

# Studies on *Haliplectus* Cobb, 1913. Description of *Haliplectus algoensis* n. sp. (Nematoda: Haliplectidae, Suborder Leptolaimina)

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Specimens of the genus *Haliplectus* Cobb, 1913 which exhibited remarkable morphological detail were collected from coastal dune slacks in the Alexandria dune field east of the Sundays River, near Port Elizabeth, on the shore of Algoa Bay. These specimens differ from closely related species mainly in greater body length, equatorial position of the vulva and the number of supplementary organs in the male ( $n = 3$ ). They are described herein as belonging to a new species, *H. algoensis* n.sp.

Eksemplare van die genus *Haliplectus* Cobb, 1913 is versamel in klam holtes van die Alexandria duineveld oos van die Sondagsrivier naby Port Elizabeth tussen kusduine, en hulle vertoon merkwaardige detail van morfologiese kenmerke. Dié eksemplare verskil van naverwante *Haliplectus*-spesies, hoofsaaklik in die groter liggaamslengte, die ekwatoriale ligging van die vulva en die aantal supplementêre organe in die mannetjie ( $n = 3$ ). Hierdie artikel behels dus die beskrywing van 'n nuwe spesie, *H. algoensis* n.sp. en verteenwoordig ook die tweede deel van 'n studie van *Haliplectus* in Suidelike Afrika.

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The Alexandria dune field lies between the Sundays River mouth and Cape Padrone on the northern shore of Algoa Bay (33°46'S/26°28'E). It has a warm, temperate but variable climate, with rain occurring in all months of the year. This dune field is one of the largest in the world, being about 50 km long and 2–3 km wide. Dune slacks in the dune field may have originated in an area where the channel of an earlier river mouth traversed an area with limited sand supply (McLachlan, Ascaray & du Toit 1987). Tinley (1985) defines a 'slack' as a seasonally or perennially wet depression between dunes and oval, irregular or linear in shape. The slacks in the Alexandria dune field occur in a belt roughly 5 km long and 50–300 m behind the normal drift line. They are separated from the beach by a ridge or berm of sand and pebbles which is 2,0–2,5 m above mean sea level. These slacks vary in length from 100–300 m and in width from 20–70 m (Van der Merwe 1989). The new species was collected from dune slacks with vegetation hummocks on the slack floor. The ground cover is sparse with a mean cover of 2–10% and rarely exceeding 0,5 m in height. These slacks supported 13 plant species (Young 1987), with *Sporobolus* sp., *Arctotheca* sp. and *Gazania* sp. predominating. Sand particle size ranged from 200–410  $\mu\text{m}$ . Salinity of the groundwater was 1%.

## Materials and Methods

Descriptions, measurements and drawings were made from specimens killed and fixed in hot 6% neutral formalin and mounted in anhydrous glycerine. Coiled and curved structures were measured along the median line and the position of the amphid aperture was taken from the anterior rim of the aperture to the anterior end of the body. All mounts are deposited in the nematode collections at the Rand Afrikaans University (RAU) and the University of Port Elizabeth.

