

## **Nematodofauna of Retain Plants and Their Seasonal Dynamics**

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### **Annotation**

The rapid development of the economy of Uzbekistan, as well as the rational use of natural resources, poses a huge task for zoology. In particular, wild plants usually grow in tugai biotopes that form a kind of landscape. As a result of a long period of existence of plant communities, in tugai conditions, their relationships with other organisms belonging to different groups were clearly formed. These organisms include nematodes. In tugai, located in river valleys, favorable conditions are created for the transition of parasitic nematodes to agrocenoses. Particular importance is attached to the process of detecting natural foci of parasitic nematode species, the study of their seasonal dynamics and measures to combat them.

Key words: nematodofauna, seasonal dynamics, tugai, ecological-trophic groups, root soil, sugar cane, licorice, common turanga.

The purpose and objectives of the study.

The aim of this study was to study the patterns of taxonomic and ecological distribution of plant nematodofauna in tugai biotopes of the Zarafshan River valley.

Materials and methods: The work includes information from studies carried out during 2019 in the tugai landscape zones of the Zarafshan River delta. The study of the species composition of

the nematodofauna was carried out on the basis of an analysis of our own and published data obtained during phytohelminthological studies of sugar cane, salifolia turanga, licorice, sea buckthorn, willow. When collecting and processing phytohelminthological material, traditional methods were used. Nematodes were isolated by the visual method, by the funnel method (Berman's method), by the Sainkhorot clarification method, the centrifugal-flotation method was partially used, the study and identification of nematodes was carried out using temporary and permanent preparations.

## Results and Discussions.

When studying nemato-fauna, the species composition of nematodes of tugai plants was revealed; the taxonomic composition of the identified nematode species was established; studied the seasonal dynamics of the nematodofauna of tugai plants;

During the work, natural foci of especially dangerous parasitic nematode species and virus carriers were identified.

### Nematodofauna of wild sugarcane and its root soil

The nematodofauna of this plant and its root soil is represented by 54 species in the amount of 483 specimens. Of these, 32 species are in Akdarya, 23 are in Karadarysh, 41 are in the Dzhambai tugai biotopes. Of the ecological-trophic groups, the dominant position is occupied by devisaprobes and polytrophs.

Such nematodes as *Cephalobus parvus*, *C. persegnia*, *Longidorella parva*, *Aporoelaimellus obtusioaudatus*, *Acrobeles cylindrisus*, *Aphelanohus avenas* were found in relatively large numbers and became dominants.

### Seasonal dynamics of the nematodofauna of wild sugarcane

Any population is a kind of dynamic system, the density of which is constantly changing in response to a variety of environmental influences. Fluctuations in the number of individuals in nematode populations can be very diverse in nature and duration. The population dynamics of nematodes also characterizes the changes in the number of individuals that make up the population in time and in space, which occur under the influence of environmental factors.

To study the seasonal dynamics of the nematodofauna of wild sugarcane, the collection was carried out in the Akdarya tugai landscape, 34 species were found in spring (933 specimens), in summer - 43 species (1774 specimens), in autumn - 23 species (219 acts), in winter - 33 species (369 ind.).

Each season has its own dominant species, for example, if representatives of the genus *Cephalobus* dominated in spring, then *Longidorella parva* dominated in summer. It also became known that *Aphelenohus avenae* is more common in autumn, and *Longidorella ragva* in winter. In addition, it was also noted that some species of nematodes are found only in certain seasons, these include *Acrobelas cylindrius*, *A.stenocephalus*, found only in spring and summer.

In the root system and root soil of wild sugarcane, nematodes are more often found at a depth of up to 30 cm. The deeper the soil, the less nematodes are found. It was found that representatives of the orders Tylenohida and Rhabditida were relatively more common than other taxonomic groups. Among the ecological-trophic groups, the dominant position is occupied by devisaprobes and polytrophs.

Nematodofauna of the root system and root soil of licorice

In the root system and root soil of licorice, 1,060 individuals of nematodes belonging to 77 species were recorded. Of these, 28 species are in the Akdarya, 53 species in the Karadarya and tugai biotopes, and 40 species in the Dzhambai reserve.

In all the above-mentioned biotopes, *Mesorhabditis monohystera* is most often found, which makes up 31.5% of all detected individuals of nematodes and is an eudominant.

The species *Cephalobus parvus* (5.1%), *Eudorylaimus monohystera* (8.5%) became dominants, *Cephalobus persegnis* (4.1%), *Apalanohus avenae* (3.5%), *Eudorylatmus minutus* (2.1%), *Heterodara glycyrrhizae* (2.2%), *Aphelenohotues saochari* (3.4%) became subdominants. The rest of the species were noted as precedents and sub-precedents.

Among the ecology-trophic groups, representatives of typical saprobionts and devisaprobionts dominated.

