

Description of *Discocriconemella mineira* n. sp. and *D. degrissei* Males from Brazil¹

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Abstract: A new species of *Discocriconemella* and the male of *Discocriconemella degrissei* are described from Minas Gerais state of Brazil. *Discocriconemella mineira* n. sp. differs from *D. discolabia* by having a longer stylet (61–71 vs. 35–47 μm) and fewer body annuli (78–88 vs. 155–174), and from *D. inarata* by the longer stylet (61–71 vs. 51–61 μm) and shorter body length (253–342 vs. 354–486 μm). It differs from *D. persae* by having a shorter stylet, fewer body annuli, and a shorter post vulval body portion ($R_v = 6-7$ vs. 14–20). *Discocriconemella mineira* can be separated from *D. degrissei* by the head disc which is round in *D. mineira* and quadrilobate in *D. degrissei*. Males of *D. degrissei* resemble those of *D. retroversa*.

Key words: Criconeematidae, morphology, SEM, taxonomy.

During a nematode survey carried out in 1987 in Brazil, soil samples were collected from native forests in the southern part of Minas Gerais state. Some of these samples contained all stages of *Discocriconemella degrissei* Loof & Sharma, 1980, including adult males and specimens of a new *Discocriconemella* that is described here.

The original description of *D. degrissei* was based only on females collected in the Bahia state, Brazil. Males are described here for the first time, and information is given on the morphometrical characteristics of females as observed with scanning electron microscopy (SEM).

MATERIALS AND METHODS

Nematodes were extracted from soil samples by Cobb's decanting and sieving method. They were prepared for light microscopy observations by fixation in hot 4% formaldehyde + 1% propionic acid and processed to glycerine (7). Wergin's methods (8) were used for the preparation of nematodes for SEM observation. Specimens were coated with gold and observed with a JEOL 50-A stereoscan at 5 kV of accelerating voltage.

SYSTEMATICS

Discocriconemella mineira n. sp. (Figs. 1, 3A–D, 4A–F)

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

Females ($n = 20$): Relaxed body curved ventrally, cylindrical. Annuli with posterior margins smooth, few anastomoses. Head disc round without indentations, 10–12 μm wide. Labial plate inside head disc with small projections, resembling rudimentary lobes. Oral opening I-like. Conspicuous amphid apertures slit-like. Narrow collar present, between head disc and first body annulus, visible in profile, more or less distinct. Stylet well developed, knobs anteriorly directed, 9–11 μm across. Excretory pore at level or anterior to esophagus base. Ovary outstretched. Spermatheca oval, diameter 10–12 μm , sperm present. Vagina slightly curved. Vulva open, on eighth annulus from posterior terminus, anterior lips bilobed. Anal opening distinct, pit-like, at posterior margin of 4–5th annulus from posterior terminus. Tail bluntly conoid, terminal annulus often lobed.

Males: Not observed.

Diagnosis: *Discocriconemella mineira* n. sp. shares the characteristic shape of a round head disc, without indentations, with three species of the genus (*D. discolabia* Diab & Jenkins, 1966; *D. inarata* Hoffmann, 1974; and *D. perseae* Cid del Prado Vera & Loof, 1984). It differs from *D. discolabia* mainly by fewer body annuli (78–88 vs. 155–174),

