Scientific Papers. Series A. Agronomy, Vol. LV-2012
ISSN Online 2285-5793; ISSN-L 2285-5785

DIVERSITY OF *XIPHINEMA* SPECIES (NEMATODA: DORYLAIMIDA) ASSOCIATED WITH DIFFERENT CROPS IN ROMANIA

Mariana BONTĂ (GROZA)[1], Vlada PENEVA[2], Stela LAZAROVA[2], Ioan ROŞCA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd., Bucharest, 011464, Romania, Phone: +40 (21) 3182888, E-mail: mariana_bonta@yahoo.com, ioanrosca_usamv@yahoo.com;
[2]Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 2 Yurii Gagarin Street, 1113 Sofia, Bulgaria, E-mail: vpeneva@ecolab.bas.bg, stela.lazarova@gmail.com

***Correspondent author e-mail*:** mariana_bonta@yahoo.com

Abstract

Nematodes of the genus Xiphinema (family Longidoridae) are economically important plant pests, some of them known as vectors of nepo-viruses [13]. Accurate identification of Xiphinema spp. is important in regard to their virus transmission capability. Nine species of the genus Xiphinema are reported so far from Romania. New information on the morphology and distribution of several Xiphinema species recovered from different crops and regions of Romania is provided. Soil samples were collected at a depth of 20-40 cm in the rhizosphere of various plants: grapevine, peach, apricot, alfalfa, strawberry. Based on the morphological and morphometrical characters the following species were identified: Xiphinema italiae Meyl, 1953, X. vuittenezi Luc, Lima, Weischer et Flegg, 1964, X. pachtaicum (Tulaganov, 1938) Kirjanova, 1951, X. simile Lamberti, Choleva et Agostinelli, 1983, X. taylori Lamberti, Ciancio, Agostinelli et Coiro, 1992 and X. parasimile Barsi et Lamberti, 2004. Xiphinema parasimile represents a new geographical record.

Key words: *Longidoridae, morphology, new record, diversity.*

INTRODUCTION

Hitherto, nine species of the genus *Xiphinema* have been recorded from Romania [4, 5]: *X. americanum* Cobb, 1913, *X. italiae, X. index* Thorne et Allen, 1950, *X. rotundatum* Schuurmans Stekhoven et Teunissen, 1938, and *X. vuittenezi* from grapevine in different regions of the country [7, 8, 9]; *X. brevicolle* Lordello et Da Costa, 1961, was found in association with grape, peach, currant [10] and *X. diversicaudatum* (Micoletzky, 1927), Thorne, 1939 was recorded also from the rhizosphere of strawberry, cherry and plum trees [11], *X. pachtaicum* (Tulaganov, 1938) Kirjanova, and *X. simile* Lamberti, Choleva et Agostinelli, 1983 were found in association with grapevine. According to Romanenko, *X. taylori* occurred in Romania and was erroneously reported as *X. brevicolle* [6]. Three *Xiphinema* species are known as vector of nepo-viruses: *X. index* and *X. italiae* are vectors of Grapevine funleaf virus and *X. diversicaudatum* transmits Arabis mosaic virus [3].

MATERIAL AND METHOD

Soil samples were collected from the rhizosphere of various plants (grapevine, peach, apricot, alfalfa) at a depth of 20-40 cm, from different regions of country: Odobeşti (Vrancea county), Ostrov (Călăraşi county), Adam Clisi, Murfatlar (Constanţa county), Nicoreşti (Galaţi county), Huşi, Bîrlad (Vaslui county), Băneasa (Ilfov county).

Nematodes were extracted from 200 cm^3 soil by a sieving and decanting technique. Nematodes were heat killed at 60°C for two minute and fixed in a 4% formaldehyde solution. The specimens were processed to anhydrous glycerol and mounted on permanent microscopic glass slides [12].

The morphological and morphometrical observations were made using Leica DMLB microscope fitted with Leica FDC 295 camera, Olympus BX41 and Olympus BX51 compound microscopes with DIC.

RESULTS AND DISCUSSIONS

During our investigations the following species were identified: *X. pachtaicum, X. simile*, *X. parasimile*, *X. taylori, X. italiae* and *X. vuittenezi*, from different crops and regions of Romania (Table 1, Fig. 1 and 2).

