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AFRICANEMA INTERSTITIALIS GEN. NOV., SP. NOV., A SPECIES WHICH INDICATES THE RELATIONSHIP BETWEEN THE TREFUSIIDAE (HALANONCHINAE) AND THE TRIPYLOIDIDAE (NEMATODA)

BY

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SUMMARY

The Nematod *Africanema interstitialis* gen. nov., sp. nov. is described from South African and Namibian beaches. The species is characterized by jointed external labial and cephalic setae which are clearly separated from each other. The buccal cavity is very large and cylindrical without teeth. The combination of these characters indicates a close relationship between the Trefusiidae (Halanonchinae) and the Tripyloididae.

RÉSUMÉ

On décrit le Nématode *Africanema interstitialis* gen. nov., sp. nov. de plages d'Afrique du Sud et de Namibie. L'espèce se caractérise par des soies articulées (labiales externes et céphaliques) qui sont nettement séparées entre elles. La cavité buccale est fort grande, cylindrique, sans dents. La combinaison de ces caractères indique une étroite parenté entre Trefusiidae (Halanonchinae) et Tripyloididae.

INTRODUCTION

Three sandy beaches and an estuary were selected by zoologists of the University of Port Elizabeth to study the ecology and taxonomy of the meiofauna of South African and Namibian (South West Africa) beaches. *Africanema interstitialis* gen. nov., sp. nov. was found in the sandy beaches only, viz. Sundays River Beach in Algoa Bay, 30 km north of Port Elizabeth (25°52′E 33°43′S); Cape Receife Beach, 2 km south of Port Elizabeth (22°41′30′′E 34°00′30′′S); and the Bay of Cusp, Langstrand, Namibia (14°10′E 22°04′S).

The average particle size for Sundays River Beach is 250 μm, for Cape Receife Beach 300 μm and between 260-300 μm for Langstrand. The Cape Receife Beach is much more sheltered than Sundays and Langstrand.

MATERIAL AND METHODS

All areas were sampled once. Marine sediment samples were taken with a copper corer 60 cm in length and 3.6 cm in diameter. Stratified samples were taken of all sites and tital levels excluding Sundays River Beach (this beach was only sampled at MWS at a depth of 0-30 cm).

Extraction was done by decantation. The specimens were fixed in hot (60°) neutral formalin and mounted in glycerine after dehydratation.

Drawings were made with the aid of a drawing tube on a Leitz Dialux 20 microscope with interference contrast equipment.

All measurements are in micrometer; curved structures are measured along the arc.

Values in the formula (measurements) are as in Vincx et al. (1982).

Thirty-three specimens of the new species were encountered. The specimens were distributed in the samples as follows:

(1) Sundays River Beach, Algoa Bay, Sundays River: 3 ♂♂, 2 ♀♀ and 3 juv., 6 km north of the Sundays River mouth, only MWS, 0-30 cm depth.

(2) Cape Receife, Algoa Bay, Port Elizabeth: 5 ♂♂, 2 ♀♀ and 3 juv; from 6 m above LWS to HWS, in samples from 15 to 60 cm or from 30 cm to the water table.

(3) Bay of Cusp, Langstrand, Namibia: 3♂♂, 2 ♀♀ and 10 juv, all at HWS and in the 15-30 cm deep layer.

Africanema interstitialis sp. nov.

Specimens measured: 7 males and 5 females.

Type specimens. Holotype male ♂$_1$ (slide no 953) and paratype female ♀$_1$ (slide no. 945) in the Nematode Collection of the Instituut voor Dierkunde, Gent, Belgium. Other paratypes in the same collection or in the Department of Zoology, University of Port Elizabeth, Port Elizabeth, South Africa.

Type locality: Sundays River Beach. Sampling date 9th February, 1987.

Other localities: Cape Receife Beach and Bay of Cusp, Langstrand, Namibia (S.W.A). Sampling date 12th August, 1986.

