

Description of *Distolabrellus veechi* n. gen., n. sp. (Nematoda:Rhabditidae)

R. V. ANDERSON¹

Abstract: A new, monotypic genus and species in the subfamily Mesorhabditinae is described and illustrated. The primary character which separates the species and genus from all others in the Rhabditidae is a lip region with six set-off and well-separated liplets of two alternating shapes. Other diagnostic characters are transverse and fine longitudinal body striations, cuticular micropores, a prismatic prostom, well-developed esophageal collar, and three denticles on each metarhabdion. Males have a peloderan, open bursa bearing two pre- and seven post-anal bursal papillae, fused spicules over 50 μm long, and paired diverticulate cement glands associated with the vas deferens. *Key words:* taxonomy, morphology, scanning electron microscopy, new genera, new species.

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Study of morphological characters of a fecund, free-living rhabditid species used by Veech (3) in physiological studies (tentatively designated as *Pelodera* sp.) convinced me that the species was undescribed and sufficiently different to justify establishing a new genus in the subfamily Mesorhabditinae Andrassy, 1976 to accommodate it. The new species and genus are named and described herein. The set-off lips characterizing the genus are considered as extensions of the lip region and are termed liplets. The classification schemes followed in this study are based largely on

the comprehensive treatments of the Rhabditidae by Andrassy (1) and Sudhaus (2).

MATERIALS AND METHODS

For morphological study, specimens obtained from oatmeal agar were slowly heat killed, fixed in 4% formalin, and processed through a glycerine-ethanol series to permanent glycerine totomounts. Structural details of the cephalic region and stoma were studied with on face views of eight specimens and severed heads rolled in glycerine under a cover glass. Cuticular surface features of the head and body were verified by scanning electron microscope (SEM) micrographs of six adult females.

Distolabrellus n. gen.

DIAGNOSIS: Mesorhabditinae. Lip region bearing six set-off, separated liplets of

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¹Research Scientist, Biosystematics Research Institute, Central Experimental Farm, Ottawa, Ontario, Canada, K1A 006.

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two different, alternating shapes. Body cuticle with coarse transverse annules and fine longitudinal striae subtended by minute pores. Cheilostom absent, prostom (buccal cylinder) prismatic, its length about three times the width. Metarhabdions bulboid, each bearing three denticles. Esophageal collar well developed. Corpus of esophagus with a distinct bulb (metacarpus), lumen lining without transverse serrations. Female monodelphic, prodelphic, vulva far posterior. Female tail conoid, attenuated. Bursa peloderan, open, bursal papillae nine, two preanal. Vas deferens with a pair of laterally attached cement glands. Spicules large, linear, distally fused for about half their length.

Distolabrellus is derived from the Latin *disto*, stand apart, differ, and *labrellum*, lip, n.dim., and is masculine in gender.

TYPE and ONLY SPECIES: *Distolabrellus veechi* n. gen., n. sp.

RELATIONSHIPS: The six set-off liplets of two alternating shapes separate the genus from all other known taxa of the Rhabditidae. The monodelphic, prodelphic female places the genus in the Mesorhabditinae as defined by Andrassy (1). With few exceptions, all members of this subfamily have in common separated lips, metastomal teeth, weakly cuticularized telorhabdions (if present), an open peloderan bursa, and a pair of two preanal bursal papillae. Of the six genera represented, *Distolabrellus* n. gen. is most similar to *Crustorhabditis* (Sudhaus, 1974) Andrassy, 1976, *Mesorhabditis* (Osche, 1952) Dougherty, 1953, and *Cruznema* Artigas, 1927. *Crustorhabditis* differs from *Distolabrellus* n.gen. in having two versus three metastomal denticles, absence of an esophageal collar, ten versus nine bursal papillae, and spicules fused for more than 50% of their length versus no more than half in *Distolabrellus* n.gen. Members of *Mesorhabditis* differ in having other than a prismatic prostom, setose labial papillae, a smaller metastom with two versus three denticles, a transversely straited esophageal luminal lining, and absence of an esophageal collar. *Cruznema* differs by the presence of a discrete cheilostom, reduced esophageal collar, greater development of the ovary in gravid females (reflexed to

near vulva versus to less than midbody in *Distolabrellus*), and separate spicules.

Distolabrellus veechi n. sp.

HOLOTYPE (female): L = 1390 μm ; a = 20; b = 6.3; c = 14; c' = 4.2; V = 87.

