

Ogma toparti sp. n. and two known *Criconematoidea* from the French Caribbean (Nemata : Tylenchina)

Esther VAN DEN BERG* and Patrick QUÉNÉHERVÉ**

* National Collection of Nematodes, Biosystematics Division, Plant Protection Research Institute, Private Bag X 134, Pretoria, South Africa and

** Laboratoire de Nématologie, Centre ORSTOM, B.P. 8006, 97259 Fort-de-France, Martinique.

Accepted for publication 2 August 1994.

Summary – *Ogma toparti* sp. n. is described and figured from Martinique. Females are characterized by 47 to 52 retrorse body annuli with twelve longitudinal rows of scales at midbody which are more irregularly spaced on dorsal side of body, reticulate pattern on cuticula, one lip annulus which is smaller than first body annulus, a 56 to 66 μm long stylet and scalloped vulval lips. A key to those *Ogma* species with twelve longitudinal rows of scales is given. *Criconema longulum* Gunhold, 1953 and *Paratylenchus coronatus* Colbran, 1965 are reported from Guadeloupe for the first time.

Résumé – *Ogma toparti* sp. n. et deux *Criconematoidea* déjà connus, provenant des Antilles françaises (Nemata : Tylenchina) – *Ogma toparti* sp. n., provenant de la Martinique, est décrit et illustré. Les femelles sont caractérisées par : 47-52 anneaux retorses comportant au milieu du corps douze rangées longitudinales d'écaillés, plus ou moins régulièrement espacées sur la face dorsale du corps; tracé réticulaire sur la cuticule; un seul anneau labial, moins large que le premier anneau du corps; stylet long de 56-66 μm ; lèvres vulvaires dentelées. Une clé des espèces d'*Ogma* présentant douze rangées d'écaillés cuticulaires est proposée. *Criconema longulum* Gunhold, 1953 et *Paratylenchus coronatus* Colbran, 1965 sont signalés pour la première fois en Guadeloupe.

Key-words : *Criconema*, Guadeloupe, Martinique, nematodes, *Ogma*, *Paratylenchus*, taxonomy.

Three recent papers (Van den Berg & Cadet, 1991, 1992; Van den Berg & Quénehervé, 1993) reported on new and known plant-parasitic nematode species from the French Caribbean. Further collections revealed the presence of two more known and one new species from this area. *Criconema longulum* Gunhold, 1953 and *Paratylenchus coronatus* Colbran, 1965 are new records for this area. *Ogma toparti* sp. n. is described and figured. Descriptions are given for the two known species and SEM photographs for two of the species. A key to those *Ogma* species with predominantly twelve longitudinal rows of scales is given.

Extracting and handling procedures were similar to those given by Van den Berg and Cadet (1991).

Criconema longulum Gunhold, 1953

(Figs 1, 2)

This species appears to be widespread. First described from Austria by Gunhold (1953), it was also reported from white birch (*Betula papyfera*) in Canada (Wu, 1965), *Scirpus americanus* on a beach in California and grass in Hawaii (Raski & Golden, 1966). It was further reported by De Grisse (1968) from Europe, USA and Canada and by Hoffman (1974) from the USA. Recently Minagawa (1981) reported it from many different plants in Japan. Bernard (1982) reported speci-

mens from *Elymus mollis* from the Aleutian islands, Alaska.

Presently it was found on the Soufrière volcano in Guadeloupe.

MEASUREMENTS

See Table 1 (measurements are presented and compared with previously described species from other localities).

DESCRIPTION

Females : Body curved ventrad into an open C. Lip region with two annuli, both projecting mostly outward with smooth margins; labial area raised high above first lip annulus with six pseudolips and a prominent labial disc. Lip region easy discernable from larger first two body annuli which are slightly retrorse with coarse posterior margins. All succeeding body annuli retrorse with coarse posterior margins gradually becoming more retrorse towards posterior end of body up till last five annuli which are drawn out, fused together and not retrorse. Stylet slender, strongly curved ventrad or dorsad with slender, cupped basal knobs with a deep hollow posteriorly. Hemizonid not seen. Excretory pore situated from opposite to four annuli posterior to base of oesophagus. Anastomoses very rare. Spermatheca small, round and empty in all specimens. Vulval opening

Table 1. Comparison of measurements (in μm) of females of *Criconema longulum* Gunhold, 1953 from Guadeloupe with those of other localities (Measurement in μm).

