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## Comparative Analysis Of Ecological - Faunistic Complexes Of Nematodes Of The Surveyed Wild Cereal Plants Of Uzbekistan

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### ABSTRACT

The article provides data on the study of a comparative analysis of the fauna and ecological composition of nematodes of wild-growing cereal plants. Common methods in phytohelminthology were used to study the fauna of nematodes. As a result of studies, 110 species of nematodes were registered in the plants and root soil of the examined wild-growing cereal plants. The data on the distribution of the identified species by order, the ecological classification of the detected species and the degree of communication between the communities of plant nematodes are presented. Based on the results of the study, it is argued that wild cereals are reserves of parasitic nematodes, and can serve as a hotbed for the conservation of nematode invasion for cultivated plants.

### KEYWORDS

Wild-growing cereals, faunistic complex, phytonematodes, ecological classification, degree of connection, community.

### INTRODUCTION

The study of phytonematodes of wild flora is of great interest for establishing host plants and biotypes. This question is also of interest

because many polyphagous parasitic nematodes can easily pass from cultivated plants to wild ones and vice versa. In this

sense, plants of wild flora can ensure the preservation of the parasite in nature. Studies show that wild plants can have a fairly diverse fauna. Studies of the nematode fauna of wild-growing cereals show that the species and ecological composition of plant nematodes in a certain way depends on the conditions of plant growth. For this reason, conducting a large-scale phytohelminthological survey to study phyto nematodes of wild-growing cereal plants growing in and around wheat fields, as well as the defeat of wild vegetation by parasitic nematodes, is of great scientific and practical importance and served as the basis for conducting phytohelminthological studies on these crops.

## MATERIALS AND METHODS

The material for phytohelminthological studies was samples of wild-growing cereals such as bulbous bluegrass (*Poa bulbosa* L.), wild-growing barley (*Hordeum spontaneum* C. Koch.), Louis oats (*Avena ludoviciana* L.), intoxicating chaff (*Lolium temulentum* L.) and wild rye (*Secale sylvestre* Host.). collected by the route method during 2015-2018. [4]. Collected and analyzed 764 soil and 1438 plant samples. The collection of soil and plant samples was carried out in agrocenoses and the entire surrounding territory of Uzbekistan. Soil and plant samples were collected in mid-spring (April) and early summer (June). To isolate nematodes from soil and plant organs, a modified Berman funnel method was used [1]. Part of the soil sample was examined for the presence of cyst nematodes according to the standard Decker method [5]. For fixation of nematodes, 4–6% formalin was used, and glycerol preparations were made according to the Seinhorst method [6]. In order to prevent the deformation of internal organs and twisting of their bodies, fixed phytonematodes were heated over an electric stove to a temperature of 50-55°C.

Anatomical and morphological study of phytonematodes was carried out using temporary and permanent preparations. When determining the species of nematodes, the works of domestic and foreign phytohelminthologists were used, as well as morphometric parameters obtained according to the generally accepted de Mann formula modified according to Mikoletski [7]. Thus, a total of 6240 soil and plant samples of wheat and 946 samples from the studied wild-growing cereals were collected in the route faunistic studies.

In the ecological analysis of the registered species of plant nematodes, we used the ecological classification proposed by A.A. Paramonov [3], based on the trophic relationships of nematodes with plants or other soil organisms. According to this classification, phytonematodes are divided into 5 ecological groups: parasisobionts - free-living soil forms; eusaprobites are real inhabitants of a putrid environment; devisaprobites - semi-saprobiotic inhabitants; phytohelminths of a nonspecific pathogenic effect or nonspecific parasites and phytohelminths of a specific pathogenic effect are real plant parasites.

To compare the degree of similarity and difference in the faunistic complexes of nematodes of various wild-growing cereals in quantitative terms, we used a somewhat simplified version of the calculation of the Sørensen-Chekanovsky coefficient, taking into account the number of common and particular species for the compared faunistic complexes [2].

110 species of nematodes have been registered on wild-growing cereal plants and in their root soil. The identified species of nematodes of the surveyed wild grasses are distributed according to orders as follows: Chromadorida - 1 species, Plectida - 2, Enoplida - 2, Mononchida - 3, Dorylaimida - 19,

Rhabditida - 34, Aphelenchida - 15, and Tylenchida - 34 species. In terms of the number of species and the number of individuals, representatives of the orders Rhabditida and Tylenchida prevail, followed by the orders Dorylaimida and Aphelenchida in descending order. In a small number of species and numbers of individuals, phytonematode species of the orders Chromadorida, Plectida, Enoplida, and Mononchida were identified.