Measurements:

Holotype (♂$_1$): 27 92 ? 395 M 1550
———————————— 1700
18 25 ? 25 25 22

a = 68.0 b = 4.3 c = 11.3 c' = 6.8 spic = 23

Paratype (♀$_1$): 27 ? 178 401 495 1320
———————————— 1485
18 ? 24 25 25 20

a = 59.4 b = 3.7 c = 9.0 c' = 8.3 v = 33.3%

Other paratypes

	♂♂ (n = 6)	♀♀ (n = 4)
L:	1442 - 1850	1268 - 1682
a:	56.2 - 81.3	49.2 - 73.1
b:	3.7 - 4.2	3.6 - 4.0
c:	10.6 - 14.0	8.3 - 13.7
c':	5.3 - 6.4	5.6 - 8.2
spic/V:	23 - 32	29.8 - 38.8

Males.- Body cylindrical, slender with rounded head end and cylindro-conical tail.

Cuticle finely striated; striations very faint at the level of the buccal cavity, not present anterior to the 6 external labial setae; ten striations occupy a distance of 4 - 5 μm.

The six internal labial setae are 4-6 μm long and are situated at the base of the three lips (two per lip). The six external labial setae are 16-26 μm long, are situated at 9-10 μm from the apical end and consist of three segments each; the base of these jointed setae is broader and is continuous with the cuticle of the cephalic region. Dentritical processes are obvious in the basal and sometimes in the middel segments; the top segment has a knot-like terminal part which ends in a pointed tip (the terminal segment is lost in some specimens). The middle and the outer segments of the setae are filled with small granules. The four cephalic setae are two segmented and filled with granules; they are 5-9μm long and situated at the posterior level of the amphideal fovea.

Somatic setae are scarce, mostly restricted to the pharyngeal region.

At the ventral side in the phargyngeal region, 12 small conical papillae are present, each connected with a small tube. The first papilla is situated at 38-48 μm from the anterior end; the distance between the different papillae varies between 9 and 19 μm.

The amphideal fovea has an elongated, irregular outline and its length varies between 8 and 15 μm; its diameter ranges between 3 and 5 μm (i.e. 17-34% of the corresponding body diameter) and its anterior margin is situated at 13-19 μm from the anterior end. No indication of a spiral origin could be found. Inwardly the fovea forms a deep funnel (cf. fig. 1G)

Three prominent lips (one dorsal and two ventrosublateral) are deeply separated from each other and weakly cuticularized.

The buccal cavity is cylindrical with slightly narrowing ends in lateral optical section; the sclerotized walls surround a more or less triangular lumen (cf. apical view in fig.1F). Its length varies between 20 and 28 μm; its width ranges between 9 and 11 μm. No teeth. Only the posterior part is surrounded by pharyngeal tissue.

The pharynx is cylindrical without terminal bulb; the cardia is 12 μm long.

The nerve ring is situated at 169 μm; i.e. 45% of the pharyngeal length (not seen in the holotype male but in four of the six male paratypes).

The outlet of the ventral gland cell is very well sclerotized and the pore is situated at 43% of the pharyngeal length.

Diorchic with anterior testis the most developed and situated at the right of the intestine; the posterior testis is much shorter and is situated at the left of the intestine. Sperm cells oval with dense nucleus. Spicules provided with median stiffening piece; distal tip trifid; a capitulum is weakly developed; spicule length varies between 23-32 μm, i.e. 0.8-1.3 times the anal body diameter. Gubernaculum absent. Musculature of the copulatory apparatus not prominent.

