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Free-Living and Phytoparasitic Nematodes in the Degrez Reservoir

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Annotation: The article provides data on the fauna of free-living nematodes in the Degrez reservoir (Uzbekistan). As a result of the study, 91 species of nematodes belonging to 3 subclasses, 9 orders, 35 families, 52 genera were registered in the Degrez reservoir.

Keywords: fauna, free-living nematodes, Degrez reservoir.

INTRODUCTION: Nematodes are important as food for macrobenthos components, an indicator of the degree of water pollution and increasing the productivity of water bodies. Therefore, assessing the ecological and faunal state of free-living and plant-parasitic nematodes in water bodies is of great scientific and practical importance.

Large-scale research is being conducted around the world to study the various characteristics (composition, quantity, distribution) and functional properties (metabolism and energy, nature of organic matter and reproduction rate) of free-living nematodes, as well as compiling indicators of nematode biodiversity to assess water quality.

Research work on free-living and plant-parasitic nematodes of reservoirs located in Central Asia was carried out by E. Daday (1904, 1906, 1913), B. N. Zyubin (1971), I. Ergashboev, L. H. Kostin (1981), L. V. Lemzina (1984), G. B. Sultanalieva (1996).

However, the above analyzes showed that in Uzbekistan, in particular, phytohelminthological studies on the morpho-anatomical features and applied significance of free-living and plant-parasitic nematodes in the reservoirs of the Surkhandarya region have been little studied.

MATERIALS AND WORKING METHODS

In 2010-2020, an ecological and faunistic analysis of free-living and plant-parasitic nematodes was carried out in the Uchkizil and South Surkhan reservoirs [12].

Therefore, assessing the ecological and faunal state of free-living and plant-parasitic nematodes, revealing the characteristics of the distribution of nematodes on the roots and root soil of coastal plants, identifying parasitic species and developing recommendations for combating them are of great scientific and practical importance.

Collection of nematodes from soil samples along the banks of the Degere reservoirs was carried out in 2022-2023.

A total of 400 soil samples and 300 plant tissue samples were collected and processed. 4839 nematodes were isolated from samples using various methods. For fixation of nematodes, 4-5%

formalin was used. During laboratory processing of materials, permanent preparations were prepared using glycerol according to the Seinhorst method [11]. To identify species, we used morphometric indicators obtained using the generally accepted De Man formula [8] modified by Mikoletsky [9]. For systematic analysis, we used the A.A. system. Paramonov [5, 6].

In the Degres reservoir, 91 species of free-living nematodes were discovered, belonging to 52 genera, 35 families, 9 orders and 3 subclasses.

The detected nematodes belong to three subclasses: Adenophorea, Chromadoria and Rhabditia. The most representative in both cases was Adenophorea, which included the largest number of families, genera, and species (Table 1).

Table 1. Structure of the fauna of free-living nematodes in Degrez reservoirs

Subclass	Family		Genus		Species	
	Quantity	%	Quantity	%	Quantity	%
Degresskoye Reservoir						
Adenophorea	15	42,8	22	42,3	43	47,4
Chromadoria	10	28,6	13	25,1	21	23,0
Rhabditia	10	28,6	17	32,6	27	29,6
Всего	35	100	52	100	91	100

In Degresi there are fewer families from this subclass (21.2%). To objectively assess the specific gravity of the families that make up the fauna of reservoirs, various principles and methods of qualitative and quantitative analysis are used.

In botany, “floristic spectra” are widely used, expressing the main features of the systematic composition of floristic complexes [1, 2, 3, 4]. The validity of such an analysis of the structure of faunal complexes, in particular helminths, was shown by M. Kiselevskaya [10], M.M. Tokobaev [7].

The detected nematodes are distributed by family as follows: (Table 2).Таблица 2

Structure of the nematode fauna of the Degrez reservoirs (by family)

№	Family	Degrez reservoir	
		Number of species	%
1	Alaimidae	**1**	**1,0**
2	Enoplidae	**1**	**1,0**
3	Oxystominidae	**1**	**1,0**
4	Prismatolaimidae	**1**	**1,0**
5	Tripylidae	**5**	**5,4**
6	Tobrilidae	**10**	**12,6**
7	Dorylaimidae	**7**	**7,6**
8	Quadsianematidae	**2**	**2,1**
9	Aporcelaimidae	**1**	**1,0**
10	Nyqolaimidae	**1**	**1,0**
11	Paradorylamidae	**1**	**1,0**
12	Thornidae	**1**	**1,0**
13	Ironidae	**2**	**2,1**
14	Mononchidae	**7**	**7,6**
15	Mylonchulidae	**2**	**2,1**
16	Chromadoridae	**1**	**1,0**
17	Cyatholamidae	**2**	**2,1**
18	Microlaimidae	**1**	**1,0**
19	Monhysteridae	**3**	**3,2**
20	Leptolaimidae	**2**	**2,1**
21	Cylindrolaimidae	**1**	**1,0**
22	Axonolaimidae	**2**	**2,1**

23	Chronogasteridae	**2**	**2,1**
24	Rabdolaimidae	**2**	**2,1**
25	Plectidae	**5**	**5,4**
26	Rhabditidae	**3**	**3,2**
27	Panagrolaimidae	**4**	**4,3**
28	Teratocephalidae	**1**	**1,0**
29	Cephalobidae	**10**	**12,6**
30	Aphelenchididae	**1**	**1,0**
31	Paraphelenchidae	**2**	**2,1**
32	Aphelenchoididae	**1**	**1,0**
33	Tylenchidae	**1**	**1,0**
34	Tylodoridae	**1**	**1,0**
35	Hoplolaimidae	**3**	**3,2**
	Total	**91**	**100**

The table shows that all families of nematodes are represented by a small number of species. Some of them include 8-10 species, others 3 species, the rest -1-2 species.

Using the example of “faunal spectra” by M.M. Tokobaev examines the structure of the helminth fauna of wild mammals in Central Asia and determines the “main flows” of ecologically and biologically determined forms, a list of families arranged in descending order in terms of species richness.

Analysis of the “faunal spectrum” of nematodes in the Degrez reservoirs allows us to identify at least three groups of families: dominants, subdominants and incidentists. The group of dominants includes families containing 5-10 species. 6 for the Degrez reservoir (Tobrilidae, Mononchidae, Dorylaimidae Plectidae, Cephalobidae, Tobrilidae).

Families containing 2-4 species of the Degrez reservoir constitute groups of subdominants. They account for 13 (Quadsianematidae, Ironidae, Mylonchulidae, Cyatholamidae, Monhysteridae, Leptolaimidae, Axonolaimidae, Chronogasteridae, Rabdolaimidae, Rhabditidae, Panagrolaimidae, Paraphelenchidae, Hoplolaimidae).

Recident families of Degrez reservoirs there are 16 such families (Alaimidae, Enoplidae, Oxystominidae, Prismatolaimidae, Aporcelaimidae, Nyqolaimidae, Paradorylamidae, Thornidae, Chromadoridae, Microlaimidae, Cylindrolaimidae, Teratocephalidae, Aphelenchoididae, Tylenchidae, Tylodoridae) they contain 1 species each.

Given the abundance of nematodes and their reproduction rate, we can say that they play an important role in the metabolism and energy flow in water bodies. The problem of increasing the productivity of reservoirs and protecting natural resources must be solved taking into account the general patterns of fruit formation, including nematodes, which are a necessary and natural part of the aquatic biocenosis. In conclusion, it should be noted that the study of the fauna of free-living nematodes in water bodies is of great practical and scientific importance.

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