

Metacrolobus festonatus gen. n. sp. n. and *Scottnema lindsayae* Timm, 1971 (Nemata : Cephalobidae) from Subantarctic and Antarctic regions with proposal of the new subfamily Metacrolobinae

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Summary – A SEM Study is conducted for the first time on *Scottnema lindsayae* Timm, 1971 from Antarctica. *Metacrolobus festonatus* gen. n., sp. n. from Tierra del Fuego is described and illustrated. This new genus, included among Cephalobidae, is characterized by having three leaf-like lips (the dorsal one larger than the two subventrals) with incised margins and three tangential ridges around stoma, connected with lips by three pairs of radial ridges. The family Cephalobidae is discussed and the new subfamily Metacrolobinae is erected to accommodate the new genus *Metacrolobus* gen. n.

Résumé – *Metacrolobus festonatus* gen. n. sp. n. et *Scottnema lindsayae* Timm 1971 (Nemata : Cephalobidae) provenant des régions antarctique et subantarctique, et proposition de la nouvelle sous-famille des Metacrolobinae – Pour la première fois, *Scottnema lindsayae* Timm, 1971 provenant de l'Antarctique est étudiée au MEB. *Metacrolobus festonatus* gen. n. sp. n. provenant de la Terre de Feu est décrit et figuré. Ce nouveau genre, inclus parmi les Cephalobidae, est caractérisé par trois lèvres foliacées (la dorsale plus grande que les deux subventrales), à bord incisé et trois crêtes tangentielles autour du stoma, reliées aux lèvres par trois paires de crêtes radiales. La famille des Cephalobidae est discutée et la nouvelle sous-famille Metacrolobinae est proposée pour accueillir le nouveau genre *Metacrolobus*.

Key-words : Cephalobidae, Metacrolobinae subfam. n., *Scottnema*, *Metacrolobus* gen. n., taxonomy, SEM, Antarctica, Tierra del Fuego, nematodes.

Faunistic research expeditions to Antarctica and to Subantarctic Tierra del Fuego, made within the Italian Program of Antarctic Research, yielded numerous species of nematodes belonging to the family Cephalobidae. Among them, especially interesting was the finding in the Tierra del Fuego of a new genus, *Metacrolobus* gen. n., with the species *M. festonatus* sp. n., and the new finding in Antarctica of the rare genus *Scottnema*, known only from this continent, with the species *S. lindsayae* Timm, 1971. Like most Cephalobidae, both genera are characterized by very complex and elaborate labial structures, that are difficult to interpret with light microscope and were therefore studied with scanning electron microscope.

Nematodes were fixed in formalin 4 % and processed to glycerin with Seinhorst's rapid method to be observed at the light microscope. For SEM, two glycerin embedded specimens per species were first washed with gradually added distilled water; subsequently they were dehydrated by a gradual series of ethanol concentrations increasing till 100 %; then critical point dried with CO₂, mounted on stubs and coated with gold.

Terminology of head structures is based on Rashid *et al.* (1989).

Scottnema lindsayae Timm, 1971

(Figs 1 M, 2 H - M)

Seven specimens were collected from the following stations in Victoria Land, Antarctica : Kay Island, dry mosses with soil; "River", wet mosses; Tarn Flat, lake bottom detritus; Crater Cirque, lake bottom detritus and wet mosses. These specimens fit well to the description given by Timm (1971), except for a rather smaller size.

MEASUREMENTS

Females (n = 2) : L = 0.72-0.78 mm; a = 20-21; b = 4.3-4.5; c = 14.4-15.6; c' = 2.4-2.5; V = 64-65.

Males (n = 5) : L = 0.64-0.79 mm; a = 17-24; b = 4.1-5.0; c = 11.3-15.4; c' = 1.7-2.0; T = 33-39.

DESCRIPTION

Pharynx 144-181 µm; stoma length 17-21 µm; lip width 13-14 µm; male tail length 49-59 µm; female tail length 49-51 µm; spicule length 33-35 µm; gubernaculum length 16 µm; post-vulval sac length 42-45 µm.

