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# Fauna of Phytonematodes in Soils With Different Levels of Salinity

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**Abstract:** In this article, it was determined that phytonematodes differ in species diversity and quantity in different soil types, which depends on the chemical composition of the soil and the level of humus. It was observed that phytonematodes differ in ecological and trophic composition in the studied soils. Saprophages formed the biocenotic complex of nematodes in humus soils. As a result of studying the fauna of phytonematodes in irrigated gray-meadow soils with varying degrees of salinity, the composition of their species and ecological-trophic groups depends on soil types, its chemical composition of humus and salinity. A comparative analysis of the qualitative and quantitative indicators of phytonematodes in soils with different levels of salinity revealed that phytonematodes are not uniformly distributed in the soils. Depending on the level of salinity, the number of nematodes changed as follows. In weakly saline soils, nematodes are widespread in the upper layers of the soil, and phytohelminths, specialized from ecological groups, are the majority. As a result of penetration into the deep layers of the soil, the number of nematodes has decreased significantly. In moderately saline soils, nematodes are widely distributed in the 0-10 and 10-20 cm layers. The species and numbers of nematodes are less common in highly saline soils. With increasing soil salinity, the total number of phytonematodes decreased.
**Key words:** phytonematoda, soil, ecological-trophic group, agrocenosis, salinity, humus.

## 1. Introduction:

In the increasingly developing social and economic life of the world community, it can be observed that the demographic situation (population growth) is increasing intensively from year to year. This intensive growth rate is causing a corresponding increase in the population's demand for food products. However, according to statistics, the average annual loss of productivity of various plants due to the harmful effects of phytonematodes worldwide is estimated at 12.6%, that is, 215.77 billion US dollars. It was also noted that 14.45% of the average annual yield of agricultural crops with a high food or export value, with a damage value of 142.47 billion US dollars, was reduced under the influence of parasitic phytonematodes. Currently, it is of great scientific and practical importance to identify parasitic phytonematodes, which cause early growth of the plant, a sharp decrease in productivity, or the fact that the obtained crop cannot meet the consumption requirements, and to develop effective measures against them [10].

Currently, more than 24,000 species of nematode fauna are known in the world, and they are a widespread, biologically progressive group in nature [7]. Since nematodes are soil organisms, they are directly related to the soil. Individual groups of phytonematodes are strongly linked to specific habitat conditions. According to the information of most authors, the distribution of phytonematodes is influenced by the chemical, organic and mechanical composition of the soil, the moisture regime, the penetration of the plant root system into the soil layers, and the climate. Increasing soil productivity, protecting the environment is one of the most important problems of our time. Soil invertebrates are bioindicators that ensure the increase of soil productivity and determine the state of the environment [5,9].

Phytonematodes are nutritionally dependent on bacteria, fungi, plants and other organisms, actively participate in the process of mineralization of substances in the soil and ensure soil fertility, are a source of nitrogen in the soil. [6,1]. However, information on the comprehensive assessment of the impact of various types of soil ecological factors on phytonematode fauna is rare in the literature. in irrigated gray-meadow soils with varying degrees of salinity.

Study of the composition of phytonematodes species and ecological-trophic groups in irrigated gray-meadow soils with varying degrees of salinity.

## 2. Materials and Methods:

Materials for scientific research were collected in May 2022 from the wheat agrocenoses of the village "Pakhtakor", Khavas district, Syrdarya region. Samples were collected from 0–10 cm, 10–20 cm, and 20–30 cm layers of irrigated gray-meadow soils with varying degrees of salinity. Phytonematodes were separated from soil samples by Berman funnel and soil washing methods [2]. Glycerin-gelatin permanent preparations and temporary preparations were prepared by generally accepted methods in phytohelminthology [2].

## 3. Results and Discussion:

As a result of studying the fauna of phytonematodes in irrigated gray-meadow soils with varying degrees of salinity from wheat agrocenoses of "Pakhtakor" village, Khavas district, Syrdarya region, 33 species 1173 ind. phytonematodes were identified. Identified phytonematodes belong to 2 subclasses, 7 genera, 16 families, and 21 genera [3].

The analysis of phytonematodes identified in irrigated gray-meadow soils with varying degrees of salinity by genera showed that Tylenchida, Dorylaimida, Aphelenchida genera are diverse in terms of nematode types and numbers. Representatives of the Tylenchida family were especially abundant in our samples. The genera Enoplida, Rhabditida, Plestida and Mononchida were very rare compared to other genera.