## *Haliplectus algoensis* n. sp. (Figure 1A–G)

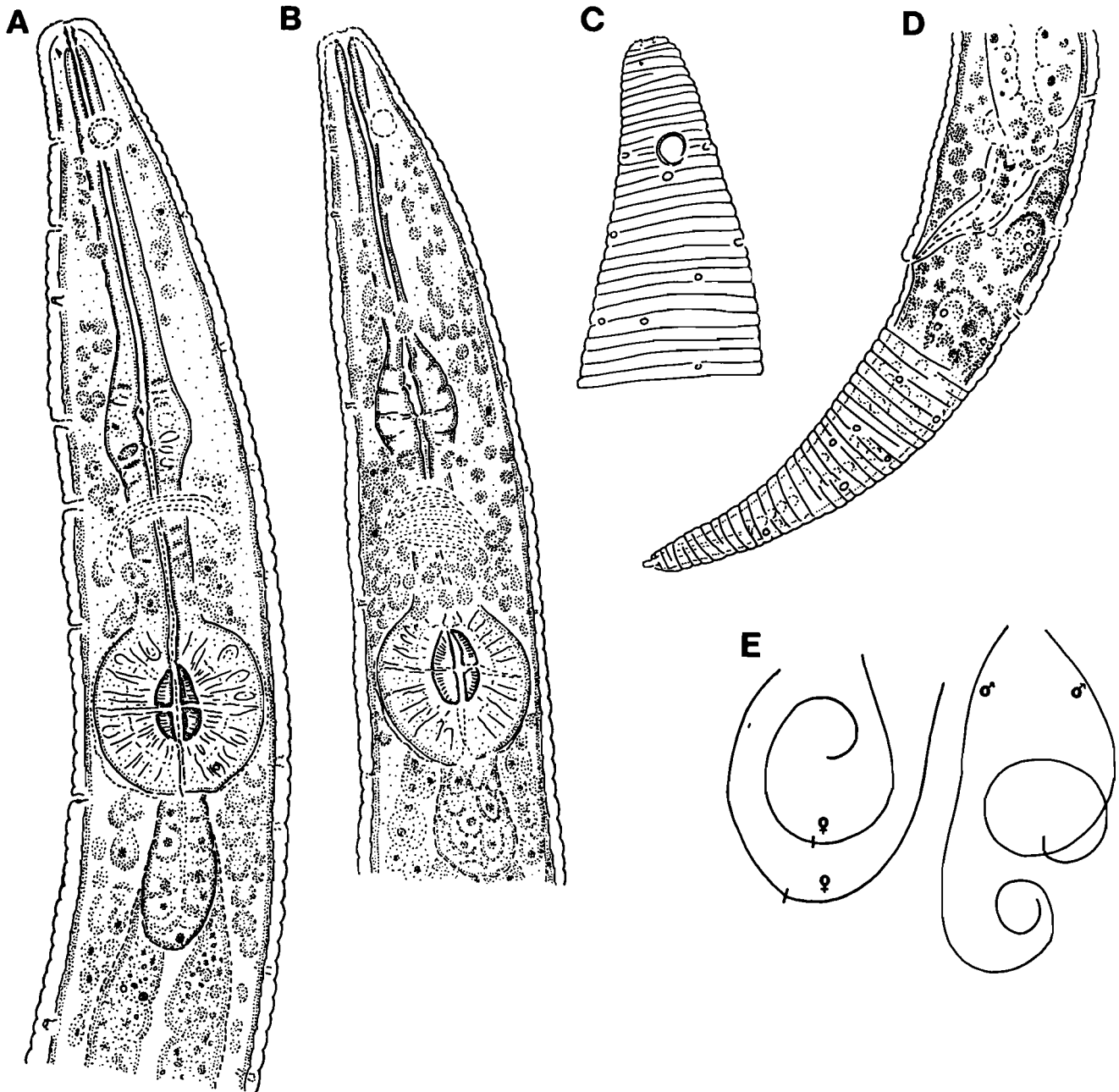
*Paratype male*: L = 0,68 mm; a = 26,3; b = 8,7; c = 16,3; c' = 2,1; Tail length = 42  $\mu\text{m}$ ; Pharynx length = 39,5  $\mu\text{m}$ .

*Holotype male*: L = 0,66 mm; a = 28,6; b = 7,8; c = 15,1; c' = 2,4; Tail length = 43  $\mu\text{m}$ ; Pharynx length = 41,8  $\mu\text{m}$ .

*Paratype female*: L = 0,6 mm; a = 29,3; b = 7,6; c = 21,1; c' = 3,3; V = 50,1; Tail length = 49,5  $\mu\text{m}$ ; Pharynx length = 39  $\mu\text{m}$ .

*Paratype female*: L = 0,54 mm; a = 21,7; b = 7,5; c = 15,5; c' = 2,6; V = 50,2; Tail length = 35  $\mu\text{m}$ ; Pharynx length = 38,5  $\mu\text{m}$ .

