Fundam. appl. Nematol., 1994, **17** (4), 333-338

Chiloplacoides antarcticus n. gen., n. sp. from western Dronning Maud Land, Antarctica (Nematoda : Cephalobidae)

Juan HEYNS

Department of Zoology, Rand Afrikaans University, P.O. Box 524, 2006 Auckland Park, South Africa.

Accepted for publication 4 October 1993.

Summary – *Chiloplacoides antarcticus* n. gen., n. sp. is described from western Dronning Maud Land, Antarctica. The new genus, which belongs in the Cephalobidae, is distinguished by prominent, distinctly separate, globular lips; elongate, plate-like labial probolae which are distally forked and without tines or fringes; absence of cephalic probolae; presence of long seta-like guard processes; and bilateral symmetry of the stoma just posterior to the oral opening.

Résumé – Chiloplacoides antarcticus *n. gen., n. sp. provenant de l'ouest de la Terre de Dronning Maud, Antarctique (Nematoda : Cephalobidae)* – Description est donnée de *Chiloplacoides antarcticus* n. gen., n. sp. provenant de l'ouest de la Terre de Dronning Maud, Antarctique. Ce nouveau genre de Cephalobidae se distingue par les caractères suivants : lèvres très en relief, nettement séparées, globuleuses; probolae allongées, lamelliformes, fourchues à la partie distale et dépourvues de dents ou de cirres; probolae céphaliques absentes; procès de protection longs, sétiformes.

Key-words : Nematoda, Cephalobidae, *Chiloplacoides* n. gen., Antarctica.

The Percy FitzPatrick Institute of African Ornithology of the University of Cape Town is conducting a research programme on the effects of ornithogenic products on ecosystem structure and functioning at Robertskollen, a group of nunatakks (ice-free rocky outcrops) in the northern Ahlmannryggen, western Dronning Maud Land, Antarctica (Cooper *et al.*, 1991). A detailed area description and preliminary species lists of birds, lichens, mosses, algae, fungi, mites and tardigrades were given by Ryan *et al.* (1989) and Ryan and Watkins (1989).

Further sampling was done at Robertskollen during the 1991-92 austral summer, and the nematodes collected were made available for taxonomic studies. Only three dominant species were found, viz. a plectid, a dorylaim and a cephalobid. The latter proved to represent a new genus, and is herein described as *Chiloplacoides antarcticus* n. gen., n. sp.

For information on material and methods see Heyns (in press). The terminology for head structures employed in this paper is consistent with that of Sauer and Annells (1984), Rashid *et al.* (1989) and De Ley *et al.* (1993).

Chiloplacoides n. gen.

DIAGNOSIS

Cephalobidae. Medium-sized cephalobid with six prominent, distinctly separate, globular lips. Labial probolae elongate plate-like, without tines or fringes, distally forked, basally fused with the tangential ridges. Without cephalic probolae but with long seta-like guard processes. Internal structures (?prorhabdions) visible in mouth opening bilaterally symmetrical, not triradial. Rhabdions distinct under light microscope. Pharynx typically cephaloboid. Cuticle coarsely annulated, without longitudinal striae. Tail of female elongate-conoid, with rounded terminus. Tail of male slightly shorter, ventrally arcuate. Reproductive system in both sexes typically cephaloboid.

TYPE AND ONLY SPECIES

Chiloplacoides antarcticus n. gen., n. sp.

RELATIONSHIPS

The new genus is characterized by the possession of prominent globular lips which are well separated from one another, by the exceptionally long, seta-like guard processes, and by the bilateral symmetry of the prostom. The only cephalobid genus in which the structure of the lips, as seen with the aid of SEM, approaches this condition is *Acrobeloides* (Cobb, 1924), as figured by Sauer and Annells (1984, see their Fig. 4 G). The labial probolae are rather similar to those of *Stegelleta* Thorne, 1938 and *Acrobelophis* Andrássy, 1984, but apart from the abovementioned characters. *Chiloplacoides* n. gen. also differs from *Stegelleta* in the absence of longitudinal striae, and from *Acrobelophis* in the rounded tail terminus.

