

Geocenamus semicircularis (Tylenchida: Belonolaimidae) from East Falkland Island in the Subantarctic and its taxonomic status

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Summary. Nematode specimens collected from East Falkland Island were identified as *Geocenamus semicircularis* (Luth & Decker, 1985). These specimens were indistinguishable from *G. nothus* (Allen, 1955), therefore *G. semicircularis* (Luth & Decker, 1985) is here proposed as junior synonym of *G. nothus* (Allen, 1955). Data on morphometrics and drawings and SEM photographs of these nematodes are given.

Key words: *Geocenamus nothus*, *G. semicircularis*, taxonomy, East Falkland Island, SEM, synonymy.

The two Falkland Islands (East and West) are situated some 600 km off the coast of southern Argentina at about 52° S, 60° W. The marine nematode fauna around the islands has been described by Baylis (1916) and Allgen (1959). Maslen (1979, 1981) reviewed the terrestrial nematode fauna of the Antarctic region and Signy Island (South Orkney Islands). Boström (in press) has described several nematode populations from South Georgia and East Falkland Island. However, information of the terrestrial nematode fauna of East Falkland remains sparse and this paper adds to the information with a description of a species of *Geocenamus*.

MATERIALS AND METHODS

Samples from East Falkland Island were collected by Dr. Anders Wasell on 15th January 1994 at Cerritos Arroyo from a grassland grazed by sheep and geese. The nematodes were extracted by a wet funnel method (Sohlenius, 1979), killed in hot water and fixed in cold TAF. For light microscopy (LM), nematodes were transferred to anhydrous glycerine by a slow method (Hooper, 1970) and mounted on slides as described by Boström & Gydemo (1983). For scanning electron microscopy (SEM), specimens were processed according to Boström (1989). Curvature-value, the ratio:

length of body by radius of body curvature, is proposed here for measuring the body curvature on the ventral side. Slides are deposited in the Department of Invertebrate Zoology, Swedish Museum of Natural History, Stockholm and in the Nematological Collection of Zoological Institute, Saint-Petersburg.

DESCRIPTION

Geocenamus semicircularis (Luth & Decker, 1985) (Figs. 1 & 2, Table 1)

Morphometric data are presented in Table 1 and data obtained from the literature on *Geocenamus semicircularis* and *G. nothus* are given for comparison with the population under study.

Body ventrally curved and forms an arc, the length of which equals approximately one third of the circle (for exact curvature-value see Table 1). Body annuli 1.5-2 μm thick at mid-body. Cephalic region continuous with body contour. Cephalic framework has light sclerotization, stylet knobs directed posteriorly. Orifice of the dorsal oesophageal gland opens 1.5-2 μm posterior to stylet base. Excretory pore 80-110 μm from anterior end. Vulval epiptygma present, spermatheca bilobed or trilobed, filled with

