equally spaced around the labial disc, 2) a well-developed stylet (43–50) with anteriorly directed knobs, 3) 92–111 body annuli with smooth posterior margins, 4) an open vulva with anterior

vulval lip bearing two pointed projections and sigmoid vagina, 5) an acute conical tail with irregularities on the three or four terminal annuli.

Relationships

Mesocriconema ornicauda n. sp. has an acute conical tail and characteristic cuticular irregularities on the three or four terminal annuli as does *M. annulatiforme* (De Grisse & Loof, 1967) Loof & De Grisse, 1989 (2,3). *Mesocriconema ornicauda* differs from *M. annulatiforme* by the shorter stylet of the females (43–50 vs. 54–65) and the moderately conoid male tail (Fig. 3A), which is sharply conoid with a pointed terminus in *M. annulatiforme* (Fig. 3B).

Ogma floridense n. sp.
(Figs. 4A–H; 5A–F; 6A–E; 7A, C)

Holotype (female in glycerine): Measurements in Table 2.

Females in glycerine (n = 10): Measurements in Table 2. Body slightly curved ventrally, tapered slightly anteriorly, more so posteriorly, tail conoid. Labial annuli two (Figs. 4A, 5C): First one set off 15.0–17.5 wide, directed slightly forward, marked by minute crenations (Fig. 5A); second one smaller, 11–15 wide; borders smooth (Figs. 4A; 5A, C). Oral disc slightly hexagonal (Fig. 5A), submedian lobes appearing as small, distinct outgrowths in lateral view (Fig. 5C). En face view submedian lobes are fused within an irregular hexagonal rim with six outward connections (Fig. 5A). Oral opening at center of oral disc and between two plates (Fig. 5A). Amphidial apertures slit-like, on lateral edges of the oral disc (Fig. 5A, C).

Annuli at midbody with 10 retrose entire scales, sometimes divided into two, rarely three, blunt projections, 3–8 long (Figs. 4B, D, E; 5D). Anterior and posterior annuli fringes close, continuous (Fig. 5A, B). Excretory pore on ventral divided scale at level of esophagus base (Fig 4B).

Vulva with two rounded lips, smooth, projecting outward, posteriorly directed (Figs. 4D, 5E). Ovary outstretched, sometimes overlapping posterior part of esophagus (Fig. 4A). Spermatheca present. Tail elongate, conoid, uniformly decreasing to single lobed terminus (Figs. 4C; 5F; 6A, B).

TABLE 2. Morphometrics of holotype and 14 female paratypes of *Ogma floridense* from Florida.

Morphological characters†	Holotype	Range	Average	Standard deviation
		Measurements in μm		
Body length	433	360–471	424	44.9
Body width	45	34–46	43	3.8
Esophagus length	123	101–135	122	10.2
Excretory pore anterior body end distance	143	108–152	133	13.6
Stylet length	89	87–98	91	4.2
Head (first labial annulus) width	16	15–17.5	16	0.8
Tail length	42	21–51	41	8.9
		Annulus numbers		
R (ventral side)	55	52–57	55	1.4
Rst	13	12–15	14	0.8
Roes	17	15–18	17	0.8
Rex	19	17–19	18	0.7
Rv	12	11–12		0.5
Ran	8	7–8		0.5
		Percentages		
V	85	82–87	84	1.5
St%L	20	19–24	21	1.8
St%esoph	72	68–86	75	5.3
		Ratios		
a	9.6	8.3–11.0	9.8	0.88
b	3.5	3.1–3.7	3.4	0.18
c	10.3	8.7–17.5	10.8	2.5
VL/VB	2.1	1.9–2.4	2.1	0.16
VL/St	0.75	0.51–0.90	0.74	0.10

† Abbreviations defined in Siddiqi (5).

Male (n = 1): Specimen enclosed in fourth-stage cuticle (Figs. 4F–H; 6C–E). L = 460; width = 28; body annuli 4.5–5.0 thick; a = 16; b = ?; c = 15; vestigial stylet length = 42; excretory pore 126 from anterior end; lateral field 4.7 wide, 17% of body width, marked with four longitudinal lines (Figs. 4G, 6D); spicules slender, ventrally curved 42 long (Figs. 4H, 6C); gubernaculum simple, 6 long; tail 28 long; testis 44 long; R = 106.