Chiloplacoides antarcticus n. sp.
(Figs 1-3)

Measurements

Females (paratypes) (n = 10): L = 0.74 (0.60-0.91) mm; a = 18.8 (16.2-22.1); b = 4.9 (4.4-5.4); c = 14.9 (12.9-16.3); c′ = 2.63 (2.20-3.00); V = 62.5 (59.6-65.3).

Males (paratypes) (n = 10): L = 0.67 (0.60-0.88) mm; a = 19.3 (17.7-21.0); b = 4.9 (4.4-5.4); c = 14.8 (13.1-17.2); c′ = 2.03 (1.90-2.40).

Holotype (female): l = 0.74 mm; a = 19.7; b = 4.8; c = 14.6; c′ = 2.65; V = 63.1.

Description

Body of heat-relaxed specimens slightly ventrally curved, more so in male than in female; of about equal thickness throughout except slightly tapering in neck region. Cuticle about 1.5 μm thick, rather coarsely annulated, the annules about 2.2 (1.8-2.7) μm wide on the neck, 2.0 (1.7-2.3) μm at midbody and 1.5 (1.3-1.7) μm dorsally on the tail. On the ventral side of the tail the annules are smaller and less distinct, practically disappearing towards the tail terminus in the male. Lateral field 6.3 (5-8.5) μm wide, marked by three incisures, which originate towards the middle of the neck region (Fig. 1 I). Deirid seen in seven specimens, situated between the central and dorsal lateral lines, varying in location from opposite isthmus to middle of basal bulb, at 115-165 μm from anterior end. Phasmid located near middle of tail, at 52 (44-59) % tail length in female, 45 (40-54) % in male. In the female the two outer lines usually disappear towards the middle of the tail, with only the central line continuing beyond the phasmid. In the male there is much variation. Rarely, all three lines disappear before they reach the phasmid, while normally at least one or two continue beyond the phasmid, and sometimes all three lines continue almost to the tail tip. In some specimens the tail is more or less strongly dorso-ventrally flattened. Head with six prominent globular lips, distinctly separated by clefts, without cephalic probolae. Outer labial and cephalic papillae distinct in SEM micrographs. Broad ovalshaped amphid apertures on lateral lips indistinct. Guard processes in ventral and dorsolateral clefts well-developed into 5-7 μm long slender seta-like structures, which are slack and may be irregularly bent in any direction in fixed specimens. Labial probolae elongate, plate-like, their stout bases fused with the tangential ridges to form a solid ring around the oral opening, and their distal one third to one half forked, with the prongs curved inwards; without tines or fringes. Inner structures (?prorhabdions) visible in oral opening not triradial but bilaterally symmetrical. Inner surfaces of these structures (?prorhabdions) with three or four minute denticles. Stoma, measured from anterior end of lips, 15.3 (14-17) μm long. Cheilorhabdions indistinct. Other rhabdions strongly sclerotized and clearly marked also by subdivisions within the pharyngeal collar surrounding the stoma. No denticles visible on any rhabdions under LM. Pharynx typically cephaloboid; procorpus cylindroid; isthmus rather long, sometimes slightly coiled, clearly demarcated from procorpus. Total pharynx, including stoma, 151 (132-178) μm long. Nerve ring encircling isthmus at 110 (95-133) μm from anterior end. Excretory pore seen in ten specimens, 101 (90-109) μm from anterior end. Hemizonid indistinct, seen in two specimens only, at 123 and 137 μm from anterior end. Cardia distinctly heart-shaped. Intestinal wall with small granules. Intestinal contents consisting of a brownish, rather refractive vermiform mass. Rectum 31.4 (30-33) μm long in female. Detail of junction between alimentary canal and reproductive system not distinct in any male specimen.