Characters	Guadeloupe	Europe		North America, Canada and Alaska (3)	Japan (4)
		Previously described (1)	Norgerholt and Hockai (2)		
n	10	?	12	70	62
L	322 \pm 37.7 (277-376)	240-500	418 \pm 18 (397-439)	350-622	321-458
a	9; 8 (n = 2)	6-9	10 \pm 0.9 (10-12)	9-15	7-11
b	3 \pm 0.2 (3-4)	3	4	3-6	3-5
c	9 \pm 1.2 (7-11)	10-12	12 \pm 1.2 (10-13)	8-17	10-22
o	6 (n = 2)	-	6 \pm 0.4 (6-7)	-	-
DGO (5)	4; 5 (n = 2)	-	-	4-7	-
V	83 \pm 1.2 (81-85)	81-89	86 \pm 1 (85-87)	81-88	82-91
OV	38 (n = 1)	-	51 \pm 3.2 (47-56)	48-63	-
R	78-85	79-90	85-89	67-95	57-71
RSt	19-22	12-24	16-18	12-14	-
ROes	25-26	21-25	22-24	-	-
Rex	25-27	19-29	26-28	19-26	18-22
RV	14-17	13-18	15-17	12-19	10-15
RVan	3-4	3-8	4-5	-	2-5
Ran	9-13	8-12	9-11	8-12	5-10
VLVB	2 \pm 0.3 (1-2)	3	2	-	-
St%L	25 \pm 3.2 (20-29)	16-20	14 \pm 5.1 (13-18)	-	-
First lip annulus diameter	13 \pm 0.7 (13-14)	-	13 \pm 0.4 (12-13)	12-17	-
Second lip annulus diameter	13 \pm 0.9 (11-14)	-	14 \pm 0.8 (13-15)	12-17	-
First body annulus diameter	18 \pm 1 (16-20)	-	18 \pm 0.9 (17-19)	-	-
Second body annulus diameter	21 \pm 1.8 (19-24)	-	21 \pm 1.1 (20-22)	-	-
Stylet length	79 \pm 3.1 (75-84)	70-83	76 \pm 3.3 (72-80)	55-88	63-79
Stylet knob width	9 \pm 0.6 (8-10)	-	8 \pm 0.5 (8-9)	7-10	8-10
Stylet knob height	3 \pm 0.5 (3-4)	-	3 \pm 0.4 (3-4)	-	4
Metenchium length	69 \pm 2.4 (66-72)	-	66 \pm 3.4 (63-71)	-	54-68
Telenchium length	10 \pm 1.1 (9-13)	-	10 \pm 3.4 (9-11)	-	-
Excretory pore from front	101 \pm 11.2 (88-115)	-	129 \pm 6.2 (122-139)	119-157	101-150
Width at midbody	39; 48 (n = 2)	-	40 \pm 3.7 (36-46)	-	-
Width at excretory pore	42; 48 (n = 2)	-	39 \pm 3.1 (35-44)	-	-
Annuli width at midbody	4 \pm 0.7 (4-5)	-	5 \pm 0.2 (5-6)	5-7	-
Tail length	35 \pm 4.1 (27-40)	-	36 \pm 4.2 (31-42)	30-55	22-40
Length of oesophagus	98 \pm 4.7 (89-105)	-	-	94-113	-

(1) According to De Grisse (1968) and Gunhold (1953).

(2) Original.

(3) According to Bernard (1982), Hoffman (1974), Raski and Golden (1966), and Wu (1965).

(4) According to Minagawa (1981).

(5) Dorsal oesophageal gland opening from base of stylet knobs.

covered with vulval flap with corners projecting further backward.

