

# Description of two new *Ditylenchus* species with long, filiform tails (Nemata : Tylenchida) from Tierra del Fuego

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## SUMMARY

Two, morphologically similar *Ditylenchus* species are different from all described species by their filiform tails. *D. filicauda* sp. n. has a L of 480-820  $\mu\text{m}$  and a tail of 116-160  $\mu\text{m}$ . *D. flagellicauda* sp. n. has a L of 760-1 050  $\mu\text{m}$  and a tail of 175-248  $\mu\text{m}$ . Both have a stylet of 7-8  $\mu\text{m}$ , indistinct body annuli of 0.8-0.9  $\mu\text{m}$ , indistinct lateral field of four lines, postvulval uterine sac of 1/3-2/3 vulva-anus distance, large, refractive sperm and small to very small caudal alae.

## RÉSUMÉ

*Description de deux espèces nouvelles de Ditylenchus, à queue longue et filiforme (Nemata : Tylenchida), provenant de la Terre de Feu*

Deux espèces de *Ditylenchus*, morphologiquement très semblables sont décrites qui diffèrent de toutes les autres espèces du genre par leur queue filiforme. *D. filicauda* sp. n. mesure 480-920  $\mu\text{m}$  et sa queue 116-160  $\mu\text{m}$ . *D. flagellicauda* sp. n. mesure 760-1 050  $\mu\text{m}$  et sa queue 175-248  $\mu\text{m}$ . Les deux espèces ont un stylet long de 7-8  $\mu\text{m}$ , une annélation indistincte (anneaux larges de 0,8-0,9  $\mu\text{m}$ ), un champ latéral indistinct à quatre lignes, un sac utérin postvulvaire équivalent à 1/3-2/3 de la distance vulve-anus, de grands spermatozoïdes et des ailes caudales peu développées.

At least four *Ditylenchus* species are present in the material collected by D. J. Raski in 1983 in Tierra del Fuego, Chile. Two species with filiform tails are well represented in several samples. A third species was remarkable because of the large offset head and the distinct stylet with large, flange-like knobs; as only one female was present this species will not be described.

Four other *Ditylenchus* specimens probably represent a fourth species characterized by a very short stylet (5.5-7  $\mu\text{m}$ ) and a thick tail. The specimens came from three different samples and some were not in a very good condition, so also here description will wait for further material.

## Material and methods

The specimens were relaxed and killed in hot water, then preserved in 4 % formalin. The collections were subject to the sugar flotation/centrifugation technique after storage. All specimens were handpicked into 2 1/2 % formalin then replaced to FAA for at least 48 h before passing into glycerin following Cobb's slow method : 2 1/2 % glycerin in 30 % ethanol for at least 24 h then 5 % glycerin in 30 % ethanol until complete evaporation of the ethanol and water under room conditions. Finally the specimens were stored in a desiccator over  $\text{CaCl}_2$  to complete the dehydration. The nematodes were mounted in glycerin.

## *Ditylenchus filicauda* sp. n. (Fig. 1)

## MEASUREMENTS

*Females* (paratypes; n = 7) : L = 651.4  $\mu\text{m}$   $\pm$  86.9 (540-820); a = 48.8  $\pm$  8.4 (37-60); oes. = 122.4  $\mu\text{m}$   $\pm$  12.6 (102-135); b = 5.4  $\pm$  0.8 (4.8-7.2); tail = 148.3  $\mu\text{m}$   $\pm$  6.1 (142-158); c = 4.4  $\pm$  0.7 (3.7-5.8); V = 63.2  $\pm$  1.8 (60.5-65.5); G = 30-34 %.

*Males* (paratypes; n = 3) : L = 480-595  $\mu\text{m}$ ; a = 40-57; oes. = 84-104  $\mu\text{m}$ ; b = 5.1-5.7; tail = 116-160  $\mu\text{m}$ ; c = 3.7-4.1; T = 29-39 %.

*Holotype* (female) : L = 565  $\mu\text{m}$ ; a = 51.5; oes. = 104  $\mu\text{m}$ ; b = 5.4; tail = 129  $\mu\text{m}$ ; c = 4.4; V = 62; G<sub>1</sub> = 33 %.

