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FAUNISTIC COMPLEX OF PHYTONEMATOD OF POMEGRANATE AGROCENOSES OF SOUTH UZBEKISTAN

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ABSTRACT: The article provides data on the faunistic complex of phytonematodes of pomegranate agrocenoses in southern Uzbekistan. The study revealed 128 species of plant nematodes belonging to 54 genera, 30 families, 7 orders and 3 subclasses. It has been established that the species Eudorylaimus pratensis, Cephalobus persegnis, Eucephalobus oxyuroides, Chiloplacus sclerovaginatus, Ch. propinquus, Panagrolaimus rigidus, Rhabditis brevispina, Aphelenchus avenae, Aphelenchoides parietinus, A. bicaudatus, A. blasthophthorus, A. composticola, A. graminis, A. limberi, Filenchus filiformis, Tylenchorhynchus cylindricus, Quinisulcius cylindricus, T.claytoni Helicotylenchus erythrinae, Pratylenchus pratensis, P. crenatus, Meloidogyne incognita, M. javanica, and Ditylenchus dipsaci.

KEYWORDS: Pomegranate agrocenocic, root system, rhizosphere, parasitic phytonematodes, ectoparasitic perforators, endoparasitic perforators.

INTRODUCTION

Today in the world providing the population with high quality fruits is one of the most important tasks. Especially, in recent years, the high harmfulness from parasitic plant nematodes of fruit trees and shrubs has led to a decrease in productivity and deterioration in the quality of products. Therefore, the disclosure of the diversity of phytonematodes in different agrocenoses, the peculiarities of their distribution, the identification of parasitic species and the development of integrated measures to combat them, acquire an important scientific and practical significance.

The pomegranate was brought to Uzbekistan two thousand years ago from Iran, Turkmenistan and northern Afghanistan. Currently, anoraks are installed in most regions of Uzbekistan. All parts of the pomegranate are useful for humans, and the fruit juice contains 12-20% sugar, organic acids, vitamins and other useful substances. The pomegranate fruit consists of 38.6-63.5% water, 27.6-51.6% peel, 7.2-22.2% grains. The fruit contains 1.6% protein, 0.1-0.7% fat, 0.2-5.2% fiber and 0.5-0.7% ash. Pomegranate juice contains 0.208-0.218% of minerals, including manganese, phosphorus, magnesium, aluminum, silicon, chromium, nickel, calcium, copper. In folk medicine, pomegranate peel, fruit, fruit peel and flower are used as a remedy for diarrhea, scabies, cough, diarrhea, ringworm, gastrointestinal diseases, anemia.

The species composition, patterns of distribution of phytonematodes and substantiation of measures to combat parasitic species of pomegranate agrocenoses on the territory of the

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Republics of Central Asia were first studied by Sh.Kh. Khurramov and A.S. Bekmuradov [1, P. 13-15; 2, - 92 p .; 3, P. 28-32; 8, P. 146-157; 9, 333 p.].

MATERIALS AND METODS

In order to study the faunistic complex of phytonematodes of pomegranate agrocenoses of southern Uzbekistan (Surkhandarya and Kashkadarya regions) in the period from 2009-2019. We collected phytonematodes from the root soil and root system of plants in shirkat farms from 17 districts of the Surkhandarya and Kashkadarya regions of the Republic. The studies were carried out by the generally accepted route method [6, P. 338-369; 7, P. 3-11].

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 glycerol with alcohol (1: 3), and permanent preparations on glycerol were prepared for in-office processing of the material according to the Seinhorst method [11, P. 67-69]. Soil samples for the presence of cyst nematodes were usually analyzed according to the standard Decker method [4, 445 p.]. Preparations for determining the species of root-knot nematodes were prepared according to the well-known method of E.S. Kiryanova, E.L. Krall [5, 447 p.].

RESULTS AND DISCUSSIONS

As a result of the phytohelminthological studies carried out in the pomegranate agrocenoses of southern Uzbekistan, we found a total of 128 species of plant nematodes belonging to 54 genera, 30 families, 7 orders and 3 subclasses. In total, the detected nematodes are distributed by orders as follows: Order Enoplida is represented by 3 species, order Mononchida-2, Dorylaimida-26, Plectida-4, Rhabditida-30, Aphelenchida-23 and order Tylenchida-40 species.
The data obtained show that phytonematodes of pomegranate plants and its basal soil differ significantly from each other both in species composition and in the number of individuals.
In the root soil of the pomegranate, 15622 individuals (69.3% of the total number of detected phytonematodes) were registered, belonging to 128 species. Eudorulaimus parvus, E. pratensis, E. similis, E. discolaimioideus, Aporcelaimellus obtusicaudatus, Tylencholaimus minimus, and Diphtherophora communis were common pararisobionts. The dominant daisy-family species are Cephalobus persegnis, Eucephalobus oxyuroides, Acrobeloides buetschlii, Chiloplacus quintastriatus, Ch. sclerovaginatus and Panagrolaimus rigidus, and Rhabditis brevispina was common among eusaprobionts.

