Five new species of Leptonchidae (Nemata: Dorylaimoidea) from South Africa

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The following is a first report on Dorylaimoidea collected during a preliminary survey of the nematode fauna of South Africa. Samples were taken from cultivated fields bearing various crops, including tobacco, maize, sunflowers, peanuts, etc., in several localities in the Transvaal, Orange Free State and Cape Province. Numerous new species representative of all the major soil and plant inhabiting groups were encountered, and it is intended to describe these and report on the known species in a series of papers.

Genus Leptonchus Cobb, 1920

Leptonchus transvaalensis n. sp. (Fig. 1 D-G)

FEMALE: 1.08-1.17 mm; a = 29-34; b = 5.5; c = 52-59; V = \(12-15\)%

MALE: 0.97 mm; a = 27; b = 4.9; c = 42; T = 61%

DESCRIPTION: Body cylindroid, slightly ventrally arcuate when relaxed. Cuticle with fine transverse striae. Subcuticle coarsely striated, irregularly separated from outer layers. Lip region shaped as in Leptonchus granulosus Cobb, 1920, about 1/3 as wide as base of neck, and set off by strong constriction. Amphids 2/3 as wide as head, duplex, situated far forward at base of lips, the wide apertures extending anterior to the post-labial constriction. Spear slender, slightly dorsally arcuate, as long as width of lip region. Spear extension strongly arcuate, shorter than spear. Guiding ring a shallow truncated cone. Esophagus slender until it expands to form an elongate-pyriform basal bulb, which is about 1-1/3 times as long as the neck diameter. Nerve ring situated at middle of slender part of esophagus. Hemizonid not observed. Cardia discoid, as wide as base of bulb, which is 1/2 as wide as corresponding body diameter. Intestine 2 cells in circumference, the cells containing coarse, yellowish, refractive granules. Junction of intestine to prerectum located about 2 body widths posterior to vulva (prerectum occupying 36% of total body length). Rectum slightly longer than anal body diameter. Tail very bluntly conoid, shorter than anal body diameter. Two pairs of caudal pores, one pair sublateral, almost terminal, the other pair subdorsal, just posterior to anus. Lateral cords 1/3 as wide as body, with pores arranged in 2 lines. Vulva a very small transverse slit, appearing almost circular in a lateral view. Ovaries reflexed 1/3 the distance back to vulva.

MALE: Anterior part of body similar to that of female, posteriorly strongly ventrally arcuate. Junction between testes near middle of body, anterior testis occupying 15% and posterior testis 12% of body length. Intestine joined to prerectum at about 10 body widths anterior to anus (prerectum occupying 31% of total body length). Spicula and lateral guiding pieces typical for the genus. Supplements consisting of an adanal pair and a ventromedian series of 9 beginning about 2 spiculum lengths anterior to anus. The 1st 4 of these are contiguous, the other 5 only slightly separated. Tail bluntly rounded, dorsally convex, ventrally somewhat arcuate.

DIAGNOSIS: Leptonchus transvaalensis n. sp. differs from all known species in this genus in having the supplements close together. The female can be

*Based partly on material adapted from a thesis done under the supervision of Professor Gerald Thorne, and presented to the Graduate School of the University of Wisconsin in partial fulfillment of the requirements of the degree of Doctor of Philosophy.

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Figure 1. A-C: Tyleptus striatus n. sp.; A. Anterior portion of female, × 800; B. Surface view of head, showing amphid, × 800; C. Female tail, × 640; D-G: Leptochus transvaalensis n. sp.; D. Head, × 1000; E. Surface view of head, showing amphid, × 1000; F. Male tail, × 450; G. Female tail, × 600; H-I: Dorylaimoides thecolaimus n. sp.; H. Head, × 1000; I. Female tail, × 640.
recognized by the duplex amphid, the prerectum reaching almost to the vulva, and the bluntly conoid tail.

