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Mesocriconema kirjanovae (Nematoda: Criconematidae) from Southeastern Spain

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Abstract: An abundant female population of a criconematid species identified as *Mesocriconema kirjanovae* (Andrássy, 1962) Loof & De Grisse, 1989 is reported from a natural habitat in southeastern Spain. Measurements and morpho-anatomy obtained with light microscopy and scanning electron microscopy are included and compared with previous data on this species.

Key words: Criconematidae, *Erica* sp., *Mesocriconema annulatiforme, M. kirjanovae, M. raskiense,* morphology, nematode, ring nematode, scanning electron microscopy (SEM), Spain, taxonomy.

The status of *Macroposthonia* de Man, 1880 has been controversial for many years. Recently, however, (3) a meeting was held at the Institute of Zoology at the State University, Gent, Belgium, at which all participants agreed with the arguments by Luc and Raski (7) for considering *Macroposthonia* de Man, 1880 a *genus dubium* and the type species, *M. annulata* (syn. *M. kirjanovae* (Andrássy, 1962) De Grisse and Loof, 1965) a *species dubium.* Loof and De Grisse (6) replaced the generic name *Macroposthonia* de Man, 1880 by the next available synonym *Mesocriconema* Andrássy, 1965 (2). According to these authors, specimens identified as *Macroposthonia annulata* are conspecific with *Mesocriconema kirjanovae,* which Luc and Raski (7) regard as a valid species. In the present article, the morphology of specimens of *M. kirjanovae* in southeastern Spain is presented with LM and SEM observations to clarify identity of the species and extend its known range in variation.

Materials and Methods

Specimens used in this study were extracted from soil by centrifugation, fixed in hot 4% formaldehyde:1% propionic acid, and processed to glycerine by Seinhorst's rapid method. Wergin's method (9) was used for preparing 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 (8). All measurements are in micrometers (μm) unless otherwise stated.

Table 1. Morphometrics of 15 females of *Mesocriconema kirjanovae* (Andrássy, 1962) Loof & De Grisse, 1989 from southeastern Spain.

Morphological characters†	Average	Standard deviation	Range
	Measurements in μm		
Body length	491	7.47	449–559
Body width	54	0.79	50–60
Esophagus length	110	1.78	103–131
Excretory pore anterior end distance	108	2.02	103–112
Stylet length	62	0.46	58–64
Tail length	35	0.90	30–41
	Annule numbers		
R (ventral side)	80	1.07	71–87
Rst	14	0.22	13–16
Roes	22	0.23	20–23
Rex	22	0.31	21–23
RV	10	0.17	9–11
RVan	2	0.07	2–3
Ran	8	0.16	7–9
RB	6	0.10	6–7
	Percentages		
V	88	0.27	87–90
St % L	12.6	0.18	11.1–13.9
St % esoph	56.4	0.81	48.8–60.2
Cp % St	77.1	0.56	74.2–81.3
	Ratios		
a	9.1	0.14	8.0–10.0
b	4.5	0.09	4.0–5.4
c	14.5	0.37	11.8–16.7
VL/VB	1.4	0.02	1.3–1.6

† Abbreviations defined in Siddiqi (8).