## DESCRIPTION

*Adults* : Thin nematodes with long fine tail; straight to slightly curved when preserved. Cuticle thin, with delicate annuli, 0.8-0.9  $\mu\text{m}$  apart. Lateral field 2.5-3  $\mu\text{m}$  wide with four equally spaced lines; the lateral field was, however, only observed in two females and one male : the lines are as faint as the transverse annuli. Head low, truncated, not offset, 4.5-5.5  $\mu\text{m}$  wide and 1.5-2.5  $\mu\text{m}$

high; basal framework appears as a distinct line in lateral view. Stylet delicate, not always distinct, finely knobbed, 7-8  $\mu\text{m}$  long. Opening of the dorsal oesophageal gland close to spear knobs. Median bulb oval, without valve and apparently non muscular; the smallest bulb was 10.5  $\mu\text{m}$  long and 4  $\mu\text{m}$  wide; the largest one measured 14 by 9  $\mu\text{m}$ . MB = 34-40 %. Terminal bulb variable : from 16-25  $\mu\text{m}$  long in three males and five females to 44-46  $\mu\text{m}$  long in two other females; width 6-12  $\mu\text{m}$ . These longer bulbs overlap the intestine. The longer bulbs have larger and more distinct gland nuclei. First intestinal cells are small and hyaline, they form the transition between oesophagus and intestine proper. Intestinal cells elongated, probably in pairs, and probably uninucleated, lumen small. Rectum about one anal body width long. Excretory pore not always distinct at 71-83  $\mu\text{m}$  from anterior end, at level of posterior half of isthmus and immediately following the hemizonid. Deirid shortly afterwards. Male and female tail similar in length and shape, filiform but never with a very thin end;  $c'$  = 15-19 in females and  $c'$  = 12-16 in males (different because of protruded cloacal aperture in males).

*Female* : Female reproductive system at right to ventral side of intestine. Wide post-vulval uterine sac 28-55  $\mu\text{m}$  long, i.e. 32-67 % of the vulva-anus distance. Vulva a simple, transverse slit 5.5-7  $\mu\text{m}$  wide. Vagina 5-5.5  $\mu\text{m}$  long, i.e. 1/2-1/3 corresponding body diameter; quadricolumellar uterus; elongated spermatheca; sperm 3.5-5  $\mu\text{m}$  in diameter with about 2  $\mu\text{m}$  large, very refractive globule (probably nucleus; distinct even under low magnification); oocytes in one row.

*Male* : Male reproductive system with 13-15.5  $\mu\text{m}$  long, curved spicules; thin gubernaculum at some distance from cloacal aperture, 3.5-5.5  $\mu\text{m}$  long; bursa adanal, weakly developed, starting about halfway the spicule, variable in length (from only 15  $\mu\text{m}$  in one male to 23-25  $\mu\text{m}$  in other two males).

#### TYPE MATERIAL

*Holotype* : Female in slide 2471 UCNC, Davis California, U.S.A. *Paratypes* : Two other females and one juvenile in the holotype slide, same collection containing also a paratype of *Lelenchus filicaudata*. Another slide in the same collection, contains two females and one male paratype. Remaining slides : four with one female, two with one male in the collection of the Zoology Museum, State University of Ghent, Belgium.

#### TYPE LOCALITY

Moist soil under deep tundra, Orange Bay, Hoste Island, Tierra del Fuego, Chile. Samples collected by D. J. Raski 19-20 January, 1983.

Samples 8 (most of the specimens), 9 (one fem.), 5 (one fem.).

#### DIAGNOSIS AND RELATIONSHIP

*Ditylenchus* species of medium length, 7-8  $\mu\text{m}$  stylet, filiform tail of 116-160  $\mu\text{m}$  length. The filiform tail is exceptional in *Ditylenchus* (Fortuner, 1982); a species with a similar tail length is *D. longicauda* Geraert & Choi, 1988 (tail = 95-155  $\mu\text{m}$ ) but the tail is thicker ( $c'$  = 7-11 in *D. longicauda* and 12-19 in *D. filicauda*); stylet is 9-10  $\mu\text{m}$  (*vs* 7-8  $\mu\text{m}$ ) and there are six lines in the lateral field (*vs* four).

#### *Ditylenchus flagellicauda* sp. n.

(Fig. 2)

#### MEASUREMENTS

*Females* (paratypes; n = 4) : L = 760-1 050  $\mu\text{m}$ ; a = 51-78; oes. = 135-165  $\mu\text{m}$ ; b = 5.5-6.8; tail = 192-248  $\mu\text{m}$ ; c = 3.8-4.8; V = 58-63;  $G_1$  = 25-34 %.

