



**ANALYSIS OF NEMATODES FOUND IN THE SOIL OF THE
RHIZOSPHERE COISIMA RADIANS (NURLI KARRAK) IN
OKHALIKSOY AREA OF SAMARKAND, UZBEKISTAN**

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Abstract

Our research is devoted to the study of the nematodafauna and its biocenotic features of some medicinal plants in the mountain ecosystem of Samarkand region in 2023-2024. As part of this research, the Coisima radians nematodafauna distributed in biocenosis of mountain was analyzed. Nematodes were found in 26 of 40 plant and soil samples taken from a depth of up to 20 cm of the shoot system of the Coisima radians plant, the root system and the rhizosphere. [1] This figure was distributed as follows in an equal number of samples taken from the plant and soil, i.e. nematodes were found in 2 out of 10 samples taken from the shoot system of the plant, 5 out of 10 samples from the root system, 10 out of 10 samples taken from 0-10 cm layers of rhizosphere soil, and 9 out of some samples from 10-20 cm layers of the rhizosphere soil.

Keywords. Medicinal plant, rhizosphere, fungal diseases, gene pool, baermann funnel.

Introduction

The number of wild plants in Uzbekistan reaches 4150. Of these, 577 have healing properties. About 45% of medicines used in medicine are extracted from or made from plants. Products obtained from medicinal plants are obtained from their various organs. Because the substances needed are settled in different organs, depending on the type of plant, living conditions. Medicinal plants are treatment for various diseases. They are distributed in various agro- and biocenosis. [2] It is especially abundant in mountain biocenoses. But their natural habitat is steadily decreasing. The reason for this, along with various bacterial and fungal diseases, phytonematodes also cause great harm. It is important to note that nematodes are the most numerous and diverse multicellular organisms in the soil rhizosphere. That is why the gene pool of wild medicinal plants, its biodiversity is disappearing. For prevention, parasitic





nematodes in medicinal plants growing in their natural habitats can be identified, allowing for the development of effective control measures.

Materials and Methods

To extract nematodes from the vegetative organs of the plant and from samples of rhizosphere soil samples, Baermann funnel method was used. This method consists in the following: a rubber hose is attached to a glass funnel with thin tubes, one end of the funnel is secured to a wooden frame with a barrel, the hose is clamped with an iron clasp, the funnel is filled with half pure water and labeled. After that, the above-ground vegetative organs and root system of the plant are separately chopped into 1-1.5 cm pieces using scissors or a knife, 10-15 grams of each specimen are weighed and wrapped in 15x15 cm gauze squares. The wrapped samples are lowered into the water of the labeled funnels. The setup is left undisturbed for 14-15 hours. During this time, the nematodes in the sample will slowly migrate out into the water and settle at the bottom of the funnel tube. [3] The nematodes that have been drowned and collected must be transferred to a solution after the allotted time has elapsed. To transfer the nematodes from the funnel along with the water and fix them at the same time, 1.5 cm³ of 40% formalin solution (one-tenth of the total volume) is added to a clean solution. Then, the hose clamp is gently released, allowing the nematodes from the bottom of the funnel tube to be transferred into the solution along with the water. The nematodes, now in a solution with formalin, are immediately fixed by the action of the formalin (which is diluted to 4-5% as the water passes with the nematodes). The test tube containing the transferred and fixed nematodes is labeled, sealed with a corrugated stopper (probe), and set aside for subsequent procedures. [4]

Results

A total of 311 nematodes, belonging to 35 species, were found in samples taken from the surface and underground vegetative organs, as well as the rhizosphere soil layers, of the Coisima radians plant.

The nematode fauna consisted of representatives from six genera, but these groups differed significantly from each other in both the number of species and the number of individuals within each group. For example, the order *Rhabditida* consists of 13 species and 158 individuals; the order *Dorylaimida* consists of 8 species and 54 individuals; the order *Tylenchida* consists of 5 species and 35 individuals; the order *Aphelenchida* consists of 6 species and 46 individuals; the order *Plectida* consists of 2 species and 13 individuals; and the order *Monhysterida* consists of 1 species and 1 individual. [4]





