

**PHYTONEMATODES REPRESENTATIVES OF THE ORDER TYLENCHIDA  
(FILIPJEV, 1934) THORNE, 1949 ON POMEGRANATE AGROCENOS OF SOUTH  
UZBEKISTAN**

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**ABSTRACT:** The article provides data on the distribution of phytonematodes by representatives of the order Tylenchida (Filipjev, 1934) Thorne, 1949 on pomegranate agrocnoses of southern (Surkhandarya and Kashkadarya) regions of Uzbekistan. As a result of the study, 40 species of plant nematodes were registered in the root system and root soil of pomegranate plants.

**KEYWORDS:** Phytonematodes, pomegranate agrocnoses, root system, rhizosphere, phytohelminths of nonspecific pathogenic effect, phytohelminths of specific pathogenic effect.

## **INTRODUCTION**

Phytoparasitic nematodes among parasites and pests of wild and cultivated plants are not the last in nature.

The order Tylenchida occupies a special place in the system of phytohelminthology, since it includes the central and most important group of phytonematodes, represented by typical phytohelminths: pathogenic forms that cause plant diseases - phytohelminthiases.

When studying some crops and their nematological fauna, it turns out that yield losses are determined not only by the harmful activity of the "stylet nematodes" of the tylenchid order. The forms of this group of nematodes are also involved in the processes of saprobiotic decay and expand the volume of affected areas of plant tissue as a result of vigorous inoculating function [6, 446 p.].

On the territory of Central Asia, phytonematodes of cultivated and wild-growing pomegranate were first studied by Sh.Kh. Khurramov and A.S. Bekmuradov [1, P.782-784., 2, 92 p., 7, P. 146-157., 8, 333 p.].

## **MATERIALS AND METHODS**

In order to study the species composition and distribution, bioecological features of phytonematodes of pomegranate agrocnoses in the period from 2005-2019 we collected phytonematodes from the root soil and root system of plants in 34 shirkat farms from 17 districts of the Surkhandarya and Kashkadarya regions of the Republic of Uzbekistan. The studies were carried out by the generally accepted route method [5; P. 338-369].

During the phytohelminthological study, 1700 samples of soil and root system of pomegranate plants were collected and analyzed. Phytonematodes were removed by the Berman funnel method and fixed with 4% formalin solution. Enlightenment of nematodes was carried out in a mixture of glycerin with alcohol (1:3), and permanent preparations on glycerin were prepared for in-office processing of the material according to the Seinhorst method [9; P. 67-69.]. Soil samples for the presence of cyst nematodes were usually analyzed according to the standard

Decker method [3; 447 p.]. Preparations for the determination of the types of root-knot nematodes were prepared according to the well-known method of E.S. Kiryanova, E.L. Krall [4; 447 p.].

## **RESULTS AND DISCUSSIONS**

For the entire period of phytohelminthological studies of pomegranate agrocenoses in the southern regions of Uzbekistan, representatives of the order Tylenchida, we identified 40 species of phytonematodes. Detected species belonging to 3 suborders (Tylenchina, Criconematina, Hexatyline), 6 superfamilies (Tylenchoidea, Dolichodoroidea, Hoplolaimoidea, Criconematoidea, Anguinoidea, Sphaerularioidea), nine families (Tylenchidae, Dolichodoridae, Psilenchidae, Hoplolaimidae, Pratylenchidae, Meloidogynidae, Paratylenchidae, Anguinidae, Sphaerulariidae), in 12 subfamilies (Tylenchinae, Dolichodoridae, Tylenchorhynchinae, Psilenchinae, Rotylenchinae, Rotylenchoidinae, Pratylenchinae, Meloidogyninae, Paratylenchinae, Anguininae, Nothotylenchinae, Sphaerulariinae) and 16 genera (Tylenchus, Filenchus, Aglenchus, Tylenchorhynchus, Bitylenchus, Quinisulcius, Merlanius, Psilenchus, Rotylenchus, Helicotylenchus, Pratylenchus, Meloidogyne, Paratylenchus, Ditylenchus, Nothotylenchus, Prothallonema).

**Phytohelminths of nonspecific pathogenic effect.** In our material, they are represented by 15 species:

*Tylenchus davainei* Bastian, 1865 was registered in the roots and rhizosphere of pomegranate plants in Shurchi, Saryassiya, Muzrabad, Angor districts of Surkhandarya region and Karshi, Kitab, Yakkabag districts of Kashkadarya region.

*Filenchus filiformis* (Butschli, 1873) Meyl, 1961 was found in the roots and rhizosphere of pomegranate plants in Shurchi, Baysun, Denau, Kumkurgan, Saryassiya, Termez, Muzrabad, Angor districts of Surkhandarya region and Karshi, Kitab, Yakkabag districts of Kashkadarya regions.