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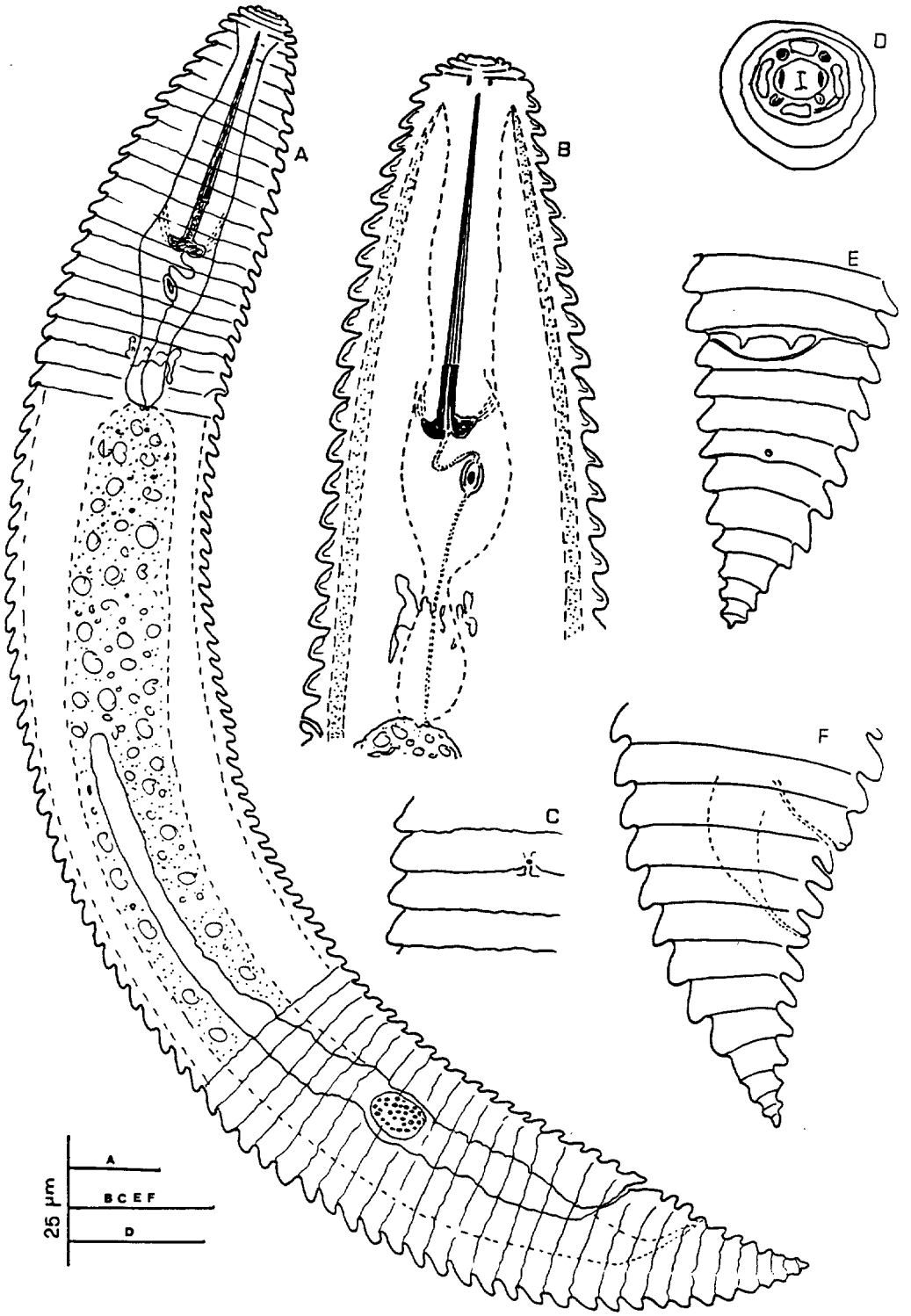

FIG. 1. *Mesocriconema kirjanovae* (Andrássy, 1962) Loof & De Grisse, 1989). A) Entire female. B) Female anterior region. C) Anterior body annules showing excretory pore. D) Face view. E, F) Tail regions (ventral and lateral, respectively).

