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## POTATO PHYTONEMATODES OF SAMARKAND REGION

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### Abstract

The article presents information about potato phytonematodes of Samarkand region. Nematodes were observed to be more common in the soil around the roots of potato crops than in the roots, stems and leaves. In the fauna of potato phytonematodes grown in different regions, species groups belonging to a certain region and species groups common to all studied regions were identified. Plant parasitic nematodes - *Bitylenchus dubius*, *Rotylenchus goodeyi*, *Helicotylenchus erythrinae*, *H. multicinctus*, *Pratylenchus pratensis*, *P. macrophallus* and *Ditylenchus dipsaci* species were found.

**Keywords:** phytonematoda, fauna, potato - *Solanum tuberosum* L., soil, distribution, ecological-trophic groups, dominant, parasite.

**Introduction** Along with wheat, corn and rice crops, potatoes occupy the main place in the production of plant products in the world. Today, based on the needs of the population and market requirements, potato and vegetable cultivation is growing year by year. In this regard, the areas of potato and vegetable crops have expanded in Uzbekistan, and hundreds of new farms specializing in this field have been established. Therefore, determining the species composition of phytonematodes in potato and vegetable growing areas of the republic, including the potato fields of Samarkand region, revealing the distribution of parasitic species and their ecological characteristics, is considered one of the urgent tasks of today.

### Analysis of literature on the topic

Information about phytonematodes of potato crops in Uzbekistan, parasite types and their damage, species composition, measures to combat parasites A.T. Tolaganov [6], S.M. Rizaeva [4], D.T. Sidikov [5] studies. However, in Uzbekistan, in



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particular, in the conditions of the Samarkand region, large-scale studies on the population, ecology and taxonomy of the phytonematodes found in the potato crop have not been carried out. cannot explain in detail the current situation of parasitic species found in potato crops.

## The purpose of the study.

It consists in determining the composition of the potato phytonematode fauna of Samarkand region, revealing the features of distribution of phytonematodes in the soil around plant roots and roots, and identifying the types of parasites.

## Research methodology.

Research materials were collected from farms and private estates of Tayloq, Bulung'ur, Jomboy and Okdarya districts of Samarkand region. The soil of the area is gray soils. Samples were taken by route method [2] from stems and leaves, roots and soil around the roots of potato (*Solanum tuberosum* L.) cultivars "Arizona" and "Sante". 75 samples (25 stems and leaves, 25 roots, 25 soil) were collected from each district, a total of 300 samples. Nematodes were isolated from the samples by the Berman funnel method [2] and fixed in TAF (triethanolamine: formalin: water in 2 ratio) solution. A.A. Paramonov [3], E.S. Kiryanova and E.L. Permanent and temporary micropreparations were prepared according to the methods of Krall [2]. The species composition of nematodes was studied using a BX53, "OLYMPUS", SC-180 (Japan, 2018) light source microscope.

Dominance level of phytonematodes present in potato root and pre-root soils is K. Kasprzak, determined according to the method of W. Niedbala (1981) [8], in which species that make up more than 10.0% of the number of individuals of the identified total species are eudominant, 5.1-10.0% - dominant, 2.1-5, 0% are subdominants, 1.1-2.0% are recessants, less than 1.0% are subprecedents [7].

## Analysis and results.

As a result of research, two subclasses, 8 genera, 22 families, and 67 species of phytonematodes belonging to 42 genera were found in potato farms and the soil around its roots in Tayloq, Okdarya, Bulung'ur, and Jomboy districts of Samarkand region. Among the identified nematodes, representatives of Rhabditi (22 species), Dorylaimida (14) and Tylenchida (13 species) prevailed. Aphelenchida (7 species)



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was average, Mononchida (4), Chromadorida (2), Plectida (4) and Enoplida (1) were few species.

In the ecological analysis of the species of phytonematodes found during the research. We used the ecological classification of nematodes based on their trophic relationship with plants or other soil organisms proposed by A.A.Paramonov (1964) [3]. According to this classification, phytonematodes are divided into 5 ecological groups: pararhizobionts - free-living soil forms; eusaprobionts are true representatives of the rotten environment; devisaprobionts - semi-saprobionts; non-pathogenic phytohelminths or non-pathogenic phytohelminths and pathogenic phytohelminths or true plant parasites. Nematodes identified in our research materials were divided into five groups according to ecological groups: pararhizobionts - 19 species (28.3 of all species found), eusaprobionts - 9 (13.4%), devisaprobionts - 19 (28.3%), non-pathogenic phytohelminths - 13 (19.4%), real parasites - 7 species (10.6%).

Of the nematode species detected in the soil around the potato and its roots, eudominants - 1 species (according to the individual percentage of all identified species), dominants - 6 species, subdominant species - 4 species, recessants - 9 species, subresidents - 47 species.