**Type Locality and Habitat:** Two females and a single male collected in the veld near Bethal, Transvaal.

**Holotype (female) and Allotype (male):** Slide *Dorylaimus* 10a, collection of the Division of Entomology, Pretoria, South Africa.

**Paratype:** Slide *Dorylaimus* 9, same data as above.

**Genus Tyleptus** Thorne, 1939

**Diagnosis emended:** Leptonchinae. Body cylindroid. Outer cuticle smooth or with microscopic transverse striae. Subcuticle with refractive radial elements (*Tyleptus projectus* Thorne, 1939) or with transverse striae (*Tyleptus striatus* n. sp.). Lateral cords with 2 lines of coarse ducts reaching to the lateral pores. Six conspicuous, projecting liplets around the oral opening. Spear dorylaimoid with strongly sclerotized extension surrounded by conspicuous muscles. Guiding ring simple. Esophagus a slender tube until it expands to the pyriform basal bulb. Bulbar lumen in 2 sections, the posterior one forming a narrow, triquetrous, valvular chamber. Vulva transverse. Ovary single, reflexed.

**Type Species:** *Tyleptus projectus* Thorne, 1939

The genus differs from *Leptonchus* Cobb, 1920, *Proleptonchus* Lordello, 1955 and *Tylolaimophorus* de Man, 1880 in the simple guiding ring and the duplex lumen of the esophageal bulb. From *Leptonchus* and *Tylolaimophorus* it further differs in being monodelphic, and from *Proleptonchus* in having the ovary posterior to the vulva, not anterior. The description of this hitherto monotypical genus is emended to include the species here described as *Tyleptus striatus* n. sp., which is closely related to *T. projectus*, but has a subcuticle like that of the genus *Leptonchus*.

**Tyleptus striatus** n. sp. (Fig. 1 A-C)

**Females** (5): 0.74 (0.69-0.84) mm; a = 26 (24-31); b = 4.1 (3.9-4.2); c = 76 (65-84); V = 3.9 (3.9-4.1) 35 (34-36)% 23.3 (18.8-27.6)

**Description:** Body tapering slightly towards lips, which are 2/5 as wide as base of neck. Outer cuticle with microscopically fine transverse striae. Subcuticle with coarse, irregular, transverse annules, averaging about 1 micron in width. Lip region as in *Tyleptus projectus*. Spear length 2/3 width of lip region, the aperture occupying less than 1/3 its length. Spear extension heavily sclerotized, equal to spear in length. Junction between spear extension and lumen of esophagus thickened. Guiding ring frail, located far forward near base of lips. Amphids about 2/3 as wide as head. Esophagus beginning as a small ellipsoid muscular swelling enclosing spear extension, then continuing as a slender non-muscular tube in which the conspicuous lumen shows a zig-zag arrangement, until it enlarges into a pyriform basal bulb in which only 3 gland nuclei can be observed. Nerve ring situated about 1/3 the distance from the anterior end of the esophagus. Two elongate, probably glandular bodies are visible in the neck, a smaller dorsal one at about the level of the nerve ring, and a larger ventral one slightly more posterior. Two gland nuclei are present in the latter. Cardia hemispherical, 1/4 as wide as body. Intestinal wall with small refractive granules. Prerectum length about 3 times body width. Rectum length about 1-1/2 times anal body diameter. Tail hemispherical, with a pair of conspicuous subterminal papillae. Lateral cords 1/4 width of body. Vulva transverse.
extending half-way across body. Length of anterior uterine branch slightly more than body width. Ovary reflexed almost the whole distance back to vulva. In one aberrant specimen, the oviduct is coiled and the ovary out-

Figure 2. Poronema porosum n. gen., n. sp.
A. Surface view of head, showing amphid, × 1200; B. Face view, × 1200; C. Female, × 700.
stretched. Egg 3 body widths in length and 1/2 as wide as body. Male unknown.

**Diagnosis**: *Tyleptus striatus* n. sp. differs from *Tyleptus projectus* Thorne, 1939 in the striated subcuticle, narrower and less angular spear, shorter spear extension, smaller cardia, and somewhat smaller size.

