**Comprehensive study of nematodes of the medicinal valeriana (*Valeriana officinalis*) in the conditions of the Uzbekistan**

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**Abstract.** Article analyzes the faunal complex of medicinal valeriana phytonematodes collected from 2020 to 2024 from 4 districts and 4 farms of the Surkhandarya Valley. Sample collection was carried out using the route (Collecting samples by going to predetermined areas in a certain direction) method generally accepted in modern faunal studies. The Berman funnel method was used to isolate nematodes permanent and temporary preparations for determination of the type and gender of nematodes were prepared according to the Seinhorst method; when determining the species of phytonematodes, the works of domestic and foreign authors were used, as well as morphometric indicators obtained using the generally accepted de Mann formula. During the study period, we found 67 species of phytonematodes belonging to 39 genera, 26 families, 8 orders, and 4 subclasses on medicinal valeriana agrocenoses. The discovered nematodes are distributed among the orders as follows: The order Monhysterida is represented by 1 species: Enoplida-1, Mononchida-2, Dorylaimida-6, Areolaimida-1, Rhabditida-19, Diplogastrida-1 and the order Tylenchida-36 species. The degree of dominance of registered phytonematodes in the roots and root soil of medicinal valeriana was studied. According to the frequency of occurrence of the detected species of phytonematodes in root and soil samples, there were dominant 5 species, eudominant 1 species; in the root soil of medicinal valerian; of the subdominants 7 species and 14 species were classified as recedents. In the root system of medicinal valerian, the subdominants are total 7 species. In the root system of medicinal valerian, all other species of phytonematodes registered (28 species) are classified as subrecedents.

**INTRODUCTION**

In the agricultural sector of Uzbekistan, the impact of dangerous pests affects the productivity of plants, the quality of products obtained from them, and their exportability, causing serious economic damage to farms that grow these products. Accordingly, it is important to determine the species composition of the phytonematode fauna, which causes a sharp decrease in productivity or the inability of the grown crop to meet consumer requirements, to analyze the population density of phytonematodes in different periods of plant vegetation, and to develop modern and promising measures to combat them based on the study of the bioecological characteristics of the dominant parasitic species.

Currently, extensive scientific research is being conducted worldwide to identify species of parasitic nematodes that cause significant economic damage to agricultural crops, including some acclimatized medicinal plants, and to develop effective methods for combating common phytoparasites. In this regard, special attention is paid to studying the nematode fauna of the medicinal valeriana plant (*Valeriana officinalis*), as well as the taxonomy and ecology of nematodes, and to identifying the infestation of some acclimatized medicinal plants with parasitic nematodes throughout the entire growing season and the signs of disease in the plant caused by them.