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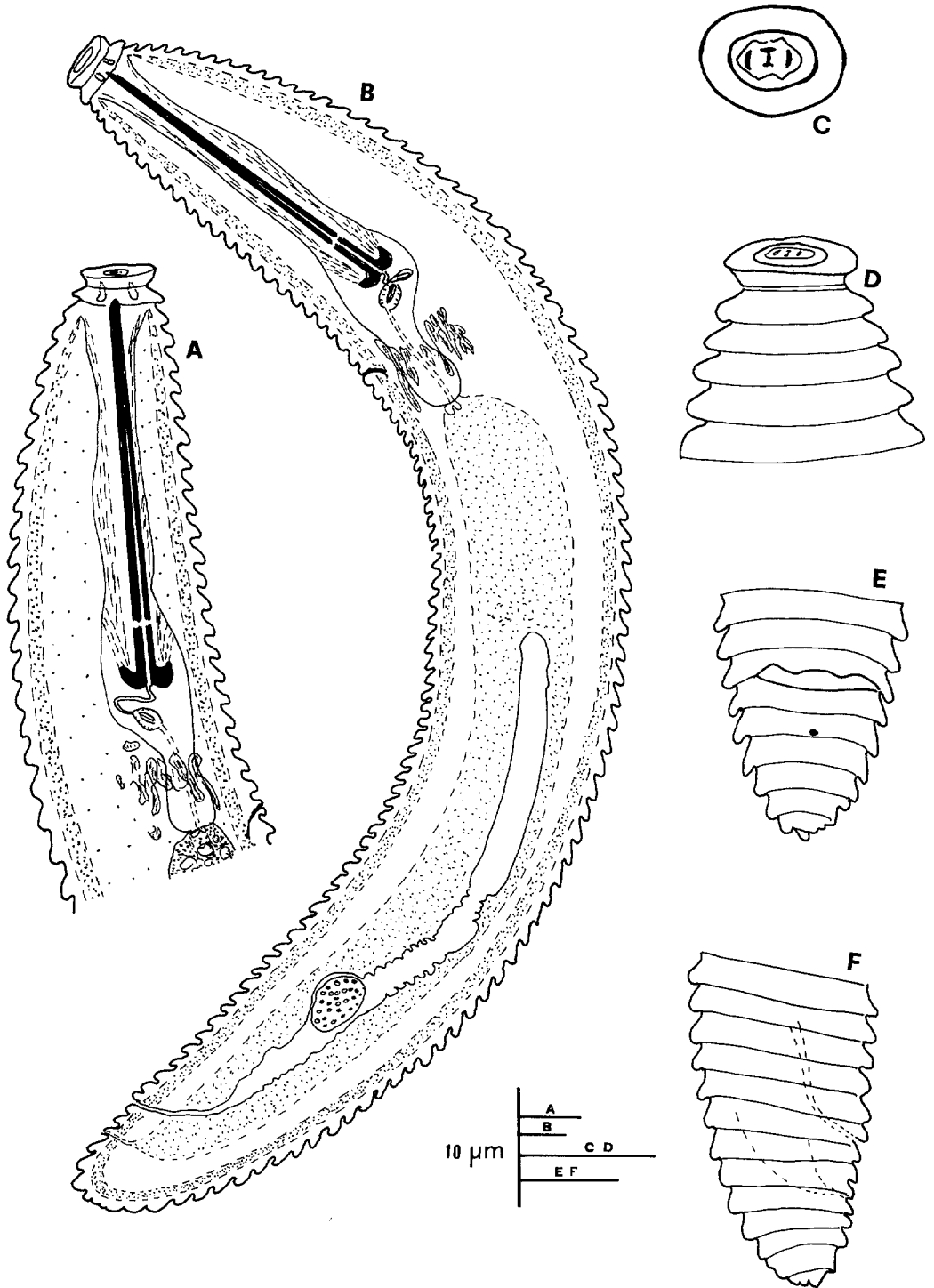


FIG. 1. *Discocriconemella mineira* n. sp. female. A) Anterior region. B) Entire female. C) En face view. D) Head region, profile. E) Posterior body region, ventral view. F) Post-vulval body region, lateral view.