*Males* (paratypes; n = 5) : L = 790-1 000  $\mu\text{m}$ ; a = 55-62; oes. = 142-153  $\mu\text{m}$ ; b = 5.6-6.1; tail = 175-226  $\mu\text{m}$ ; c = 3.9-5.1; T = 39-41.

*Holotype* (female) : L = 905  $\mu\text{m}$ ; a = 55; oes. = 135  $\mu\text{m}$ ; b = 6.7; tail = 196  $\mu\text{m}$ ; c = 4.6; V = 62.5;  $G_1$  = 32 %.

#### DESCRIPTION

*Adults* : Large *Ditylenchus* species with very long, and thin tail; almost straight when fixed by gentle heat. Annulation indistinct in most specimens; in two females and one male very delicate annuli 0.8-0.9  $\mu\text{m}$  wide have been seen. Lateral field also very indistinct, probably four lines, the exact number of lines only observed in one male (Fig. 2), 2-3  $\mu\text{m}$  wide. Head low, truncated, not offset, 4.5-5  $\mu\text{m}$  wide, 1.5-2  $\mu\text{m}$  high; basal framework appears as a distinct line in lateral view. Stylet distinct, with small rounded knobs; 7-8  $\mu\text{m}$  long. Opening dorsal oesophageal gland close to spear knobs. Median bulb oval, without valve, 12.5-14.5  $\mu\text{m}$  long and 5.5-7.5  $\mu\text{m}$  wide; MB = 33-38 %. Terminal bulb usually elongated and slightly overlapping the intestine; one female has a shorter and thicker bulb (29  $\mu\text{m}$   $\times$  13.5  $\mu\text{m}$ ) than the four others (37-47  $\mu\text{m}$   $\times$  8-11  $\mu\text{m}$ ); in males also bulb measurements are variable : 29-41  $\mu\text{m}$  long and 7-11  $\mu\text{m}$  wide. At least one, 4-5  $\mu\text{m}$  large nucleus, in the posterior half; in two females three large nuclei were present. Excretory pore indistinct in half of the specimens, in the others a very fine pore, at 91-98  $\mu\text{m}$  from anterior end, just posterior to the large hemizonid somewhere at posterior half of isthmus. Deirid seen in one specimen, just posterior to excretory pore. Cardia consists of several small cells that form the anterior end of the intestine. Intestinal cells elongated, arranged per pairs (probably some twenty), uninucleated; lumen of varying width,

sinuous. Excretory gland at ventral side of anterior intestine. Rectum about anal body diameter long. Male and female tail similar in length and shape, filiform often with very thin end with  $c' = 15-27$  in females and  $c' = 13-21$  in males. In the holotype female three tail nuclei were distinct (Fig. 2 E); in the anal region many smaller and granulated nuclei (probably of the nervous system).

*Female*: Female reproductive system as well left, right or dorsal of intestine. Wide postvulval uterine sac, 47-56  $\mu\text{m}$  long, i.e. 32-42% of the vulva-anus distance. Vulval slit 9  $\mu\text{m}$  (single observation). Vagina 5.5-6.5  $\mu\text{m}$  long, i.e. about 1/3 body diameter. In the prevulval uterine sac a bulge consisting of several small cells can be found. The quadricolumellar uterus consists of the usual sixteen cells. Spermatheca elongated, filled with

