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TWO NEW SPECIES OF *DIPHTHEROPHORA* (DIPHTHEROPHORIDAE, NEMATODA)

by
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Summary. Two new nematode species of *Diphtherophora* de Man, 1880, e. g. *D. vitoshae* and *D. bataki* were collected in the rhizosphere of woody strawberry and raspberry from West and South Bulgaria. They differ from all species of *Diphtherophora* by a less sclerotized spear guide and the shape of spicules.

Two new species of *Diphtherophora* were found in the rhizosphere of woody strawberry and raspberry from West and South Bulgaria and are described here.

The specimens were extracted from soil samples with a sieving and decanting method, killed by gentle heat, fixed in T.A.F. and mounted in dehydrated glycerin.

DIPHTHEROPHORA VITOSHAE sp. n.

(Fig. 1, A-G)

MEASUREMENTS: *paratype females* (n = 30); L = 0.70 mm (0.64-0.86); a = 17 (13-27); b = 4.7 (4.2-5.8); c = 33.1 (26.5-41.2); V = 55.7 (52.7-58.5); spear 15.4 µm (13-18); *paratype males* (n = 25): L = 0.65 mm (0.53-0.80); a = 25 (21-28); b = 4.6 (3.9-5.6); c = 26.2 (21.8-31); spear 15 µm (13.8-17); spicules 16.5 µm (14.2-19); gubernaculum 3.7 µm (2.5-4.5); *holotype female*: L = 0.75 mm; a = 17; b = 4.5; c = 31; V = 53; spear - 14.7 µm.

DESCRIPTION

Female. After fixation body slightly curved posteriorly to vulva. Cuticle thin, transparent, two-layered, separated from the body, except at head region, excretory pore, vulva and anus (Fig. 1A); subcuticle about 1.3 µm thick. Body cavity full of granules also in living specimens. Head continuous with body contour having 6 labial and 10 cephalic papillae (Fig. 1C). Amphid with wide aperture and thick cuticle wall (Fig. 1B, F). Chamber containing distinct nerve fibres. The sensillar sac connected to amphid fovea by a sclerotized tube, about 3.5 µm long. The distance from the anterior body end to the base of oesophagus 116-166 µm. Anterior part of oesophagus cylindrical, posterior part elongate-bulboid, ending in a bluntly conoid cardia. Oesophageal lumen with thick sclerotized wall. Gland nuclei obscured by abundant granules in the cavity in this region. Posterior to cardia are two grandular organs. Excretory pore situated 100-150 µm from anterior end. Nerve ring at mid-oesophagus region. Female reproductive system didelphic, ovaries reflexed (Fig. 1A). Vulval opening in ventral view circle shaped. Vagina with well developed musculature and a sclerotized ring. Rectum length/anal diameter ratio ranging from 0.4-0.7. Cuticle not separated from body over a short distance posterior to anus (Fig. 1D). A pair of subdorsal pores in posterior half of tail. Caudal pores (situated almost terminal and having openings only in subcuticle) filling the space between the subcuticle and cuticle with a body cavity liquid (Fig. 1D). Tail bluntly rounded, convex-conoid; equal or shorter than anal body diameter.

Male. Body slightly curved posteriorly. A pair of lateral pores, two ventromedian neck papillae and excretory pore respectively 27-39 µm, 25-44 µm, 46-72 µm and 94-145 µm from head end (Fig. 1E). Testis single, reaching mid-body. Two ventromedian supplements: the first 19-31 µm from cloacal aperture and the second 20-50 µm from first. Cuticle not separated from the body anterior and posterior to the cloaca, resembling a bursa. Spicules having a very characteristic shape; bifurcated tip; a cone-like corpus; rounded at posterior end. Well developed spicular capsule. Gubernaculum and "telamon" present (Fig. 1G).

Two male specimens have only one ventromedian neck papilla situated 50-56 µm from anterior end, another one has three ventromedian supplements: the first 5 µm from cloacal aperture, the second 36 µm from first and third 26 µm from second.