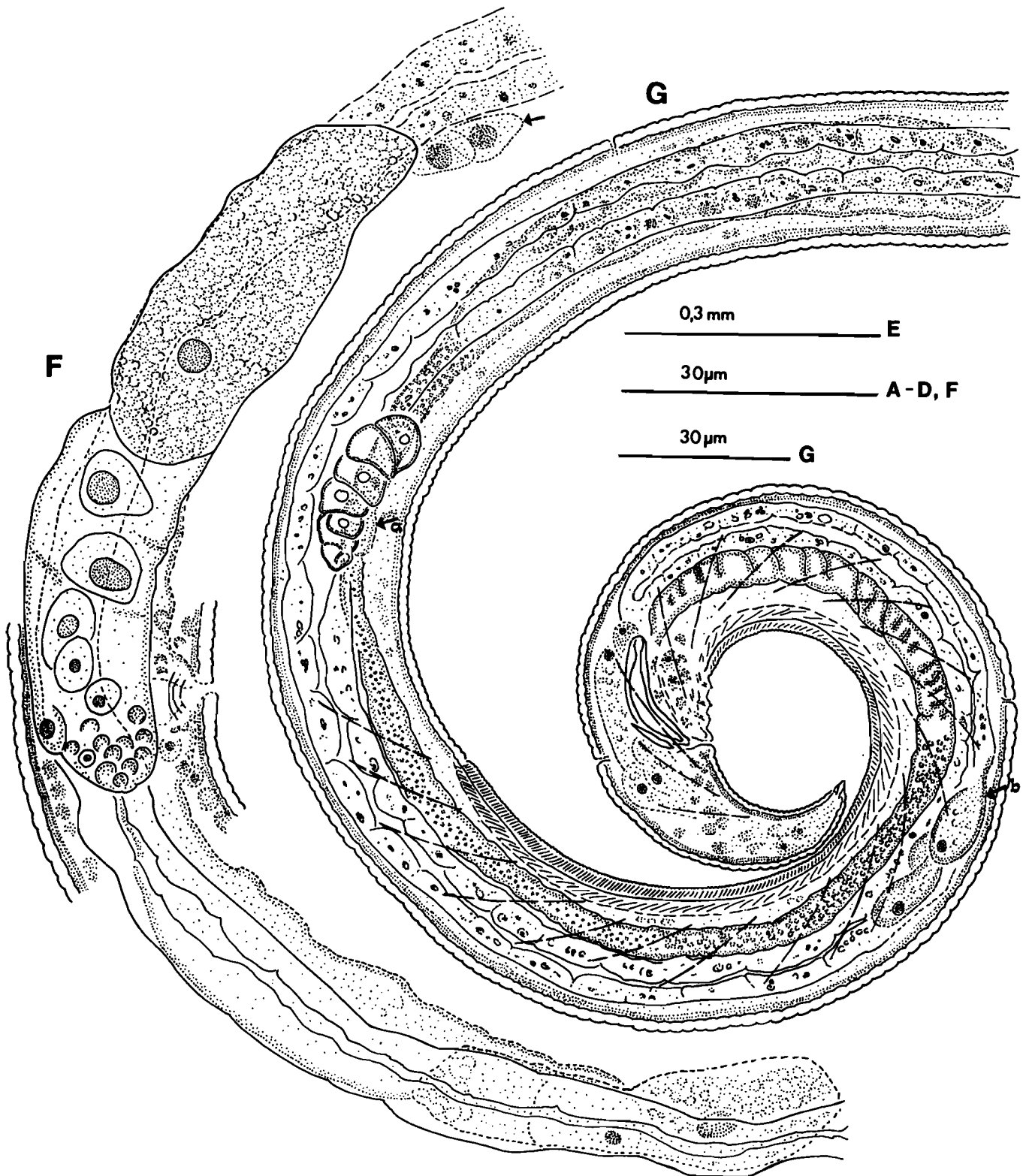
*Male*: Body posture of heat-relaxed specimens ranging from ventrally curved to a loose spiral. Body attenuated at both ends. Lips amalgamated. Two whorls of minute cephalic sensilla visible on head. Amphid aperture unispiral, 3,0  $\mu\text{m}$  in diameter, situated 8–11  $\mu\text{m}$  or 2,5 head widths from anterior end. Buccal cavity (stoma) a long, narrow, sclerotized tube, 40,8–43,0  $\mu\text{m}$  long, ending in the posterior half of the median bulb. One small tooth present in the base of the stoma. Median bulb small, oval (11–12  $\mu\text{m} \times 10 \mu\text{m}$ ), with a joint-like structure within its lumen, at junction between stoma and lumen of pharynx. Isthmus tubular, 13–16  $\mu\text{m}$  long, 5,5–6  $\mu\text{m}$  wide. Basal bulb spherical, muscular, 16–17  $\mu\text{m} \times 15$ –17  $\mu\text{m}$ . Basal bulb with elongated valvular apparatus with transversely striated plates about 8  $\mu\text{m}$  long. Valve plates horizontally divided, this division reaching into musculature of basal bulb, giving the bulb a bipartite or jointed appearance. Cardia distinct, about 19  $\mu\text{m}$  long. Intestine thick-walled with large granules within its cells. Lateral field wide, about 30% of body diameter, with two rows of somatic pores, one row dorsosublaterally and one row in a ventrosublateral position, the pores within each