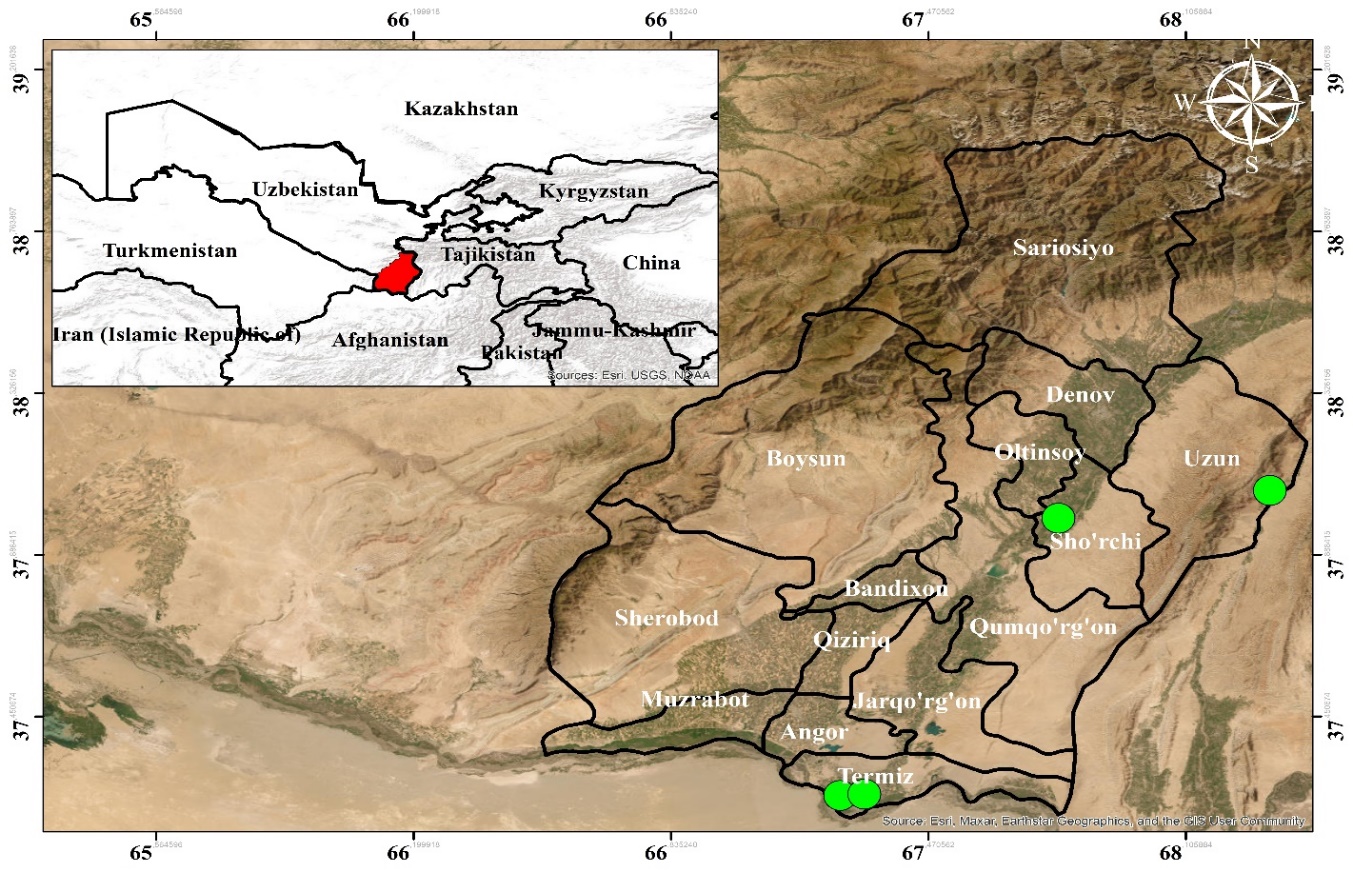
In recent years, in woody plants such as coffee, olive, and kiwi new root-knot nematode species have been discovered (Trinh et al. 2019; Ali et al. 2015; Tao et al. 2017). Medicinal valeriana - *Valeriana officinalis* belongs to the Valerianaceae family and is native to the European part of Russia, the Central Asian steppes and northern Siberia, and some regions of the North Caucasus (Xolmatov et al. 2017). It is cultivated in places in Central Asia, the Kasnodar region, and Uzbekistan (Maxmudova et al. 2017). Various pathogens, including plant-parasitic nematodes, pose a serious threat to the production of medicinal valeriana worldwide, and root-knot nematodes are one of the important factors restricting medicinal valeriana production (Chariyev et al. 2022).