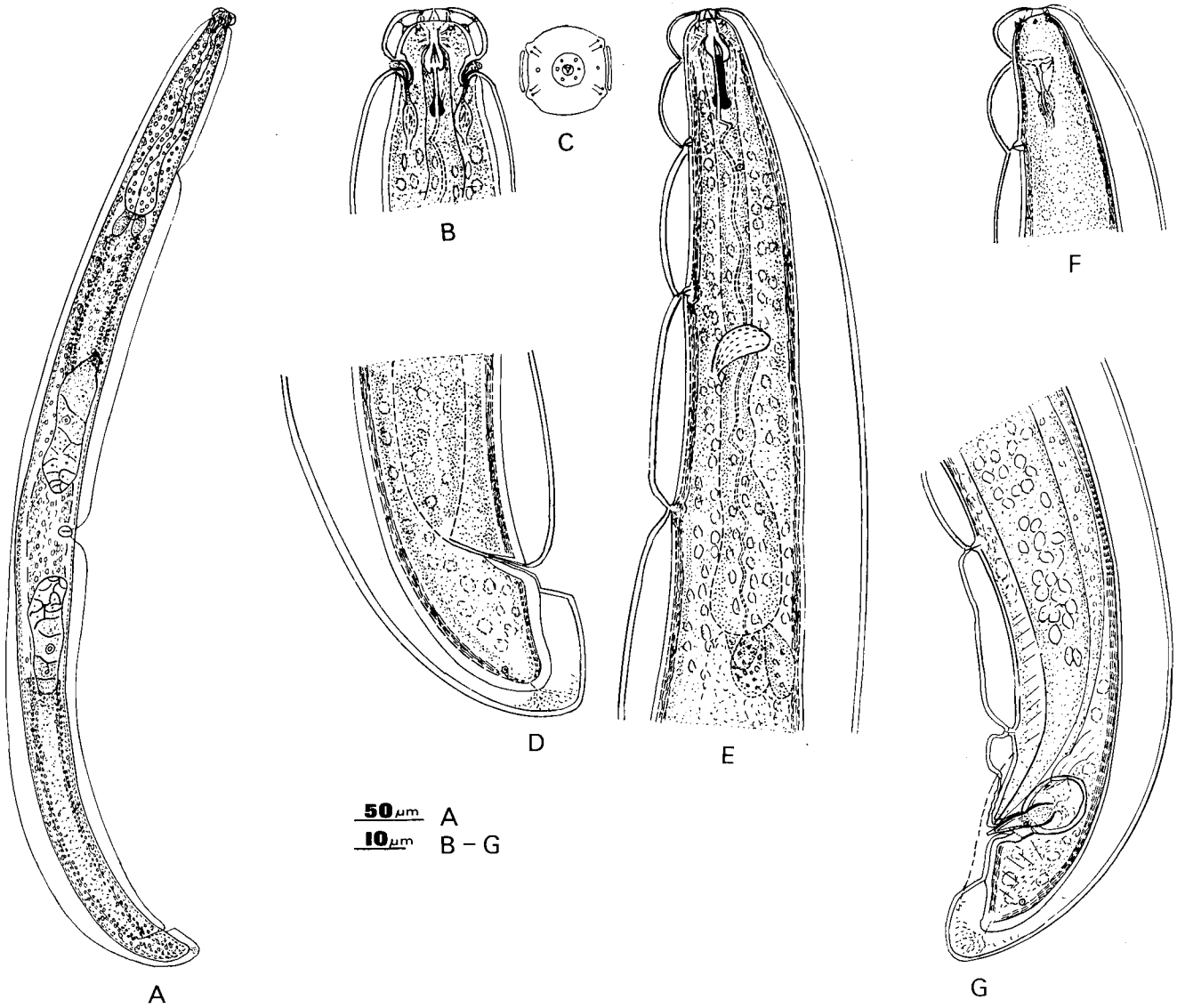

Fig. 1 - *Diphtherophora vitoshae* sp. n.: A) Entire female; B) ventral view of head end of female; C) apical view of head; D) female tail; E) anterior region of male; F) lateral view of head end of male; G) posterior region of male.

Type specimens. Holotype. Female on slide number 107 in Laboratory of Plant Nematology, Faculty of Biology, "Kl. Ohridski" University, Sofia 1421, Bulgaria.

Paratypes. 24 females and 21 males on slides number 109-114 in the same laboratory. Two females and two males deposited in the nematode collection of the Institute of Parasitology, Sofia, Bulgaria. Four females and two males in the Department of Nematology, Wageningen, The Netherlands.

Type habitat and locality. In the rhizosphere of *Fragaria vesca* L.; mountain-meadow soil, altitude 2000 m, sampling depth 15 cm, Vitosha mountain, West Bulgaria.