**Type locality and habitat**: Five females and 2 immature specimens collected from cultivated fields, Rustenburg, Transvaal. June 1959 and 1960.

**Holotype**: Slide *Tyleptus* 1b, collection of the division of Entomology, Pretoria, South Africa.

**Paratypes**: Slide *Tyleptus* 1a, same data as above. Also slide *Tyleptus* 4, deposited in the collection of the Department of Plant Pathology, University of Wisconsin, U. S. A.

**Genus Dorylaimoides** Thorne and Swanger, 1936

*Dorylaimoides thecolaimus* n. sp. (Fig. 1 H-I)

**Female**: 0.95 mm; \(a = 33\); \(b = 5.7\); \(c = 52\); \(V = 12.8\) \(60\% 10.2\)

**Description**: Body cylindroid, tapering little towards extremities, and assuming a C-shape when relaxed. Cuticle with microscopic transverse striae. Lip region set off by constriction, slightly more than 1/3 as wide as base of neck. Spear length somewhat less than lip region width, the aperture occupying 1/4 its length. Spear extension shorter than spear, forming a heavily sclerotized wide chamber at the base of the spear. Guiding ring single, located near base of lips. Amphids 2/3 as wide as head. Basal 1/4 of esophagus enlarged to 1/2 the width of the neck. Dorsal gland nucleus situated close to anterior end of enlarged part of esophagus. Nerve ring surrounding esophagus at middle of neck. Cardia hemispherical, 1/3 as wide as body. Wall of intestine with large yellow refractive granules. Prerectum length slightly more than twice body width. Rectum 1-1/2 times anal body diameter in length. Tail bluntly conoid, without papillae, slightly more than 1 anal body diameter in length. Lateral cords 1/4 to 1/3 as wide as body. Vulva transverse. Vagina extending half-way across body. Ovaries reflexed more than half-way back to vulva. Male unknown.

**Diagnosis**: *Dorylaimoides thecolaimus* n. sp. keys to *Dorylaimoides teres* Thorne and Swanger, 1936, from which it is easily distinguished by the peculiar development of the spear extension and the more posterior location of the vulva (60% as compared to 44% in *D. teres)*.

**Type locality and habitat**: One female and several immature specimens from soil beneath trees at Klapperkopfort, Pretoria.

**Holotype**: Slide *Dorylaimoides* 1, collection of the Division of Entomology, Pretoria, South Africa.

**Genus Poronema** n. gen.

Leptonchidae. Conspicuous lateral pores arranged in two lines but spaced irregularly. Similar ventral and a few dorsal pores are present. Outer cuticle with minute striae. Subcuticle with coarse transverse striae. Spear with simple basal extension. Guiding ring single. Esophagus with elongate basal expansion, about 1/3 the length of the neck. Male of type species unknown.

**Type species**: *Poronema porosum* n. sp.

**Diagnosis**: The genus is immediately recognized by the conspicuous ventral pores. It is exceptional also in the long basal enlargement of the esophagus, similar to that of *Dorylaimoides*. 

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Poronema porosum n. sp. (Fig. 2)*

**Females (5):** 0.61 (0.55-0.67) mm; **a** = 21 (17-23); **b** = 3.8 (3.1-4.6); **c** = 26 (24-28); **V** = 10.5 (9.3-11.9) 57 (56-58) \% 10-5-10-6

**Description:** About 28 to 38 large lateral pores, irregularly arranged in 2 lines, smaller towards extremities than on middle of body. The 1st of these is quite near the base of the lips, and the 3rd and 4th are close together. About 19 to 22 similar ventral pores are present, the 1st one opposite the 3rd lateral pore, the last one beyond the middle of the prerectum. Three similar dorsal pores occur on the 1st half of the neck.