In the course of the research, the composition of species and the number of individuals were observed in the nematode fauna of potatoes and the soil around its roots in each studied area. **Taylak district** It is the main potato-growing area of the region, 32 species and 321 copies of nematodes were found in potatoes in this area. Potatoes were the first crop in this area. There were 8 species of nematode characteristic for the area (*Proteroplectus longicaudatus*, *Alaimus primitivus*, *Eudorylaimus ettersbergensis*, *Heterocephalobus filiformis*, *Rhabditis longicaudata*, *Pelodera teres*, *Aphelenchoides subtenius* and *Pratylenchus pratensis*). Nematodes were found individually in Taylaq district, and we believe that the reason for this is that potatoes were planted in the potato fields in previous years.

**In Akdarya district** 49 species and 303 copies of nematodes were found in potatoes. Cabbage was the first crop before potatoes. There are 24 species of nematodes characteristic of the area (*Monhystra filiformis*, *M.similis*, *Anaplectus granulosus*, *Proteroplectus parvus*, *Clarcus papillatus*, *Mononchus truncates*, *Anatonchus tridentatus*, *Prismatolaimus dolichurus*, *Paradorylaimus filiformis*, *Dorylaimoides elegans*, *Mesodorylaimus bastiani*, *Eudorylaimus acuticauda*, *E.centrocercus*, *Tylencholaimellus striatus* ) Species diversity in the nematode fauna of this region



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was observed at a high level compared to other regions. The reason for the variety of species depends on the type of crop planted before potatoes, the previous crop was cabbage. **In Bulungur district** 26 species and 110 copies of nematodes were found. In the district, onions were planted in the field before the potato crop. Characteristic nematodes for the region - 6 species (*Labronema eudorylaimoides*, *Aporcelaimellus obscurus*, *Aphelenchus cylindricaudatus*, *Aphelenchoides tumulicaudatus*, *Tylenchus davainei* and *Filenchus filiformis*). It was observed that nematodes are relatively rare in this area.

**In Jomboy district** 17 species and 117 copies of nematodes were found. Hot pepper was planted in the field before the potato crop in the district. Fewest species were recorded in this area. The characteristic nematode of the area was identified as *Diphtherophora communis*. 14 species of nematodes are common to all districts, and the remaining species are found in 2 or 3 districts.

According to our results, it was found that the fauna of potato nematodes in each region is distinguished by a certain group, the maximum number of species was recorded in potatoes planted after the potato crop, while the fewest species were observed in potatoes in dry soils planted after hot pepper, this situation is related to the level of application of agrotechnical measures to the crops and We believe that it depends on the condition of the soil.

Among the phytonematodes, parasitic nematodes are of great practical importance, they have not been fully studied as a complex of plant roots and root nematodes. During the growing anthropogenic processes, the damage of parasitic nematodes is great and they parasitize all types of plants. Currently, more than four thousand species of phytonematodes are plant parasites [1]. In our research, 20 species (30%) of the 67 species of phytonematodes identified in the soil around the potato and its roots are parasitic nematodes. When the species composition of parasitic nematodes found in potatoes was analyzed in the section of districts, 9 species of phytohelminths were found in Tailak district, 14 species in Okdarya district, 9 species in Bulungur district, and 2 species of phytohelminths in Jomboy district. Among the parasitic nematodes identified during the research, the dangerous species for agricultural crops are *Bitylenchus dubius*, *Rotylenchus goodeyi*, *Helicotylenchus erythrinae*, *H. multicinctus*, *Pratylenchus pratensis*, *P. macrophallus* and *Ditylenchus dipsaci*.



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## Conclusions

As a result of the research, 67 types of phytonematodes were identified in the soil around the potato crop and roots in Samarkand region. In terms of species composition of nematodes, representatives of Rhabditi (22 species), Dorylaimida (14) and Tylenchida (13) groups prevailed. Aphelenchida (7) group, Mononchida (4), Chromadorida (2), Plectida (4) and Enoplida (1) species were found relatively few. According to the ecological classification of nematodes, pararhizobionts (19 species) and devisaprobionts (19 species) prevailed in the number of species, non-pathogenic phytohelminths (14 species) took the second place, eusaprobionts (9 species) took the third place, true parasites (6 species) followed. It was noted that it was organized. In the studied regions, it was observed that nematodes were more common in the soil around the roots of the potato crop than in the roots, stems and leaves. In the fauna of phytonematodes, species groups belonging to a certain area and species groups common to all studied areas were identified. *Bitylenchus dubius*, *Rotylenchus goodeyi*, *Helicotylenchus erythrinae*, *H. multicinctus*, *Pratylenchus pratensis*, *P. macrophallus* and *Ditylenchus dipsaci* species are among the parasitic nematodes dangerous for agricultural crops.

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