Discussion. Diphtherophora vitoshae sp. n. females resemble *D. lata* Thorne, 1974 but the males differ in having a pair of lateral pores, ventromedian neck papillae, and in the shape of the spicules. In the key of Ivanova (1977) *D. vitoshae* comes close to *D. vanoyei* de Coninck, 1931 and *D. brevicollis* Thorne, 1939, and in the key of Eroshenko and Tepljakov (1977) it comes close to *D. brevicollis* and *D. citri* Husain, Khan *et* s'Jacob, 1965. *D. vitoshae* can be distinguished from *D. vanoeyi* by a less sclerotized structure of the spear guide and by the shape of oesophagus and tail; from *D. brevicollis* by a longer oesophagus, number of supplements and shape of spicules;

from *D. citri* by a longer body, the anterior position of vulva, and a shorter tail.

DIPHTHEROPHORA BATAKI sp. n.

(Fig. 2, A-L)

MEASUREMENTS: *paratype females* (n = 7): L = 0.64 mm (0.58-0.74); a = 14.9 (14-16); b = 4.7 (3.9-5.5); c = 39 (36-46); V = 55.2 (53.6-57.2); spear = 17.3 µm (16.5-18.5); *paratype males* (n = 9): L = 0.60 mm (0.53-0.65); a = 24.7 (22-26); b = 4.4 (4.1-5); c = 32.2 (29.1-35.3); spear 17.1 µm (16.2-17.9); spicules 22.3 µm (20.7-23.4); gubernaculum = 4.1 µm (2.8-5.5); *holotype female*: L = 0.71 mm; a = 16; b = 4.9; c = 42.9; V = 55.3; spear = 18.5 µm.

DESCRIPTION

Female. Body slightly curved after killing by gentle heat, gradually narrowing towards both ends. Cuticle thin, transparent, two-layered, separated from the body (Fig. 2A). Body cavity in oesophageal and tail region filled with granules. Head continuous with body contour, with 6 labial and 10 cephalic papillae (Fig. 2D, E). Amphids connected with sensillar sac by means of a sclerotized tube, about 2.3 µm long (Fig. 2H,J,K). Cuticle covering foveas wall, about 1 µm thick. The distance from anterior body end to the base of oesophagus 91-134 µm, its wall well developed. Nerve ring at mid-oesophagus. Excretory pore 90-139 µm from anterior end. Cardia and glandular organs present. Ovaries reflexed. Vulval opening rounded in ventral view. Vagina with conspicuous muscles and an indistinct sclerotized ring. Rectum length/anal body diameter ratio ranging from 0.6-0.9; posterior rectum wall thickened. Tail bluntly rounded, dorsally convex, slightly shorter than anal body diameter; a pair of subdorsal pores and caudal subcuticle pores present.

Male. Body almost straight and only posterior part curved. Two ventral papillae at 22.1-34 µm and 55.8-62 µm, respectively, from anterior end (Fig. 2G). A pair of lateral hypodermal pores situated at 27.6-32 µm from anterior end (Fig. 2K). Testis single outstretched anteriorly. Body widened immediately behind the testis. Spermato-