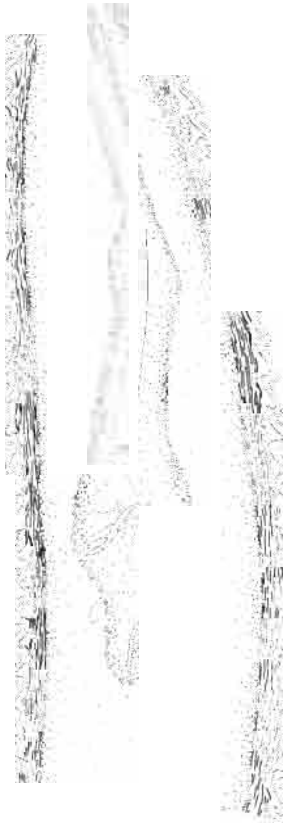
Male and juvenile : Not found.

DISCUSSION

The present specimens fit the various descriptions of the above mentioned authors well. They were also compared with ten specimens from Norgerholt, Holland and two specimens from Hockai, Belgium with which they

agree closely. For comparative purposes the measurements of the Dutch and Belgian specimens are presented in Table 1 together with those from other localities.

Amongst the Dutch specimens one female was found with two fully developed ovaries of equal length (194 μm and 194.5 μm), one normally developed vulva, vagina and vulval lip. One spermatheca is slightly larger, both are filled with small roundish sperm, the one situated about eighteen annuli and the other twelve annuli