As a result of phytohelminthological studies on wild barley and its root soil, 45 species of nematodes were found. In the root soil of barley, 45 species of nematodes were found, in the root system -30, stems and leaves -4 species. Common to the fauna of plant nematodes and its root soil are 4 species.

60 species of nematodes have been found on the plants of the wild-growing Louis oats and in its root soil. 60 species of nematodes were found in the root soil of oats, 37 species in the root system, and 6 species in stems and leaves. Common to the fauna of plant nematodes and its root soil are 6 species.

The nematoda fauna of bulbous bluegrass and its root soil is represented by 52 species. 52 species of nematodes were registered in the root soil of bluegrass, 31 species in the root system, and 6 species in stems and leaves.

Common to the fauna of plant nematodes and its root soil are 4 species.

52 species of nematodes were found in the tissues of wild rye plants and in its root soil. 52 species of nematodes were registered in the root soil of wild rye, 32 species in the root system, and 6 species in stems and leaves. Common to the fauna of plant nematodes and its root soil are 6 species.

46 species of nematodes were found on the plants of the intoxicating chaff and its root soil. In the root soil of the chaff, 46 species of nematodes were registered, in the root system - 28, in the stems and leaves - 4 species. Common to the fauna of plant nematodes and its root soil are 4 species.

Of the 110 species of phytonematodes found in plants and the rhizosphere of wild-growing cereals, 4 species were recorded only on wild barley, 7 species only on Louis oats, 5 species only on bluegrass bulbous, 8 species only on wild rye and 2 species only on intoxicating chaff, and also 8 species were found to be common for all examined crops.

The coefficient of commonality of the faunistic complexes of plant nematodes of the studied wild-growing cereal plants showed that between the complexes of plant nematodes of the above mentioned cultures, weak or no connection develops (table).

**Table**  
**Community coefficient and degree of nematode communities**  
**wild-growing cereals**

№	Compared community	Number of species		Similarity coefficient	Degree connections
		in every commu.	common for the compared communities		
1	Wild barley Louis oats	45 60	19	0,36	Absent
2	Wild barley Bulbous bluegrass	45 52	21	0,43	Absent
3	Wild barley Intoxicating spit	45 46	23	0,50	Weak
4	Wild barley Wild rye	45 52	20	0,41	Absent
5	Louis oats Bulbous bluegrass	60 52	29	0,51	Weak
6	Louis oats Intoxicating spit	60 46	28	0,52	Weak
7	Louis oats Wild rye	60 52	28	0,50	Weak
8	Bulbous bluegrass Intoxicating spit	52 46	26	0,53	Weak
9	Bulbous bluegrass Wild rye	52 52	25	0,48	Absent
10	Intoxicating spit Wild rye	46 52	15	0,31	Absent

As is known, the compared communities of faunistic complexes are considered similar with a coefficient of 0.77 and higher. Taking this into account, we can say that a weak connection develops between the communities of wild barley and intoxicating chaff, Louis oats and bulbous bluegrass, Louis oats and intoxicating chaff, Louis oats and wild rye, as well as bulbous bluegrass - intoxicating chaff. There is no connection between the communities of plant nematodes of wild barley and Louis oats, wild barley and bulbous bluegrass, wild barley and wild rye, bulbous bluegrass and wild rye, as well as intoxicating chaff and wild rye. This is explained by the fact that a weak bond develops between plants growing in similar environmental conditions of the external environment.

The detected species of phytonematodes by ecological groups are distributed as follows: paraisobionts - 22 species, eusaprobionts - 10, devisaprobionts - 29, nonspecific parasites (NSPE phytohelminths) - 35, true parasites (SPE phytohelminths) - 14.

Among ecological groups, in the quantitative ratio of species and in the number of individuals, representatives of nonspecific parasites prevail, followed by devisaprobes, paraisobionts, and real parasites. Species of plant nematodes from the ecological group of eusaprobes were few in number of species and in terms of the number of individuals.

## CONCLUSIONS

Wild-growing cereal plants are reserves of parasitic nematodes and can serve as a hotbed of preservation of nematode invasion. This proves that phytoparasites can be transferred to crops from wild cereals. Taking into account the influence of wild-growing cereal plants as a source of especially pathogenic nematode species on cultivated plants, it is necessary to conduct a systematic

fight, which can also be considered as a fight against phytohelminths.

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