In June 2012, four plants of Salvia miltiorrhiza, another species of medicinal valerian, were inoculated with 200 second-stage larvae of *M. incognita* in a greenhouse in Taiwan. After 8 weeks, all plants infected with nematode larvae showed symptoms similar to those observed in the field, and 100% of the plants developed root nodules (Tsai et al. 2020). In Iran, phytohelminthological studies were conducted to study the distribution of parasitic nematodes in medicinal plants and the damage they cause to plants. During the study, samples were taken from 20 species of medicinal plants grown in Dastgerd, 15 species in Koshan, and 25 species in Shahid Fazveh Najaf Abad. In particular, 133 individuals belonging to the genus *Meloydogyne*, 267 *Helicotylenchus*, 33 *Tylenchus* and 100 *Tylenchorhynchus* were found in the medicinal valeriana - *valeriana officinalis* (Nasresfahani et al. 2015).

In agriculture, parasitic nematodes affect the yield of medicinal plants (including medicinal valeriana), the quality and exportability of medicinal products obtained from them, and cause serious economic damage to farms that grow these products. This necessitates research into nematodes that occur in medicinal valeriana. When studying the literature data, information about plant nematodes in the medicinal valeriana agracenos of Uzbekistan needs to be sufficiently research. Therefore, carrying out phytohelminthological studies on this crop, studying the faunal complex of phytonematodes of medicinal valeriana agrocenoses, and identifying parasitic species is relevant in viticulture. Based on this, we carried out a comprehensive faunistic study to study the fauna of phytonematodes of the root system and root soil of medicinal valeriana agrocenoses and identify phytoparasitic species in the conditions of the Surkhandarya region of Uzbekistan.

**MATERIAL AND METHODS**

**Area and time of sample collection** The study is the first study on medicinal valeriana nematodes in Surkhandarya region of the Republic of Uzbekistan (Fig. 1). This study was conducted over a period of 3 years.



**Fig. 1** Locations where medicinal valeriana were sampled

**Collection of samples.** For the first time in the Surkhandarya region of the Republic of Uzbekistan, comprehensive phytohelminthological research was carried out by us. In order to study the species composition of medicinal valeriana phytonematodes fauna, 4 districts of Surkhandarya region (Termiz, Sho'rchi, Uzun and Termiz city) farms were selected. Samples 17 plant roots, 17 stem-leaf samples and 17 soil samples ( 5 plant roots, 5 stem leaves and 5 soil samples from Termez due to the small area of planting) were taken from different points of each farm in the months of 2020-2022, the most favorable for the life of phytonematodes, i.e. April, May, September, October. Thus, 56 plant roots, 56 stem-leaf samples and 56 soil samples were taken from 4 farms, and a total of 168 samples were taken (Bekmurodov et al. 2021a; Bekmurodov et al. 2021b; Khuramov et al. 2024) (Fig. 1). Farm in Termiz district was selected to study the dynamics of phytonematodes during medicinal valeriana vegetation. Samples were taken on the 15th day of every month for a total of 36 months (from April 2020 to April 2022), 2 plant roots, 2 stem-leaf samples and 2 soil samples, a total of 216 samples. Each sample was 50 grams for the study of phytonematodes and 384 samples from the root system were taken and analyzed. In the field, each soil sample was placed in a separate polythene bag along with the roots and labeled.

**Isolation and fixation of nematodes from samples.** The collected samples were analyzed in the phytohelminthological laboratory. First, the roots of the plant were carefully examined for infestation with nematodes. Then, the root soil and the root system were studied separately. The modified Berman funnel method was used to isolate nematodes from the plants' soil and the root system (Bekmurodov et al. 2020; Choriyev et al. 2024a). Exposure in the room temperature + 250C was 20-28 hours, at +300 + 350C - 10-12 hours. Soil samples for the presence of the cyst nematode were usually analyzed according to the Dekker method (Khurramov et al. 2024; Khuramov et al. 2024). Next, to fix nematodes, 4-6% formalin or a mixture of 2 ml triethanolamine + 91 ml water + 7 ml of 40% formalin (TAF) was used.Nematodes were clarified in a mixture of glycerol and alcohol (1:3), and permanent preparations of glycerol were prepared for laboratory processing of the material according to the Seinhorst method ([Ryss](https://pubmed.ncbi.nlm.nih.gov/?term=Ryss%20AY%5BAuthor%5D) 2017; [Khurramov](https://www.journalijar.com/search-result/?author=Alisher%20Shukurovich%20Khurramov) et al. 2024; Choriyev et al. 2024b).