Nematodes found in the soil of the coisima radicans and its rhizosphere list

№	Of the genus Nematoda Names	Vegetative organs		Rhizosphere Soil		Total
		shoot system	root system	0-10 sm	10-20 sm	
1	2	3	4	5	6	7
1	<i>Helicotylenchus multicinctus</i>			3	1	4
2	<i>Pratylenchus pratensis</i>	1	4	2		7
3	<i>Tylenchus zaphari</i>		1	3	4	8
4	<i>Tylenchus filiformis</i>			4	5	9
5	<i>Ditylenchus dipsaci</i>	1	6		2	9
6	<i>Aphelenchus cylindricaudatus</i>		1	4	2	7
7	<i>Paraphelenchus pseudoparietinus</i>		5	3	6	14
8	<i>Aphelenchoides bicaudatus</i>		4	3	1	8
9	<i>Aphelenchoides parietinus</i>		4	1	3	8
10	<i>Aphelenchoides saprophilus</i>			2	1	3
11	<i>Seinura tenuicauda</i>			4	2	6
12	Terrace roller	2	9	2	1	14
13	<i>Rhabditis brevispina</i>	3	13	9	3	28
14	<i>Rhabditis intermedius</i>	4	11	3	3	21
15	<i>Mesorhabditis monhystera</i>	8	13		5	26
16	<i>Panagrolaimus rigidus</i>			3	1	4
17	<i>Panagrolaimus subelongatus</i>		1	2	2	5
18	<i>Eucephalobus oxyuroides</i>	3	4	1		8
19	<i>Heterocephalobus elongatus</i>		6	1	4	11
20	<i>Heterocephalobus filiformis</i>			2	1	3
21	<i>Acrobeloides nanus</i>	3	9	3		15
22	<i>Chiloplacus lentus</i>	1	3	6	3	13
23	<i>Chiloplacus propinguus</i>		1	3	1	5
24	<i>Chiloplacus symmetricus</i>			2	3	5
25	<i>Plectus cirratus</i>			1	3	4
26	<i>Proteroplectus rhizophilus</i>		2	4	3	9
27	<i>Machystera mac</i>			2	1	3
28	<i>Nygolaimus brachyuris</i>	4	9	3	1	17
29	<i>Mesodorylaimus bastiani</i>			4	3	7
30	<i>Eudorylaimus bryophilus</i>			1	4	5
31	<i>Eudorylaimus kirjanovae</i>			3	1	4
32	<i>Eudorylaimus monhystera</i>	1	2	5	4	12
33	<i>Eudorylaimus paraobtusicaudatus</i>			1	1	2
34	<i>Eudorylaimus pratensis</i>		3	1		4
35	<i>Aporeelaimus obtusicaudatus</i>			1	2	3
	Total	31	111	92	77	311



Analyzing the number of nematode species and individuals found, 11 species and 31 individuals were recorded in the shoot system of the Coisima radians plant. Of these, 2 species and 2 individuals belonged to the order *Tylenchida*, 7 species and 24 individuals to the order *Rhabditida*, and 2 species and 5 individuals to the order *Dorylaimida*. No representatives of the orders *Aphelenchida*, *Plectida*, or *Monhysterida* were recorded in the shoot system.

In the root system of Coisima radians, 111 individuals representing 21 species were found. Of these, 4 species belonged to the order *Aphelenchida*, 3 species to the order *Dorylaimida*, 3 species to the order *Tylenchida*, 10 species to the order *Rhabditida*, and 1 species to the order *Plectida*. The number of individuals also varied greatly among the different orders. For example, of the 111 individuals found in the root system, 70 belong to the order *Rhabditida*, 11 to the order *Tylenchida*, 14 to the order *Aphelenchida*, 5 to the order *Dorylaimida*, and 2 to the order *Plectida*. Representatives of the order *Monhysterida* were not recorded in the underground vegetative organs. [5]

In the 0–10 cm soil layer of the rhizosphere, 92 individuals representing 33 species were found. The distribution of the nematodes by order was as follows: the order *Rhabditida* had 12 species, the order *Dorylaimida* had 8 species, the order *Aphelenchida* had 6 species, 4 species belonged to the order *Tylenchida*, and of the remaining 3 species, 2 belonged to the order *Plectida*, and 1 to the order *Monhysterida*.

Conclusion

A total of 31 species belonging to 6 orders were found in the 10–20 cm layers of rhizosphere soil. The distribution by order was as follows: 1 species in *Monhysterida*, 7 species in *Dorylaimida*, 6 species in *Aphelenchida*, 11 species in *Rhabditida*, 4 species in *Tylenchida*, and 2 species in *Plectida*.

In the terrestrial part and root system of the plant, representatives of the orders *Rhabditida* and, to some extent, *Dorylaimida* are more abundant. In the soil layers of the rhizosphere, representatives of both the orders *Rhabditida* and *Dorylaimida* are found, with a density that is twice as high as that of the vegetative members of the plant. At the same time, representatives of the genera *Aphelenchida* and *Tylenchida* were notable for their number and abundance of species and individuals. Representatives of the genus *Monhysteridae* did not occur at all in the vegetative organs of the plant, but they were found in the layers of soil in the rhizosphere. As vegetative members of the plant and as common species in the rhizosphere soil,



Rhabditis brevispina, *Rhabditis intermedius*, *Mesorhabditis monhystera*, and *Paraphelenchus pseudoparietinus* can be cited.

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