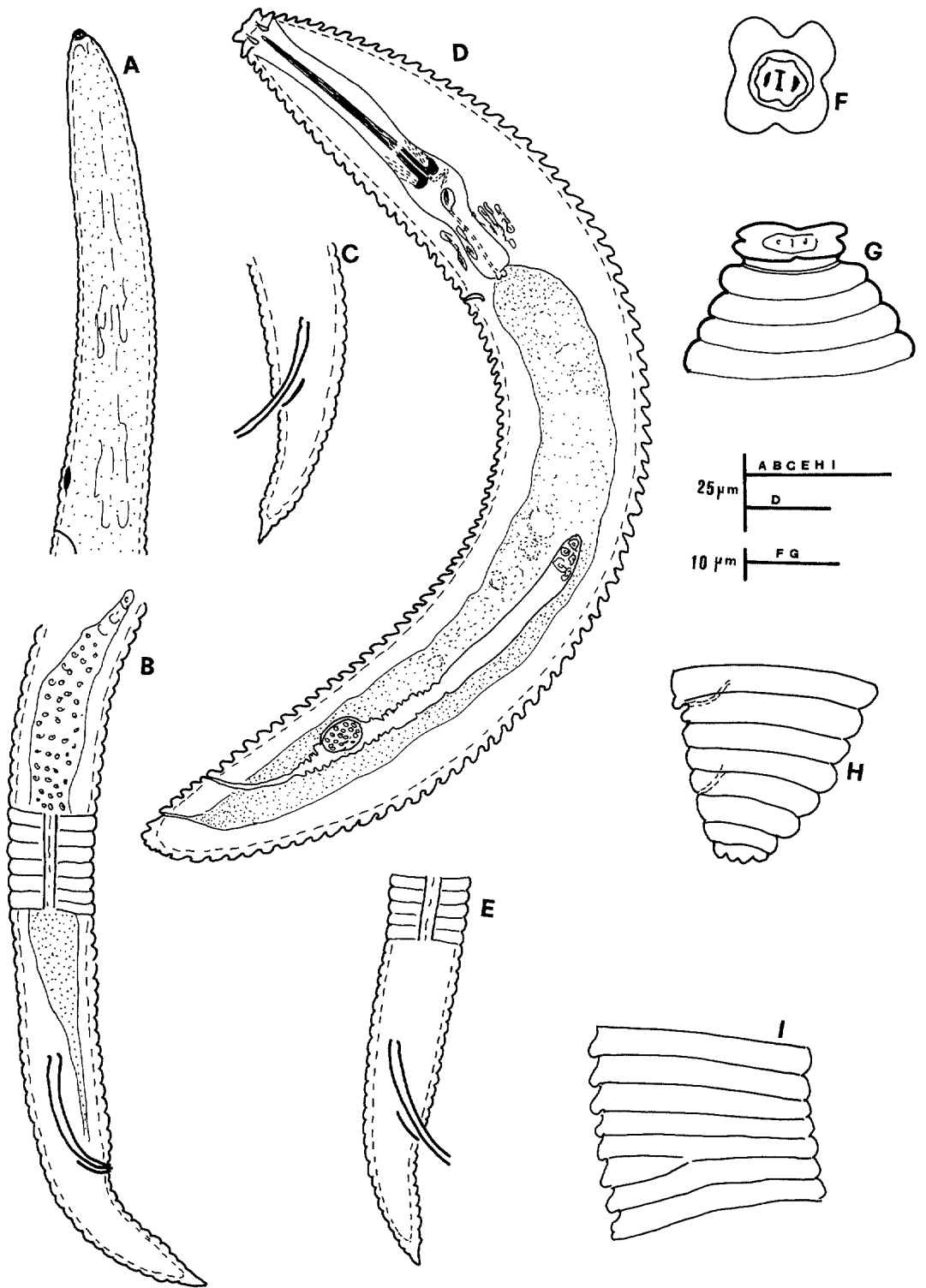


FIG. 2. *Discocriconemella degrissei* male and female. A) Male anterior region. B, C, E) Male, posterior body region. D) Female, entire body. F) Female, en face view. G) Female, profile of head region. H) Female, lateral view of post-vulval region. I) Female, cuticular structure, surface view.