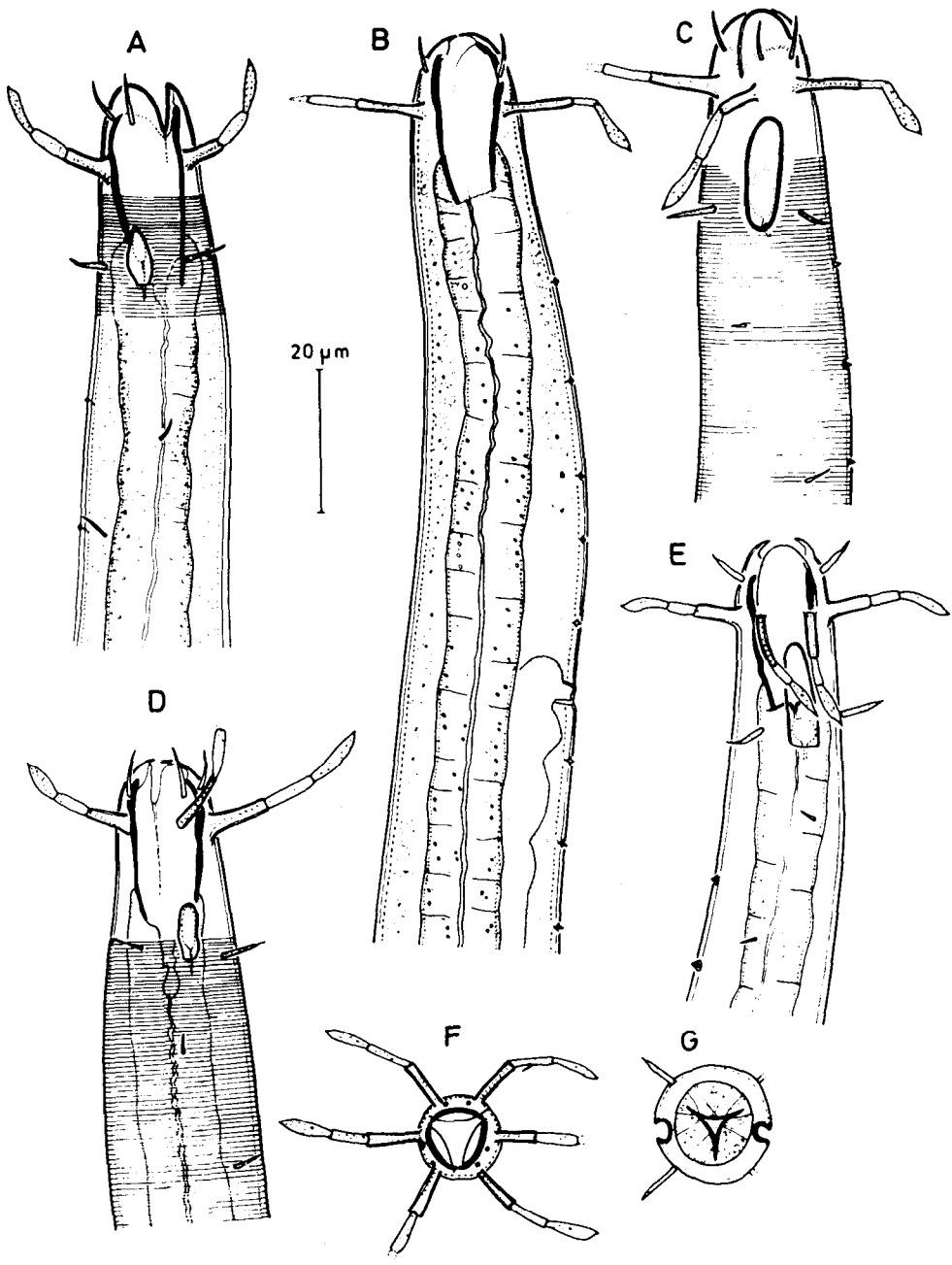

Fig. 1. *Africanema interstitialis* gen. nov., sp. nov. A, head end of paratype ♂2 (one pair of external labial setae is sticking to the body wall); B, anterior end of holotype ♂1 (in lateral optical section); C, anterior end of holotype ♂1 (surface view); D, anterior end of paratype ♀1; E, anterior end of paratype ♂3; F, en face view of a juvenile (top-level and level of the external labial setae); G, en face view of a juvenile (level of amphideal fovea).