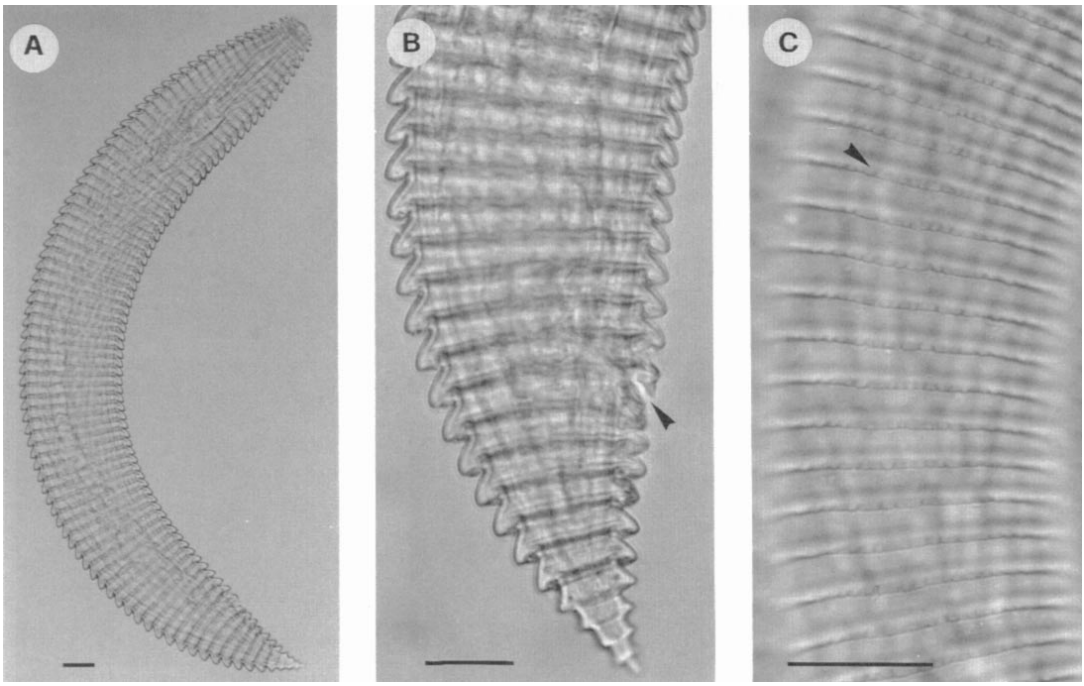

FIG. 2. Photomicrograph of *Mesocriconema kirjanovae* (Andrássy, 1962) Loof & De Grisse, 1989. A) Entire female. B) Tail region. C) Body annules of fourth-stage juvenile showing crenations (scale bars = 2 μm; arrows show vulva and juvenile annuli crenations, respectively).

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Mesocriconema kirjanovae (Andrássy, 1962)
Loof & De Grisse, 1989
(Figs. 1–4)

Description

Females in glycerine (n = 15): Measurements in Table 1. Body ventrally arcuate, tapering toward both extremities, especially posterior end. Body annules retrorse, posterior edges smooth, sometimes with very fine crenation. Anastomoses very rare (Fig. 4). Lip region not set off; four small submedian lobes present equally spaced around labial disc. Amphidial aperture oval, lateral to labial disc. Oral opening I-shaped. Second head annule wider than first, 20.6 ± 0.26 (20–22), 16.0 ± 0.47 (14–18), respectively. Stylet moderately robust; knobs forwardly directed, 11.5 ± 0.50 (11–12) wide. Excretory pore about 100 from anterior end (Rex = 22 [21–23]); at level of esophagus base or anterior. Spermatheca broadly oval to almost round, filled with spherical sperms. Vulva open; anterior lip slightly protruding as small flap, ending with two thorn-like projections. Vagina slightly curved, VL > VB. Tail conical, uniformly decreasing to single or bilobed terminus (Figs. 3E, F). Anal opening distinct, pit-like, usually located two, rarely three annules posterior to vulvar opening.

Fourth-stage juvenile female: Similar to the adult female in all morphological characteristics, the only exception being the posterior edges of body annules, which are characterized by distinct crenate posterior margins (Fig. 2C).

Male: Not found.

Habitat and locality

Specimens were collected around roots of *Erica* sp. at Capileira, Sierra Nevada, Granada, southeastern Spain.

Remarks

Measurements as well as general morphology of *M. kirjanovae* in Spain closely conform with the original description (1)

