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STEGELLETINA LATICOLLARIS N.SP., A SECOND NEW SPECIES OF THE GENUS FROM SENEGAL (NEMATODA : CEPHALOBIDAE)

by

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SUMMARY

Stegelletina laticollaris n.sp. from marginal soil at Cambérène, Senegal was studied with light microscope and SEM. It is small (L = 0.3 mm) and differs from known species of the genus in the expanded pharyngeal collar, in the cephalic probolae with six or seven digitate tines, and in the shape of the labial probolae, which carry a basal ridge and are bifurcate at two levels, with two platelets implanted at the primary bifurcation. The presence of the basal ridge is reminescent of the genus *Nothacrobeles*.

Key words : Stegelletina, Nothacrobeles, Nematoda, taxonomy, morphology, Senegal.

INTRODUCTION

Recently, DE LEY *et al.* (1990) reported a new species of the genus *Stegelletina* ANDRÁSSY, 1984 from Senegal, described as *Stegelletina capraeola* DE LEY *et al.*, 1990. While scanning the original samples for more material of *S. capraeola,* seven females and one juvenile of another new species were picked out. This second new species is described here as *Stegelletina laticollaris* n.sp. The status of the genus *Stegelletina* is questionable because its diagnosis overlaps with *Cervidellus* THORNE, 1937 on the one hand, and comes very close to *Acrobeles* VON LINSTOW, 1877 on the other (BOSTRÖM, 1985 and 1991 ; DE CLERCK and DE LEY, 1990 ; DE LEY *et al.*, 1990). The new species adds further to these difficulties because it shows affinities with *Nothacrobeles* ALLEN and NOFFSINGER, 1971. Details on the samples and on fixation methods can be found in DE LEY *et al.* (1990). Three females were submitted to critical point drying and sputter-coating for study with SEM after measuring ; one female was lost during this procedure.

RESULTS

Stegelletina laticollaris n. sp.
(Figs 1, 2)

Measurements : Table 1

TABLE 1

Measurements of Stegelletina laticollaris *n.sp.*

	Holotype ♀	Holotype and paratypes (7 ♀♀)		
		mean	SD	range
L (µm)	310	295	7	286-310
pharynx (µm)	88	87	3	84-92
tail (µm)	33	32	2	29-34
body width (µm)	20	20	1	19-21
anal width (µm)	11	11	1	11-12
a	14.1	14.4	0.4	13.9-15.0
b	3.5	3.4	0.1	3.3-3.6
c	9.3	9.2	0.7	8.6-10.4
c'	3.0	2.8	0.3	2.6-3.2
stoma (µm)	7	8	1	7-9
corpus (µm)	36	36	4	31-43
isthmus (µm)	26	26	1	23-28
bulbus (µm)	17	17	1	17-18
excret. pore (µm)	57	52	6	49-59
e.p. (% pharynx)	65	61	7	58-69
nerve ring (µm)	56	54	4	52-62
n.r. (% pharynx)	64	63	4	61-71
deirid (µm)	74	65	7	60-74
dei. (% pharynx)	84	75	8	70-84
V (%)	65	65	1	63-67
G (%)	26	26	2	22-30
vagina (µm)	5	4	1	3-6
rectum (µm)	14	13	1	11-15

Description

Small, compact animals with body straight to weakly ventrally arcuate upon fixation. Cuticle 1 µm thick or less, annulated. Annules 1.8-2.2 µm wide at mid-

body and 2.2-2.5 µm wide in neck region, carrying longitudinal striations which are only rarely continuous from annule to annule. Lateral field with three lines extending from about level of excretory pore to tail tip.