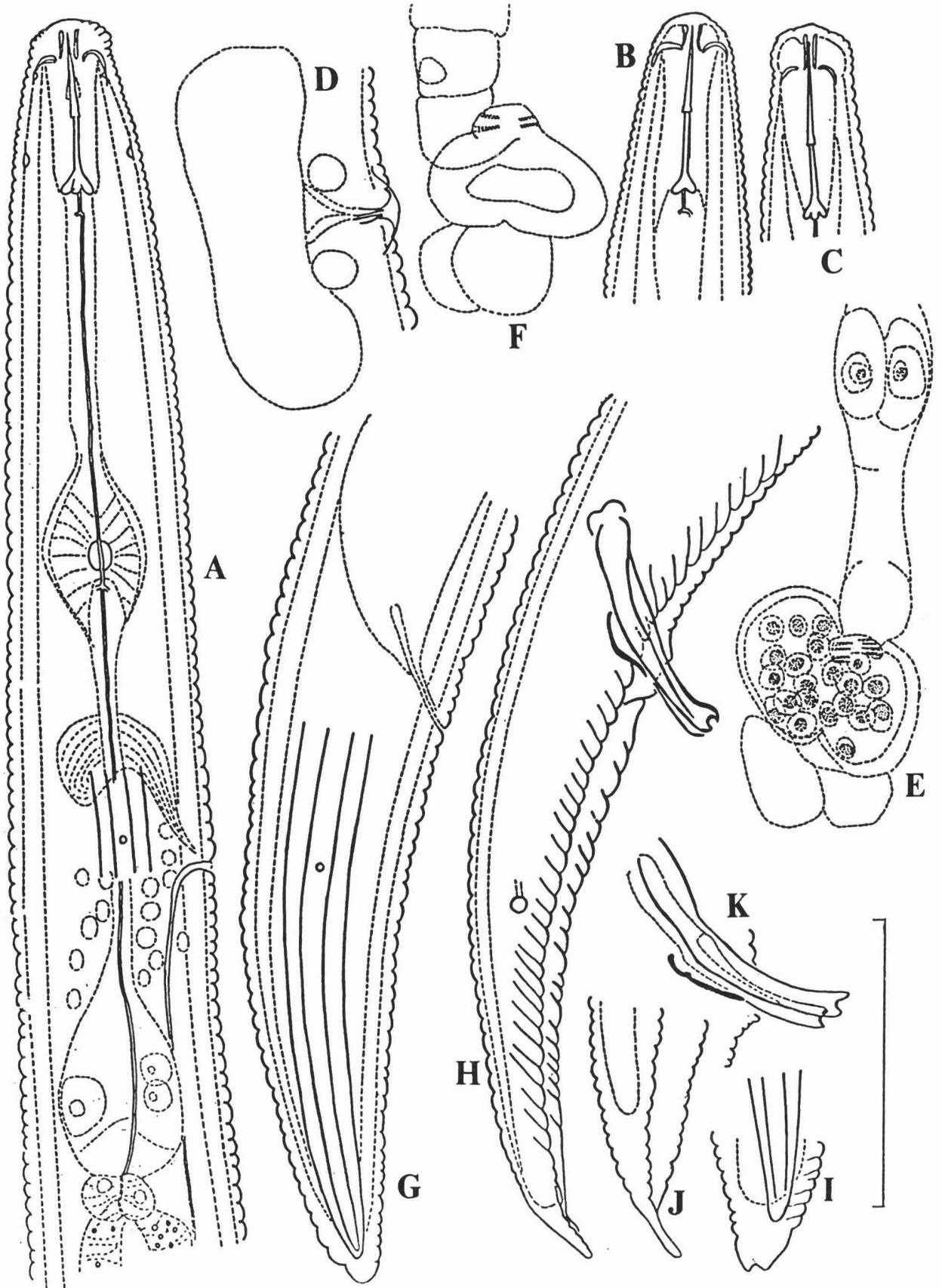


Fig. 1. *Geocenamus semicircularis* (Luth & Decker). A; D-G; I: Female; B, C, H, J, K: Male. A: Anterior part; B, C: Head; D: Vulval region; E: Typical spermatheca; F: Spermatheca without sperm; G, H: Tail; I: Tail tip; J: Male tail tip in which the caudal alae do not reach the apex of the terminus; K: Spicules. Scale bar 30 μ m.

Table 1. Morphometric data for *Geocenamus semicircularis* and *G. nothus*.