Paratypes (20 females): L = 1337 (1157–1471) μm ; a = 18 (16–21); b = 6.1 (5.2–6.9); c = 13 (11–21); c' = 3.9 (2.3–4.6); V = 86 (84–89). Eggs (20 pre-embryonic): L = 50 μm (40–57); W = 30 μm (25–35); L/W = 1.67. Egg shell hyaline, smooth.

Body linear to ventrally arcuate, width 74 (64–89) μm at midbody, annules about 2 μm wide, generally indistinct except on neck and tail, marked by fine longitudinal striae (Figs. 2 E, 3 C and D). Body markedly constricted posterior to vagina and again posterior to anus. Cuticle with minute, closely spaced rows of pores subtending the longitudinal striae, arranged in transverse bands of an annule width (Figs. 2 F, 3 D). Pores in lateral field thickened, in two longitudinal rows. Lateral field narrow 4–5 μm wide, incisures two.

Lip region bearing six, set-off liplets of two forms, each with a mammillate papilla. One subdorsal, one lateral, and one subventral liplet wedge-shaped, narrow end overlapping oral opening; the alternate three lips ovoid, ending short of oral opening (Figs. 1 B, 3 A and B). External circle of six papillae of lip region pore-like, placed directly below papilla of corresponding liplet. Amphids not observed.

Cheilostom absent, prostom prismatic, 21 (19–24) μm long, distal and proximal ends slightly thickened. Metarhabdions bulboid, each with three moderately cuticularized denticles, full complement rarely observed in females, more distinct in males. Telorhabdions (Fig. 1 D) usually obscure. Esophageal collar enclosing 43 (36–53)% of prostom.

Esophagus 220 (210–229) μm long, comprised of a corpus and metacarpus 129 (119–125) μm long, isthmus 53 (43–69) μm long, and valvular basal bulb with double chambered haustrulum 37 (31–45) μm long. Diameter of metacarpus 86% that of basal bulb. Luminal lining of esophagus smooth, or finely crenate. Esophagointestinal valve conoid. Excretory pore 183 (161–202) μm