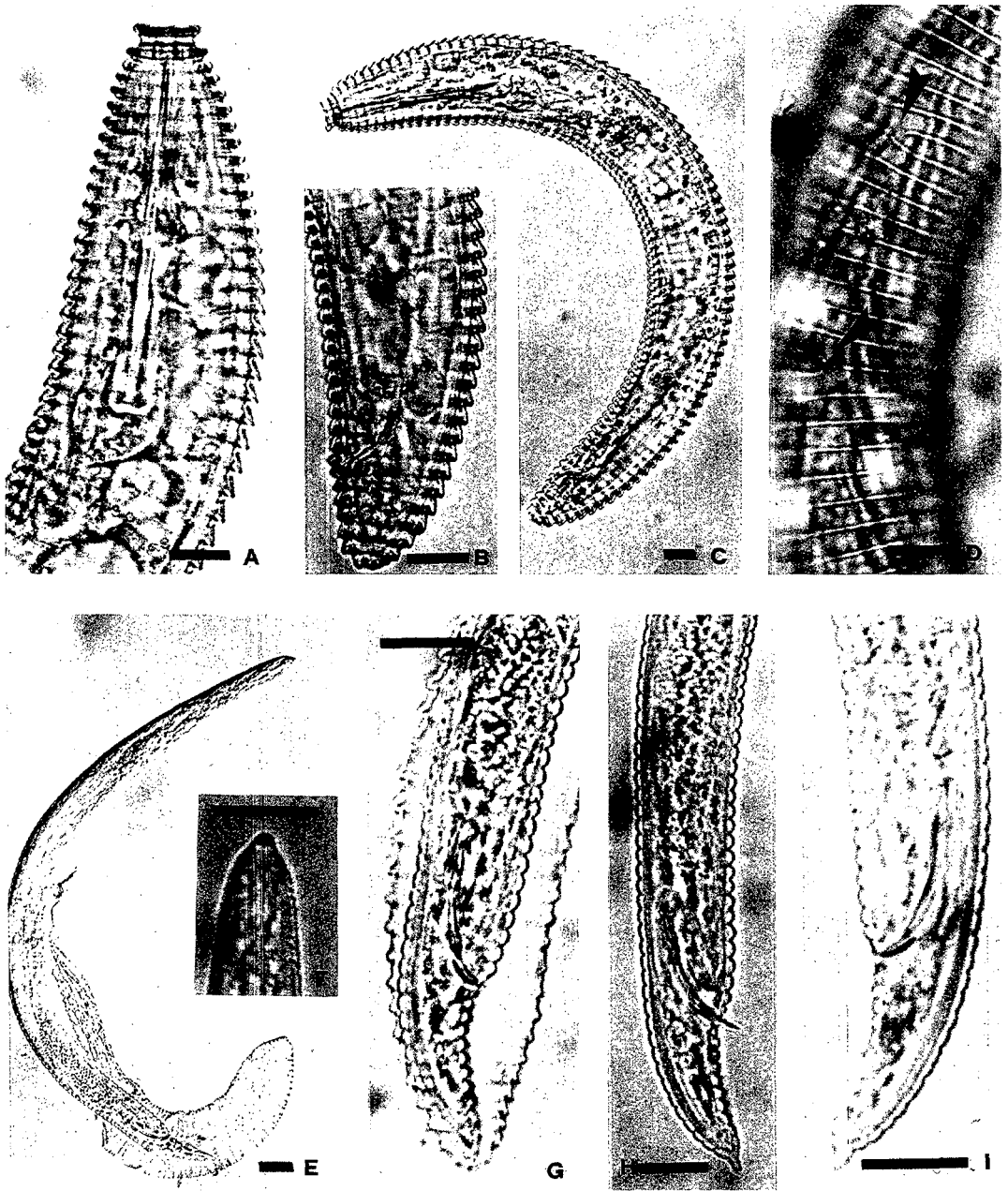


FIG. 3. Photomicrographs of *Discocriconemella mineira* n. sp. and *D. degrissei*. Scale bars = 10 μ m. A–D) Females of *D. mineira* n. sp. A) Anterior region. B) Posterior body region. C) Entire female. D) Cuticular structure, surface view showing anastomoses. Arrows indicate anastomosed annuli. E–I) Male of *D. degrissei*. E) Enclosed in the juvenile cuticle. F) Anterior region. G–I) Posterior body region.