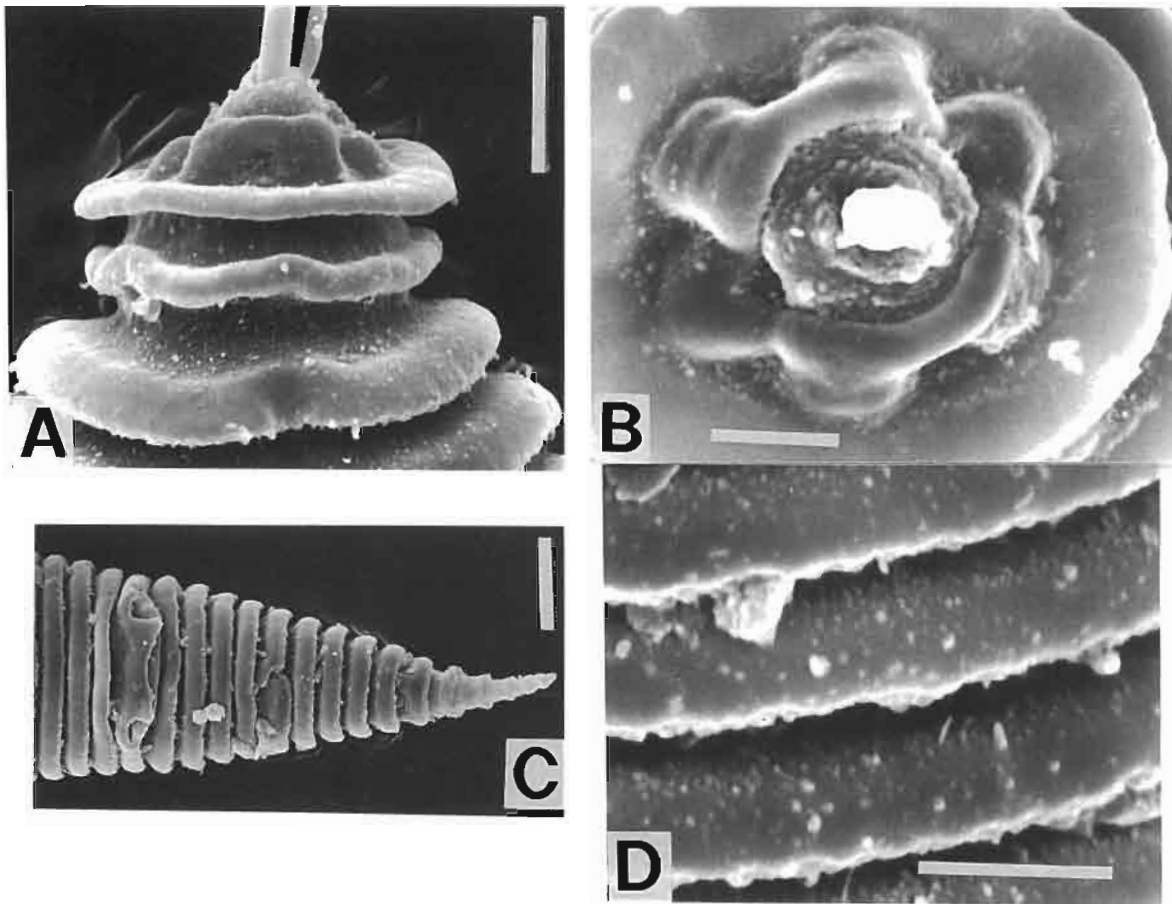


Fig. 2. *Criconema longulum* Gunhold 1953. Female. A : Lateral view of lip region; B : En face view of lip region; C : Posterior part of body; D : Annuli at midbody. (Bar = 2.5 μm in B, 5 μm in A, D and 10 μm in C).

Holotype female : L = 297 μm ; a = 6; b = 3; c = 84; o = 3; V = 91; OV = 41; stylet = 58 μm ; R = 49; RSt = 10; ROes = 17; Rex = 18; RV = 5; RVan = 3; Ran = 1; VL/VB = 0.8; ST%L = 21.

DESCRIPTION

Females : Body almost straight, at most curved slightly ventrad. Lip region with one annulus, diameter 18 ± 1.3 (15-20) μm , projecting outward or backward with wavy margin; in 75 % of specimens the lip annulus has a smaller diameter than first body annulus, in 5 % both have the same diameter, in 5 % it has a greater diameter and in the rest of the other 15 % the lip annulus is smaller but there is an additional half annulus, either dorsally or ventrally, between the lip and first body annulus; labial area slightly raised above lip annulus with six pseudolips and no submedian lobes; labial disc squarish. First and succeeding two body annuli diameters 22 ± 2.3 (17-24) μm , 27 ± 2.3 (23-30) μm and

32 ± 2.8 (27-36) μm respectively; first few body annuli mostly projecting outward, becoming more retrorse toward posterior end of body; at midbody there are twelve longitudinal rows of scales, the two opposite the lateral area of the body are situated fairly close together and somewhat separated from the dorsal and ventral rows; ventrally the four longitudinal rows are easy to distinguish and the scales are not quite as prominent as those dorsally which are also more irregularly spaced sometimes forming more than four rows for short stretches; anteriorly on body the scales are more broadly rounded becoming more pointed towards posterior end of body; reticulate pattern present on cuticula. Stylet well developed with cupped basal knobs, the latter 10 ± 0.8 (9-12) μm wide and 4 ± 0.5 (3-5) μm high. Metenchium 44 ± 2 (42-49) μm long and telenchium 15 ± 1.1 (12-18) μm long. Opening of dorsal oesophageal gland 2 ± 0.2 (1.5-2) μm from base of stylet knobs. Hemizoid not seen. Excretory pore situated from opposite to two annuli posterior to base of oesophagus, 105 ± 10.1