Lip region confluent with neck or weakly offset, 11-12 µm wide, with four cephalic and six labial papillae. Amphidial apertures inconspicuous, leaf-shaped slits (1.3 µm wide in female of Fig. 2B). Primary axils deeper and narrower than secondary axils, resulting in grouping of the lips in one dorsal and two ventrosublateral pairs. Lips asymmetrically triangular with slender, digitate tip, each also with four or five digitate tines in the secondary axils and one digitate tine or guard process in the primary axils. Tines only very faintly visible with light microscope. SEM reveals a pattern of incisures on the lips, with an incisure running transversely over each lip pair in such manner that it touches the amphid and the cephalic papilla(e), and offsets the guard processes in the primary axils from the lip tips and the tines in the secondary axils. In addition, one longitudinal incisure extends between each pair of guard processes from the primary axil down to the first body annule, and another longitudinal incisure partly divides the lips in each lip pair, running over a pair of incompletely fused tines in the middle of each secondary axil down to the transverse labial incisure (Fig. 1G, 2A,B). Labial probolae 5-6 µm high, bifurcating at two levels : once at mid-height, and again at the tips of each of the primary branches. Secondary bifurcations approximately at straight angles to the plane of the primary bifurcation. Base of each labial probola relatively broad, carrying a concave central abaxial ridge or scale a little below the primary bifurcation, as well as two angular platelets tangentially at the level of this same bifurcation. Tangential ridges present perradially, alternating with the labial probolae. No radial ridges seen.

Cheilorhabdia refractive and round, other rhabdia not sclerotized, apparently very flexible instead : buccal lumen locally strongly expanded in some specimens (Fig. 1D,E). Pharyngeal collar not simply cylindrical as in most Cephalobidae, but expanding rapidly at its anterior end to a width approaching that of the pharyngeal corpus, then narrowing gradually to a constriction lying slightly anterior to the base of the buccal cavity, and then widening again and joining the walls of the corpus without a clear demarcation (Fig. 1B-E). Buccal cavity itself sometimes also difficult to delineate from pharyngeal lumen.

Corpus cylindrical, only 1.1-1.8 times as long as isthmus. Anterior end of isthmus offset from corpus by a shallow constriction, also slightly wider and with more distinct muscular fibres than remainder of isthmus. One coelomocyte lying ventrally of bulbus. Excretory pore about level with middle of isthmus, at 22-25 annules from lip region. Nerve ring slightly more anterior and deirid a little more posterior to excretory pore, at 28-32 annules from lip region. Cardia small, 3-5 µm long. Intestinal wall thin, anteriorly with prominent cellular ridges extending transversely into the lumen. Four females with posterior end of intestine offset as a 23-28 µm long « prerectum ».

Vulva at two-thirds of body, a short slit with finely wrinkled lips. Female reproductive system compact, monodelphic, prodelphic. Spermatheca empty in all females, 7 ± 3 (4-12) µm long. Postvulval uterine branch rudimentary, 5 ± 2 (3-

8) µm long, consisting of about six minute cells which merge with the ventral chord. Ovary with nine to ten oocytes, of which four or six in double file near the straight ovary tip. One female with a single egg measuring 45 by 17 µm. Up to three coelomocytes visible around gonad. Tail conical, with sharp to very sharp tip and about 10-14 ventral annules (annulation fading towards tip). Phasmids in anterior third of tail, at 9 ± 3 (6-11) µm from anus.

No males found.

Type locality and habitat

A plot of very nutrient-poor soil lacking natural vegetation at the « Centre pour le Développement de l'Horticulture » at Cambérène, Senegal (sample n° 1014 ; see De Ley *et al.*, 1990 and De Ley, 1992).

Type specimens

Holotype female with one paratype female on slide n° 3645 and two paratype females on SEM-mount in the collection of the Instituut voor Dierkunde, Universiteit Gent, Belgium. Two paratype females deposited in the USDA nematode collection, Beltsville, Maryland, USA.

Etymology

The specific epithet is a contraction of the latin adjective *latus* (for « wide ») and the latin noun *collaris* (for « collar »), referring to the peculiar shape of the pharyngeal collar.

Diagnosis

Very small Cephalobidae with longitudinally striated annules ; three lateral lines ; labial probolae each bifurcating at two levels, carrying a central abaxial ridge as well as two basal tines ; lips asymmetrically triangular, each with four or five digitate tines in its secondary axil ; primary axils each with two digitate guard processes ; pharyngeal collar anteriorly expanded ; corpus less than twice as long as isthmus, cylindrical ; postvulval uterine branch rudimentary, less than half a body width long ; tail conical, acute.