longer stylet length (61–71 vs. 35–47 μ m), and by the more posterior vulva (Rv = 6–8 vs. 15–17), and anus (Ran = 4–5 vs. 12–14). It differs from *D. inarata* in body length (L = 253–342 vs. 354–486 μ m), longer stylet length (61–71 vs. 51–61 μ m), by the

distinctly offset and continuous head disc annulus, the presence between the head disc and first body annulus of a distinct collar, and the posterior positioned anus (Ran = 4–5 vs. 6). Our SEM view (Fig. 4B, D) shows that inside the head disc is the

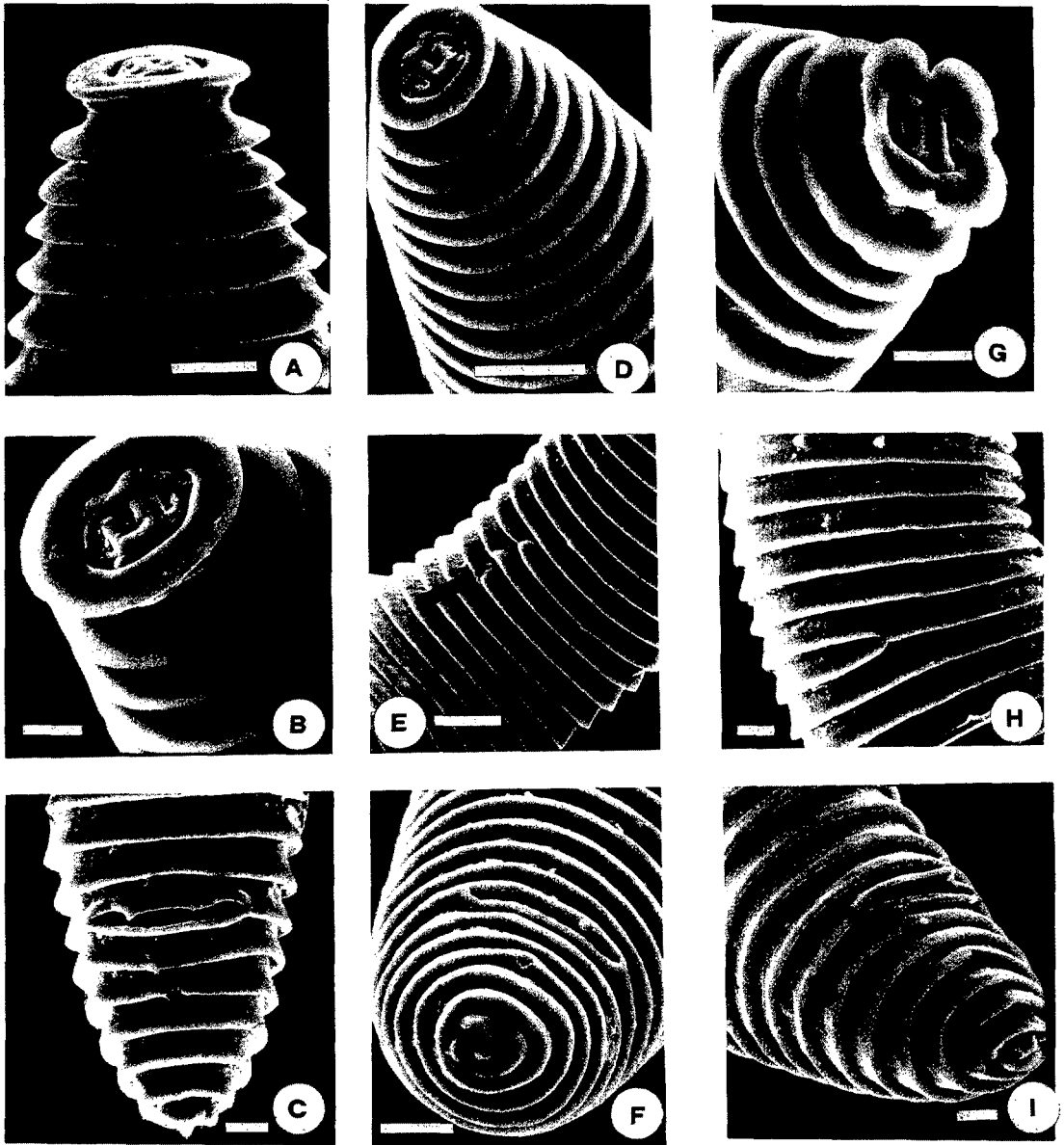


FIG. 4. SEM micrographs of *Discocriconemella mineira* n. sp. and *D. degrissei*. Scale bars = 5 μ m. A-F) Females of *D. mineira* n. sp. A) En face view. B, D) Anterior body region. E) Excretory pore region, arrow indicates pore. C, F) Posterior body region. G-I) Females of *D. degrissei*. G) Anterior body region. H) Cuticular structure, surface view. I) Posterior body region.

labial plate, bearing large oral and amphid apertures, and small projections resembling rudimentary submedian lobes. The SEM photograph presented by Cid del Prado Vera and Loof (1) of a paratype female of *D. inarata* shows no evidence of submedian lobes or similar structures.

Discocriconemella mineira differs from *D. perseae* by its shorter stylet length (51-61

vs. 69-86 μ m), length and shape of the post vulval body portion ($R_v = 6-7$ vs. 14-20; $VL/VB = 0.8-1.0$ vs. 1.4-2.2), and fewer total number of body annuli ($R = 78-88$ vs. 108-126). *Discocriconemella mineira* n. sp. can be separated from *D. degrissei* Loof & Sharma, 1980 by the head disc that is round and smooth (Fig. 1), whereas in *D. degrissei* it is quadrilobate (Fig. 4).

TABLE 1. Measurements of 20 females of *Discocriconemella mineira* n. sp. from Minas Gerais state of Brazil.