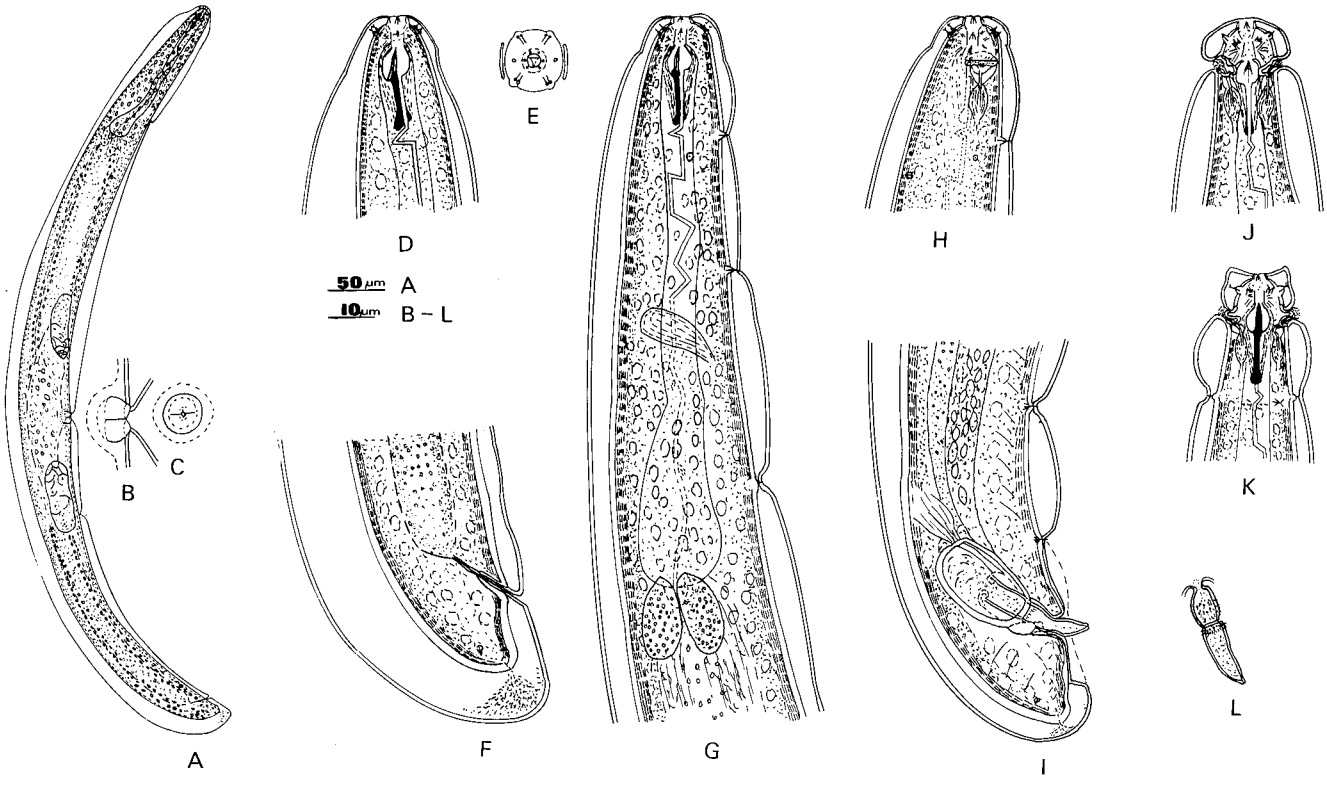

Fig. 2 - *Diphtherophora bataki* sp. n.: A) Entire female; B) lateral view of vulva; C) ventral view of vulva; D) lateral view of head end of female; E) apical view of head; F) female tail; G) anterior region of male; H) lateral view of head end of male; I) posterior region of male; J) ventral view of head end of female; K) dorsal view of head end of male; L) spicules.

zoids oval (3.2-5 µm long). Two preanal supplements: the first 16-20.7 µm from cloacal aperture; distance between the first and the second 22-34 µm (Fig. 2I). At 13.8-19.3 µm anterior and 9.6-11 µm posterior from cloacal aperture cuticle not separated. Spicules with thick (0.9-1.1 µm) cuticle interrupting at the middle, surrounded by bristle-like structures, tip bifurcated (Fig. 2I, L). Spicular pouch muscles forming a capsule. Gubernaculum and "telamon" present. Membranous cuticle appearing somewhat like a bursa.

One male has three ventromedian neck papillae respectively 22.1 µm, 41.4 µm, 60.7 µm from head region.

Type specimens. Holotype, female on slide number 108 in Laboratory of Plant Nematology, Faculty of Biology, "Kl. Ohridski" University, Sofia 1421, Bulgaria.

Paratypes. 5 females and 7 males on slides number 115-118 in the same laboratory. One female and one male deposited in the nematode collection of the Institute of Parasitology, Sofia, Bulgvaria and in the Department of Nematology, Wageningen, The Netherlands.

Type habitat and locality. In the rhizosphere of *Rubus idaeus* L.; mountain-meadow soil, altitude 1200 m; sampling depth 20 cm, Eastern Rhodopes, in the vicinity of the town of Batak, South Bulgaria.

Discussion: Diphtherophora bataki sp. n. resembles *D. vitoshae* but differs in some characters of the females: it does not have a divided cuticle for a short distance after the anus and the shape and length of the spicules differ. In the key of Ivanova (1977) *D. bataki* comes close to *D. vanoyei* de Connick, 1931 and *D. brevicollis* Thorne, 1939 and in the key of Eroshenko and Tepljakov (1977) it comes close to *D. brevicollis* and *D. citri* Husain, Khan *et* s'Jacob, 1965. *D. bataki* can be distinguished from *D. vanoyei* by a less sclerotized structure of the spear guide and by the shape of oesophagus and tail; from *D. brevicollis* by a longer oesophagus, number of supplements and shape of spicules; from *D. citri* by a longer body, the anterior position of vulva, and a shorter tail.

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