Female: Vulva apparently a transverse slit situated in a large, oval-shaped opening surrounded by numerous small lobe-like cuticular processes. Vulva in some specimens partly or wholly covered by a copulatory plug. Postvulval uterine sac 30.5 (23-45) μm in length. Spermatheca at anterior flexure of ovary, relatively small, in most specimens with few or more rounded spermatozoa, which measure 2-3 μm in diameter. Ovary reflexed past vulva, rarely with a distinct double flexure beyond the vulva, but mostly without a distinct flexure and often with the apical part of the ovary ill-defined. Tail 49.5 (43-61) μm long, elongate-conoid, dorso-ventrally flattened, with narrowly rounded terminus.

Male: General appearance similar to female, except tail shorter, 46.3 (37-58) μm in length, conoid, ventrally arcuate, the terminus rounded, with somewhat irregular appearance due to several protruding subterminal papillae; apparently two pairs of subterminal latero-ventral papillae and two pairs of subventral papillae, one pair near the phasmid and the other subterminal. In some specimens a pair of subdorsal papillae can also be seen near the terminus. Spicules 33.6 (30-38) μm long. Gubernaculum 16.5 (15-18) μm long, the distal end somewhat harpoon-shaped. Testis single, reflexed. Spermatozoa roundish, about 3 μm in diameter. Cloacal opening crescent-shaped. Anterior and posterior to the opening there are midventral raised, semicircular, unstriated, dimpled areas. Running anteriad from the sides of the cloacal opening are two shallow grooves. There is a pair of ventrosublateral pores (or papillae) just anterior to the cloaca, and probably a midventral papilla anterior to the cloacal opening. Posterior of the cloacal opening, beyond the raised dimpled area, is a midventral sunken area, bordered posteriorly by lobe-like triangular cuticular structures. These ventral structures on the tail are seldom visible in lateral view under the light microscope.