*F. infirmus* (Andrassy, 1952) Andrassy, 1976 was found in the rhizosphere of pomegranate plants in the Termez district of the Surkhandarya region.

*F. leptosoma* (De Man, 1880) Andrassy, 1972 was found in the roots and rhizosphere of pomegranate plants in the Bandykhan and Angor districts of the Surkhandarya region.

*F. polyhypnus* Steiner et Albin, 1946 was found in the roots and rhizosphere of pomegranate plants in the Angor district of the Surkhandarya region.

*F. thornei* (Andrassy, 1954) Andrassy, 1980 was recorded in the roots and rhizosphere of pomegranate plants in the Angor district of the Surkhandarya region and the Kitab district of the Kashkadarya region.

*Aglenchus agricola* (De Man, 1884) Meyl, 1961 was found in the rhizosphere of pomegranate plants in Muzrabad district of Surkhandarya region.

*Psilenchus hilarulus* De Man, 1921 was found in the roots and rhizosphere of pomegranate plants in Shurchi, Baysun, Kumkurgan, Muzrabad and Angor districts of Surkhandarya region.

*D. intermedius* (De Man, 1880) Filipjev, 1936 was found in the roots and rhizosphere of pomegranate plants of the Altynsai, Angor districts of the Surkhandarya region and the Kitab district of the Kashkadarya region.

*D. myceliophagus* Goodey, 1958 was found in the roots and rhizosphere of pomegranate plants in Denau, Altynsai, Saryassiya, Dzharkurgan, Muzrabad and Angor districts of Surkhandarya region.

*D. triformis* Hirshmann et Sasser, 1955 was registered in the roots and rhizosphere of pomegranate plants in Bandykhan, Muzrabad districts of Surkhandarya region and Kitab, Yakkabag districts of Kashkadarya region.

*Nothotylenchus acris* Thorne, 1941 was found in the roots and rhizosphere of pomegranate plants in the Saryassiya and Muzrabad districts of the Surkhandarya region.

*N. exiguus* Andrassy, 1958 was found in the rhizosphere of pomegranate plants in the Termez district of the Surkhandarya region.

*N. allii* Khan et Siddiqi, 1968 found in the rhizosphere of pomegranate plants in the Dzharkurgan district of the Surkhandarya region.

*Prothallonema asymmetricus* Thorne, 1941 was found in the rhizosphere of pomegranate plants in the Saryassiya district of the Surkhandarya region.

**Phytohelminths of specific pathogenic effect.** In our research, they are represented by 25 species:

*Tylenchorhynchus cylindricus* Cobb, 1913 was recorded in the roots and rhizosphere of pomegranate plants in the Karshi, Kitab, and Yakkabag districts of the Kashkadarya region.

*T. brassicae* Siddiqi, 1961 was found in the roots and rhizosphere of pomegranate plants in the Kitab district of the Kashkadarya region.

*T. claytoni* Steiner, 1937 was found in the roots and rhizosphere of pomegranate plants in the Yakkabag district of the Kashkadarya region.

*Bitylenchus dubius* (Butschli, 1873) Siddiqi, 1986 was registered in the roots and rhizosphere of pomegranate plants in Shurchi, Baysun, Denau, Kumkurgan, Saryassiya, Dzharkurgan, Muzrabad, Angor districts of Surkhandarya region and Karshi, Kitab, Yakkabag districts of Kashkadarya regions.

*Quinisulcius capitatus* (Allen, 1955) Siddiqi, 1971 was found in the roots and rhizosphere of pomegranate plants in Muzrabad and Angor districts of Surkhandarya region.

*Merlinius brevidens* (Allen, 1955) Siddiqi, 1975 was recorded in the roots and rhizosphere of pomegranate plants in the Karshi, Kitab, and Yakkabag districts of the Kashkadarya region.

*Rotylenchus robustus* (De Man, 1876) Filipjev, 1934 was found in the roots and rhizosphere of pomegranate plants in the Karshi, Kitab, and Yakkabag districts of the Kashkadarya region.

*R. goodeyi* Loof et Oostenbrink, 1958 found in the rhizosphere of pomegranate plants in the Baysun district of the Surkhandarya region.

*Helicotylenchus dihystra* (Cobb, 1893) Sher, 1961 was found in the roots and rhizosphere of pomegranate plants in the Termez and Angor districts of the Surkhandarya region and the Karshi, Kitab, and Yakkabag districts of the Kashkadarya region.