Characters	<i>Geocenamus semicircularis</i>		from Falkland Islands		<i>Geocenamus semicircularis</i> (after Luth & Decker, 1985)		<i>Geocenamus nothus</i> *	
	Females n=6	Males n=8	Female juveniles 4th stage n=3	Male juvenile 4th stage n=1	Females n=22	Males n=10	Females n=54	Males n=9
L	632 ± 43 (580-680)	629 ± 33 (580-680)	408 ± 59 (360-470)	550	687 (608-764)	690 (640-749)	580 (460-690)	610 (494-683)
a	25 ± 1.2 (24-27)	28.3 ± 1.0 (27-30)	22 ± 1.0 (21-23)	26	24 (22-28)	28 (26-31)	25 (21-30)	30 (25-37)
b	4.8 ± 0.29 (4.5-5.2)	4.8 ± 0.24 (4.5-5.2)	3.6 ± 0.5 (3.2-4.1)	4.0	4.7 (4.2-5.4)	4.7 (4.4-5.0)	4.7 (4.1-5.4)	4.8 (4.3-5.2)
c	12 ± 1.3 (10-14)	11.3 ± 0.7 (10-12)	10.7 ± 0.6 (10-11)	11	12 (11-15)	13 (11-14)	13 (10-16)	11.6 (10.3-13.8)
c'	3.0 ± 0.2 (2.8-3.3)	4.4 ± 0.33 (4.2-5.2)	3.0 ± 0.3 (2.7-3.3)	2.8	2.9 (2.5-3.4)	–	2.8 (2.0-3.4)	3.2 (2.9-3.5)
V	55.8 (55-56)	–	58 ± 1.7 (57-60)	–	55 (51-57)	–	56 (51-59)	–
Stylet	16.7 (16-17)	15.8 ± 0.9 (15-17)	15.3 (15-16)	16	16.4 (15.5-17.5)	16-17	16(15-17)	16 (15.5-16.5)
Curvature***	2.1 ± 0.6 (1.3-2.9)	1.9 ± 1.1 (0.6-4.3)	1.7 ± 0.4 (1.2-2.2)	2.9	–	–	–	–
Width of stylet base	3.5-4	3.5	3	3	3**	–	3-3.5**	–
Number of cephalic annules	6.3 ± 0.8 (5-7)	6 ± 0.9 (5-7)	4.3 (4-5)	5	6-7	6-7	5.5 (4-7)	5-7
Cephalic width at base	6.5-7	7-8	7 (6-8)	8	8	8	7-8**	–
Ratio: cephalic region width to height	1.7 ± 0.14 (1.6-1.8)	2.0 ± 0.17 (1.8-2.3)	2.0 ± 0.3 (1.8-2.3)	2.2	1.7**	1.7**	2.2**	–
MB****	48 ± 1.8 (45-50)	48.8 ± 1.2 (47-50)	47.7 ± 1.2 (47-49)	47	–	–	47 (41-51)	47 (44-50)
Ratio: medial bulb length to width	1.3 ± 0.17 (1.0-1.5)	1.6 ± 0.12 (1.5-1.8)	1.53 (1.5-1.6)	1.7	1.3**	–	1.6**	–
Median bulb width	10.5 (10-11)	9-10	8.7 (8-9)	9	11.5-14.5	–	10**	–
Length of gland part of oesophagus	25.2 ± 1.7 (23-28)	20-21	21.7 (21-23)	25	25**	–	23**	–
Spermatheca width	13 ± 3.8 (7-18)	–	–	–	absent	–	bilobed-multilobed	–
Ratio: spermatheca length to width	0.7 ± 0.11 (0.5-0.8)	–	–	–	–	–	–	–
Number of lateral field incisures:								
at mid-body	6	6	4	4	6	6	6	6
at anus and phasmid	4	6	4	4	4	–	6	–
Tail length	52 ± 3.1 (48-57)	–	37.3 ± 3.2 (35-41)	49	59 (50-65)**	59 (54-65)**	46 (36-63)	53 (43-64)
Tail annules	40.5 ± 5.2 (35-50)	55 ± 11.6 (37-73)	37 (36-38)	43	38 (30-44)	–	35 (26-45)	–
Number of annules between phasmid and anus	17 ± 3.5 (11-22)	22 ± 3.7 (18-30)	12.7 ± 9.0 (10-16)	19	13 (10-16)**	–	12-17**	–
Ratio: width at anus to width at base of hyaline part	2.9 ± 0.3 (2.5-3.4)	5.7 ± 1.8 (4.5-10)	2.5 (2.1-2.7)	1.7	2.8**	–	2.8-3.5**	–
Hyaline part length	5.7 (5-6)	7 ± 2.0 (5-10)	2	5	4**	–	4.5 (2-6)	–
Ratio: hyaline part length to width at base	0.95 ± 0.08 (0.8-1.0)	2.8 ± 0.51 (1.7-3.5)	0.4	0.6	0.6**	–	0.58 (0.4-0.8)**	–
Spicule length	–	23.4 ± 1.1 (22-25)	–	–	–	22.5 (21-24)	–	22 (21-24)
Gubernaculum length	–	8.5 ± 1.1 (7-9)	–	–	–	8.7 (7.5-9.5)	–	7 (6-8)

All measurements are given in micrometers. Standard deviation (SD) is given for each value with exception of cited data.