Morphological characters	Holotype	Range (n = 21)	Average	Standard deviation
Measurements in μm				
L	300.0	253-342	304.0	26.0
Body width	40.0	31-41	36.0	3.1
Esophagus length	103.0	84-105	95.0	6.5
Excretory pore distance from anterior end	89.0	65-101	85.0	10.4
Stylet length	69.0	61-71	65.0	2.9
Head disc width, lateral view	12.0	11-13	12.0	0.5
Stylet knobs width	8.9	8.4-10.1	9.2	0.6
Tail length	11.2	8.7-14.0	11.0	1.4
Annuli number				
R (ventral side)	85	78-88	82	2.5
Rst	21	18-23	19	1.2
Roes	29	25-31	27	1.9
Rex	26	23-27	25	1.1
Rv	7	6-8	7	0.4
Ran	4	4-5	4	0.3
Percentages				
V	93	93-94	93.5	0.5
St%L	23	19-25	21.0	1.4
St%es	66	64-75	67.0	3.2
Ratios				
a	7.5	6.7-9.2	8.4	0.8
b	2.9	2.9-3.5	3.1	0.2
c	27.0	22-36	28.0	3.1
VL/VB	0.89	0.8-1.0	0.9	0.06
VL/St	0.30	0.26-0.34	0.29	0.3

Type host and locality: Collected from soil in a scrub forest located near the wood shop on the campus of the Universidade Federal de Viçosa, county of Viçosa, Minas Gerais state of Brazil.

Type designation: The female holotype and 12 paratypes have been deposited at Istituto di Nematologia Agraria del Consiglio Nazionale delle Ricerche, Bari, Italy. One slide containing two or three females has been sent to each of the following institutions: Departamento de Fitopatologia, Universidade Federal de Viçosa, MG, Brazil; Nematode Collection, Nematology Department, Rothamsted Experimental Station, Harpenden, Herts, England; Collection Nationale de Nématodes, Laboratoire des Vers, Muséum National d'Histoire Naturelle, Paris, France; Nematode Collection of the Landboowhogeschool, Wageningen, The Netherlands; USDA Nematode Collection, Beltsville, Mary-

land; University of California, Davis Nematode Collection, California.