Type host and locality

Specimens collected on 15 September 1988 from soil about the roots of *Liquid-*

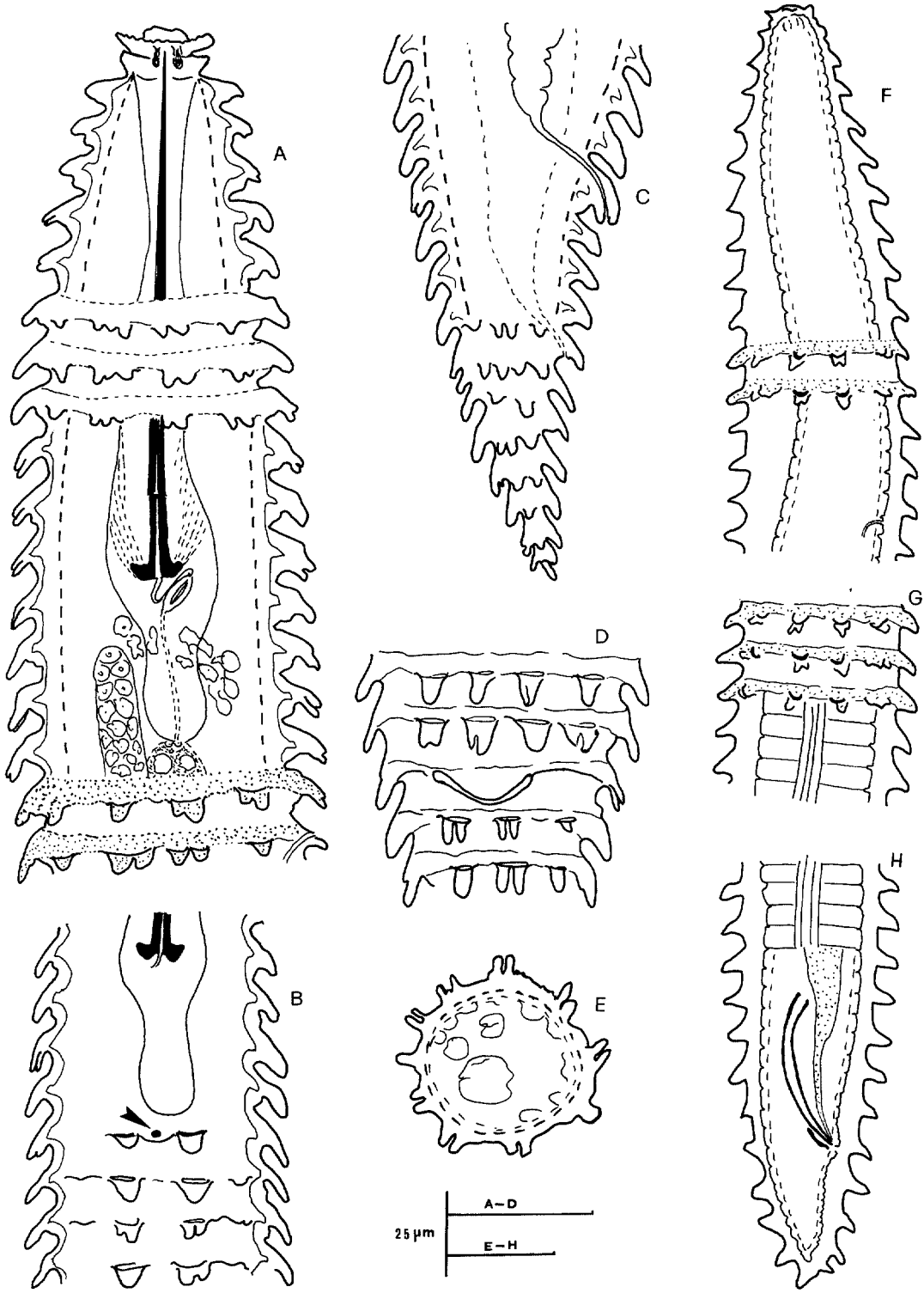

FIG. 4. *Ogma floridense* n. sp. A–E) Female. A) Anterior region. B) Posterior part of the esophageal region showing the excretory pore (arrow). C) Posterior body portion. D) Vulval area. E) Cross section at midbody. F–H) Male enclosed in the juvenile cuticle. F) Anterior region. G) Lateral field. H) Posterior body region.