**Figure 1A-E** *Haliplectus algoensis* n. sp. A: Anterior region of holotype male; B: Anterior region of female; C: External morphology of male head; D: Female tail; E: Heat-relaxed body posture.

row 6–8  $\mu\text{m}$  apart. Ventral and dorsal body pores distinct, but pores not observed on tail. Ventral and dorsal chords distinct, with body musculature well demarcated into four quadrants. Nerve ring situated around anterior part of isthmus, about 55  $\mu\text{m}$  from anterior end. Cuticle strongly annulated, annules 3  $\mu\text{m}$  wide over most parts of body. Cuticle about 0,9  $\mu\text{m}$  thick in neck region, 1,6  $\mu\text{m}$  at mid-body and 1,1–1,3  $\mu\text{m}$  towards tail. Excretory pore or gland not observed. Reproductive system diorchic, testes outstretched, anterior testis on left side of intestine, posterior testis on right side. Posterior testis small, only about one third as long as anterior testis. Posterior testis apparently joining the anterior branch in a seminal vesicle (Figure 1G). A constriction occurs between the *vas deferens* and the seminal vesicle. *Vas deferens* not muscular, and differenti-

ated into three distinct regions (Figure 1G). Spicules (22–24  $\mu\text{m}$ ) of equal length and about 1,1 cloacal body diameters long. Spicules sclerotized, arcuate, not cephalated. Gubernaculum 7–8  $\mu\text{m}$  long, plate-like, sclerotized. Three pre-anal supplementary organs present at 5  $\mu\text{m}$  (S3), 7  $\mu\text{m}$  (S2) and 10  $\mu\text{m}$  (S1) anterior to cloacal opening. A midventral ridge, 0,7–1  $\mu\text{m}$  high, stretches from S1 for about 122  $\mu\text{m}$  anteriorly. A well-defined, fibrous muscle sheath is associated with this ridge (Figure 1G) and normal, well-developed copulatory muscles extend from the tail to the anterior end of this ridge. About four ejaculatory glands observed in the cloacal region of one specimen (Figure 1G, arrow b). Four pairs each of ventrosublateral and dorsosublateral pores observed on tail. Body strongly coiled and tail strongly ventrally curved.



**Figure 1F, G** *Haliplectus algoensis* n. sp. F: Female genital system (arrow indicates coelomocytes); G: Male genital system (arrow a indicates seminal vesicle and arrow b indicates ejaculatory glands).