Among the representatives of phytohelminths of nonspecific pathogenic effect, Aphelenchus avenae, Aphelenchoides parietinus, A. blasthophthorus, A. composticola, A. graminis, A. limberi, and Ditylenchus myceliophagus prevailed, while Xiphinema opisthohysterum, Bitylentechus erythrinae, Pratylenchus pratensis, Meloidogyne incognita, M. javanica, Paratylenchus hamatus and Ditylenchus dipsaci.
The main faunal complex of phytonematodes in the pomegranate root soil is represented by the species E. pratensis, D. communis, C. persegnis, E. oxyuroides, A. buetschlii, Ch. sclerovaginatus, P.rigidus, Rh.brevispina, A. avenae, A. parietinus, A.bicaudatus, A.

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blasthophthorus, A. composticola, A. graminis, A. limberi, Tylenchorhynchus cylindricus, T.claytoni, Q.capitatus, H erythrinae, P. pratensis, M. javanica, D. dipsaci, and some comparatively few species.

In the root soil of plants, according to the species composition, representatives of the order Tylenchida dominate, containing 33.6% of all species found in the root soil. At the same time, in terms of the number of individuals, representatives of the Aphelenchida order predominate, which is 32.9% of all registered individuals in the root soil of pomegranate plants.

In the root system of the pomegranate, 6931 individuals (30.7% of the total number of detected phytonematodes) were found, belonging to 73 species. Among the pararisobionts, only D. communis is found in the root system. C. persegnis, E. oxyuroides, A. buetschlii, Ch. quintastriatus, Ch. sclerovaginatus and P. rigidus. Among eusaprobionts, Rh. brevispina.

Among the representatives of phytohelminths of nonspecific pathogenic effect, A. avenae, A. parietinus, A. bicaudatus, A. blasthophthorus, A. composticola, A. graminis, and A. limberi dominate.

From the group of phytohelminths with a specific pathogenic effect, Q. capitatus, H. erythrinae, P. pratensis, M. incognita, M. javanica, and D. dipsaci prevailed.

The main phytonematode community of the pomegranate root system is represented by the species C. persegnis, Ch. sclerovaginatus, P. rigidus, A. avenae, A. parietinus, A. bicaudatus, A. composticola, A. graminis, A. limberi, Q. capitatus, H. erythrinae, P. pratensis, M. incognita, M. javanica, and D. dipsaci.

In the root system, in terms of species composition, representatives of the order Tylenchida dominate, containing 34.5% of all detected species in the root system of plants. In terms of the number of individuals, representatives of the Aphelenchida order prevail, which is 47.7% of all registered individuals in the roots of pomegranate plants.

The following species dominate in the root soil and root system of pomegranate plants: C. persegnis, Ch. sclerovaginatus, P. rigidus, Rh. brevispina, A. avenae, A. parietinus, A.bicaudatus, A.blasthophthorus, A. composticola, A. graminis, A. limberi, Tylenchorhynchus cylindricus, T.claytoni, Q. capitatus, H. erythrinae, P. pratensis, M. incognita, M. javanica, and D. dipsaci.

During the period of research on pomegranate agrocenoses of the territory of South Uzbekistan, we identified 128 species of phytonematodes belonging to 3 subclasses, 7 orders, 13 suborders, 21 superfamilies, 30 families, 34 subfamilies and 54 genera. All detected phytonematodes by orders are distributed as follows: (Table 1.).

Table 1.

Taxonomic composition of pomegranate plant nematodes (by order)

Orders	Number of specie	%	Number of individual	%
Enoplida	3	2,3	328	1,5
Mononchida	2	1,6	90	0,4
Dorylaimida	26	20,3	1526	6,8
Plectida	4	3,1	140	0,6

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Rhabditida	30	23,4	5294	23,5
Aphelenchida	23	18,0	7744	34,3
Tylenchida	40	31,3	7431	32,9
Total:	128	100	22553	100

Order Enoplida is represented by 2 suborders: Oncholaimina and Tripyloidina; 2 superfamilies: Oxystominoidea and Tripyloidea; 2 families: Alaimidae and Prismatolaimidae; 2 subfamilies: Alaiminae and Prismatolaiminae; 2 genera: Alaimus and Prismatolaimus; 3 species (which is 2.3% of the total number of species). A total of 328 specimens (1.5% of the total number of detected plant nematodes).

The order Mononchida includes one suborder Mononchina, one superfamily Mononchoidea, one family Múlonchulidae, one subfamily Mylonchulinae, one genus Mylonchulus and 2 species (1.6%). A total of 90 individuals (0.4%) of phytonematodes were registered.