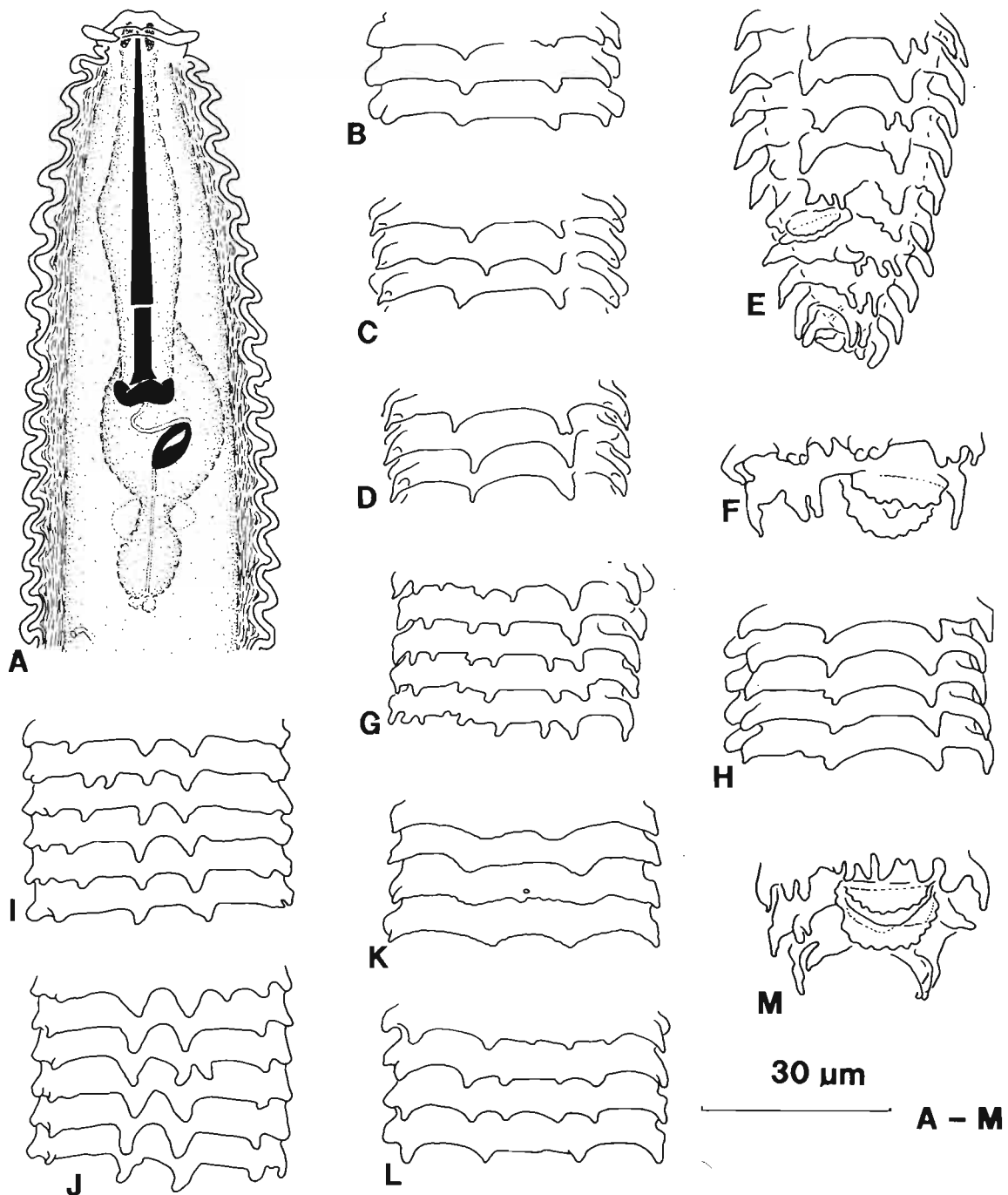


Fig. 3. *Ogma toparti* sp. n. Female. **A** : Anterior part of holotype body; **B** : Holotype, ventral annuli with projections opposite stylet knobs; **C** : Holotype, ventral annuli with projections opposite excretory pore; **D** : Holotype, ventral annuli with projections at midbody; **E** : Holotype, posterior end of body; **F** : Vulva of another female; **G** : Annuli 8-12 with projections on dorsal side of another female; **H** : Ventral annuli 8-12 with projections on ventral side of same female; **I, J** : Lateral projections of two females; **K** : Annuli 6-9 with projections on ventral side of another female; **L** : Dorsal annuli 6-9 with projections of same female; **M** : Vulva of another female.