**Making perineal patterns**. Specifically, female adults were selected from grape root-knot tissue under an anatomical microscope, and a hard plastic consisting of 45% lactic acid solution was used to make an impression of the perineal cuticular pattern with a scalpel. Then, the perineal pattern was cleaned with a 45% lactic acid solution, placed on a glass slide, and covered with a coverslip using pure glycerine as a floating carrier.

**Light microscopy.** All nematode samples were observed and examined under a trinocular microscope N-300M. A1 inverted microscope. All samples were measured using the de Man indices (Choriyev et al. 2024a) and the measurements were expressed in micrometers.

**Identification of the type and sex of nematodes.** To determine the type and sex of nematodes, a trinocular microscope N-300M was used, as well as nematode identification books and atlases (Raxmatova et al. 2020; Bekmurodov et al. 2021a; Saidova et al. 2022; Rahman Khan et al. 2023; Hindy et al. 2022). Next, to determine the size of nematodes, the De Man formula was used, accepted by most researchers, and modified by Mikoletsky (Khurramov et al. 2024; Choriyev et al. 2024a). In our work, we used the system of plant nematodes developed by A. A. Paramonov and M. Hodda based on evolutionary morphology and ecological-morphological analysis methods (Hodda 2011; Hodda 2022; Khurramov et al. 2024; Choriyev et al. 2024b). The degree of dominance of plant nematodes in roots and soil samples was determined by the percentage of individuals of certain species to the number of all detected (Khurramov et al. 2024). At the same time, species that make up more than 10% of all detected species are dominant or eudominant, dominant - 5.1-10%, subdominant - 2.1-5%, subrecedent less than 2.1% of individuals. The ecological classification of L.I. Gruzdeva and Y. Kozlovskaya was used to divide phytonematodes into ecological groups(Choriyev et al. 2024a).

**RESULTS AND DISCUSSION**

**Composition of species and individuals of nematodes.** As a result of phytohelminthological studies in medicinal valeriana agrocenoses in the southern region of Uzbekistan, we have found 67 species of plant nematodes belonging to 39 genera, 29 subfamilies, 26 families, 17 superfamilies, 12 suborders, 8 orders and 4 subclasses (Table 1).

In total, the detected nematodes are distributed by orders as follows: Order Monhysterida is represented by 1 species: Enoplida-1, Mononchida-2, Dorylaimida-6, Areolaimida-1, Rhabditida-19, Diplogastrida-1 and the order Tylenchida-36 species. In our material, the subclass Enoplia is represented by 3 orders: Enoplida, Mononchida and Dorylaimida.

The order Enoplida is represented by 1 families: Onchulidae; 1 genera: *Prismatolaimus*; 1 species (which is 1.49% of the total number of species) and only 22 specimens (0,63% of the total number of plant nematodes found). The order Mononchida includes 2 family: Mononchidae and Mylonchulidae; 2 genera: *Clarcus, Mylonchulus*; 2 species (2.98%), a total of 28 specimens (0.81%) of plant nematodes. The order Dorylaimida includes 4 families:

**Table 1.** Species and quantitative composition of phytonematodes were found in the stem leav, root and soil of medicinal valerianas