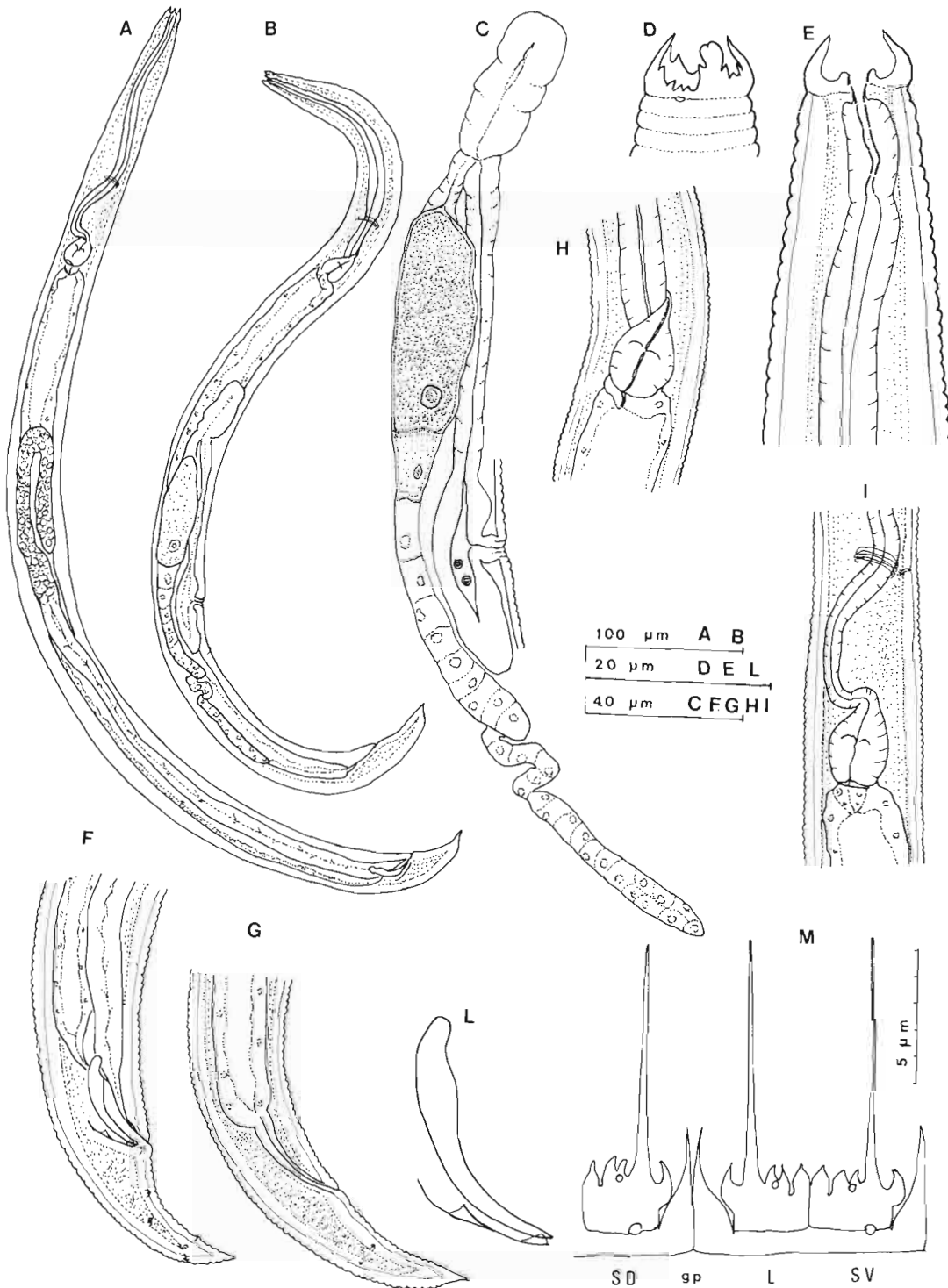


Fig. 1. A-L. *Metacrolobus festonatus* gen. n. sp. n. A: Male body. B: Female body. C: Female genital apparatus. D, E: Male head end. F: Male posterior end. G: Female posterior end. H, I: Pharynx end. L: Spicule and gubernaculum. - M: *Scottinema lindsayae* Timm, 1971: diagram of lips on right side of lip region as seen with SEM. (gp = guard processes; L = lateral; SD = subdorsal; SV = subventral.)