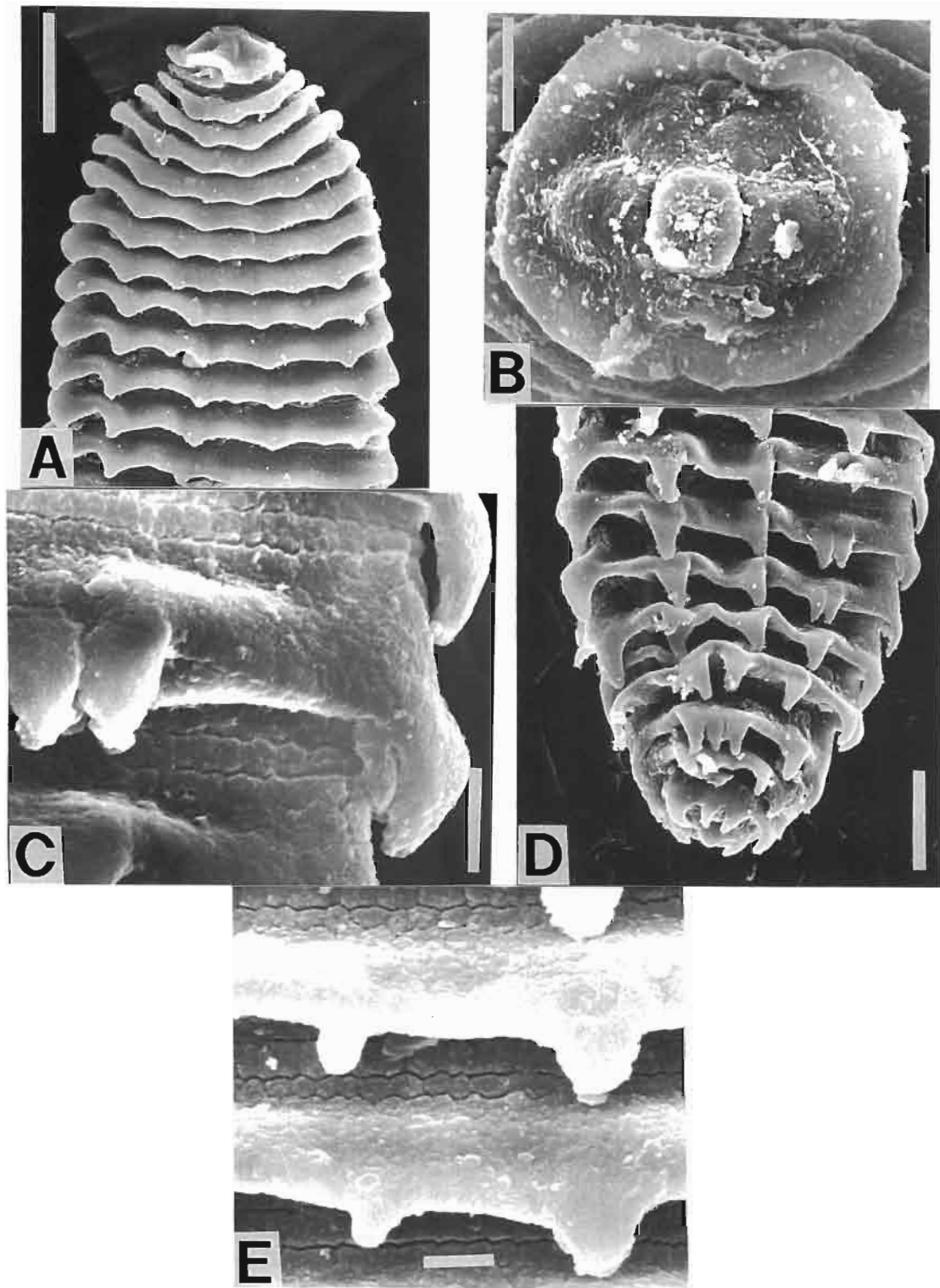


Fig. 4. *Ogma topartu* sp. n. Female. *A*: Anterior part of body; *B*: En face view of lip region; *C*: Enlarged projections and reticulate pattern of cuticula; *D*: Posterior end of body; *E*: Projections and cuticular structure (Bar = 2.5 μ m in C.E. 5 μ m in B and 10 μ m in A.D.).

Table 2. Main distinguishing characters differentiating *Ogma toparti* sp. n. from other species with predominantly twelve longitudinal rows of cuticular scales in the genus *Ogma* Southern, 1914 (all measurements in μm).