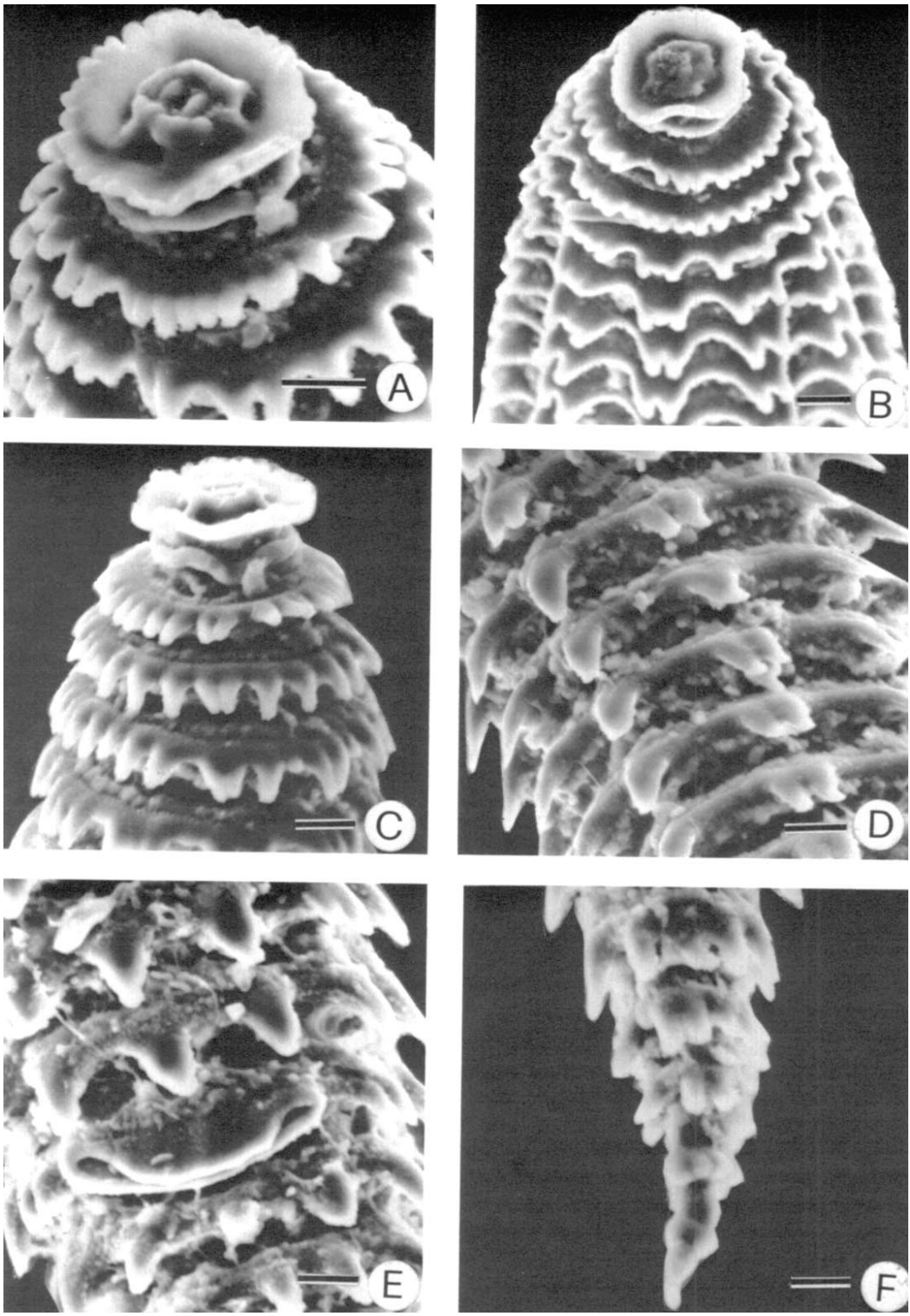

FIG. 5. SEM micrographs of *Ogma floridense* n. sp. females. Scale bars = 5 μm. A–C) Anterior body portion. D) Cuticle structure with most of the cuticular scales entire or divided into two projections. E) Vulva. F) Tail terminus.