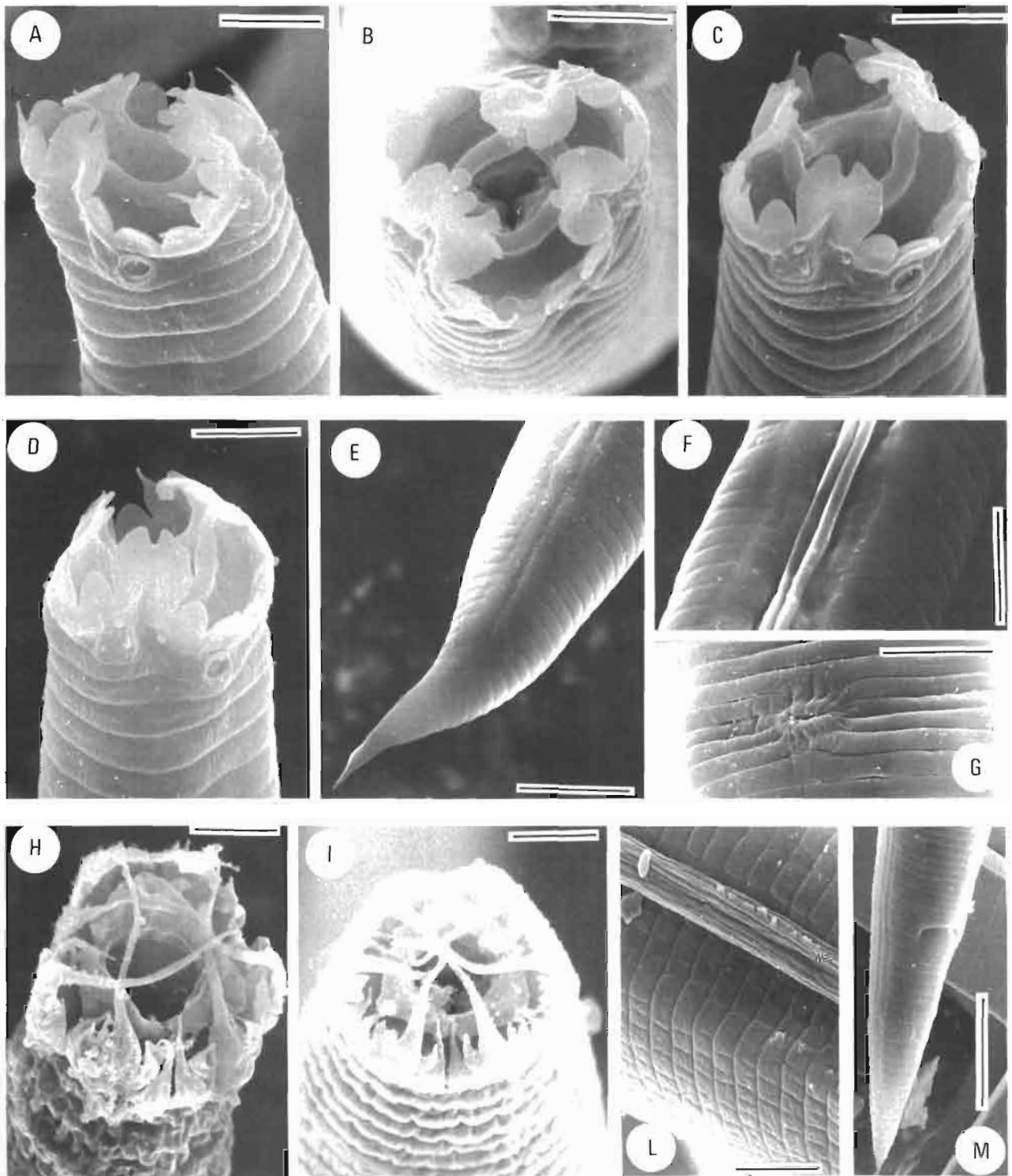


Fig. 2. A-G. *Metacrolobus festonatus* gen. n. sp. n. A, B, C, D : Cephalic/labial region; E : Female tail; F : Lateral lines; G : Vulva. – H-M. *Scottinema lindsayi* Timm, 1971. H, I : Cephalic/labial region; L : Lateral lines; M : Female tail. (Bar = 5 μ m in A-D, H, I, L : 10 μ m in G, E, F; 20 μ m in M.)

11 μm deep. Post-vulval sac 32 μm long, about as long as corresponding body width. Rectum 31 μm long. Phasmids 36 μm from tail tip and 14 μm from anus. Tail conoid, 49 μm long, slightly ventrally bent, ending in a fine mucro.

Male: Similar to female in most respects. Lip width 10 μm ; lip height 6 μm ; stoma length 12 μm . Corpus of pharynx 126 μm long; isthmus 23 μm long; basal bulb ovoid, 19 \times 16.5 μm , with crescentic valves; nerve ring surrounds corpus at 118 μm from anterior end. Excretory pore slightly posterior and hemizonid about at the same level as nerve ring. Deirids located 140 μm far from anterior end, at isthmus level. Genital apparatus monorchic, testis anteriorly reflexed. Spicules cephaloboid, 30 μm long; gubernaculum 17 μm long, provided with a pair of antero-lateral extensions (*cornua cruris* of De Ley *et al.*, 1993). Five pairs of caudal papillae, three of them (one subdorsal, one lateral and one subventral) near tail tip, one lateral and one subventral anterior to phasmids; a pair of subventral adanal papillae and three pairs of subventral precloacal ones are also present. Tail similar as in female, 47 μm long.