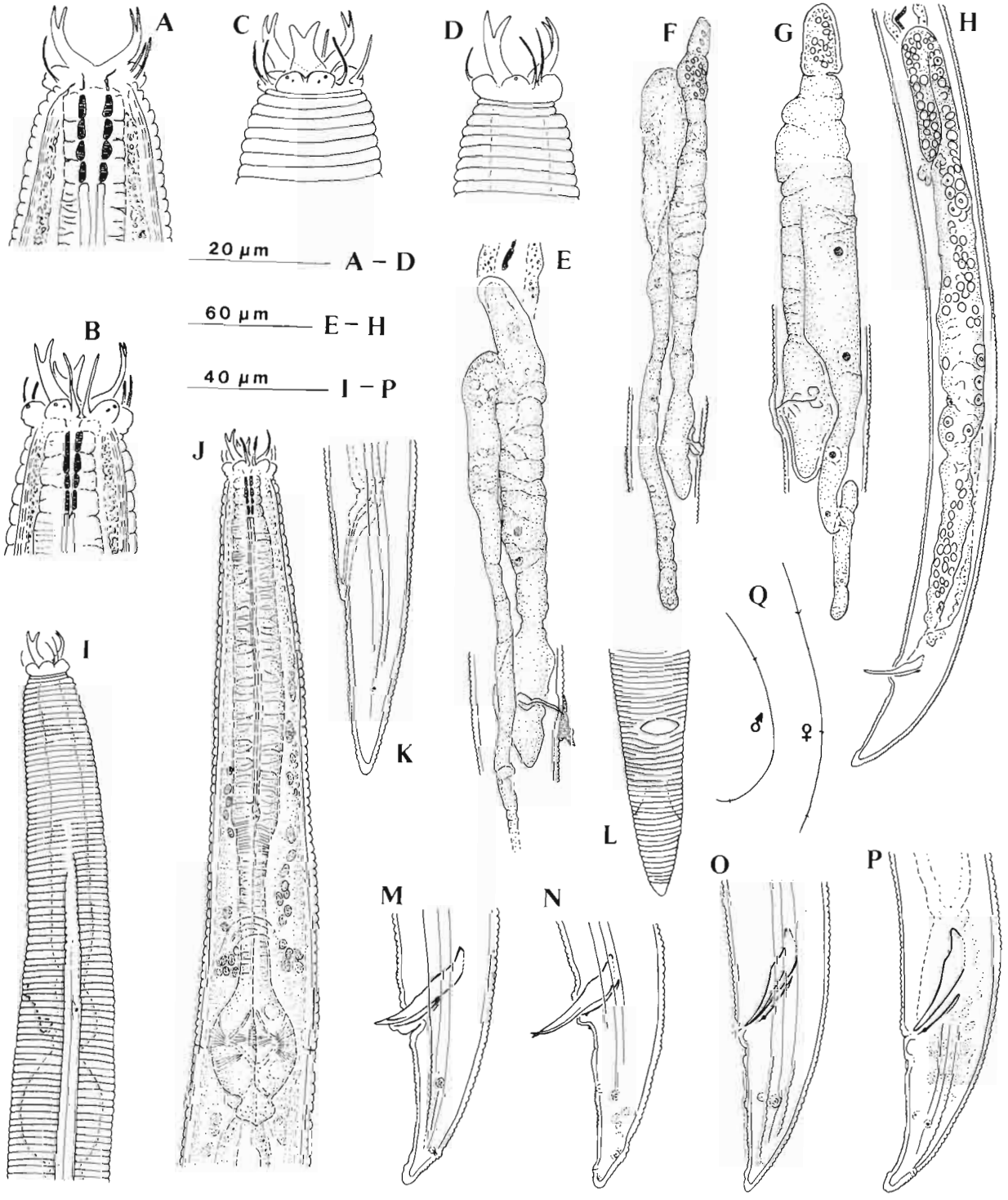

Fig. 1. Chiloplacoides antarcticus *n. gen., n. sp. A : Head, median section, dorsal view; B : Head, median section, ventral view; C : Head, dorsal view; D : Head, lateral view; E-G : Reproductive system in three females; H : Reproductive system of male; I : Lateral view of neck region, showing deirid and ventral excretory pore; J : Neck region in ventral view, showing deirids opposite basal bulb; K, L : Female tail in lateral and ventral views; M-P : Male tail, showing variation in development of lateral lines; Q : Body posture in relaxed specimens.*