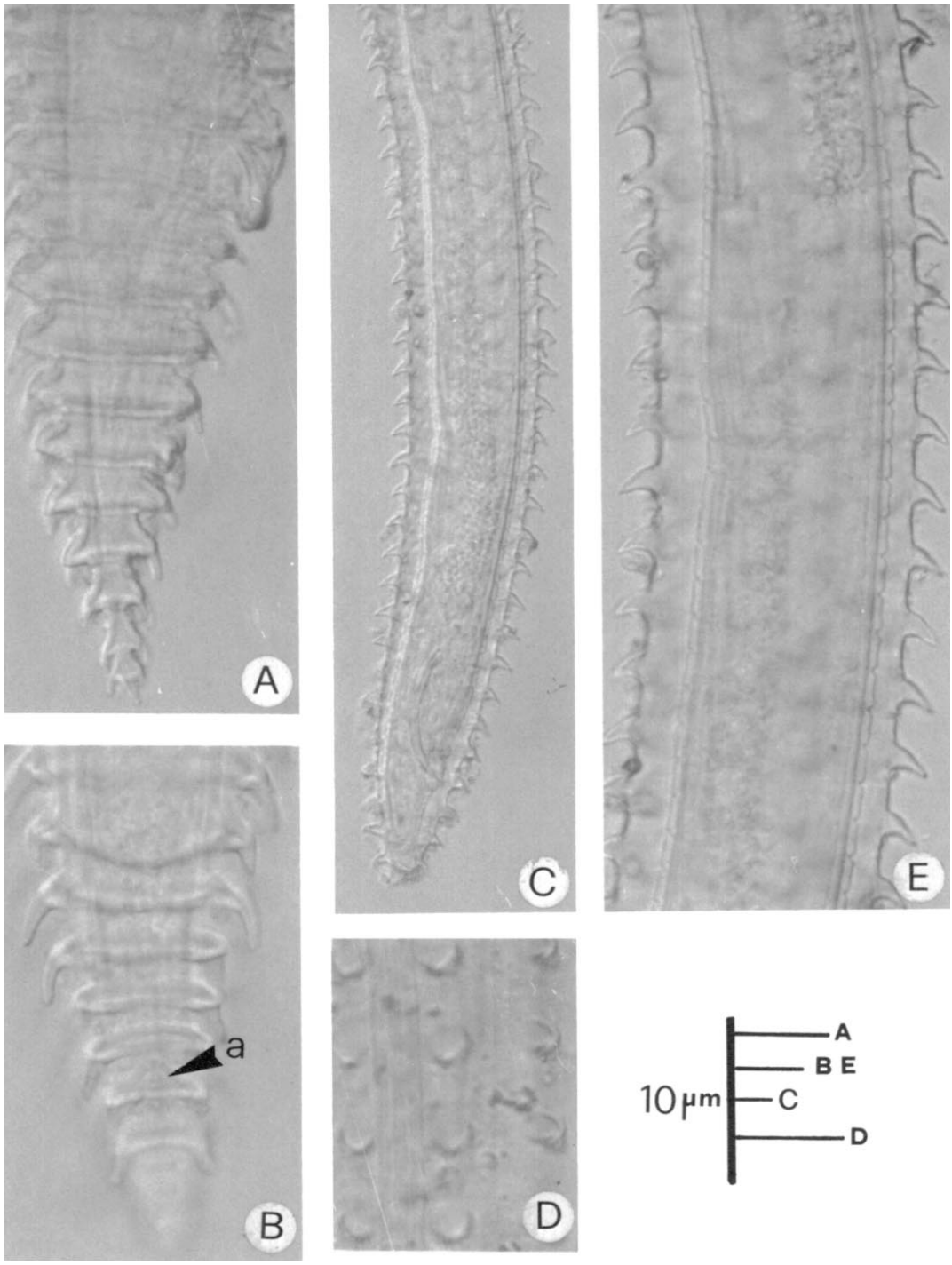

FIG. 6. Photomicrographs of *Ogma floridense* n. sp. female and male. A, B) Terminal posterior body portion, lateral and ventral view. a = anus. C) Posterior body portion of male. D) Male lateral field with four incisures. E) Cuticular structures of juvenile and male cuticle.