TYPE HABITATS AND LOCALITIES

Holotype, female and juvenile paratypes from coastal dunes between Capo S. Pablo and Capo Medio (Argentina: Tierra del Fuego): mosses and lichens with sand. Male paratype from Agua Fresca (Chile: Tierra del Fuego): mosses.

TYPE SPECIMENS

Holotype (female), 1 paratype female on stub, 1 paratype male, 1 paratype juvenile in the collection of the Dipartimento di biologia Animale, University of Catania, Italy.

POSITION AND RELATIONSHIPS OF *METACROLOBUS* GEN. N. WITHIN THE FAMILY CEPHALOBIDAE

The main differential characters of *Metacrolobus* n. gen. among Cephalobidae are: absence of labial probolae, presence of three labial flaps instead of the usual six lips, with incised margins; presence of three tangential ridges not merging, but giving origin to three pairs of radial ridges, each pair constituted by two closely running rounded ridges, which do not end at the lip base but run along the internal labial surface; lip region with imperfectly triradiate, almost bilateral symmetry. In the leaflike lips separated by deep clefts and in the absence of labial probolae the new genus comes close to *Acrolobus* Boström, 1985 and to *Teratolobus* Andrassy, 1968; with *Acrolobus* the new genus *Metacrolobus* shares also the trend towards bilateral symmetry in the lip region; it differs from both genera in having only three flap-like lips with incised edges instead of six with smooth edges; from *Teratolobus* it differs also in having tangential ridges (Rashid *et al.*, 1989) and from *Acrolobus* in the absence of knoblike projections on the radial ridges;

from both of them it differs in the peculiar connections of radial ridges both with tangential ridges and with lips.

The family Cephalobidae, after its definition and classification given by Andrassy (1984) has been discussed by several authors (Boström, 1988; Rashid *et al.*, 1989; De Ley *et al.*, 1993), as a consequence of the significant new knowledge obtained with SEM studies of the often complex and elaborate cephalic regions, hardly interpretable at light microscope, and of the revised study of some insufficiently known genera. The latest proposal of classification (De Ley *et al.*, 1993) recognizes within Cephalobidae the subfamilies Cephalobinae, Kirjanovii-nae and Acrolobinae. Because of the absence of labial probolae, of the deep clefts between lips and of the presence of well developed *cornua cruris*, *Metacrolobus* gen. n. is mostly related to the last subfamily. Still, the structure of the lips in the new genus is quite peculiar because of the complete fusion of the three pairs of lips into three flap-like structures and of the presence of tines on their margins; a further major peculiarity is represented by the structure of the tangential and of the radial ridges and by their connection with the lip surfaces. In consideration of these peculiar characteristics a new subfamily within Cephalobidae, *Metacrolobinae* subfam. n., is erected to accommodate *Metacrolobus* gen. n.

Metacrolobinae subfam. n.

DIAGNOSIS

Cephalobidae. Lips fused two by two into three leaf-like labial structures (one dorsal and two subventral) with incised margins, separated by deep axils lacking guard processes. Three tangential ridges not merging into each other, connected to the leaf-like lips by three pairs of radial ridges, each running along the internal surface of a lip.

TYPE AND ONLY GENUS

Metacrolobus gen. n.

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References

- ANDRÁSSY, I. (1984). *Klasse Nematoda*. Stuttgart, G. Fischer Verlag, 509 p.
- BOSTRÖM, S. (1988). *Morphological and systematic studies of the family Cephalobidae (Nematoda: Rhabdiida)*. Ph. D. Thesis, University of Stockholm, 34 p.

- RASHID, F., GERAERT, E., COOMANS, A. & SUATMADJI, W. (1989). Cephalobidae from the Krakatau region (Nematoda : Rhabditida). *Nematologica*, 34 (1988) : 125-143.
- TIMM, R. W. (1971). Antarctic soil and freshwater nematodes from the McMurdo Sound region. *Proc. helminth. Soc. Wash.*, 28 : 42-52.
- DE LEY, P., SIDDIQI, M. R. & BOSTRÖM S. (1993). A revision of the genus *Pseudacrobeles* Steiner, 1938 (Nematoda : Cephalobidae). Part 2. Subgenus *Bunobus* subgen. n., problematical species, discussion and key. *Fund. appl. Nematol.*, 16 : 289-308.