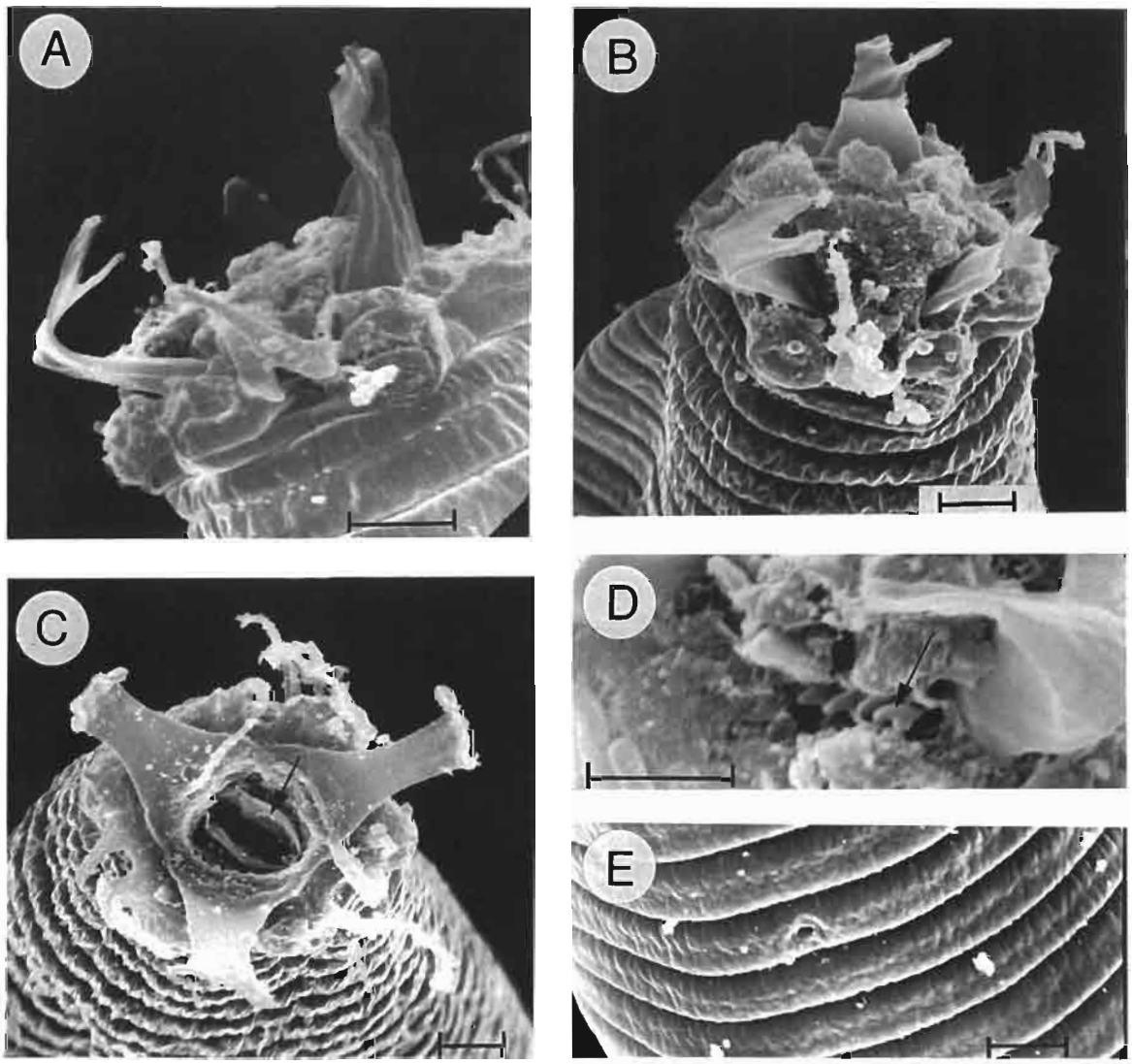

Fig. 2. Chiloplacoides antarcticus *n. gen., n. sp. A : Subventral view of female head, showing two guard processes in center of picture; B : Subdorsal / en-face view of female head. Two subventral labial probolae to the left and to the top of the picture; C : En-face view of male head, with the dorsal probola to the top left of the picture. Note : i) the complete fusion of the bases of the labial probolae with the tangential ridges, ii) the bilateral symmetry of the internal structures (prorhabdions?), iii) the minute denticles on their inner surfaces (arrowhead); D : Denticles in the mouth opening of a juvenile specimen; E : Excretory pore.* (Bar = 2 μm.).

TYPE LOCALITY AND HABITAT

From soil and mosses in exposed patches on nunataks at Robertskollen, western Dronning Maud Land, Antarctica, *legit* D. Balfour and W. Steele, Dec. 1991-Jan. 1992.

TYPE SPECIMENS

Holotype and several paratypes in the nematode collection of the Department of Zoology, Rand Afrikaans University. Three paratypes (one female, two males) deposited at the FitzPatrick Institute of African Ornithology, University of Cape Town, and two paratypes (female and male) in the Institute for Zoology, University of Ghent, Belgium.