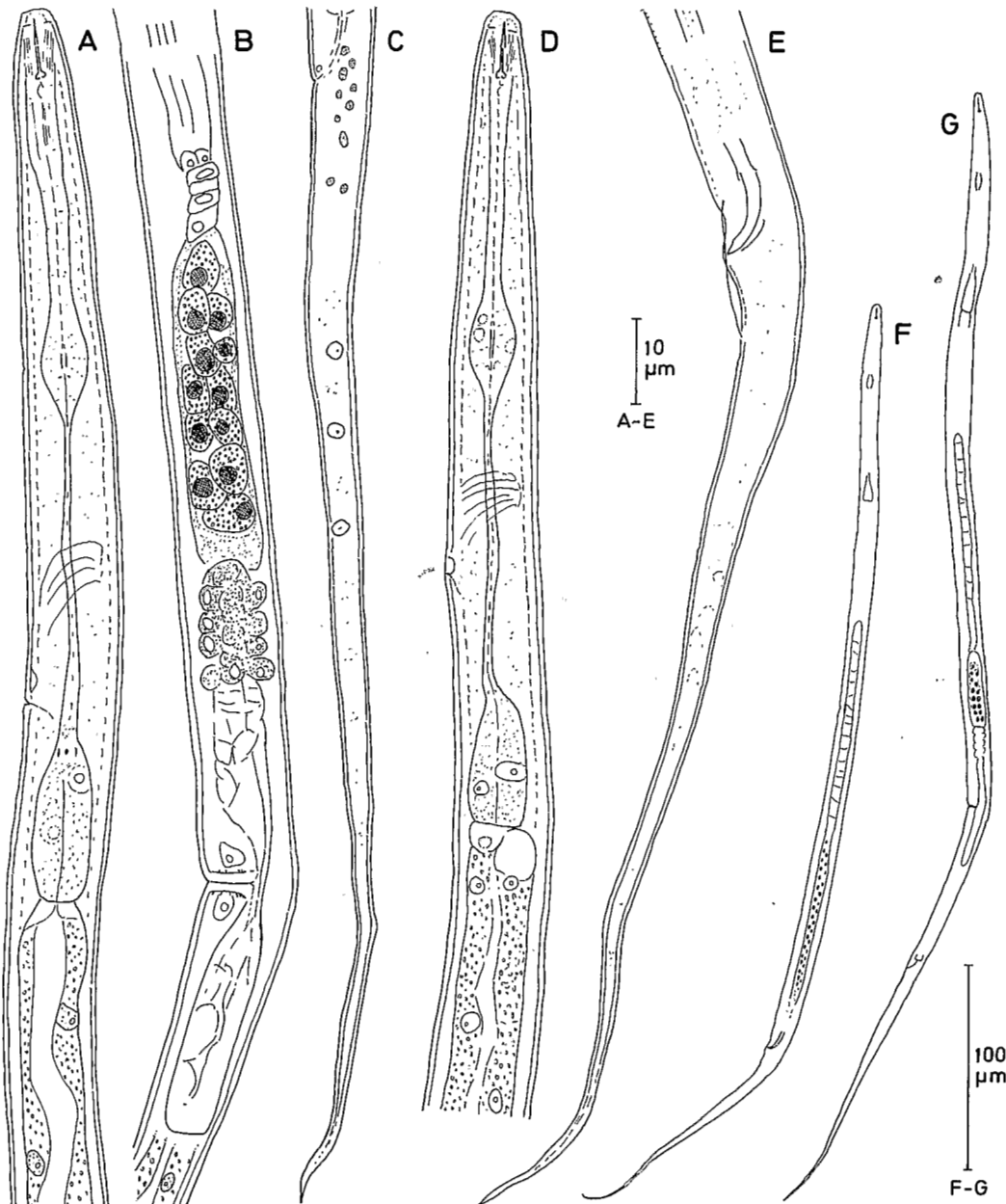
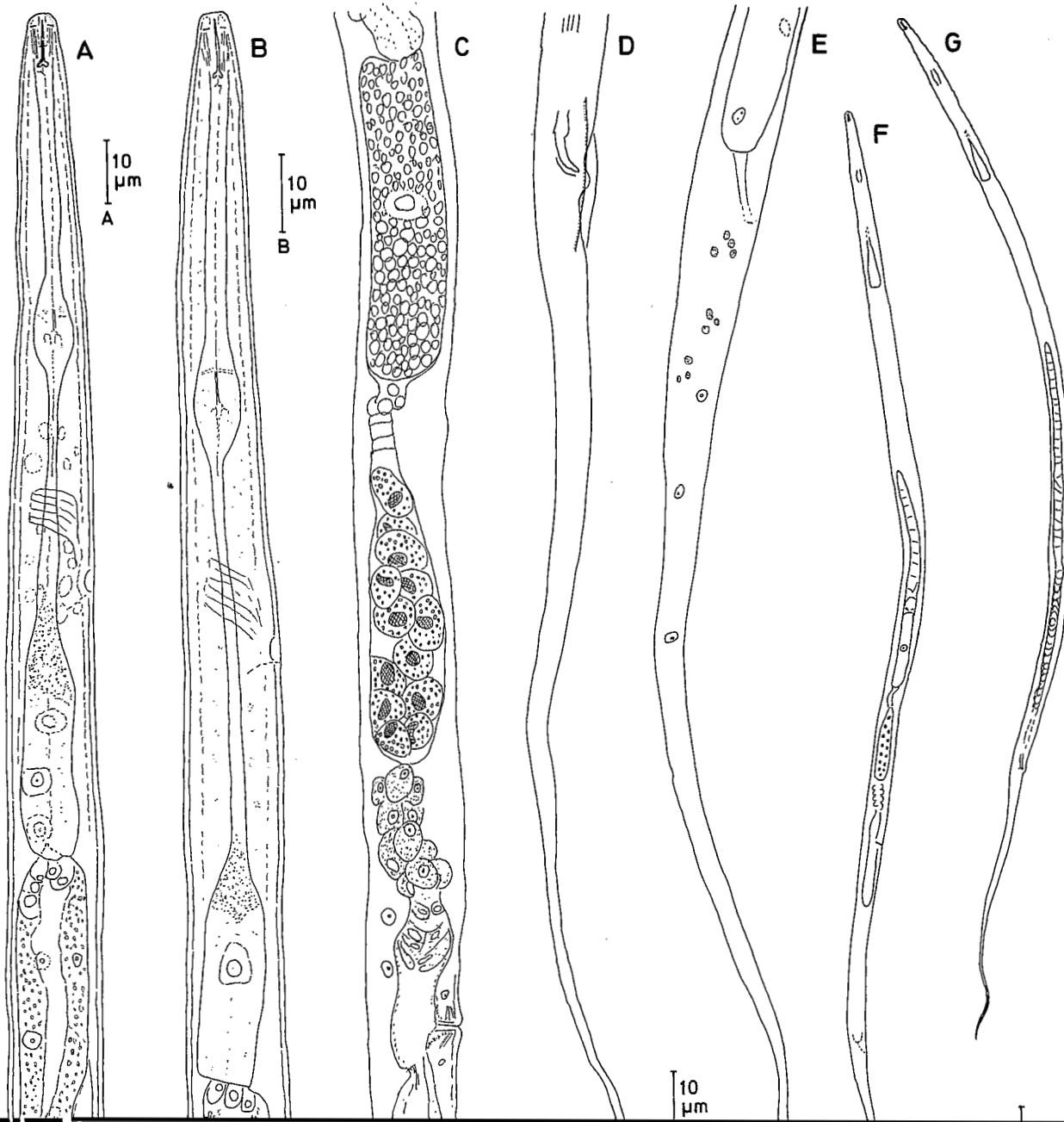


