

Achaeta gigantea sp. n., a large-sized species of Enchytraeidae (Oligochaeta) from South Africa

By

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Abstract. *Achaeta gigantea* sp. n. is described from South Africa. It is the largest known species within the genus *Achaeta*. Its main characteristics are: epidermal sacs (setal follicles) absent; clitellum on XII-1/2 XIII showing a very typical arrangement of different cells; septal glands very much lobed and not united dorsally; dorsal vessel originates in IX; sperm funnel bent on itself; an odd big seminal vesicle in XI; spermatheca well developed, free, extending backwards to the VIII-Xth segments.

In the course of his trip in South Africa in 1991, Dr. A. Zicsi collected some large enchytraeid specimens and handed them to the present author. The animals belong to a species new to science which is described here as *Achaeta gigantea* sp. n.

Very few terrestrial enchytraeids have been described from South Africa so far (Michaelsen, 1907, 1913 a, 1913 b). The genus *Achaeta* is new to the country.

Material and methods

The enchytraeid worms studied were collected from sandy soil of a small indigenous forest near to a stream, 5 km from Grahamstown, South Africa. They were preserved in ethanol immediately after collection, *i.e.* the animals were examined only in preserved condition. Owing to the thick cuticle and the sand grains in the intestine the big worms were not transparent. Therefore seven specimens were cut up along the dorsal midline from XVth segment till the prostomium. Afterwards, they were stained in borax-carmin, haematoxylin-eosine or bromphenol-blue. In some cases, the organs (spermathecae, seminal vesicle, sperm funnel, septal glands) were picked up, and permanent mounts were made in euparal. The length and the diameter (at VIIIth segment

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and at the clitellum) of the intact specimens were measured also under light microscope.

Altogether 17 adult and 2 subadult specimens + 3 fragments were examined.

Achaeta gigantea sp. n.

(Figs. 1 A-G and 2 A-C)

Large species, length 23.0-45.5 mm, diameter at VIII 0.9-1.2 mm, at the clitellar region 1.0-1.5 mm. Number of segments about 66-85. It is difficult to count them, because they are ringed secondarily in the apical part and at the end of the body. In the middle part the body is entirely smooth and the septa are absent especially after the clitellar region. Colour whitish or brown, respectively, due to sand grains in the gut content. Head pore on tip of 0, dorsal pores absent. Setae, epidermal sacs (setal follicles) and lens-shaped epithelial cells absent. Cuticle thick, cutaneous surface with 2, at the end of body 7-8, afterwards 4-2 ring-shaped thickenings per segment, small cutaneous glands with small oval hyaline cells arranged in transverse rows. Clitellum extends from XII-1/2 XIII, ring-shaped, well developed (Fig. 2). Dorsally, granular and hyaline cells arranged in transversal rows forming a mosaic pattern (Fig. 2 C). Laterally, only granular cells in rows. Ventrally, an oval white pad is striking, composed by 20-22 (20-22 μm wide) rows of hyaline cells arranged into two-cell layers each (Fig. 2 A, B). The pad is surrounded by granular cells. Brain about 150-230 μm long, rounded posteriorly (Fig. 1 A). Three pairs of multiply lobed septal glands with ventral lobes in IV/V-VI/VII, none of them connected dorsally. Oesophageal appendage hardly visible in V. Chloragogen cells from V weakly developed. Lymphocytes oval or round, 15-30 μm long, gently granulated. Nephridia of the usual type of the genus, postseptal tapers gradually into a terminal efferent duct (Fig. 1 D). Two pairs of preclitellar nephridia present at VIII/DX and IX/X. The dorsal vessel originates in IX with large dilatation in IX, VIII and VII. Blood probably colourless (in the fixed animals it is not stained with eosin).