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Species | Number of individuals | | | | | Degree of dominance |
| Soil | root | Leaf-stem | Total | % |
| 1 | *Prismatolaimus intermedius* | 22 |  |  | 22 | 0,64 | subrecedent |
| 2 | *Clarcus papillatus* | 10 |  |  | 10 | 0,29 | subrecedent |
| 3 | *Mylonchulus sigmaturus* | 18 |  |  | 18 | 0,52 | subrecedent |
| 4 | *Dorylaimus stagnalis* | 14 |  |  | 14 | 0,40 | subrecedent |
| 5 | *D.bastianoides* | 13 |  |  | 13 | 0,37 | subrecedent |
| 6 | *Eudorylaimus pratensis* | 8 |  |  | 8 | 0,23 | subrecedent |
| 7 | *E.papillatus* | 13 | 3 |  | 16 | 0,46 | subrecedent |
| 8 | *Nygolaimus brachyuris* | 11 |  |  | 11 | 0,32 | subrecedent |
| 9 | *Alaimus primitivus* | 7 | 2 |  | 9 | 0,26 | subrecedent |
| 10 | *Monhystera filiformis* | 31 | 12 |  | 43 | 1,24 | recedent |
| 11 | *Anaplectus granulosus* | 13 |  |  | 13 | 0,37 | subrecedent |
| 12 | *Heterocephalobus filiformis* | 17 | 7 |  | 24 | 0,69 | subrecedent |
| 13 | *Cephalobus persegnis* | 71 | 28 |  | 99 | 2,86 | subdominant |
| 14 | *C.parvus* | 18 | 10 |  | 28 | 0,81 | subrecedent |
| 15 | *Eucephalobus oxyuroides* | 37 | 21 | 2 | 60 | 1,73 | recedent |
| 16 | *Acrobeloides nanus* | 85 | 41 |  | 126 | 3,64 | subdominant |
| 17 | *A.tricornis* | 64 | 18 |  | 82 | 2,37 | subdominant |
| 18 | *Chiloplacus symmetricus* | 39 |  |  | 39 | 1,13 | recedent |
| 19 | *Ch.demani* | 28 | 17 |  | 45 | 1,30 | recedent |
| 20 | *Ch.sclerovaginatus* | 111 | 58 | 7 | 176 | 5,08 | dominant |
| 21 | *Cervidellus insubricus* | 14 | 4 | 2 | 20 | 0,58 | subrecedent |
| 22 | *Panagrolaimus rigidus* | 228 | 113 | 17 | 358 | 10,33 | eudominant |
| 23 | *P.subelongatus* | 129 | 44 | 3 | 176 | 5,08 | dominant |
| 24 | *P.armatus* | 28 | 15 |  | 43 | 1,24 | recedent |
| 25 | *P.mucophilus* | 137 | 62 | 9 | 208 | 6,00 | dominant |
| 26 | *Panagrobelus incises* | 18 | 8 |  | 26 | 0,75 | subrecedent |
| 27 | *Diploscapter rhizophilus* | 13 | 6 |  | 19 | 0,55 | subrecedent |
| 28 | *Pelodera monhysteroides* | 18 | 3 |  | 21 | 0,61 | subrecedent |
| 29 | *Rhabditis brevispina* | 203 | 96 |  | 299 | 8,63 | dominant |
| 30 | *Rh.filiformis* | 23 | 14 |  | 37 | 1,07 | recedent |
| 31 | *Mesodiplogaster lheritieri* | 17 | 8 |  | 25 | 0,72 | subrecedent |
| 32 | *Aphelenchus avenae* | 82 | 53 | 7 | 142 | 4,10 | subdominant |
| 33 | *A.eremitus* | 12 | 2 | 3 | 17 | 0,49 | subrecedent |
| 34 | *Aphelenchoides parietinus* | 125 | 71 |  | 196 | 5,65 | dominant |
| 35 | *A.dactylocercus* | 6 | 1 |  | 7 | 0,20 | subrecedent |
| 36 | *A.helophilus* | 6 | 3 |  | 9 | 0,26 | subrecedent |
| 37 | *A.composticola* | 43 | 58 |  | 101 | 2,91 | subdominant |
| 38 | *A.macronucleatus* | 4 | 4 |  | 8 | 0,23 | subrecedent |
| 39 | *A.subtenuis* | 9 | 2 |  | 11 | 0,32 | subrecedent |
| 40 | *A.cyrtus* | 6 |  |  | 6 | 0,17 | subrecedent |
| 41 | Seinura citri | 14 |  |  | 14 | 0,40 | subrecedent |
| 42 | S.diversus | 9 |  |  | 9 | 0,26 | subrecedent |
| 43 | Tylenchus davainei | 7 | 2 |  | 9 | 0,26 | subrecedent |
| 44 | Tetylenchus dimidius | 5 | 3 |  | 8 | 0,23 | subrecedent |
| 45 | Filenchus filiformis | 28 | 16 |  | 44 | 1,27 | recedent |
| 46 | F.valkanovi | 17 | 25 | 1 | 43 | 1,24 | recedent |
| 47 | Lelenchus discrepans | 15 | 4 |  | 19 | 0,55 | subrecedent |