Fig. 1. *Ditylenchus filicauda* sp. n. A : Female, oesophageal region, showing deirid and two intestinal nuclei; B : Female reproductive system showing the four lines of the lateral field and one intestinal nucleus posterior to the postvulval uterine sac; C : Female tail with three large nuclei (and several small nuclei in the anal region); D : Male, oesophageal region with four intestinal nuclei; E : Male tail with indication of annulation and lateral field; F : Male, entire view; G : Female, entire view.



7-9  $\mu\text{m}$  large sperm with a 2.5-3.5  $\mu\text{m}$  large refractive globule (nucleus?). Oocytes in one row.

*Male* : Male reproductive system with 13-14  $\mu\text{m}$  long curved spicules; gubernaculum at some distance from cloacal aperture, 5-6.5  $\mu\text{m}$  long; bursa small, starting anterior to spicule (except in one male with a very small bursa), variable in length : 25-34  $\mu\text{m}$  (14  $\mu\text{m}$  in the male mentioned).

#### TYPE MATERIAL

*Holotype* : Female in slide 2472 of the UCNC at Davis, California, USA. *Paratypes* : One female in holotype slide; one male, in another slide, same collection; one slide with two females, two males in the collection of the Museum of Zoology, State University Gent, Belgium; two slides containing paratypes of *Basi-*

#### DIAGNOSIS AND RELATIONSHIP

Large *Ditylenchus* species with 7-8  $\mu\text{m}$  stylet, indistinct annulation and lateral field, extremely long, effiliated tail. No other *Ditylenchus* species has a similar tail. *D. filicauda* sp. n. is smaller and has a shorter tail.

#### REMARKS

As both species have a similar morphology and as they differ mostly by measurements, they could represent the smaller and the larger form of the same « species » (cf. Geraert, 1990). Both new species, although occurring in the same bay area of the same island were not mixed : the smaller species (*D. filicauda* sp. n.) was present in samples 5, 8, 9, the larger (*D. flagellicauda* sp. n.) in 6, 11, 12.

*rienchus helenae* and *B. uncinatus* also contain resp. one female and one male of this *Ditylenchus* species.

#### TYPE LOCALITY

Moist soil under deep tundra, Orange Bay, Hoste Island, Tierra del Fuego, Chile; samples taken by D. J. Raski, 20 Jan. 1983. Found in samples 11, 12 and 6.

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