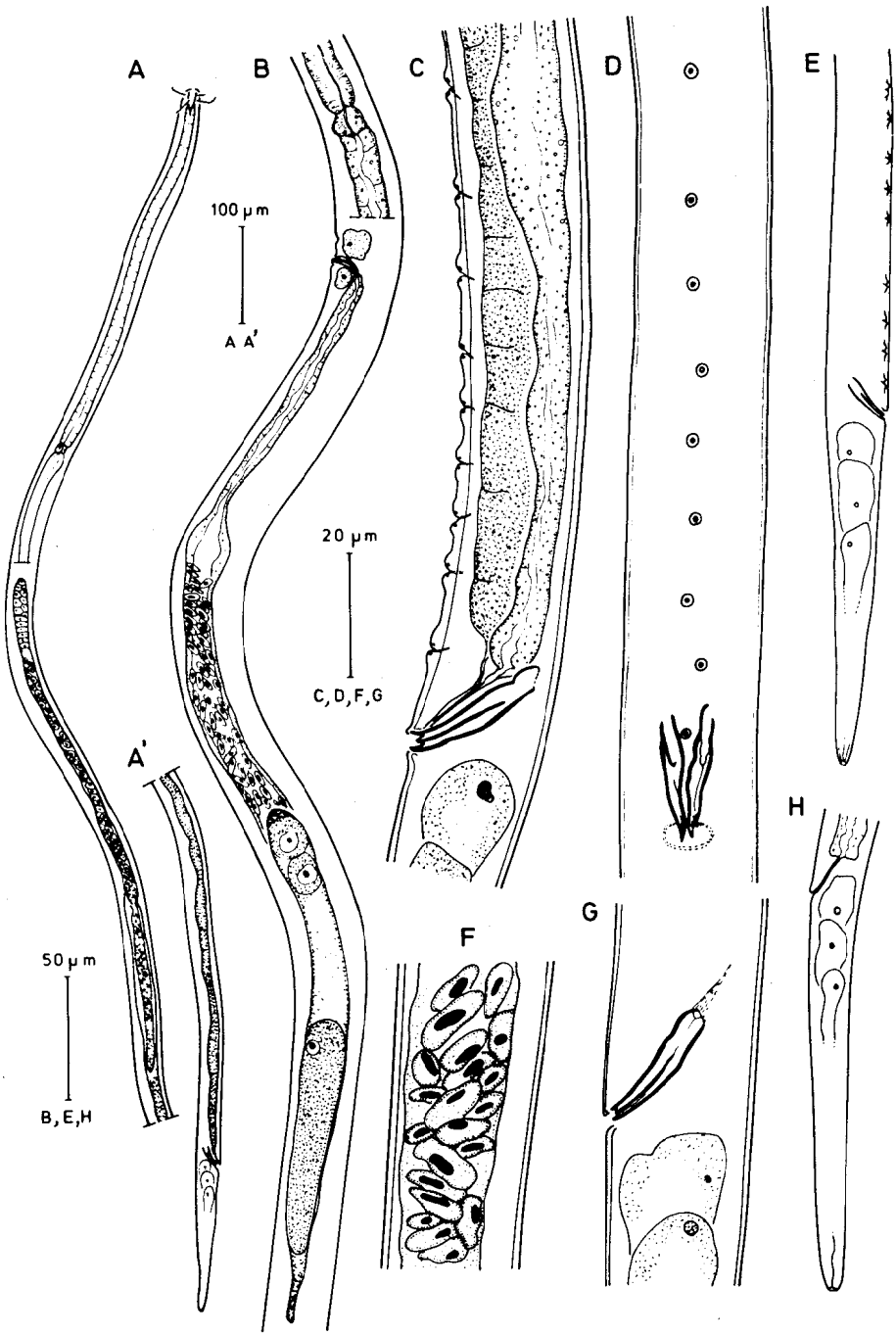

Fig. 2. *Africanema interstitialis* gen. nov., sp. nov. A-A', total view of holotype ♂1; B, genital system of paratype ♀1; C, cloacal region of paratype ♂3 (lateral view); D, cloacal region of paratype ♂4 (ventral view); E, tail region of holotype ♂1 (lateral view); F, sperm cells of holotype ♂1; G, left spicule of holotype ♂1; H, tail of paratype ♀1.