Seminal vesicle large, unpaired, dorsally in XI (Fig. 1 E). Testis and ovarium odd in the ventral midline of X/XI and XI/XII, respectively (Fig. 1 B). Sperm funnel about 800 μm long, three times longer than wide, strongly bent on itself or S-shaped (Fig. 1 C). Collar wider than the funnel itself. The sperm duct (16 μm wide) wound into a more or less distinct spiral. The main opening simple without any glands. The male openings located 430 μm from each other (Fig. 2 A). Spermatheca free, consists of a short ectal duct with distinct canal. No glands at the ectal orifice. Mid-part of the spermatheca wider than the duct, displaying circular invaginations then expanding into a large

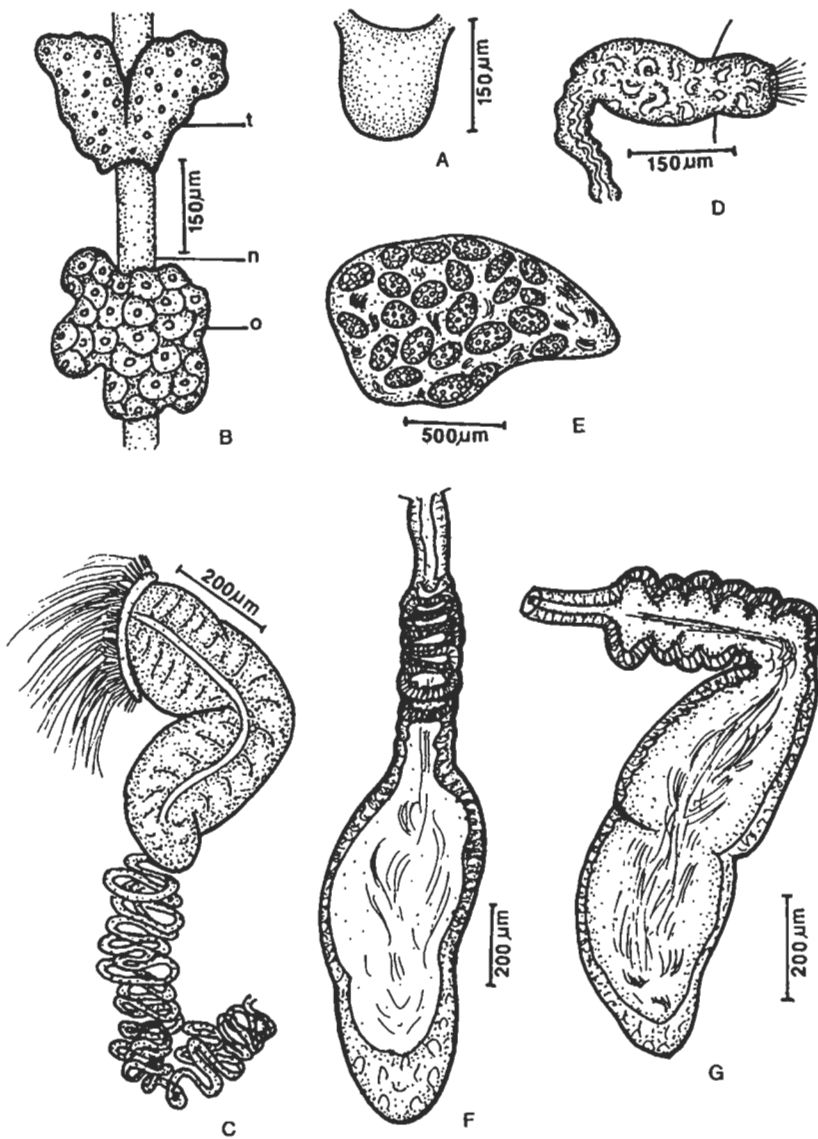


Fig. 1. *Achaeta gigantea* sp. n. A: brain; B: t = testis, o = ovarium, n = ventral nerve chord; C: sperm funnel; D: nephridium; E: seminal vesicle; F and G: spermathecae