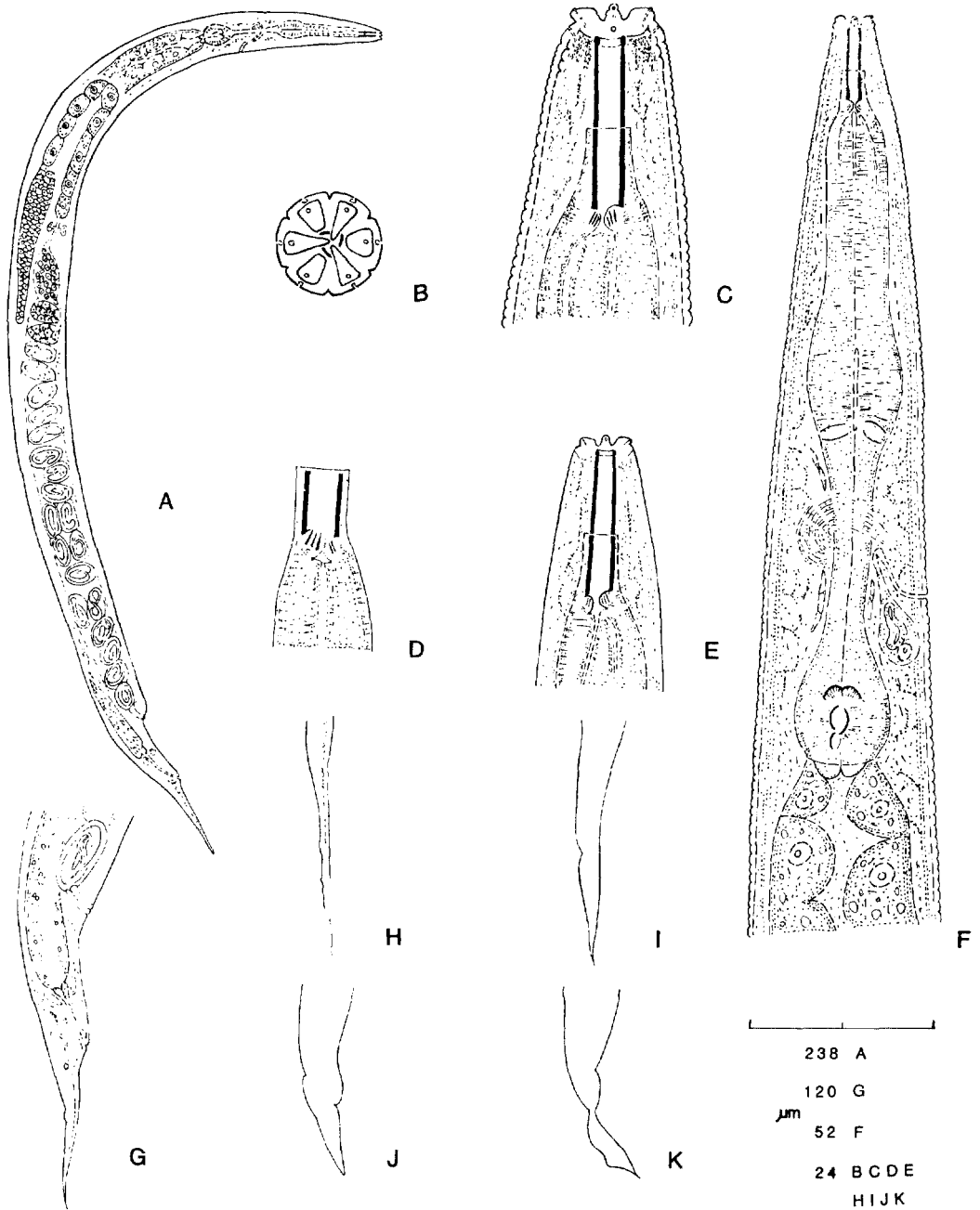


Fig. 1. *Distolabrellus veechi* n. gen., n. sp. A) Adult gravid female. B) On face of lip region (ventral surface down) showing the two shapes and alternate arrangement of the six setoff liplets characterizing the species and genus. C) Anterior end of male. D) Metastom region of adult female. Generally the denticles are more clearly delineated and uniform in males than in gravid females. E) Head end of second stage juvenile. F) Esophageal region of adult female. G) Posterior end of adult females. H, I, J, and K) Representative female tail termini.