Nine pre-anal supplements are present with irregular distances between them and not exactly situated on the mid-ventral line (cf. fig. 2D). In lateral optical section, each supplement consists of a narrow tube which is surrounded by two elevations. In some males the supplements are hardly visible. The anteriormost supplement is situated at 106-124 μm, the posterior one at 14-18 μm from the cloacal opening.

Tail cylindro-conical with three prominent gland cells. Spinneret weakly developed.

Females.- Resemble males in most aspects. Differences are: — only the smaller type of the males amphideal fovea is present: the length of the amphideal fovea varies between 6 and 9 μm i.e. 17-25% of the c.b.d. The anterior border of the fovea is situated at 17-22 μm from the apical end.

Monodelphic with posterior reflexed ovary. The proximal part of the uterus is filled with numerous sperm cells. The vagina is well sclerotized and is bent posteriorly; two vaginal gland cells present.

DIAGNOSIS

Africanema gen. nov.

Generic diagnosis.- Trefusiidae. Halanonchinae. Cuticle obviously striated. Three circles of anterior setiform sensilla clearly separated from each other. External labial setae cephalic setae are jointed. Males with pharyngeal and pre-anal supplements and two opposed testes; gubernaculum; females monodelphic, opistodelphic. Tail short, cylindro-conical.

Type and only species: *Africanema interstitialis* sp. nov.

Africanema interstitialis sp. nov.

Specific diagnosis.- Characterized by the four cephalic setae situated at the posterior border of or posteriorly to the buccal cavity and by the presence of 12 pharyngeal and 9 preanal papilliform supplements in the males.

DISCUSSION

Africanema interstitialis gen. nov., sp. nov. belongs to the Trefusiidae Gerlach, 1966 (as defined by Lorenzen, 1981) because the cephalic setae are widely separated from the 6 external labial setae. The amphideal fovea is not wound. Three prominent lips are present; the buccal cavity is unarmed and cylindrical without partitions.

The Trefusiidae are divided in two subfamilies: Trefusiinae Gerlach, 1966 and Halanonchinae Wieser & Hopper, 1967. The new species belongs to the Halanonchinae because of the large unarmed buccal cavity, the presence of one posterior ovary and one ventral row of pre-anal supplements in the males.

The new species differs from the species of the only genus of the subfamily Halanonchinae, *Halanonchus*, by its striated cuticle. long internal labial sensilla, jointed external labial and cephalic setae, the cephalic setae situated in a much posterior position (at the posterior border of the buccal cavity), the absence of a gubernaculum and a short tail.

Therefore, we decide to erect a new genus for this species.

However, the three deeply cut lips, the shape of the jointed external labial setae and the large buccal cavity suggest also a relationship with the Tripyloididae (especially with species of the genus *Bathylaimus*). But, in the last family, the external labial sensilla and the cephalic setae are always at the same level. The shape of the external labial setae in some species of the genus *Bathylaimus* (e.g. *Bathylaimus parafilicaudatus* Allgén, 1935) resembles that of *Africanema interstitialis* gen. nov., sp. nov.. But the species of the Tripyloididae have as apomorphic character the presence of one anterior testis (according to Lorenzen, 1981); the new species has two opposed testes. The presence of jointed setae in some genera of the Trefusiidae, Trefusiinae (e.g. *Trefusia, Rhabdocoma*) is never combined with a large cylindrical buccal cavity as in *Africanema interstitialis* gen. nov., sp. nov.. All these species of the Trefusiinae hardly have a buccal cavity as the pharynx reaches the level of the lip region.

The combination of characters in *Africanema interstitialis* gen. nov., sp. nov. indicates a close relationship between the Trefusiidae and the Tripyloididae.

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