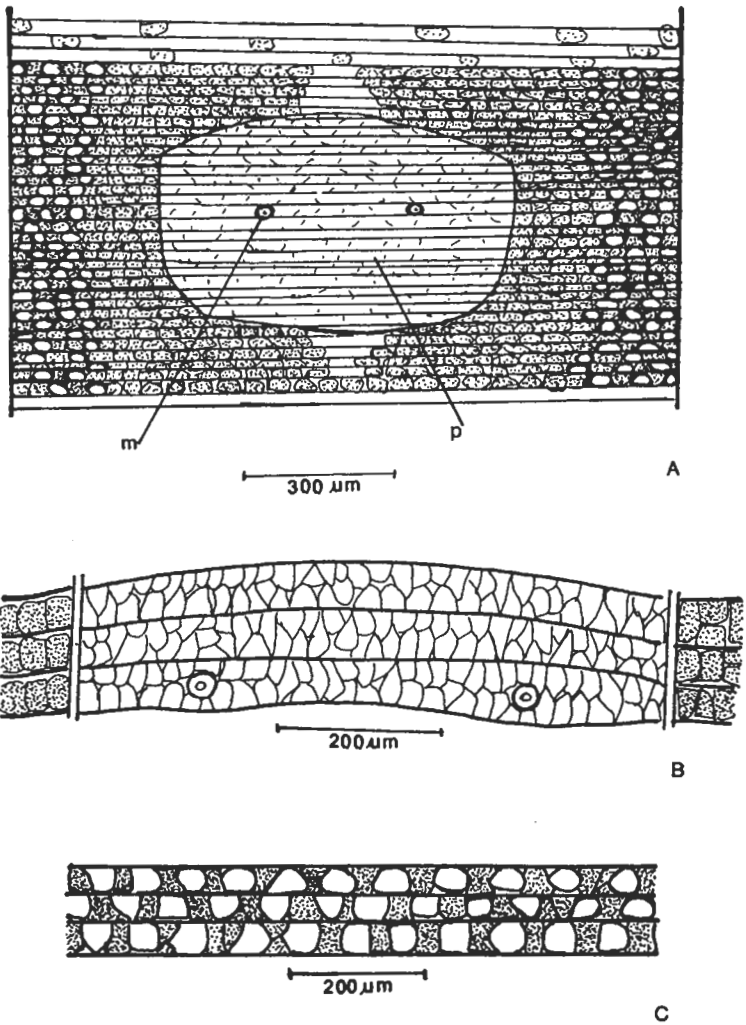


Fig. 2. *Achaeta gigantea* sp. n. A: ventral side of the clitellum of a dissected specimen, p = white pad with the male opening; B: three rows from the white oval pad magnified; the male opening is visible in the third row; C: three rows of glandular cells from the dorsal side of the clitellum (detailed in the text)

ampulla which also invaginated in the middle, filled with sperm and reaching to IX-X (Fig. 1 F, G).

Holotype: A. 3 (conserved in 70 % ethanol).

Paratypes: P. 72.1: 10 adult and 2 subadult specimens + 3 fragments (in 70 % ethanol); P. 72.2: three slides in euparal of a dissected and disjointed specimen stained in borax-carmin; P. 72.3: organs from a dissected specimen one slide in euparal, not stained; P. 72.4: three slides in euparal of a dissected and disjointed specimen stained in haematoxilin-eosine; P. 72.5: a total dissected specimen in euparal, stained in bromphenol-blue; P. 72.6: a dissected worm stained in borax-carmin (in 70 % ethanol); P. 72.7: three slides in euparal of a dissected and disjointed specimen stained in haematoxilin; P. 72.8: organs from a dissected specimen stained in borax carmin (in 70 % ethanol).

The type material is deposited in the collection of the author, Department of Systematic Zoology and Ecology, Eötvös Loránd University, Budapest.

Type locality: South Africa, Cape Province, 5 km from Grahamstown, sandy soil in the vicinity of a small stream in a indigenous forest, 33°20' S and 26°31' E; collected by A. Zicsi, 22. 11. 1991.

The distinguishing features of the new *Achaeta* species are: large size, characteristic arrangement of clitellar glands, form of the spermatheca and unique form of the septal glands having many lobes both dorsally and ventrally.

Etymology: The species name refers to the large size of the new species: γιγαντευσ (Greek), or giganteus (Latin) = gigantic, uncommonly large.

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