Species	L	V	c	Stylet	R	Rst	Rex	RV	Ran	Lip annuli margins	Lip annuli	Rows of scales	Form of scales
<i>O. cobbi</i> (Micoletzky, 1925) Siddiqi, 1986	320-520	80-87	10-17	95-113	57-64	16-18	-	10-12	7-9	Both crenate	2	12 (10-16)	Mostly simple triangular but some cleft
<i>O. damubiale</i> Andrassy, 1985	470-490	84-86	11-13	90-95	58-60	11-13	-	13	7-8	Both crenate	2	12	Mostly simple triangular
<i>O. hechuanensis</i> Kajji & Weisheng, 1991	751-967	89-93	18-34	117-138	64-74	-	19-22	5-7	2-4	Smooth	2	10-13	Simple
<i>O. lentiforme</i> Schuurmans - Stekhoven & Teunissen, 1938	388-495	84-86	12-14	82	64-72	15	-	11-12	5-6	Smooth?	2	8-12	Simple, rounded
<i>O. naomiae</i> Van den Berg, 1992	367-573	93-98	-	81-102	63-69	15-22	22-25	5-8	-	Wave-like	1	10-12	Finger-like projections
<i>O. nemorosum</i> Minagawa, 1993	335-491	82-87	9-21	87-108	45-54	11-17	15-19	9-13	4-8	First-crenate Second-smooth	2	12-16	Triangular, rectangular, sometimes bifurcate, or with smaller scales inbetween rows
<i>O. squamifer</i> (Heyns, 1970) Andrassy, 1979	625-702	88-90	-	102-108	66-71	13	21	8-10	3	-	3	12	Simple, rounded, rectangular
<i>O. toparti</i> sp. n.	254-352	91-94	59-131	56-66	47-52	10-13	16-18	4-6	1	Wave-like	1	12	Simple, triangular
<i>O. vexillatrix</i> (Orton Williams, 1985) Raski & Luc, 1987	334-526	95-96	-	94-103	46-63	11-18	20-22	5-6	-	Crenate	1	12-16	Anterior projections not in rows; all finger-like
<i>O. zernovi</i> Kirjanova, 1948	390-570	85-91	12-16	82-93	62-69	11-19	-	9-11	5-7	Smooth	2	10-12	Simple, rounded

(88-125) μm from anterior end of body. Width at mid-body 45 ± 4.6 (36-54) μm and at excretory pore 47 ± 4.9 (38-54) μm . Annuli 6 ± 0.8 (5-8) μm wide at midbody. Spermatheca small, one and a half to two and a half annuli long, mostly filled with roundish sperm, situated three to eight annuli anterior to vulva. Ventral and dorsal overhanging vulval lips with scalloped margins. In lateral view the body narrows slightly posterior to vulva. Tail round 4 ± 0.9 (3-6) μm long.

Male and juvenile : Not found.

TYPE SPECIMENS

Holotype female (slide 28955) and eleven *paratype* females (slides 28953-28955) deposited in the National Collection of Nematodes, Biosystematics Division, Plant Protection Research Institute, Pretoria, South Africa. Seven *paratype* females deposited in the collection of the Muséum National d'Histoire Naturelle, Paris, France.

TYPE LOCALITY

Specimens (No 7912) collected by P. Quénéhervé from an indigenous forest near Reclucé, Martinique.

DIAGNOSIS AND RELATIONSHIP

Ogma toparti sp. n. females are characterized by 47 to 52 retrorse body annuli with twelve longitudinal rows of scales at midbody which are more irregularly spaced on dorsal side of body, reticulate pattern on cuticula, one lip annulus which is smaller than first body annulus, a 56 to 66 μm long stylet and scalloped anterior and posterior vulval lips.

With the above characters this new species is separated from all other species in the genus which have pre-

dominantly twelve longitudinal rows of cuticular scales. The main differentiating characters between these species are presented in Table 2.

Key to *Ogma* species with predominantly twelve longitudinal rows of cuticular scales.