REMARKS

The dorso-ventrally flattened condition of the male tail is rather similar to that seen in *Pseudacrobeles macrocystis* De Ley & Siddiqi, 1991 (See Fig. 6 C in De Ley *et al.*, 1993). The small lobe-like cuticular processes sur-

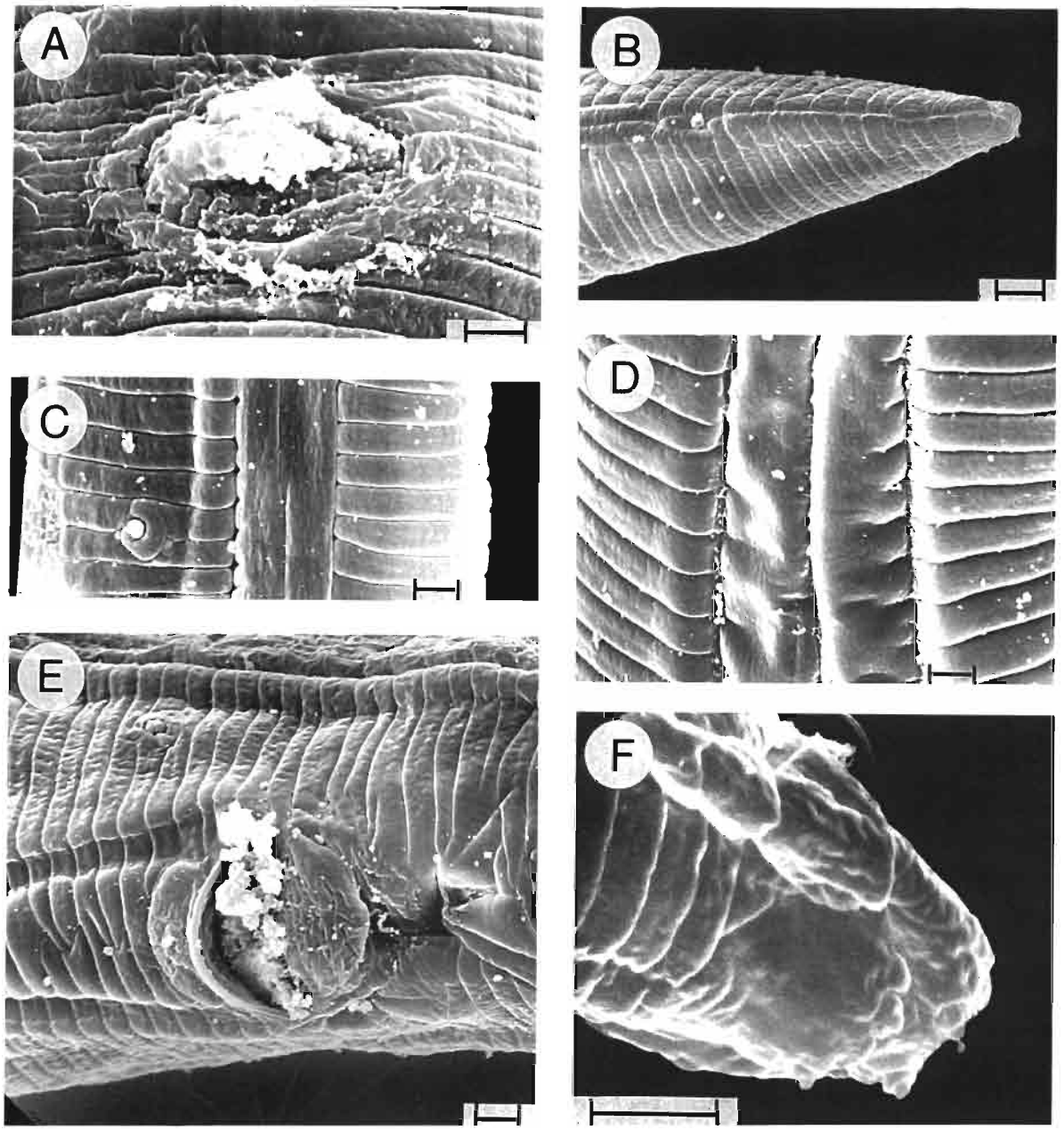

Fig. 3. Chiloplacoides antarcticus *n. gen., n. sp. A : Vulva, showing remnant of copulatory plug, and some of the small lobe-like cuticular structures surrounding the opening; B : Lateral view of female tail showing phasmid; C : Lateral lines in region of cloaca, with ventrosublateral pore; D : Lateral lines in region of vulva; E : Cloacal region; F : Subventral view of tip of male tail.* (Bar = 2 µm.).

rounding the vulva apparently correspond to the areas around the vulva demarcated by longitudinal lines or ridges described *i.a.* by Boström (1984) for *Chiloplacus minimus* (Thorne, 1925) (see Boström's Fig. 3 E) and Rashid *et al.* (1989) for *Cephalobus cubaensis* Steiner, 1935; *Heterocephalobus loofi* Andrássy, 1968; *Cervidellus neftasiensis* Boström, 1986, etc. (see Rashid *et al.* Figs 2 F, 3 D and 5 F). The shallow longitudinal grooves running anterior to the cloacal opening are similar to those illustrated for some *Acrobeles* species by Sauer *et al.* (1979) (see their Figs 10, 11 and 12).

Acknowledgments

Thanks are due to the following personnel of the FitzPatrick Institute of African Ornithology, University of Cape Town : Dave Balfour and Dr. Will Steele for collection of samples and

Dr. Jean Harris and Carol Green for extraction of nematodes. Processing and mounting of specimens was done at the Rand Afrikaans University by Mrs. Errie Heyns.