**Female:** Description as in male. Reproductive system didelphic, amphidelphic. Ovaries reflexed, reaching to 63 μm from vulva or past vulva. Vulva small, transverse slit-like opening. Vagina not distinctly muscular, slightly anteriorly directed in one specimen. Anterior branch of reproductive system on right side of intestine, posterior branch on left side. No mature oocytes observed. Two to four coelomo-

cytes observed in region of reproductive organs (Figure 1F, arrow). Anterior lip of anus slightly elevated. Rectum about 14 μm long, prerectum not observed. Four pairs of ventrosublateral and five pairs of dorsosublateral pores observed on tail. Spinneret well-defined. Caudal glands three, indistinct. Tail conoid, slightly curved ventrally.

*Juveniles* ( $n = 2$ ):  $L = 0,54\text{--}0,6$  mm;  $a = 25,8\text{--}26$ ;  $b = 7,3$ ;  $c = 10,6\text{--}12,2$ ;  $c' = 3,1\text{--}3,4$ ; Tail length =  $49\text{--}51$   $\mu\text{m}$ ; Pharynx length =  $36,5\text{--}36,6$   $\mu\text{m}$ ; Stoma length =  $39\text{--}40,8$   $\mu\text{m}$ .

*Description*: as for adults. Genital primordia indistinct, apparently differentiated into two branches.

#### Type locality and habitat

Dune slacks with vegetation hummocks in the Alexandria dune field, east of Sundays River mouth, Algoa Bay;  $33^{\circ}46'S/26^{\circ}28'E$ . Collected in 1987 by A. McLachlan.

#### Type specimens

Holotype male on slide RAU 7141. Paratypes: One female and one male on slide RAU 7139 in the collection of the Department of Zoology, Rand Afrikaans University and one female on slide RAU 7140 in the collection of the Department of Zoology, University of Port Elizabeth.

#### Differential diagnosis

In body length, morphology and structure of male supplements, as well as the striated valve plates in the basal bulb, *Haliplectus algoensis* n. sp. resembles only *H. minimus* Gerlach, 1967 and *H. leptocephalus* Vinciguerra & Zullini, 1980. It differs from *H. minimus* in the larger body of both females ( $L = 0,54$ ;  $0,6$  mm against  $L = 0,49$  mm). The  $a$ -value is also higher in *H. algoensis* n. sp. (females:  $a = 21,7$ ;  $29,3$  against  $a = 15,9$ ; and males:  $a = 26,3$ ;  $28,6$  against  $a = 19$ ). The  $c$ -value of *H. algoensis* n. sp. is higher than that of *H. minimus* (females:  $c = 15,5$ ;  $21,1$  against  $c = 10,7$ ; males:  $c = 15,1$ ;  $16,3$  against  $c = 11,5$ ). The vulva is located at mid-body in *H. algoensis* n. sp. whereas it is slightly pre-equatorial in *H. minimus* ( $V = 48$ ). Gerlach (1967) suspects the presence of supplements in *H. minimus* and depicts about five in his drawing of a male. The two males found for *H.*

*algoensis* n. sp. have only three supplements.

*H. algoensis* n. sp. differs from *H. leptocephalus* in the larger body of the male ( $L = 0,66$ ;  $0,68$  mm against  $L = 0,51$  mm) and the higher  $a$ -value in both females ( $a = 21,7$ ;  $29,3$  against  $a = 16\text{--}19$ ) and males ( $a = 26,3$ ;  $28,6$  against  $a = 23$ ). The  $c$ -value is higher in *H. algoensis* n. sp., especially in the female ( $c = 15,5$ ;  $21,1$  against  $c = 10\text{--}12$ ). The vulva is in an equatorial position in *H. algoensis* n. sp. ( $50,1$ ;  $50,2\%$ ) and slightly pre-equatorial in *H. leptocephalus* ( $44\text{--}49\%$ ). The gubernaculum is slightly shorter in *H. algoensis* n. sp. than in *H. leptocephalus* ( $7$ ;  $8$   $\mu\text{m}$  against  $15$   $\mu\text{m}$ ) and the former has three supplements whereas *H. leptocephalus* has none.

#### Acknowledgements

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