Differential diagnosis and relationships

To our knowledge, no cephalobid has hitherto been described with a pharyngeal collar shaped like that of the new species. While the pharyngeal collar is swollen in *Acromoldavicus skrjabini* (Nesterov and Lisetskaya, 1965) Nesterov, 1970, there is no clear constriction at the base of the collar as in our new species (cf. Fig. 1a in Nesterov, 1970). *A. skrjabini* is quite different from *S. laticollaris* in

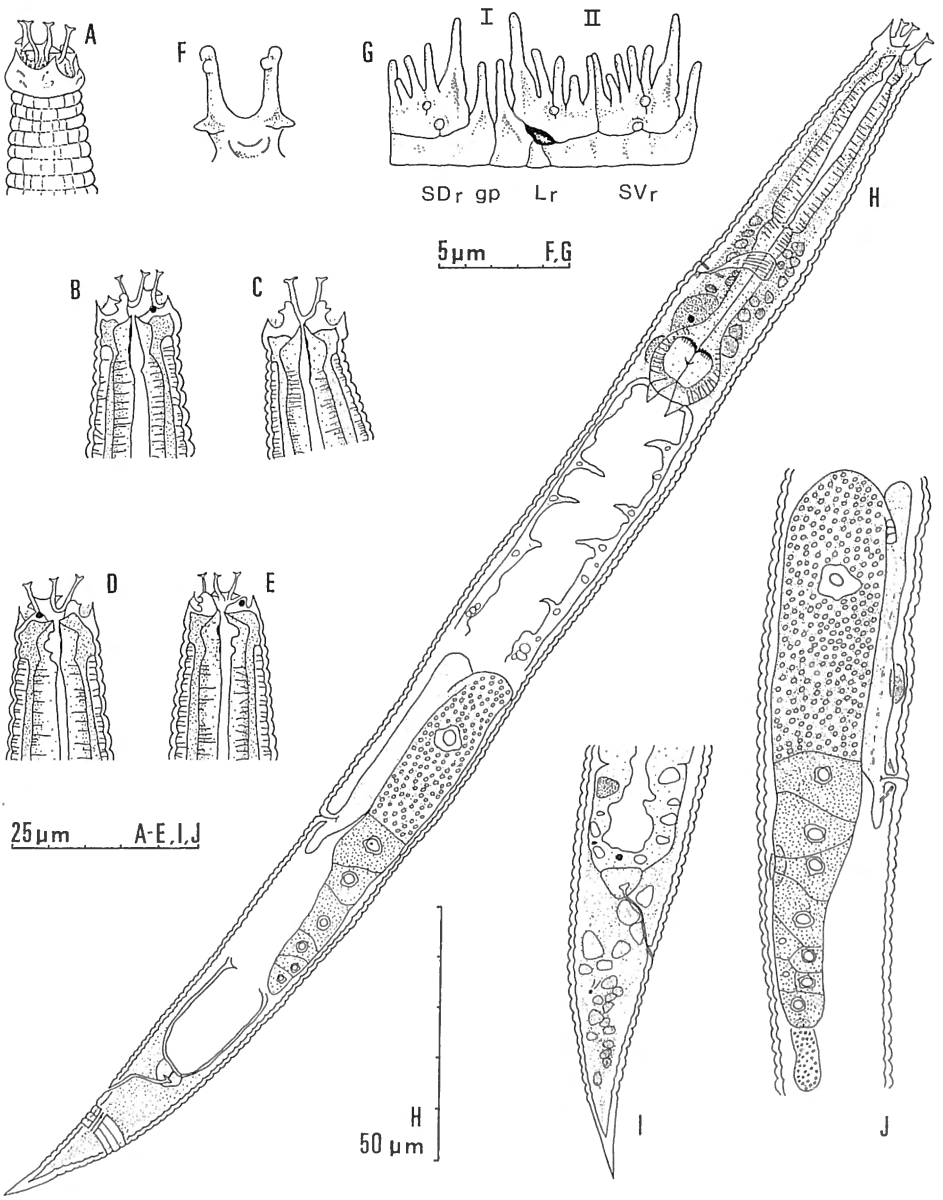

Fig. 1. — *Stegelletina laticollaris* n.sp. female morphology : A. Surface view of lip region. B-E. Lip regions in optical section. F. Right-subventral labial probola as seen with SEM. G. Diagram of lips on right side of lip region as seen with SEM. H. Entire female. I. Tail. J. Reproductive system. Abbreviations in G : I = primary axil, II = secondary axil, gp = guard processes, L_r = right-lateral lip, SD_r = right-subdorsal lip, SV_r = right-subventral lip.