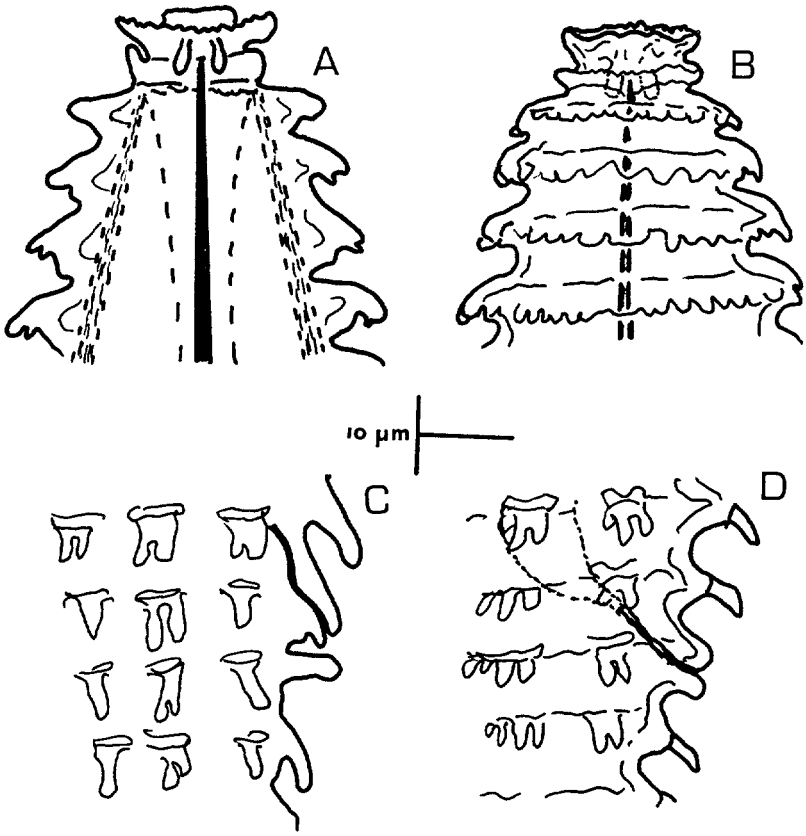

FIG. 7. Morphological characteristics of *Ogma floridense* and *O. hungaricum* females. A, C) Anterior body portion and cuticular scales of *O. floridense.* B, D) Anterior body portion and cuticular scales of *O. hungaricum.* The difference in diameter between the first two annuli is greater in *O. floridense* (A) than in *O. hungaricum* (B). Note the entire or bifid scales of *O. floridense* (C) compared with those of *O. hungaricum,* which are divided into three or four processes (D).

ambar styraciflua L. in swamps in the Aucilla wildlife management area northwest of Perry, Taylor County, Florida.

Type specimens

Female holotype and the single male, slide V-101-90-1, deposited in the Nematode Collection of the Istituto di Nematologia Agraria del Consiglio Nazionale delle Richerche, Bari, Italy. One glass slide with two specimens deposited as for *M. ornicauda* paratypes.

Diagnosis

Ogma floridense n. sp. is characterized by having 1) first labial annulus wider than the second, marked by distinctive crenations (Fig. 5A, C), 2) robust stylet (87–98), 3) 52–57 body annuli, strongly retrorse with scales 3–8 long, arranged in 10 longitudinal rows at midbody, 4) scales usually entire or divided in two processes (Figs. 4A, B, D; 5B–D).

Relationships

Ogma floridense n. sp. is most closely related to *O. hungaricum* (Andrássy, 1962) Siddiqi, 1986 (1,4,5) (Fig. 7B, D). The *Ogma floridense* female can be distinguished from *O. hungaricum* by the following: the first labial annulus wider than the second (Fig. 7A), vs. being subequal in *O. hungaricum* (Fig. 7B) (1,4); annulus scales predominantly entire or divided into two processes (Figs. 5D, 7C) vs. three, sometimes two or four in *O. hungaricum* (Fig. 7D); shorter body length (360–471 vs. 480–550); shorter stylet (87–98 vs. 95–110); a more anterior excretory pore (Rex = 17–19 vs. 21–23) (1,4).

Remarks

Ogma is a neuter name in accordance with Article 30 (a) of the International Code of Zoological Nomenclature.

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