Discocriconemella degrissei

Loof & Sharma, 1980

(Figs. 2A-C, E; 3E-I; 4H)

Males (n = 12): L = 331 ± 21 (308-366) μm ; maximum body width = 16 ± 1.6 (14-18) μm ; a = 21 ± 2.6 (18-26); c = 13 ± 1.2 (11-14); post-cloacal body portion = 26 ± 3.6 (22-30) μm ; spicules = 23 ± 1.0 (22-25) μm ; gubernaculum = 4-5 μm ; excretory pore distance from anterior end = 85 ± 7.2 (80-89) μm .

Relaxed body curved ventrally, cylindrical. Generally a little longer than female. Generally total number of annuli about 2 \times females. Cephalic region not set off, conical, annulation fine, capped by small conical knob. Anterior body annuli fine, more distinct on mid-body and tail (2.0-2.3 μm). Lateral field with two distinct incisures;

sometimes one additional incisure occurs between them, incomplete, very fine. Stylet absent. Esophagus degenerate. Hemizonid occupying one or two annuli, 7–8 μm anterior to excretory pore, about 73–81 μm from anterior end. Reproductive system extends anteriorly 80–115 μm , about 30% body length. Spicules slender, very slight ventral curvature. Gubernaculum simple. Caudal alae absent. Tail conical, terminus pointed.

Females ($n = 10$): $L = 313 \pm 17$ (281–338) μm ; $a = 7.0 \pm 0.4$ (6.4–7.7); $b = 3.1 \pm 0.3$ (2.8–3.8); $c = 26 \pm 2.4$ (23–32); $V\% = 92.6 \pm 0.4$ (92–93.5); stylet length = 64 ± 1.7 (62–67) μm ; $St\%L = 20 \pm 0.9$ (19–22); $VL/VB = 0.84 \pm 0.1$ (0.70–1.15); $Rst = 17 \pm 1.2$ (15–19); $Roes = 25 \pm 1.3$ (23–27); $Rex = 25 \pm 1.7$ (21–28); $Rv = 7 \pm 0.4$ (6–8); $Ran = 4 \pm 0.6$ (3–5); $R = 78 \pm 1.6$ (76–80).

Diagnosis: *Discocriconemella* males are reported for only six species. All of them, including *D. degrissei* males, have conoid or rounded lip regions surmounted by a distinct knob or disc which seems to be a rudimentary head disc. Tails of *Discocriconemella* males vary in shape, from rounded to conical, with or without a short projection at the terminus. *Discocriconemella degrissei* males closely resemble those of *D. retroversa* Sauer & Winoto (6), but females of the two species are clearly separated by distinct morphometric characteristics.

Illustrations and morphometrics of *D. degrissei* females from Viçosa, Minas Gerais state, do not differ from the original description of Loof and Sharma (4) and those reported by Rashid et al. (5). Our SEM observations showed the body annuli with smooth posterior margins and very few anastomoses (Fig. 4H). Anterior end is disc shaped and is separated from the remainder of the body by a distinct neck. The head disc has two deep dorsal and ventral indentations and two shallower lateral ones.

Vulva opening is located on the posterior margin of a ventrally enlarged vulva–annulus. The vulva lips are equal in size, posteriorly directed, and protrude slightly from the body surface. Anal opening is a circular pore half an annulus wide on fourth body annulus from the posterior terminus.

Type host and locality: Collected from soil in a scrub forest on the Sao Geraldo farm belonging to Francisco Ferreira de Paula, km 12 on the Viçosa–Paula Cândido road, county of Paula Cândido, Minas Gerais state of Brazil.

Deposition of specimens: Specimens were deposited as follows: 15 males at Instituto di Nematologia Agraria del Consiglio Nazionale delle Ricerche, Bari, Italy; and one glass slide containing two specimens to each of the same nematode collections as the *D. mineira* n. sp. paratypes.

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