Table 1. *Xiphinema* species occurring in Romania

Species name	locality	crop	Reference/present study
X. pachtaicum (Tulaganov, 1938) Kirjanova, 1951,	Braila Nicoreşti Murfatlar Adam Clisi Ostrov	Fruit trees *Vitis vinifera* *Vitis vinifera* *Vitis vinifera* *Vitis vinifera*	Peneva V., Lazarova S., Groza M., 2006 Present study Peneva V., Lazarova S., Groza M., 2006/ Present study Present study Present study
X. simile Lamberti, Choleva et Agostinelli, 1983	Valea Călugărească Huşi Băneasa	*Medicago sativa* *Vitis vinifera* *Prunus persica*	Peneva V., Lazarova S., Groza M., 2006 Present study Present study
X. taylori Lamberti, Ciancio, Agostinelli et Coiro, 1992	Mărăcineni Satu Mare	Fruit trees strawbery	Peneva V., Lazarova S., Groza M., 2006 Present study
Xiphinema italiae Meyl, 1953	Basarabi, Murfatlar Braila Bîrlad Adam Clisi	*Vitis vinifera* *Vitis vinifera* Fruit trees *Vitis vinifera* *Vitis vinifera*	Peneva V., Lazarova S., Groza M., 2006 Peneva V., Lazarova S., Groza M., 2006 Peneva V., Lazarova S., Groza M., 2006 Present study Present study
X. vuittenezi Luc, Lima, Weischer et Flegg, 1964	Ostrov Murfatlar	*Vitis vinifera* *Vitis vinifera*	Present study Romaşcu & Zinca ,1977/ Present study
X parasimile Barsi et Lamberti, 2004	Odobeşti Băneasa	*Vitis vinifera* *Prunus armeniaca*	Present study

Xiphinema pachtaicum was the most widespread and abundant (35 nematodes/ 200 cm^3soil) species found in four localities followed by *Xiphinema simile* (26 nematodes/200 cm^3 soil) found in two localities).

Description. Females: Body slender, C shaped. Labial region 3.5-4 µm high, set-off from the rest of body. Pharyngeal bulb 60-71 µm long and 12-13 µm wide. Reproductive system amphidelphic, symbiotic bacteria present in the ovaries; uteri short (anterior 26-36 µm, posterior uterus 27-31 long, respectively; ovejector weekly developed, 22-23 µm). No sperm cells detected in the uteri or oviduct. Tail conical, dorsally convex, ventrally almost straight, terminus pointed.

Based on morphological and morphometrical characters *Xiphinema parasimile* Barsi et Lamberti, 2004 was identified in soil sample from Odobeşti (*Vitis vinifera*) and Băneasa (*Prunus armeniaca*) (Table 2).

Table 2. Measurements of. *Xiphinema parasimile* (all in micrometres except body length)

Locality **Host plant**	**Odobeşti** *Vitis vinifera*	**Băneasa** *Prunus armeniaca*
n	5	5
L(mm)	1.87±0.07 1.82-1.99	1.78±0.06 1.68-1.9
a	68.0±2.0 65.4-69.9	67.02±6.1 55.8-76.8
b	7.4±0.9 5.9-8.0	6.6±0.42 6.2-7.4
c	66.7±4.7 59.6-71.0	61.5±8.2 54.2-79.1
c’	1.8±0.2 1.6-2.1	1.94±0.1 1.8-2.1
V%	54.1±1.2 52.1-55.4	57.0±1.1 55.5-57.8
Odontostyle	67.8±2.3 64-70	70.4±1.69 67-72
Odontophore	40.8±1.4 39-42	43.2±1.67 40-45
Anterior to guide ring	61.5±2.5 58-64	62.4±1.8 59-64
Tail length	28.2±3.0 26-33	30±1.5 27-32
h	6.8±0.9; 5.5-8	6.4±0.4; 6-7
Width at lip region	8.8±0.2 8.5-9	8.2±0.36 8-9
Width at guide ring	20.4±2.4 19-24	19.8±0.3 19-20
Width at pharyngeal base	23.6±0.6 23-25	23±1.0 22-25
Width at mid-body	27.5±0.6 27-28	25.6±0.9 24-26
Width at anus	15.9±0.4 15-16	15.4±0.4 15-16