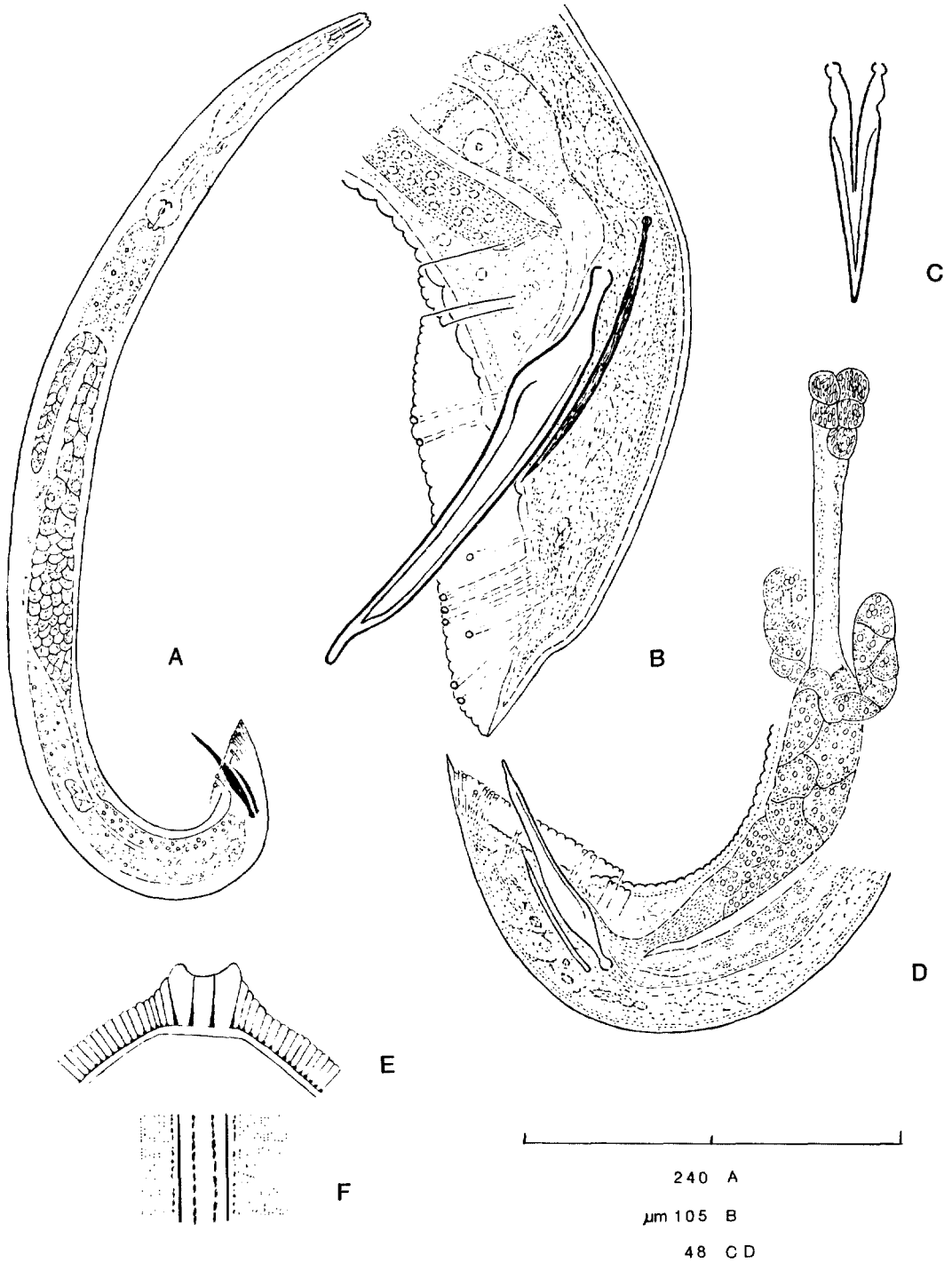


Fig. 2. *Distolabrellus veechi* n. gen., n. sp. A) Adult male. B) Tail of adult male. Note typical plication of bursa anterior to spicules and arrangement of bursal papillae. C) Ventral view of fused spicules D) Posterior end of male showing the paired lateral cement glands off the vas deferens. E) Cross section of body cuticle and lateral field. Semidiagrammatic representation of the cuticular pores. Note the thickened bases of the pores which appear as punctations in lateral view. F) Lateral view of cuticle showing banding patterns of punctations which open in the longitudinal surface striae shown in E and Fig. 3 D.