Lip region angular, as wide as adjoining head from which it is separated by a strong constriction. Papillae very prominent. Spear length slightly more than width of lip region, the aperture occupying about 1/4 its length. Spear extension moderately sclerotized, equal to spear in length. Amphids stirrup-shaped, 3/5 as wide as head. Sensilla pouch exceptionally wide. Esophagus starting as a slight ellipsoid swelling enclosing junction of spear extension and lumen of esophagus, about 1/3 as wide as body. This is followed by a slight narrowing whereupon it widens again, and finally expands in its basal 1/3 to twice the diameter of the anterior part. Large dorsal gland nucleus and 1 pair of submedian gland nuclei observed. Nerve ring surrounding slender anterior portion of esophagus at about 1/3 its length from the basal expansion. Hemizonid opposite base of nerve ring, between 2nd and 3rd ventral pores. Cardia conoid, 1/4 to 1/3 as wide as body, attached to base of esophagus by a discoid structure. Rectum length equal to anal body diameter. Prerectum 2 to 3-1/2 times as long as rectum. Tail dorsally convex-conoid to rounded terminus.

Vulva transverse. Vagina extending about 1/3 across body. Ovaries paired, opposed, reflexed. No spermatozoa present in the young females collected.

**Type Locality and Habitat:** Five females from cultivated soil, Rustenburg, Transvaal, June, 1959.

**Holotype:** Slide Poronema 1, collection of the Division of Entomology, Pretoria, South Africa.

**Paratypes:** Slides Poronema 1a, 1b and 1c, same data as above.

**Genus Botalium n. gen.**


**Type Species:** Botalium eversoni n. sp.

**Diagnosis:** This genus resembles Xiphinema lewsi, 1950, of the Longidoridae, but can be distinguished from it by the absence both of sclerotized plates in the vestibule and excretory pore, and anterior location of the guiding ring. Within the Leptochiniae it resembles Dorylilium Cobb, 1920 in

*Note: After this paper went to press, the author discovered further specimens of the nematode described here as *Poronema porosum*. Examination of these revealed that the nematode is polynematid, thus not a leptonchaid, and could probably best be placed in the genus *Lardellonema* Audran, 1960, in spite of certain discrepancies, such as absence of the scale-like structures and double guiding ring mentioned by Lordello for *L. bauricenti* (Lordello, 1957) Andrássy, 1960, and the presence of a few dorsal pores. *Poronema* thus becomes a synonym of *Lardellonema*, and the new species becomes *Lardellonema varium*.
having a flanged spear extension and basal bulb set off by constriction, but
differs from it in having a striated subcuticle and 2 ovaries, corresponding
in these respects with *Leptonchus* Cobb, 1920.

Figure 3. *Botalium eversum* n. gen., n. sp.

A. Anterior portion of female, × 550; B. Head, × 1000; C. Surface view of
head, showing everted amphid, × 1000; D. Female tail, × 850; E. Mail tail.
× 550.
**Botalium eversum** n. sp. (Fig. 3)

**FEMALE:** 1.37 mm; a = 34; b = 5.5; c = 63; V = 12.856\% 12.4

**MALE:** 1.35 mm; a = 34; b = 6.1; c = 45; T = 65\%

**DESCRIPTION:** Body cylindroid, straight when relaxed, except posterior portion of male curved ventrally. Outer cuticle smooth; subcuticle coarsely striated, irregularly separated from outer cuticle. Lips closely amalgamated, rounded, with a button-shaped labial disc, about 1/2 as wide as lip region. Lip region slightly more than 1/3 as wide as base of neck, set off by a strong constriction. Amphids stirrup-shaped, 3/4 as wide as head with the amphidial pockets everted by fixation in both specimens collected. Spear length almost twice lip region width; junction with spear extension obscure. Spear extension equal to spear in length, with strongly sclerotized flanges. Guiding ring double. Esophagus slender, 1/8 as wide as neck, beginning with a small muscular section surrounding base of spear extension. Basal bulb 1/2 as wide and 1-1/2 times as long as neck diameter, set off by constriction. Nerve ring at middle of neck. Hemizonid present opposite nerve ring. Cardia cylindroid, almost as wide as basal bulb. Intestine with yellowish almost colorless granules, conspicuous only towards junction with prerectum. Prerectum extending more than 1/3 the distance to vulva, 26\% of total body length. Rectum about as long as anal body diameter. Tail dorsally convex, ventrally slightly arcuate, bluntly rounded. Two pairs of caudal pores, the one subdorsal, slightly behind the anus, the other submedian, nearer to the terminus. Vulva transverse. Ovaries symmetrical, reflexed about 1/3 the distance back to vulva.