Continuation of Table 1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 48 | L.leptosoma | 19 |  |  | 19 | 0,55 | subrecedent |
| 49 | Aglenchus Agricola | 4 | 2 |  | 6 | 0,17 | subrecedent |
| 50 | A.thornei | 5 | 1 |  | 6 | 0,17 | subrecedent |
| 51 | Tylenchorhynchus brassicae | 41 | 12 |  | 53 | 1,53 | recedent |
| 52 | Bitylenchus dubius | 23 | 14 |  | 37 | 1,07 | recedent |
| 53 | Helicotylenchus dihystera | 24 | 13 |  | 37 | 1,07 | recedent |
| 54 | H.multicinctus | 11 | 6 |  | 17 | 0,49 | subrecedent |
| 55 | Rotylenchus robustus | 46 | 21 |  | 67 | 1,93 | recedent |
| 56 | Pratylenchus pratensis | 53 | 21 |  | 74 | 2,14 | subdominant |
| 57 | P.neglectus | 27 | 13 |  | 40 | 1,15 | recedent |
| 58 | P.tumidiceps | 18 | 5 |  | 23 | 0,66 | subrecedent |
| 59 | P.scribneri | 35 | 19 |  | 54 | 1,56 | recedent |
| 60 | Paratylenchus macrophallus | 7 | 1 |  | 8 | 0,23 | subrecedent |
| 61 | Hexatylus viviparous | 3 | 21 | 7 | 31 | 0,89 | subrecedent |
| 62 | Neotylenchus abulbosus | 8 | 6 |  | 14 | 0,40 | subrecedent |
| 63 | Ditylenchus dipsaci | 88 | 71 | 5 | 164 | 4,73 | subdominant |
| 64 | D.intermedius | 13 | 5 |  | 18 | 0,52 | subrecedent |
| 65 | D.myceliophagus | 14 | 13 |  | 27 | 0,78 | subrecedent |
| 66 | D.destructor | 16 | 11 |  | 27 | 0,78 | subrecedent |
| 67 | Nothotylenchus acris | 6 | 7 |  | 13 | 0,37 | subrecedent |
|  | 67 (soil) | 2307 | 1096 | 63 | 3466 | 100 | eudominant: 1 |
| 54 (root) | dominant: 5 |
| 11 (Leaf-stem) | subdominant: 7 |
| recedent: 14 |
| subrecedent: 40 |

Dorylaimidae, Qudsianematidae, Nygolaimidae, Alaimidae; 4 genera: *Dorylaimus, Eudorylaimus, Nygolaimus* and *Alaimus*; 6 species (8.96%), total 71 specimens (2.05%) of plant nematodes.

The subclass Chromadoria includes the orders Monhysterida and Areolaimida. The order Monhysterida includes 1 families: Monhysteridae; 1 genera: *Monhystera;* 1 species (1.49%), total 43 individuals (1.24%) phytonematodes. The order Areolaimida is represented by 1 families: Plectidae; 1 genera: *Anaplectus*; 1 species (1.49%), total 13 individuals (0.38%) phytonematodes.