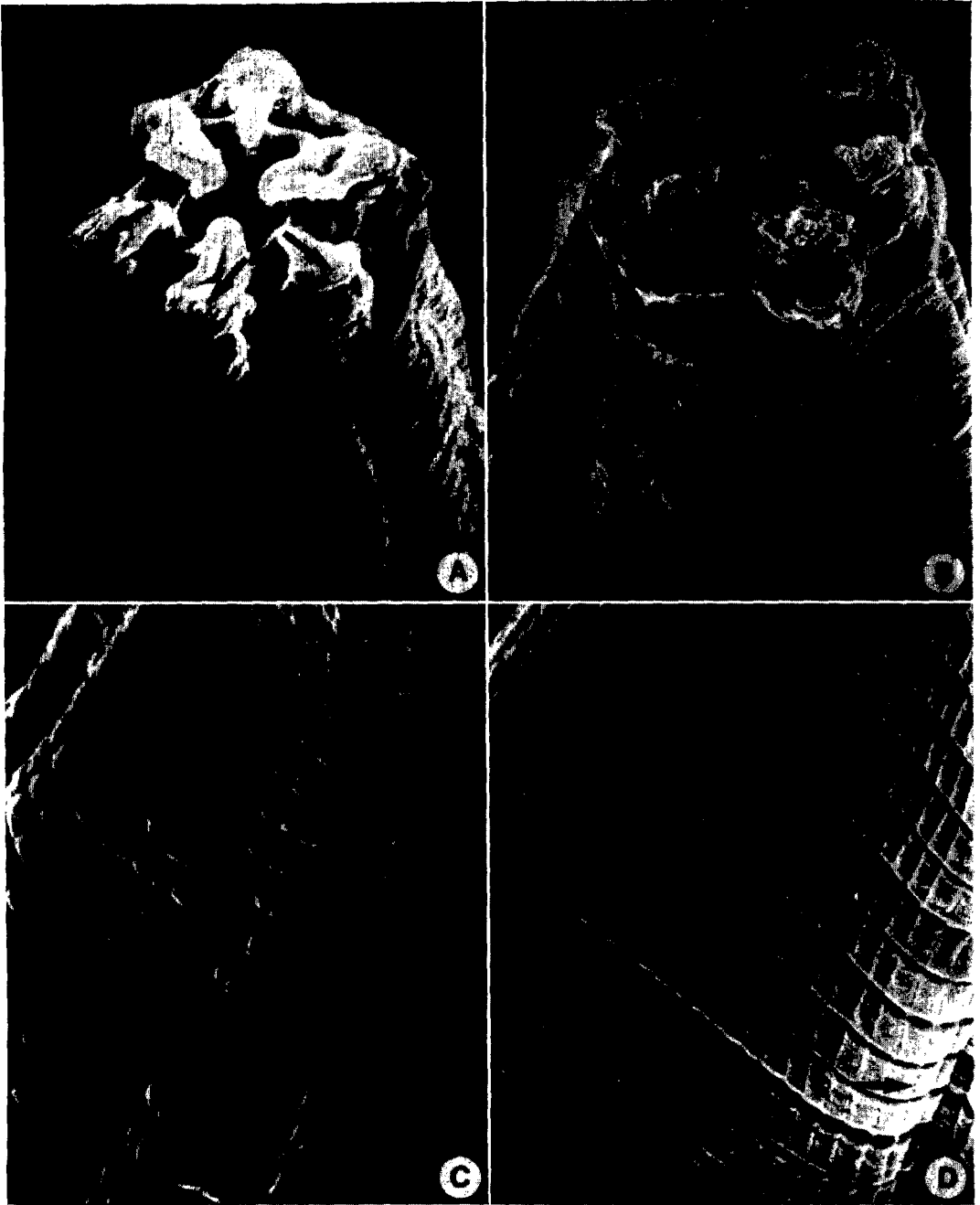


Fig. 3. Scanning electron micrographs of head and body cuticle of *Distolabrellus veechi* n.gen., n.sp. 5900X A, B). Lip regions of two females showing the six, set-off liplets (collapsed in processing) of two alternating shapes and sizes, which characterize the genus. Each liplet bears a mammillate papilla (single arrow), that of the lip is pore-like (double arrow). C, D) Body surface characters of two females, shown near base of esophagus, are coarse transverse annules marked by fine longitudinal striae subtended by minute pores (arrows). Further posterior body annules often are each subdivided by a fine transverse stria.

posterior to head end, duct directed anteriorly, joining a large, nucleated renette.

Female monodelphic, prodelphic; young gravid females oviparous, older females ovoviviparous. Ovary 60 (51–65)% of body length, reflexed posteriorly to less than half distance to vulva; oogonia in two or three rows. Spermatheca irregularly saccate, well anterior to vulva, filled with large sperms 6–10 μm in diameter. Rest of reproductive system filled with eggs in progressive stages of pre- and post-embryonic development. Vagina short, cylindrical, walls of uniform thickness, vulval lips not protuberant. Gonopore usually enclosed by remenants of male copulatory cement, sometimes with embedded sperms. Rectum 45 (39–50) μm long, 1.6–2.0 times anal body width, rectal glands, when observed, three. Tail conoid, 101 (76–113) μm long, 1.6–2.0 times anal body width. Contents of tail faint except for prominent ventral caudal nerve (Fig. 1 G), tail terminus pointed. Phasmids 14 (11–20) μm posterior to level of anus.

ALLOTYPE (Male): L = 1090 μm , a = 21; b = 5.3; c = 32; c' = 2.0; T = 63. Spicule length 70 μm , gubernaculum 43 μm .

PARATYPES (15 males): L = 821 (724–993) μm ; a = 20 (17–21); b = 4.2 (3.7–5.3); c = 21 (18–26); c' = 1.7 (1.5–2.0); T = 60 (55–65). Spicule length 62 (57–73) μm , gubernaculum 38 (33–43) μm .

Males similar to females, no sexual dimorphism of lip region. Body ventrally arcuate, posterior extremity strongly hamate. Excretory pore 148 (131–184) μm posterior to head end. Testis reflexed, germ cells in double row, sperms in dilated seminal vesicle 12 (10–15) μm in diameter, ar-

ranged in multiple rows. Vas deferens elongate, with a right and left lateral, saccate cement gland attached distally (Fig. 2 D). Spicules linear, distal half fused, proximal end cephalated, distal end dorsally concave. Gubernaculum linear, 50–66% of spicule length, distal end attenuated, flexible. Bursa open, peloderan, margins crenate, typically plicate anterior to spicules (Fig. 2 B). Bursal genital papillae nine, arranged in a 2 () 1 + 4 + 2 series, numbers 3 and 7 (consecutively from anteriormost) opening on outer sides of bursa, remaining pairs opening at bursal margin (Fig. 2 B).

TYPE HOST and LOCALITY: Collected by Dr. M. A. McClure from the rhizosphere of Bermuda grass, in vicinity of Tucson, Arizona.

TYPE DESIGNATIONS: Holotype (female) type slide no. 270. Allotype (male) type slide no. 270 a. Paratypes (female) type slide nos. 270 b-h. Paratypes (male) type slide nos. 270 i-j. Deposited in the Canadian National Collection of Nematodes, Ottawa, Ontario. Seven female, five male paratypes deposited in the United States Department of Agriculture Nematode Collection, Beltsville, Maryland.

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