*) after Allen, 1955; Brzeski, 1992, summarized.

***) after drawing and calculations from original description.

****) Curvature-value is the ratio: length of the body by radius of the body curvature.

*****) MB - distance from the anterior end to the center of the medial bulb expressed as a percentage of the total length of the oesophagus.

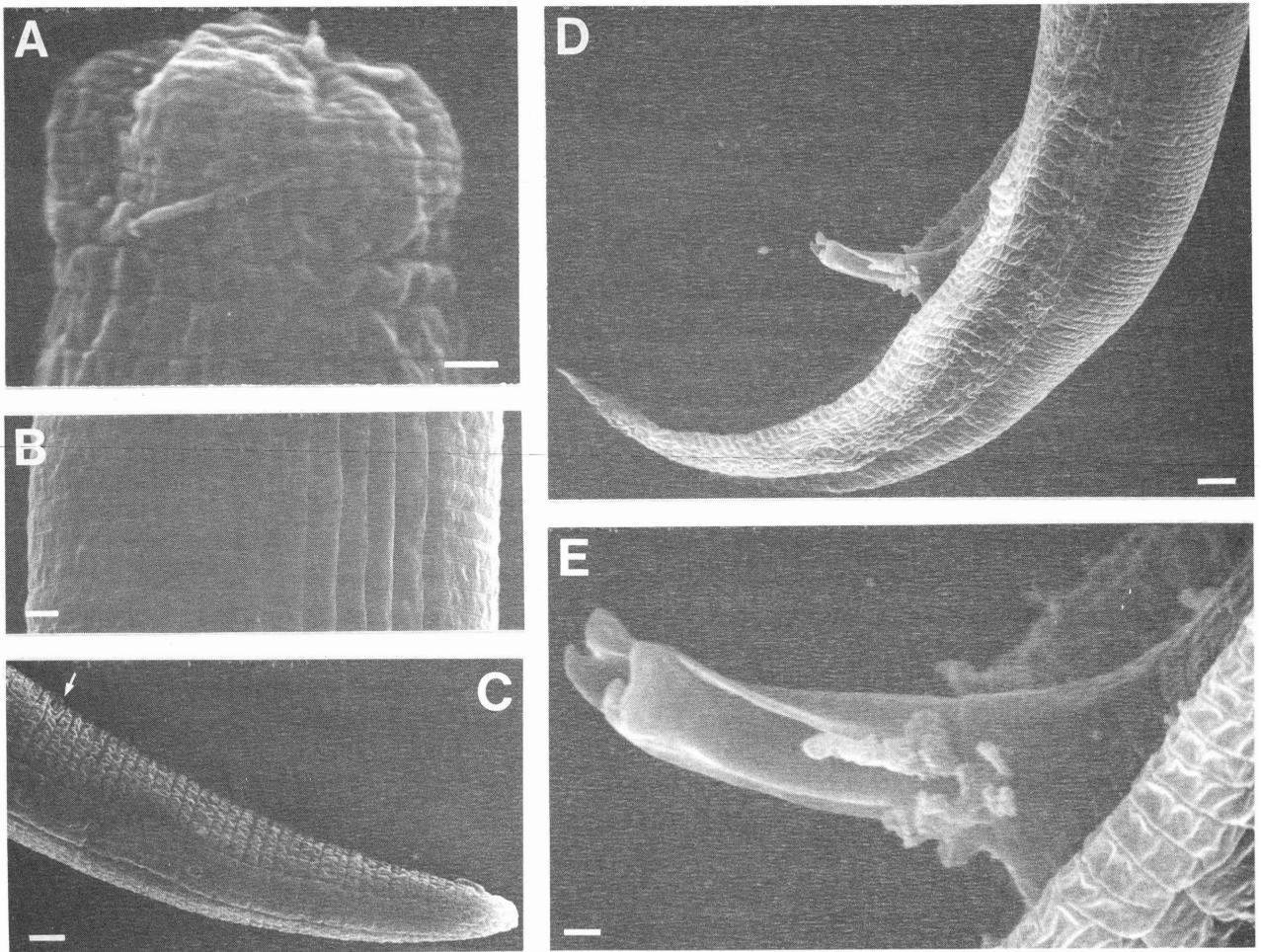


Fig. 2. *Geocenamus semicircularis* (Luth & Decker). SEM photographs. A-C: Female; D, E: Male. A: Anterior end, sublateral view; B: Lateral field at mid-body; C: Tail (lateral field with four incisures), -anus at the arrow; D: Male tail; E: Spicula end. Scale bars: A, E = 1 μm ; B = 2 μm ; C-D = 4 μm .

spherical sperm 2-3 μm diameter. One female has spermatheca without sperm (Fig. 1 F). Tail conical, tail tip smooth or with one incisure at terminus. Caudal alae of males, with one exception reach tail tip apex (Fig. 1 H, J)

RELATIONSHIPS AND DISCUSSION

G. semicircularis was first described by Luth & Decker (1985) and the description of this species with SEM photographs are also presented in a Dissertation thesis (Luth, 1985).

G. semicircularis Luth & Decker differs from closely related species, including *G. nothus* (Allen), by the following characters: 4 incisures between anus and phasmid in females (vs. 6 in *G. nothus*), absence of spermatheca (vs. bilobed spermatheca in *G. nothus*),

vulval epiptygma was not mentioned (vs. presence of well-developed epiptygma in *G. nothus*). Examination of the population of *G. semicircularis* from East Falkland Island necessitates changes to the diagnosis of this species. Females of *G. semicircularis* from East Falkland Island have well-developed epiptygma and bilobed spermatheca filled with sperm. There were numerous males in the type population - allotype and 10 paratypes and therefore absence of a spermatheca in female paratypes and the holotype