References

BOSTRÖM, S. (1984). Description and morphological variability of *Chiloplacus minimus* (Thorne, 1925) Andrássy, 1959 (Nematoda : Cephalobidae). *Nematologica,* 30 : 151-160.

COOPER, J., SIEGFRIED, W. R., RYAN, P. G., CRAFFORD, J. E. & STOCK, W. D. (1991). Effects of ornithogenic products on ecosystem structure and functioning : a new South African Biological Antarctic Research Subprogramme. *S. Afr. J. Sci.,* 87 : 223-226.

DE LEY, P., SIDDIQI, M. R. & BOSTRÖM, S. (1993). A revision of the genus *Pseudacrobeles* Steiner, 1938 (Nematoda : Cephalobidae). Part 1. Subgenus *Pseudacrobeles* grad. n. *Fundam. appl. Nematol.,* 16 : 219-238.

HEYNS, J. (in press). *Plectus antarcticus* de Man, 1904 from western Dronning Maud Land, Antarctica. *Nematologica.*

RASHID, F., GERAERT, E., COOMANS, A. & SUATMADJI, W. (1989). Cephalobidae from the Krakatau region (Nematoda : Rhabditida). *Nematologica,* 34 (1988) : 125-143.

RYAN, P. G. & WATKINS, B. P. (1989). Snow petrel breeding biology at an inland site in continental Antarctica. *Colonial Waterbirds,* 12 : 176-184.

RYAN, P. G., WATKINS, B. P., LEWIS SMITH, R. I., DASTYCH, H., EICKER, A., FOISSNER, W., HEATWOLE, H., MILLER, W. R. & THOMPSON, G. (1989). Biological survey of Robertskollen, western Dronning Maud Land : area description and preliminary species lists. *S. Afr. J. antarctic Res.,* 19 : 10-20.

SAUER, M. R. & ANNELLS, C. M. (1984). Lip region structure in Acrobelinae (Nematoda : Cephalobidae). *Nematologica,* 30 : 140-150.

SAUER, M. R., CHAPMAN R. N. & BRZESKI, M. W. (1979). External morphology of some Acrobelinae. *Nematologica,* 25 : 482-486.