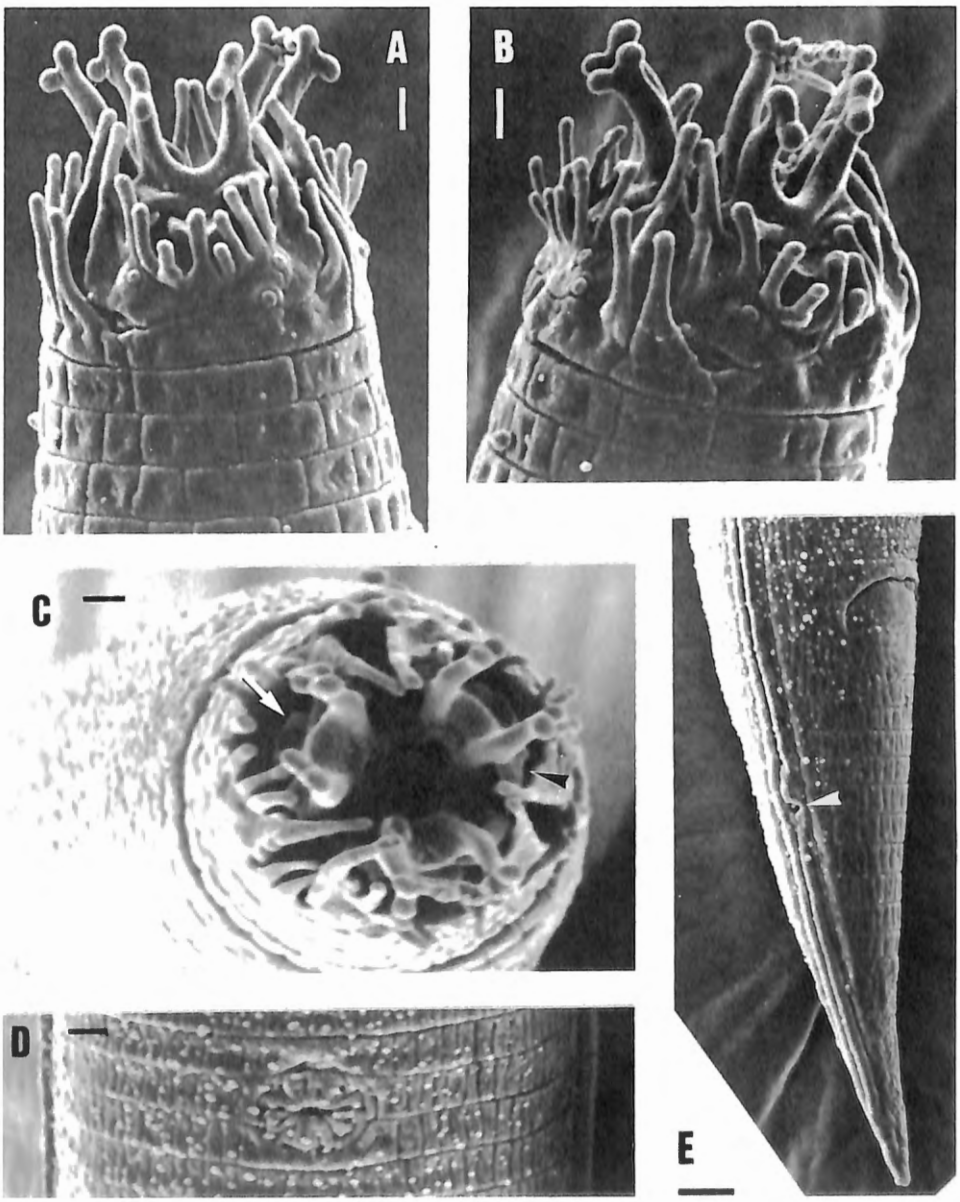

Fig. 2. — *Stegelletina laticollaris* n.sp. female morphology : A. Lip region in ventrosublateral view. B. Lip region in lateral view. C. Lip region *en face* (arrow points at a basal ridge, arrowhead at tangential platelet). D. Vulva. E. Tail (arrowhead points at phasmid). Scale bar is 1 µm in A-D and 2 µm in E ; dorsal side is on left in A,B and in top right corner in C.

several other respects, with e.g. very large, flap-like lips overhanging small labial probolae that are acute and not bifurcate.