is probably caused by the quality of the morphology in the holotype and paratype specimens or their physiological state. Therefore, the only difference between *G. nothus* and *G. semicircularis* is the number of incisures of the lateral field between the anus and the phasmid. Juveniles of *G. semicircularis* from East Falkland Island have 4 incisures from the anterior end to the tail tip

(Table 1.) Juveniles of *G. nothus* from different populations have similar numbers of incisures (Brzeski, personal communication) as these specimens. Brzeski (1991, and personal communication) also reported that females of *G. nothus* have variable numbers of incisures present in the tail, from 4 to 6 within some populations. Therefore, we conclude that this difference is not significant to support species status for *G. semicircularis*.

Merlinius semicircularis Luth & Decker, 1985 = synonym of *Tylenchorhynchus nothus* Allen, 1955, new synonymy = *Geocenamus nothus* (Allen, 1955) Brzeski, 1991, valid name.

Presence of four incisures in the lateral field in juveniles of *Geocenamus nothus* has phylogenetic significance. Six incisures is typical for the group of closely related Belonolaimidae: *Geocenamus*, *Nagelus*, *Amplimerlinius*, whereas, the more primitive genera *Psilenchus*, *Tylenchorhynchus* and others have only 4 incisures. Presence of 4 incisures in juveniles of *G. nothus* and in the tail of females from some populations of this species is the primitive state for the Belonolaimidae.

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Резюме. На основании изучения *Geocenamus semicircularis* (Luth & Decker) с острова Восточный Фолклендский было показано отсутствие существенных различий между этим видом и *G. nothus* (Allen, 1955). Предложена новая синонимика *Geocenamus semicircularis* = *G. nothus*. Приводятся данные по морфометрии вида, а также рисунки и СЭМ фотографии.