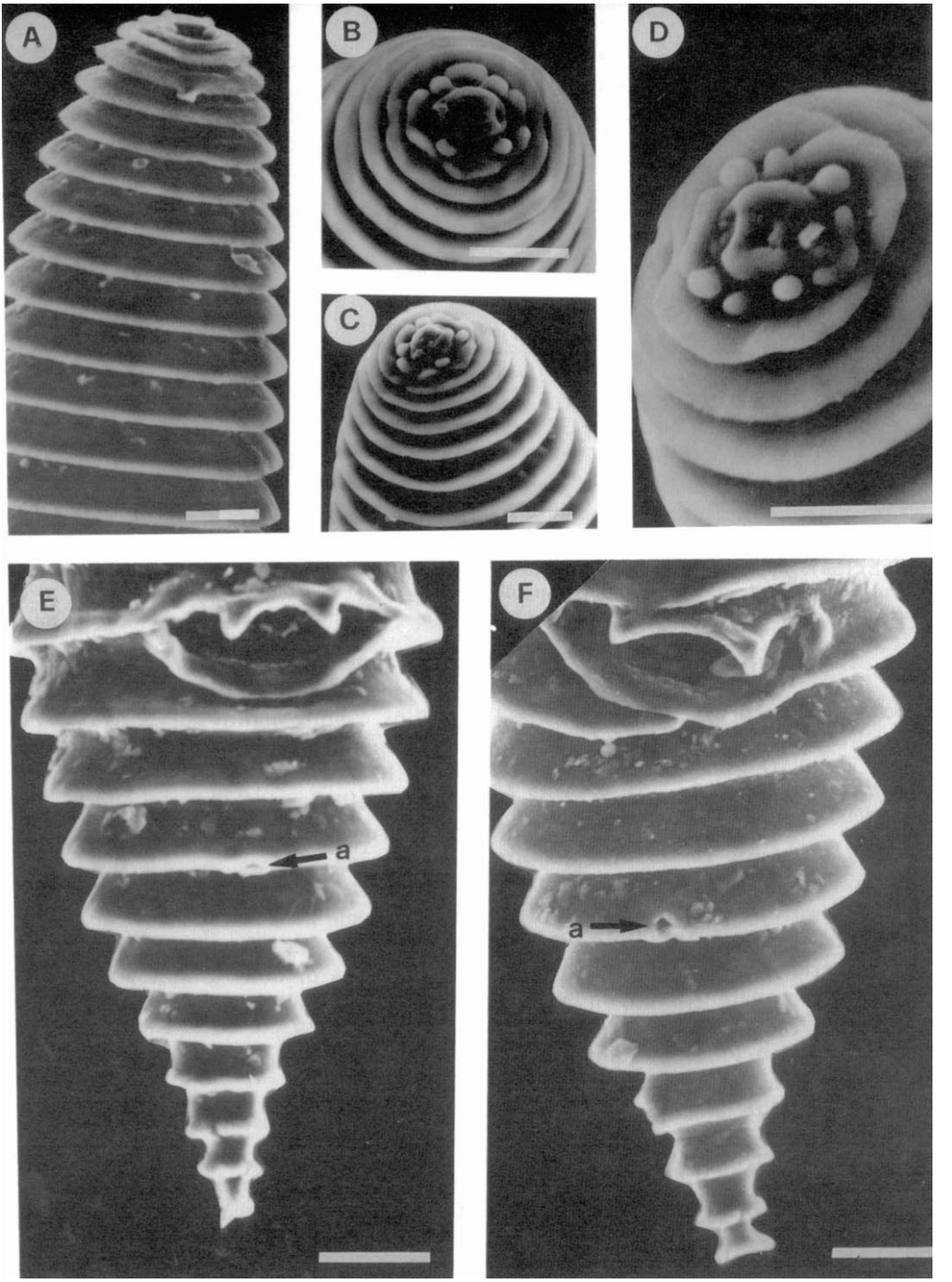

FIG. 3. SEM micrographs of *Mesocriconema kirjanovae* (Andrássy, 1962) Loof & De Grisse, 1989. A) Female anterior region. B–D) Lip regions. E, F) Tail regions (a = anus; scale bars = 10 μm).