The subclass Rhabditia includes the orders Rhabditida. The order Rhabditida includes 5 families: Cephalobidae, Acrobelidae, Panagrolaimidae, Rhabditidae and Mesorhabditidae; 11 genera: *Heterocephalobus, Cephalobus, Eucephalobus, Acrobeloides, Chiloplacus, Cervidellus, Panagrolaimus, Panagrobelus, Diploscapter, Pelodera* and *Rhabditis*; 19 species (28.36%), total 1886 individuals (54.41%) phytonematodes.

The subclass Diplogastria includes the orders Diplogastrida and Tylenchida. The order Diplogastrida includes 1 families: Diplogasteroididae; 1 genera*: Mesodiplogaster*; 1 species (1.49%), total 25 individuals (0.72%) phytonematodes. The order Tylenchida is represented by 11 families: Aphelenchidae, Aphelenchoididae, Seinuridae, Tylenchidae, Dolichodoridae, Hoplolaimidae, Rotylenchidae, Pratylenchidae, Criconematidae, Neotylenchidae and Anguinidae; 18 genera: *Aphelenchus, Aphelenchoides, Seinura, Tylenchus, Tetylenchus, Filenchus, Lelenchus, Aglenchus, Tylenchorhynchus, Bitylenchus, Helicotylenchus, Rotylenchus, Pratylenchus, Paratylenchus, Hexatylus, Neotylenchus, Ditylenchus* and *Nothotylenchus*; 36 species (53.74%), total 1378 individuals (39.76%) phytonematodes.

The above analysis shows that in terms of species composition, the order Tylenchida occupies the first place, making up 53.74% of all detected species of medicinal valeriana plant nematodes. Then, the order Rhabditida (28.36%) and the order Dorylaimida (8.96%).

In terms of the number of individuals among the orders, the order Rhabditida occupies the first place, which is 54.41% of the total number of plant nematodes found. Then the order Tylenchida (39.76%) and the order Dorylaimida (2.05%).

11 phytonematode species were recorded in the stems and leaves of the medicinal valerian plant, 54 in the roots, and 67 in the soil. Of the identified phytonematodes, 1 species was eudominant, 5 species were dominant, 7 species were subdominant, 14 species were recedent and 40 species of phytonematodes were subrecedent. 2307 individs of 67 species of nematodes were found in the rhizosphere of the medicinal valerian plant, among which 1 species of phytonematode *Panagrolaimus rigidus* is the eudominant species, and 5 species of phytonematodes *Chiloplacus sclerovaginatus, Panagrolaimus subelongatus, P.mucophilus, Rhabditis brevispina,* and *Aphelenchoides parietinus* are the dominant species. 7 types of phytonematodes *Cephalobus persegnis, Acrobeloides nanus, A. tricornis, Aphelenchus avenae, Aphelenchoides composticola, Pratylenchus pratensis, Ditylenchus dipsaci* are subdominant species. 14 species of phytonematodes *Monhystera filiformis, Eucephalobus oxyuroides, Chiloplacus symmetricus, Ch.demani, Panagrolaimus armatus, Rhabditis filiformis, Filenchus filiformis, F. valkanovi, Tylenchorhynchus brassicae, Bitylenchus dubius, Helicotylenchus dihystera, Rotylenchus robustus, Pratylenchus neglectus, P. scribneri* are as recedent species found in the soil. Among the phytonematode species, 13 species were recorded to occur only in the soil of the medicinal valeriana.

1096 individuals of 54 species of nematodes were found in the roots of the medicinal valeriana. Of the phytonematodes identified in the root, 1 species is eudominant, 5 species are dominant, 7 species are subdominant, 13 species are recedent, and 28 species are subrecedent. Among the phytonematode species, 43 species were recorded to occur only in the roots and root soil of the medicinal valeriana.