*H. digitiformis* Ivanova, 1967 was found in the roots and rhizosphere of pomegranate plants in the Karshi, Kitab and Yakkabag districts of the Kashkadarya region.

*H. digonicus* Perry, 1959 was recorded in the roots and rhizosphere of pomegranate plants in the Angor district of the Surkhandarya region and the Karshi, Kitab, and Yakkabag districts of the Kashkadarya region.

*H. erythrinae* (Zimmermann, 1904) Golden, 1956 found in the roots and rhizosphere of pomegranate plants in the Shurchi, Baysun, Altynsai, Kumkurgan, Saryassiya, Uzun, Bandykhan, Sherabad, Termez, Muzrabad, Angor districts of the Surkhandarya region and the Karshi, Kitab, and Yakkabag districts of the Kashkadarya region.

*H. multicinctus* (Cobb, 1893) Golden, 1956 was found in the roots and rhizosphere of pomegranate plants in the Angor district of the Surkhandarya region.

*H. pseudorobustus* (Steiner, 1914) Golden, 1956 was found in the roots and rhizosphere of pomegranate plants in the Dzharkurgan and Angor districts of the Surkhandarya region.

*H. varicaudatus* Yuen, 1964 was registered in the roots and rhizosphere of pomegranate plants in the Kitab district of the Kashkadarya region.

*Pratylenchus pratensis* (De Man, 1880) Filipjev, 1936 found in the roots and rhizosphere of pomegranate plants in Shurchi, Baysun, Denau, Altynsai, Kumkurgan, Saryassiya, Bandykhan, Dzharkurgan, Termez, Muzrabad, Angor districts of the Surkhandarya region and the Karshi, Kitab, and Yakkabag districts of the Kashkadarya region.

*P. crenatus* Loof, 1960 was found in the roots and rhizosphere of pomegranate plants in the Karshi, Kitab, and Yakkabag districts of the Kashkadarya region.

*P. manohari* Quraishi, 1982 was recorded in the roots and rhizosphere of pomegranate plants in the Kitab and Yakkabag districts of the Kashkadarya region.

*P. neglectus* (Rensch, 1924) Filipjev et Sch. Stekhoven, 1941 was found in the roots and rhizosphere of pomegranate plants in the Kitab and Karshi districts of the Kashkadarya region.

*P. penetrans* (Cobb, 1917) Filipjev et Sch. Stekhoven, 1941 was found in the roots and rhizosphere of pomegranate plants in the Karshi, Kitab and Yakkabag districts of the Kashkadarya region.

*Meloidogyne incognita* (Kofoid et White, 1919) Chitwood, 1949 was found in the roots and rhizosphere of pomegranate plants in Denau, Uzun, Dzharkurgan, Sherabad, Angor districts of Surkhandarya region and Karshi, Kitab, Yakkabag districts of Kashkadarya region.

*M. javanica* (Treub, 1885) Chitwood, 1949 was found in the roots and rhizosphere of pomegranate plants in the Angor district of the Surkhandarya region.

*Paratylenchus bukowinensis* Micoletzky, 1922 was found in the roots and rhizosphere of pomegranate plants in the Kitab and Karshi districts of the Kashkadarya region.



*P. hamatus* Thorne et Allen, 1950 was found in the roots and rhizosphere of pomegranate plants in the Jarkurgan, Termez, Muzrabad and Angor districts of the Surkhandarya region.

*Ditylenchus dipsaci* (Kuhn, 1857) Filipjev, 1936 was registered in the roots and rhizosphere of pomegranate plants in the Altynsay, Saryassiya, Uzun, Termez, Angor districts of the Surkhandarya region and the Karshi, Kitab, Yakkabag districts of the Kashkadarya region.

## **CONCLUSION**

During research from phytohelminths of a nonspecific pathogenic effect, the species *Filenchus filiformis*, *Psilenchus hilarulus*, *D. intermedius*, *D. myceliophagus*, *D. triformis* were identified in numerous specimens in the roots and rhizosphere of pomegranate plants. Among the phytohelminths of a specific pathogenic effect, the dominant species were *Tylenchorhynchus cylindricus*, *Bitylenchus dubius*, *Quinisulcius capitatus*, *Merlinius brevidens*, *Rotylenchus robustus*, *Helicotylenchus dihystra*, *H. erythrinae*.

The results of the phytohelminthological study showed that phytonematodes of the order Tylenchida cause serious diseases in pomegranate agrocenoses in the southern regions of Uzbekistan and cause great economic damage to the fruit growing of the Republic. Therefore, the study of the distribution and species composition, bioecological features and substantiation of measures to combat these pests is of great scientific and practical importance.

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