The order Dorylaimida is represented by 2 suborders: Dorylaimina and Diphtherophorina; 4 superfamilies: Nygolaimoidea, Dorylaimoidea, Leptonchoidea, and Diphtherophoroidea; 9 families: Nygolaimidae, Dorylaimidae, Qudsianematidae, Aporcelaimidae, Nordiidae, Xiphinematidae, Leptonchidae, Tylencholaimidae and Diphtherophoridae; 9 subfamilies: Nygolaiminae, Mesodorylaiminae, Qudsianematinae, Aporcelaiminae, Nordiinae, Xiphinematinae, Leptonchinae, Tylencholaiminae and Diphtherophorinae; 11 genera: Nygolaimus, Mesodorylaimus, Eudorylaimus, Ecumenicus, Labronema, Aporcelaimellus, Longidorella, Xiphinema, Leptonchus, Tylencholaimus and Diphtherophora; 26 species (20.3%). A total of 1526 individuals (6.8%) of phytonematodes were found.

Order Plectida includes one superfamily Plectoidea, one family Plectidae, one subfamily Plectinae; 2 genera: Plectus and Proteroplectus, 4 species (3.1%), a total of 140 specimens (0.6%) of phytonematodes.

The order Rhabditida includes 2 suborders: Cephalobina and Rhabditina: 3 superfamilies: Cephaloboidea, Panagrolaimoidea and Rhabditoidea; 3 families: Cephalobidae, Panagrolaimidae and Rhabditidae; 5 subfamilies: Cephalobinae, Acrobelinae, Panagrolaiminae, Peloderinae and Rhabditinae; 10 genera: Heterocephalobus, Cephalobus, Eucephalobus, Acrobeloides, Chiloplacus, Cervidellus, Acrobeles, Panagrolaimus, Xylorhabditis and Rhabditis; 30 species (23.4%). A total of 5294 individuals (23.5%) of phytonematodes were identified.

The order Aphelenchida is represented by one suborder - Aphelenchina, one superfamily - Aphelenchoidea, 3 families: Aphelenchidae, Aphelenchoididae and Seinuridae; 3 subfamilies: Aphelenchinae, Aphelenchoidinae and Seinurinae, 3 genera: Aphelenchus, Aphelenchoides and Seinura, 23 species (18.0%). A total of 7744 individuals (34.3%) of phytonematodes were recorded.

The order Tylenchida detachment covers 3 suborder: Tylenchina, Criconematina and Hexatylina, 6 superfamilies: Tylenchoidea, Dolichodoroidea, Hoplolaimoidea, Criconematoidea, Anguinoidea and Sphaerularioidea, 9 families: Tylenchidae, Dolichodoridae, Psilenchidae, Hoplolaimidae, Pratylenchidae, Meloidogynidae, Paratylenchidae, Anguinidae and Sphaerulariidae, 11 subfamilies: Tylenchinae, Tylenchorhynchinae, Psilenchinae, Rotylenchinae, Rotylenchoidinae, Pratylenchinae, Meloidogyninae, Paratylenchinae, Anguininae, Nothotylenchinae and Sphaerulariinae, 14 genera: Tylenchus, Filenchus, Aglenchus, Bitylenchus, Quinisulcius, Psilenchus, Rotylenchus, Helicotylenchus, Pratylenchus, Meloidogyne,

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Paratylenchus, Ditylenchus, Nothotylenchus and Prothallonema, 40 species (31.3%). A total of 7431 individuals (32.9%) of phytonematodes were registered.

CONCLUSION

The above analysis shows that among the orders in terms of species composition, the order Tylenchida occupies the first place, accounting for 31.3% of all detected species of nematodes of pomegranate plants. This is followed by the order Rhabditida (23.4%), followed by Dorylaimida (20.3%) and the order Aphelenchida (18.0%).

In terms of the number of individuals among the orders, the Aphelenchida order takes the first place - 34.3% of the total number of detected phytonematodes. Then the orders Tylenchida-32.9%, Rhabditida-23.5% and Dorylaimida-6.8%.

In the faunistic complex, pomegranate plant nematodes are represented by 30 families. The most diverse in terms of species composition is the family Cephalobidae, which accounts for 18.3% of all detected species of pomegranate plant nematodes. Then Aphelenchoididae - 15.4%, Qudsianematidae - 8.2%, Tylenchidae - 6.9 and Anguinidae - 6.2% each.

Aphelenchoididae ranks first in the number of individuals among families. It contains the main number (35.2%) of phytonematodes, followed by Cephalobidae - 14.2%, Meloidogynidae - 6.3%, Aphelenchidae - 5.4%, Anguinidae - 4.9% and Hoplolaimidae - 4.2% individuals.

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