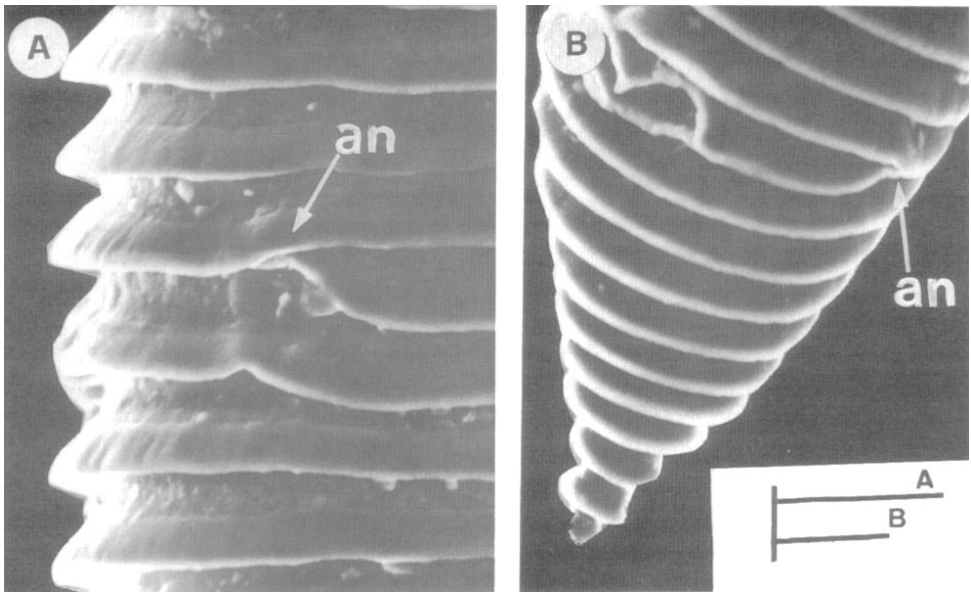

FIG. 4. SEM micrographs of *Mesocriconema kirjanovae* (Andrássy, 1962) Loof & De Grisse, 1989. A, B) Annules at anterior and posterior regions showing anastomoses, respectively (an = anastomose, scale bars = 10 μm).

and those reported by De Grisse (5), except for a slight difference in body and stylet lengths in the original population (449–559, 58–64 vs. 380–410, 51–54, respectively).

De Grisse (4) on the specific differentiation of *M. raskiense* (De Grisse, 1964) Loof & De Grisse, 1989 from *M. kirjanovae* reports absence of anastomosed annules for *M. kirjanovae*. In our population, although rare, anastomoses involving only two annules may be present (Fig. 4A, B) at mid- and posterior body portions.

Mesocriconema kirjanovae shares the characteristic conical postvulvar body portion and pointed tail with species of the genus *Mesocriconema* Andrássy, 1965 (Table 2). The female posterior body of *M. kirjanovae* uniformly decreases to a single or bilobed tail terminus, establishing an important differentiating character between this species and *M. annulatiforme*, which often

TABLE 2. Minimum and maximum values of the most important diagnostic characteristics of *Mesocriconema* species having conical tails.

Species	R	RV	Ran	VL/VB	L	V	St
annulatiforme	84–100	9–12	6–9	1.3–1.9	386–610	89–94	58–64
britsiense	90	9	6	1.2	390	91	53
denoudeni	101–126	8–11	6–8	1.0–1.3	402–517	92–93	54–59
kirjanovae†	76–89	10–12	8–9	1.4	380–410	88–90	51–54
annulata‡	73–89	9–12	7–8	1.2–1.6	370–512	86–92	51–60
kirjanovae§	71–87	9–11	7–9	1.3–1.6	449–559	87–90	58–64
ornicauda	92–111	10–12	6–9	1.1–1.6	366–465	88–93	43–50
parareedi	111–121	12–13	3–5	1.3–1.6	380–480	88–90	59–66
peruense	79	7		1.2	536	93	75
peruensiforme	69	7	4	1.0	648	93	87
raskiense	62–72	9–12	6–9	1.3–1.9	450–509	85–90	50–56
reedi	104–112	9–10	5–7	1.1–1.3	360–460	90–92	51–62

† From Andrassy, 1962.
‡ From De Grisse, 1965.
§ From southeastern Spain.

bears irregularities on the terminal tail annules. In addition, *M. kirjanovae* and *M. annulatiforme* differ by the following characteristics: a) RVan = 1–2 in *M. kirjanovae* (also in the Spanish population) and 2–4 in *M. annulatiforme;* b) J 4 body annules crenate in *M. kirjanovae,* smooth in *M. annulatiforme.*

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