Among the species recorded on plant roots, the most abundant phytonematode species in terms of number of individuals are *Panagrolaimus rigidus* (113 individs), *P. mucophilus* (62 individs), *Rhabditis brevispina* (96 individs), *Ditylenchus dipsaci* (71 individs), *Aphelenchoides parietinus* (71 individs), *A. composticola* (58 individs), and *Chiloplacus sclerovaginatus* (58 individs).

63 phytonematodes belonging to 11 species were found in the stems and leaves of the medicinal valeriana. Of the phytonematodes identified in the stems and leaves, 1 species is eudominant, 3 species are dominant, 2 species are subdominant, 2 species are recedent, and 3 species are subrecedent.

**Ecological grouping of nematode species**. Phytonematodes unite very different ecological groups. L.I.Gruzdeva, Y.Kozlovskaya proposed an ecological classification based on the trophic relationships of nematodes with plants or other soil organisms and identified 7 ecological groups. Accordingly, phytonematodes were analyzed into 7 ecological groups - polytrophs, predators, typical saprobionts, bacteriophages, mycophages, potential phytohelminths, and true parasites. Phytonematodes identified from the stem-leaf, root system and rhizosphere of medicinal valeriana , according to the ecological classification, are distributed as follows: polytrophs – 6 species (8.95%), predators – 4 species (5.97%), typical saprobionts – 5 species (7.46%), bacteriophages – 18 species (26.87%), mycophages – 9 species (13.43%), potential phytohelminths – 14 species (20.90%) and true parasites – 11 species (16.42%) (Table 2.).

**Table 2.** The qualitative and quantitative ratio of nematodes medicinal valeriana by ecological groups

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| № | Ecological groups | Number of species | % | Number of individs | % |
| 1 | Polytrophs | 6 | 8,95 | 71 | 2,05 |
| 2 | Predators | 4 | 5,97 | 51 | 1,47 |
| 3 | Typical saprobionts | 5 | 7,46 | 401 | 11,57 |
| 4 | Bacteriophages | 18 | 26,87 | 1588 | 45,82 |
| 5 | Mycophages | 9 | 13,43 | 497 | 14,34 |
| 6 | Potential phytohelminths | 14 | 20,90 | 284 | 8,19 |
| 7 | True parasites | 11 | 16,42 | 574 | 16,56 |
|  | Total | 67 | 100 | 3466 | 100 |

Also, phytonematodes identified in the medicinal valeriana and rhizosphere were distributed into ecological groups according to the number of individs as follows: polytrophs - 71 individuals (2.05%), predators - 51 individuals (1.47%), typical saprobionts - 401 individuals (11.57%), bacteriophages - 1588 individuals (45.82%), mycophages - 497 individuals (14.34%), potential phytohelminths - 284 individuals (8.19%) and true parasites - 574 individuals (16.56%).

The true parasites were dominated by the species *Ditylenchus dipsaci, T. brassicae, B. dubius, H. dihystera, P. pratensis, P. neglectus*. They were found in the rhizosphere and the root system of plants and were the most numerous in terms of the number of individs. The increase in the diversity of phytonematodes species in the medicinal valeriana root and soils was closely linked to the spring season (March to April). In this case, the peak of species diversity increase in phytonematode population was observed by April. However, with the beginning of the summer season (June, July, August), the number of individs in medicinal valeriana agrocenoses, corresponding to the types of phytonematodes in plant roots and in the soil near the roots, decreases sharply. This seasonal fluctuation in phytonematode population is primarily influenced by abiotic factors such as biomass management, soil moisture, and temperature, which are considered to be decisive factors for plant life and phytonematode life.

The research carried out in the farms of our region in made it possible to determine the faunal complex of phytonematodes found in medicinal valeriana roots and in the soil before the roots. Among them, economically important phytopathogenic species such as *Ditylenchus dipsaci, T. brassicae, H. dihystera* and *P. pratensis* were recorded in medicinal valeriana agrocenoses. A wide area spread can be shown as a result of the failure to implement preventive and agrotechnical countermeasures in cultivated fields.

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