Species included in this key are those which were originally described with twelve rows of scales and a few which were described with either eight or ten rows but in subsequent descriptions from other localities also had twelve rows of scales.

- 1 - Lip region with one annulus 2
- Lip region with two, rarely three annuli 4
- 2 - Stylet = 56-66 μm ; L = 254-352 μm ; Ran = 1 *Ogma toparti* sp. n.
- Stylet = 93-98 μm ; L = 334-573 μm ; anus not seen 3
- 3 - R = 63-69; 10-12 longitudinal rows of finger-like projections; rows equally spaced around body *Ogma naomiae*
- R = 46-63; 12-16 longitudinal rows of finger-like projections posterior to oesophageal area, haphazard opposite oesophageal area; rows unequally spaced around body *Ogma vexillatrix*
- 4 - L = 751-967 μm ; RV = 5-7; stylet = 117-138 μm ; c = 18-34 *Ogma hechuanensis*
- L = 320-702 μm ; RV = 8-13; stylet = 82-113 μm ; c = 9-21 5
- 5 - L = 625-702 μm ; V = 88-90; lip region with three annuli *Ogma squamifer*



Acknowledgements

The authors would like to thank Mrs. N. H. Buckley for technical assistance, Mr. H. van Tonder for the SEM photographs and Dr. P. A. A. Loof is thanked for the loan of specimens of *Criconema longulum* and *C. demani* from Holland and Belgium.

References

- BERNARD, E. C. (1982). Criconematina (Nematoda : Tylenchida) from the Aleutian Islands. *J. Nematol.*, 14 : 323-331.
- COLBRAN, R. C. (1965). Studies of plant and soil nematodes 10. *Paratylenchus coronatus* n. sp. (Nematoda : Criconematidae), a pin nematode associated with citrus. *Qd J. agric. Sci.*, 22 : 277-279.
- DE GRISSE, A. (1968). *Bijdrage tot de morfologie en de systematiek van Criconematidae (Taylor, 1936) Thorne, 1949 (Nematoda)*. Deel 1. Doctoraatsthesis, Universiteit Gent, 150 p.
- GUNHOLD, P. (1953). Drei neue Nematoden aus den Ostalpen. *Zool. Anz.*, 150 : 35-38.
- HOFFMAN, J. K. (1974). Morphological variation in species of *Bakernema*, *Criconema* and *Criconemoides* (Criconematidae : Nematoda). *Iowa St. J. Res.*, 49 : 137-153.
- MINAGAWA, N. (1981). *Nothocriconema* from Mt. Aso, with descriptions of two new species (Tylenchida : Criconematidae). *Jap. J. Nematol.*, 10 : 16-26.
- ORTON WILLIAMS, K. J. (1985). Some Pacific Criconematina (Nematoda). *Rec. Aust. Mus.*, 37 : 71-83.
- RASKI, D. J. (1975). Revision of the genus *Paratylenchus* Mickoletzky, 1922 and descriptions of new species. Part II of three parts. *J. Nematol.*, 7 : 274-295.
- RASKI, D. J. & GOLDEN, A. M. (1966). Studies on the genus *Criconemoides* Taylor, 1936 with descriptions of eleven new species and *Bakernema variabile* n. sp. (Criconematidae : Nematoda). *Nematologica*, 11 : 501-565.
- VAN DEN BERG, E. & CADET, P. (1991). One new and some known plant parasitic nematode species from the French Caribbean (Nematoda : Tylenchida). *Revue Nématol.*, 14 : 389-405.
- VAN DEN BERG, E. & CADET, P. (1992). On five plant parasitic tylenchs from Martinique (Nematoda). *Fundam. appl. Nematol.*, 15 : 431-442.
- VAN DEN BERG, E. & QUÉNÉHERVÉ, P. (1993). *Criconemoides ornativulvatus* sp. n. from Martinique (Nematoda : Criconematinae). *Fundam. appl. Nematol.*, 16 : 539-542.
- WU, L. Y. (1965). Five new species of *Criconemoides* Taylor, 1936. (Criconematidae : Nematoda) from Canada. *Can. J. Zool.*, 43 : 203-214.