

***Filiponema baviense* sp. n. (Rhabditida: Drilonematoidea), a parasite of megascolecid earthworms from the Ba Vi National Park, Vietnam**

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Summary. *Filiponema baviense* sp. n. is described from specimens recovered from the coelomic cavity of megascolecid earthworms collected at the altitude of 1100 m on Ba Vi mountain, Vietnam. *F. baviense* sp. n. is distinguished from congeners by its bifurcated spicular distal end and by the size and structure of its *receptaculum seminis*. Fibrous filling present in the anterior pseudocoel and an oesophageal constriction close to the stomatal opening resemble the morphology of *Pharyngonema mekongianum* Pierantoni, 1923. The diagnosis of *Filiponema* Timm & Maggenti, 1966 is revised.

Key words: Drilonematidae, morphology, *Filiponema*, *F. baviense* sp. n., earthworm host.

Several species of megascolecid earthworms collected on the Ba Vi mountain, Vietnam, during April 1997 were dissected and examined for the presence of Drilonematoidea nematodes, which are parasites of tropical earthworms. One *Pheretima* species was found to be heavily infested with an undescribed species of nematode of the family Drilonematidae, and this species is described here.

MATERIAL AND METHODS

Earthworms were collected from beneath the vegetation litter and stones on the upper slopes of Ba Vi mountain. Earthworm specimens were transported live to the Laboratory of Parasitology of the Institute of Ecology and Bioresources in Hanoi and dissected in 1.8% physiological saline. Nematodes recovered from living earthworms were fixed in TAF, dehydrated and mounted in glycerine. In the measurements are used, apart from Demanian indices, the following abbreviations: L - body length, D - maximal body diameter, Oes - oesophagus length, Cd - tail length, Sp - spicula length, Gb - gubernaculum length.

DESCRIPTION

***Filiponema baviense* sp. n.**

(Fig. 1)

Holotype male: L = 3694 μ m, D = 52 μ m, Oes =

195 μ m, Cd = 165 μ m, Sp = 42 μ m, Gb = 20 μ m, a = 71.0, b = 18.9, c = 22.4.

Paratype males (n=10): L = 3817 \pm 192 (3500-4125) μ m, D = 49 \pm 4.1 (42-56) μ m, Oes = 187 \pm 10.9 (172-210) μ m, Cd = 191 \pm 16.3 (172-220) μ m, Sp = 43 \pm 2.9 (38-49) μ m, Gb = 26 \pm 2.7 (20-29), a = 77.9 \pm 7.3 (69.4-89.8), b = 20.4 \pm 0.9 (19.0-22.0), c = 20.5 \pm 1.7 (17.6-23.0).

Paratype females (n=19): L = 4425 \pm 379 (3750-5162) μ m, D = 85 \pm 7.4 (73-98) μ m, Oes = 201 \pm 10.2 (183-220) μ m, Cd = 231 \pm 43.2 (188-356) μ m, V = 63 \pm 1.8 (59-66)%, a = 52.7 \pm 5.5 (41.3-61.5), b = 22.0 \pm 1.6 (19.5-24.5), c = 19.6 \pm 2.7 (12.4-23.9).

Male. Body long and slender, with coiled posterior end and usually straight anterior end. Body tapering from amphid level to slightly flattened anterior end. Body surface covered with loose cuticular layer, in a few specimens visible as thin membrane supported by caudal (males) or cephalic (both sexes) papillae. Four cephalic sensillae. Shallow buccal cavity with small cuticular basal thickenings. The space between pharynx and body walls filled with fibrous tissue. Large, round amphids of 20 μ m dia. with 4-5 μ m wide transparent rim. Amphidial aperture of variable shape (from irregularly elliptical to circular), occasionally divided by a cuticular fold into two parts. Sensillar endings as a tight bundle on one edge of the amphid cavity. Commissure between