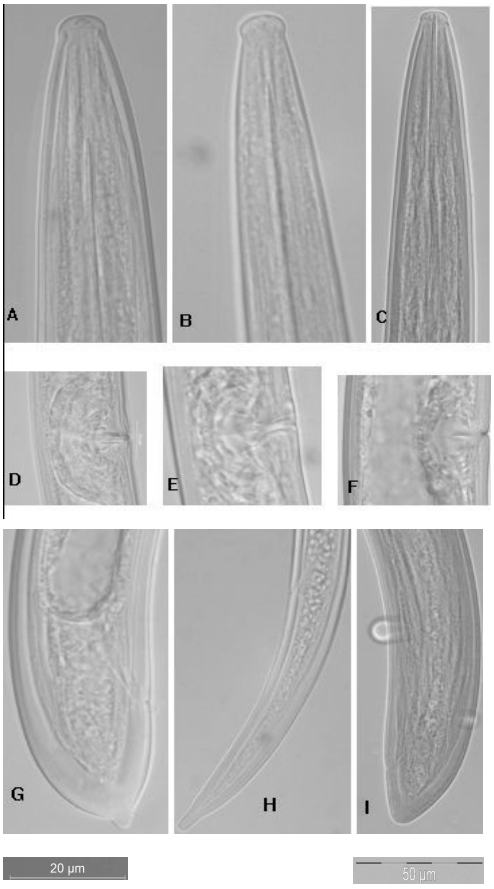

Fig. 1. Anterior end of female: A) *X. vuittenezi*, B) *X. italiae*, C) *X. taylori*; Vaginal region of: D) *X. vuittenezi*, E) *X. italiae*, F) *X. taylori*; Posterior end of female: G) *X. vuittenezi*, H) *X. italiae*, I) *X. taylori.* Scale bar: 20 µm, 50 µm

Remarks. *Xiphinema parasimile* was described from a forest habitat in Serbia and later was found in vineyards in Bulgaria [1, 2]. Morphometrics of Romanian specimens is within the ranges reported for the species in the original description and subsequent record. This is the first finding of this species in Romania.

CONCLUSIONS

Xiphinema parasimile is a new record for Romania.

Six species of *Xiphinema* genus were identified during our investigations.

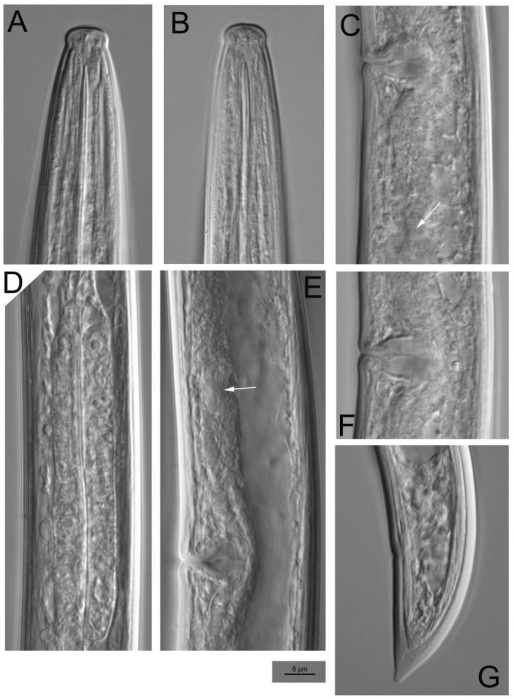

Fig 2**.** *Xiphinema parasimille* Barsi et Lamberti, 2004. Female: A-B, Anterior region; C, Posterior uterus; D, Pharyngeal bulb; E, Part of anterior genital branch, including the uterus, sphincter and *pars dilatata oviductus*; F, Vaginal region; G, Tail; Sphincter marked with arrows. Scale bar: 6 µm

ACKNOWLEDGEMENTS

This research was carried out with the support of Central Phytosanitary Laboratory Bucharest and POSDRU/107/1.5/S/76888 Project.

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