**MALE:** Anterior part of body similar to that of female. Testes, spicula and supplements dorylaimoid. Lateral guiding pieces lying somewhat oblique across spicula. Prerectum same length as in female. Supplements consisting of an anal pair and a ventro-median series of 7, beginning about 2 spiculum lengths anterior to anus, the 1st 3 nearly contiguous, the other 4 spaced about 1/2 body width apart.

**DIAGNOSIS:** *Botalium eversum* n. sp. resembles *Botalium esseri* (Chitwood, 1957) n. comb. (*syn. Xiphinemella esseri* Chitwood, 1957) which is transferred to this genus on account of the absence of sclerotized plates in the vestibule and excretory pore, and the possession of a meromyarian intestine. *Botalium eversum* n. sp. can be distinguished from *B. esseri* (Chitwood, 1957) by the more closely amalgamated lips, smaller size (1.3 mm as compared to 2.2-3.5 mm), more posterior location of the vulva (56\% as compared to 42-47\%) and the special arrangement of the supplements in the male (In specimens of *B. esseri* (Chitwood, 1957) examined by author the supplements are situated at regular intervals).

**TYPE LOCALITY AND HABITAT:** A single male and female collected from soil about maize and cowpea roots in a field near Bothaville, Orange Free State.

**HOLOTYP** (female) and **allootype** (male): Slide *Botalium 1*, collection of the Division of Entomology, Pretoria, South Africa.

**LITERATURE CITED**


Lordello, L. G. E. 1955. On the morphology of *Proleptonchus aestivus* n. gen.,
Development and Survival of Some Roundworm Larvae of Cattle at High Altitudes in Wyoming

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Wyoming is a mountainous state with much of the good grazing land at high altitudes, accessible to cattle and sheep during only a few months of the summer. The rest of the year the animals graze on the lower-altitude plains and mountain valleys. In the Medicine Bow National Forest of southeastern Wyoming, cattle graze the lower and less rugged areas. Higher and rougher country is used by sheep. The period in which the cattle are in the forest varies somewhat with the weather, but in the area studied it is usually about July 10 to October 1. The work reported here was begun to determine whether any of the common roundworms of cattle could complete development and survive until the following summer under the conditions prevalent here at high altitudes.

MATERIALS AND METHODS

Grass was collected from around piles of 1959 cattle dung at eight sites in the Medicine Bow Range during August of 1959. During June of 1960 and June of 1961 grass samples were collected from around piles of the previous year's dung at nine sites, in most cases in the same locations as the 1959 collections. It is possible that a few of the June collections were from dung more than one year old. This would not seriously alter the significance of the findings, since the object of these collections was to determine whether the larvae could develop and overwinter there. The June collections were made before cattle entered the area; thus any larvae found had survived at least one winter. Grass samples were baermannized in the laboratory and larval counts made under the microscope.

An experimental plot was fenced at the University of Wyoming Science Camp in the Medicine Bow range at an altitude of about 9880 feet. Two piles of dung were placed on this plot on eleven different dates; two in 1959, seven in 1960, and two in 1961 (Table 1). Dung was also placed in duplicate piles on these dates in 1959 and 1960 on two fenced plots (one dry and one wet) on the Laramie Plains at Red Buttes. This is about ten miles south of Laramie and at an altitude of about 7300 feet.

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