S. laticollaris appears to be closest to *Stegelletina rara* (NESTEROV, 1969) ANDRÁSSY, 1984, but can be distinguished from this species by the shape of the labial probolae, which lack platelets at the primary bifurcation and have longer secondary branches in *S. rara*. Tines on the cephalic probolae were not described in *S. rara* by NESTEROV (1969), but these may well have been present, as suggested by their inconspicuousness under light microscope in the new species.

Apart from *S. rara* and *S. capraeola* DE LEY *et al.*, 1990, no other species of *Stegelletina* is known to have an abaxial thickening on the base of each labial probola. *S. capraeola* has an abaxial knob instead of a ridge, and differs further from the new species in its non-expanded pharyngeal collar, in the labial probolae branching at three levels, in the cephalic probolae with four rounded and five digitate tines instead of six or seven digitate ones, and in a pharyngeal metacorpus with double swelling when fixed in expanded state. *S. laticollaris* can also be distinguished from *S. capraeola*, even at lower magnification, by the transverse extensions of the anterior intestinal cells into the intestinal lumen.

Together with *S. rara* and *S. capraeola*, the new species is of relevance to the diagnosis of *Stegelletina* because of the basal ridge on the labial probolae. This feature is reminescent of the genus *Nothacrobeles*, because in species of this genus the labial probolae always have a well-developed basal ridge continuous with the primary branches. Furthermore, the presence in each primary axil of two guarding pieces offset from the lips by a circumferential incisure is also a feature shared by *Nothacrobeles* and our new species (cf. Fig. 7,9 in SAUER *et al.*, 1979). Finally, *Nothacrobeles* species have tines along the rims of ridge and primary branches of the labial probolae, and the presence of tine-like platelets on the labial probolae of *S. laticollaris* therefore suggests close affinity, too.

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REFERENCES

BOSTRÖM, S. (1985) — Descriptions of *Cervidellus serratus* (THORNE, 1925) THORNE, 1937 from Sweden and *C. neftasiensis* n.sp. from Tunisia, with a note on some recently proposed genera (Nematoda : Cephalobidae). *Nematologica*, **31** : 365-374.

BOSTRÖM, S. (1991) — Some Cephalobidae (Nematoda : Rhabditida) from sand on the island of Samos, Greece. *Nematologica*, **37** : 367-375.

DE CLERCK, G. and P. DE LEY (1990) — *Stegelletina doorsselaeri* n.sp. : a new species intermediate between *Stegelletina* ANDRÁSSY, 1984 and *Acrobeles* VON LINSTOW, 1877 (Nematoda : Cephalobidae). *J. Afr. Zool.*, **104** : 221-227.

DE LEY, P. (1991) — The nematode community of a marginal soil at Cambérène, Senegal, with special attention to functional morphology and niche partitioning in the family Cephalobidae. *Academiae Analecta — Meded. K. Acad. Belg., Kl. Wet.*, **53** : 107-153.

DE LEY, P., E. GERAERT and A. COOMANS (1990) — Seven cephalobids from Senegal (Nematoda : Rhabditida). *J. Afr. Zool.*, **104** : 287-304.

NESTEROV, P.I. (1969) — [A new nematode species — *Stegelleta rara* n.sp. (Nematoda : Cephalobidae)]. *Izv. Akad. Mold. SSR*, **1** : 17-18.

NESTEROV, P.I. (1970) — [*Acromoldavicus* n.gen. and redescription of the species *Acrobeloides skrjabini* NESTEROV et LISETSKAYA, 1965 (Nematoda, Cephalobidae)]. In : [*Parasites of animals and plants. Kishinev : RIO Akad. Nauk Moldovskoi SSR*], **5** : 134-138.

SAUER, M.R., R.N. CHAPMAN and M.W. BRZESKI (1979) — External morphology of some Acrobelinae. *Nematologica*, **25** : 492-486.