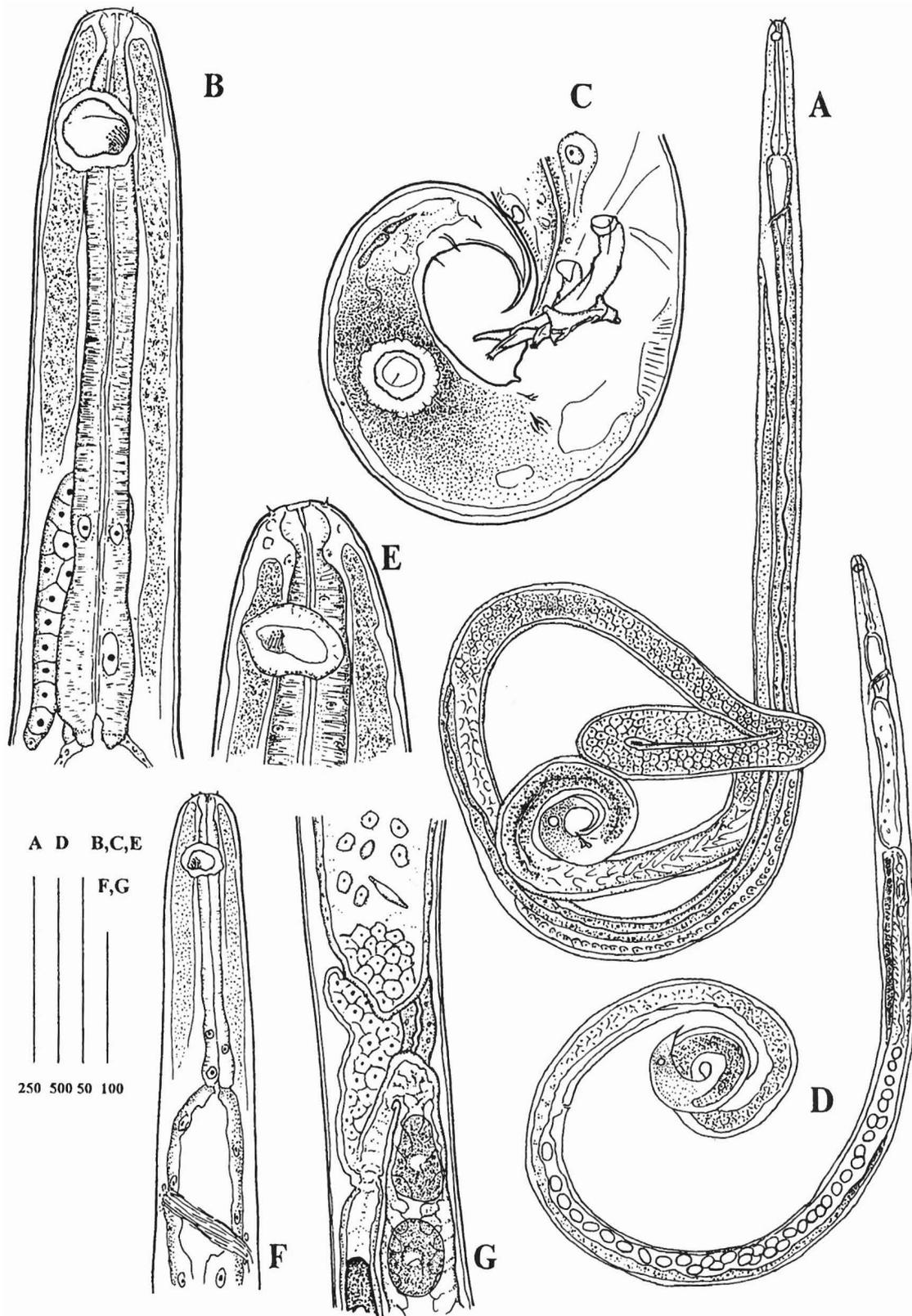


Fig. 1. *Filiponema baviense* sp. n. A: Male, total view; B: Male anterior end, lateral view; C: Male tail, lateral view; D: Female, total view; E: Female head end, lateral view; F: Female anterior end, lateral view; G: Junction of *receptaculum seminis*, oviduct and ovary. Bars in μm .

amphids. Anterior part of pharynx, with thick muscular fibers, divided from corpus by a deep constriction. Oesophagus, with cylindrical corpus, widening posteriorly up to 25 μm . One large and two smaller nuclei in basal part of oesophagus. Cardial part intrudes inside the intestinal lumen. Nerve ring encircling the intestine at 80 μm from oesophagus. Excretory pore inconspicuous. Excretory cell extending to mid-body. Flexure of testiculum situated anterior or posterior to the oesophagus base. Posterior part of testiculum occupying almost all the inner body space. *Vas deferens* with numerous vesicle-like vacuoles in the wall cells. Copulatory apparatus comprised of two spicules and gubernaculum. Slightly cephalated spicules, bifurcate on the distal end into a posterior branch with brush-like group of small spikes on the extremity and an anterior branch with curved tubular end. Gubernaculum with dorsal appendage and two crurae embracing the spicules. A pair of thin bristle-like papillae and a pair of thicker ones posterior to cloaca. Two pairs of bristle-like subventral papillae near tail terminus. Suckers from two circular cavities. Sucker opening 11-13 μm dia. with prominent 4-5 μm wide rim. Single sensillar thread visible in sucker cavity. Inner space of tail filled with fibrous tissue of suckers. Tail with pointed terminus.

Female. Body habitus and oesophagus shape as in males. Ampidial opening usually transversally elongated from 11x17 μm up to 20x28 μm . Tip cell of monodelphic gonad at anal level. Large *receptaculum seminis* situated on the anterior flexure of the gonad. *Receptaculum seminis* is connected to the junction of the ovary and oviduct by a curved channel filled with spermatocytes. Spermatocytes appear identical to those in male *vas deferens*. *Receptaculum seminis* extends to the level of the nerve ring, which encircles the intestine at 80 μm from the oesophagus. Occasionally the *receptaculum* is swollen and extends to the oesophagus base. Uterus containing up to 30 eggs. Egg-shells with smooth surface, 58-62 x 31-33 μm . Tail structure as in males, but sucker opening 22-26 μm dia. or slightly elongated transversally 21-23 x 25-28 μm . Tail with pointed terminus.