A.A. phytonematodes found in soils with different levels of salinity. According to the classification of Paramonov (1962), we divided into 5 ecological groups: pararhizobionts, eusaprobionts, devisaprobionts, non-specialized phytohelminths and specialized phytohelminths.

Pararhizobionts are soil nematodes that live around roots. Pararhizobionts feed on plant sap. Representatives of this group have a spear or stylet in their stoma (mouth cavity) and suck plant tissue sap with the spear or stylet. Nematodes found around the roots can also move into the plant tissue. Parasitic species are also inoculators that infect plant tissue. There are 13 species of pararhizobionts in our samples - Prizmatolaimis dolichurus, Prizmatolaimis primitivus, Ironus ignavis, Mylonchylus solus, Eudoraylaimus elegans, Eudoraylaimus monohustera, Eudoraylaimus obtusicaudatus, Eudoraylaimus pratensis, Eudoraylaimus parvis, E. sulphasae, Eudoraylaimus sp., Mesodoraylaimus bastian, Drepanodorus laetificanus. species met.

The total number of individuals of pararhizobionts (136) was 11.6% compared to the number of other nematodes. In terms of numbers, Eudoraylaimus parvis and Eudoraylaimus elegans species were the majority. Pararhizobionts are abundant in highly saline soils.

Eusaprobionts are true saprobiotic nematodes that live in plant debris and various decaying organic matter and feed on detritus. Saprozoa reproduce very quickly, their life span is limited to a few days, for example, they develop and lay eggs in 3-4 days. Although these nematodes do not cause disease in the plant, they are of great importance in the process of rotting organic matter. 2 species from this group were found in the soil samples - Mesorhabditis monhystera, Rhabditis brevispina.

Eusaprobionts were mostly found in the upper layers of the soil, 0-10 cm, but were almost absent in the 10-20 cm layers. Representatives of this group were found in moderately saline soils.

Devisaprobionts are immature or semi-saprobionts, they live in the humus environment, feed like saprobionts, so these nematodes can also enter healthy plant tissue. Representatives of this group have a rough cuticle, strong growths on the head, with the help of which they have the ability to tear plant tissue. Among the representatives of this group, 3 species were found - Cephalobus persegnis, Eucephalobus laevis, Plectus parietinus. Devisaprobionts constantly migrate in the soil, expanding the range of decay.

The total number of individuals (48) of foreign species was 4.1%. They are found in weak and medium salinity soils, and with increasing soil salinity, the number of representatives of this group also decreases sharply.

Unspecialized phytohelminths are ectoparasites that eat plant cell membranes and feed on plant sap, but do not cause disease in the plant, but cause disease in plant tissues along with other organisms. Non-specialized phytohelminths - 12 species of 304 make up 25.9%, this group includes Aphelenchus avenae, Aphelenchoides limberi, Aphelenchoides parietinus, Aphelenchoides xyloplilus, Cryptaphelenchus latus, Aglenchus agricola, Tylenchus davaini, Filenchus filiformus, Tylenchus clavicaudatus, Fylenchus leptosome, Tylenchus sp, The species of Ditylenchus are included. Unspecialized phytohelminths are more common in weakly saline soils.

Specialized phytohelminths - true parasites, are found in plant roots and other organs, feed on plant tissue and cause diseases in them. Specialized phytohelminths - 3 types 652 make up 55.6%, Bitylenchus dubius, Ditylenchus dipsaci, Helicotylenchus multicinctus species are found in this group. Non-specialized phytohelminths are uniformly distributed in all soil layers in weakly saline soils.

It was observed that phytonematodes differ in ecological and trophic composition in the studied soils. Saprophages form the biocenotic complex of nematodes in humus soils. As a result of studying the fauna of

phytonematodes in irrigated gray-meadow soils with varying degrees of salinity, it is explained that the composition of their species and ecological-trophic groups depends on the types of soil, its chemical composition of humus and salinity level [4].

When comparing the quality and quantity indicators of phytonematodes in soils with different levels of salinity, it was found that phytonematodes are not uniformly distributed in the soils. Depending on the degree of salinity, the number of nematodes changes as follows:

In weakly saline soils, nematodes were widespread in the upper layers of the soil, and phytohelminths, specialized from ecological groups, were the majority. As a result of penetration into the deep layers of the soil, the number of nematodes is significantly reduced.

In moderately saline soils, nematodes are widely distributed in the 0-10 and 10-20 cm layers. The species and number of nematodes were less in highly saline soils. As soil salinity increases, the total number of phytonematodes decreases.

Thus, it was found that the species diversity and quantity of phytonematodes found in different soil types differed, and this situation was explained as depending on the chemical composition of the soil and the level of humus.

## 4. Conclusion

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