Type host and locality. Infected *Pheretima robusta* collected in tropical forest near Den Thuong pagoda, on Ba Vi mountain, Vietnam (1100 m asl), 18th April 1997 by S.E.S.

Type material. Holotype deposited in the collection of Moscow State University Zoological Museum. Paratypes deposited in the German Nematode Collection, Münster, Germany, International Institute of Parasitology, St. Albans, UK and the

Laboratory of Parasitology, Institute of Ecology and Bioresources, Hanoi, Vietnam.

Differential diagnosis. *Filiponema baviense* sp. n. is the only *Filiponema* species with spicula distal end bifurcation. The very large *receptaculum seminis*, > 300 μm long, also distinguishes this species from the three others in the genus.

Taxomical remarks. Bifurcation of the spicula distal end, an oesophageal constriction near the anterior end and fibrous filling in the anterior pseudocoel resemble the morphology of *Pharyngonema mekongianum* Pierantoni, 1923 as redescribed by Spiridonov (1994). As in all known *Filiponema* species (Timm, 1967; Spiridonov *et al.*, 1989), *F. baviense* sp. n. is characterized by the circular or broadly elliptical amphidial opening and by the presence of a commissure between the amphids. The genital papillae of males are bristle-like and in some specimens support a thin cuticular membrane. Other characters which distinguish *Filiponema* from the related genera *Tonoscolecinema* and *Iponema* include the absence of conical tapering of the anterior end to the level of the stomatal opening and a central cavity of the suckers. From the original diagnoses of these three genera, only in *Filiponema* does the nerve ring encircle the intestine (Timm & Maggenti, 1966; Timm, 1967). Recently an *Iponema* species was described (Yeates & Spiridonov, 1996) in which the nerve ring encircled the intestine, and probably this nerve ring displacement from the oesophagus has occurred independently in the different Drilonematidae genera. Nevertheless, this feature can be used as a diagnostic character. A modified diagnosis of *Filiponema* Timm, 1966 is given here as some diagnostic characters proposed by Timm & Maggenti (1966) were found to be attributable only to the type species *F. philippinense* Timm & Maggenti, 1966.

Genus *Filiponema* Timm, 1966

Diagnosis. Drilonematidae. Four cephalic papillae present. Stomatal cavity reduced. No clearly demarcated conical tapering of anterior end. Amphids circular or broadly elliptical, never pocket-like or slit-like; opposite amphids are connected with a transversal commissure. Nerve ring on the intestine. *Receptaculum seminis* very large, tubular. Spicules cephalated. Gubernaculum with dorsal appendage. Caudal suckers circular, with central opening on the cavity.

Type species: *Filiponema philippinense* Timm & Maggenti, 1966.

Other species: *F. baviense* sp. n., *F. burmense* Timm, 1967; *F. sarmathicus* Spiridonov, Kozodoi & Khrustalev, 1989.

ACKNOWLEDGEMENT

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REFERENCES

- Spiridonov, S.E. 1994.** New and little known Drilonematidae (Rhabditida) from Laos. *Afro-Asian Journal of Nematology* 4: 54-60.
- Spiridonov, S.E., Kozodoi, E.M. & Khrustaley, A.V. 1989.** [*Filiponema sarmaticus* sp. n. - a new species of nematode from earthworms]. *Bulleten' Moskovskogo Obshchestva Ispytatelei Prirody (Biologicheskaja serija)* 94: 76-80.
- Timm, R.W. 1967.** Nematode parasites of the coelomic cavity of earthworms. VII. Four new genera and thirteen new species of the family Drilonematidae. *Pakistan Journal of Biology and Agricultural Sciences* 10: 1-12.
- Timm, R.W. & Maggenti, A.R. 1966.** Nematode parasites of the coelomic cavity of earthworms. V. *Plutellonema*, *Iponema*, and *Filiponema*, new genera (Drilonematidae). *Proceedings of the Helminthological Society of Washington* 33: 177-184.
- Yeates, G.W. & Spiridonov, S.E. 1996.** New nematodes of the families Drilonematidae, Ungellidae, and Mesidionematidae from New Zealand megascolecoid earthworms. *New Zealand Journal of Zoology* 23: 381-399.
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Спиридонов С. Э., Иванова Е. С. *Filiponema baviense* sp. n. (Rhabditida: Drilonematoidea) - паразит мегасколецидного дождевого червя из Национального парка Ба Ви во Вьетнаме.

Резюме. По особям, полученным при вскрытии полости тела мегасколецидных дождевых червей, собранных на высоте 1100 м на горе Ба Ви, приводится описание вида *Filiponema baviense* sp. n., отличающегося от других представителей данного рода раздвоенной дистальной оконечностью спикулы, а также размером и строением семеприемника. Волокнистое наполнение, присутствующее в передней части псевдоцеля, и перетяжка на пищевом близ отверстия стомы напоминают особенности морфологии *Pharyngonema mekongianum* Pierantoni, 1923. Предлагается пересмотренный диагноз рода *Filiponema* Timm & Maggenti, 1966.