The species of the order Rhabditida were often found in comparison with other orders and accounted for 59.2% of all detected individuals of nematodes in the root system and root soil of licorice.

Seasonal dynamics of licorice nematodofauna.

As a result of studying the seasonal dynamics of the nematode complex of common licorice, 2,485 specimens were recorded. nematodes belonging to 62 species and 4 orders. In particular, 35 species in spring, 46 species in summer, 16 species in autumn and 20 species in winter. It should be noted that *Mesorhabditis monohystera*, *Cephalobus parvus*, *Heterodera glycyrrhizae*, *Aphelenohus avenae* were found in all seasons of the year and occupied a dominant position in

terms of qualitative and quantitative composition. Representatives of the order Araeolaimida were encountered only strongly in summer, and they were not recorded in autumn and winter. Species from the order Tylenohida and Dorylaimida met in all seasons of the year.

Typical saprobionts and devisaprobionts dominated from the ecological-trophic groups.

The distribution of nematodes in the root system and root soil of licorice varied depending on the season. In particular, if in spring and summer they were found in large numbers at a depth of 0-20 cm of soil, then in autumn and winter they were recorded in such quantities at a depth of 20-30 cm. Therefore, it can be assumed that in autumn to winter as a result of cooling of the upper layers of soil, nematodes migrated from the upper soil horizons to a depth of 20-30 cm.

Nematodofauna of the root and basal soil of sea buckthorn.

As a result of the analysis of the nematode fauna of the roots and basal soil of the sea buckthorn, 856 individuals of nematodes belonging to 5 orders, 85 species were registered. In particular, it was found that in the Akdarya, Karadarya tugai biotopes and the Dzhambai reserve, 42 species, 31 species and 46 species of nematodes are distributed, respectively.

The results showed that *Aorobeloides butsohlii*, accounting for 25.9% of all registered nematodes, became an eudominant, and such species as *Eudorylaimus monohystara* (5.8%), *Aporoelaimellus obtusioaudatus* (5.6%), *Mesorhabditis monhystera* "(7.7%)", *Aphelenohoides parletinus* (7.6%), *Apb.sacohari* (7.8%) occupied the dominant position, while the ecological-trophic groups were dominated by devisaprobionts.

Seasonal dynamics of the sea buckthorn nematode fauna

In the process of studying the seasonal dynamics of the nematodofauna of the roots and basal soil of sea buckthorn, 4132 nematodes belonging to 7 orders, 93 species were registered. In particular, 41 species (994 specimens) were recorded in spring, 64 species (1494 specimens) in summer, 30 species (200 specimens) in autumn, and 50 species (1442 specimens) in winter. If in spring, summer, and autumn, representatives of the order Tylenohida dominated in the root and root soil of sea buckthorn, then in winter, representatives of the order Rhabditida dominated. Representatives of the orders Araeolaimida and Enoplida were not found in the fall. Representatives of the order Chromadorida are found only in summer.

Among the ecological-trophic groups, mycotrophs dominated in spring, while potential parasites were more common and dominant in summer, autumn and winter. Among the representatives of the ecological-trophic group of typical parasites, the following species were most often observed

in spring and summer: *Meloidogyne hapla*, *M. incognita*, *Pratylenohus pratensis*, *P. tulaganovi*, *P. vulnus*. Such species as *Aphelenohoides blastophthorus*, *Aph. kuehnii*, *Aph. pariatinus*, *Aph. sacchari* were less common in spring, summer and autumn than in winter, when they were recorded in relatively large numbers. This phenomenon, probably, may indicate a good adaptation of these species to the winter period.

#### Nematodofauna of the root system and root soil of willow

As a result of the analysis of nematodes found in the roots and root soil of willow, 885 specimens were registered. nematodes belonging to 7 orders, 53 species. In particular, in the tugai landscapes of Akdarya - 34 species, Karadarya - 25 species, and in the Dzhabbai reserve - 22 species. Of these, *Achromadora ruriola* (35.5%) was most often found in the tugai of the Karadarya, thus becoming an eudominant. It also became known that *Aphelenohus avenae*, accounting for 12.6% of all detected nematodes, became an eudominant. This species is widespread in all three studied biotopes. In addition, the dominant position was occupied by the species *Achgomadoga terricola* (6.7%) in the tugai of the Karadarya, *Leptonobus obtusus* (6.8%) in the tugai of the Dzhabbai Reserve and *Cephalobus pagvus* (6.5%) in the tugai of the Akdarya.

*Heterodera uzbekistanica* was found from the ecological-trophic group of typical parasites. This species was recorded only in the Akdarya tugai. Devisaprobionts dominated from the ecological-trophic group.

#### Seasonal dynamics of the nematodofauna of the willow root system and its basal soil.

As a result of studying the seasonal dynamics of the nematodofauna of the root system and basal soil of willow growing in the conditions of the Akdarya tugai biotopes, 3475 specimens were found. nematodes belonging to 7 orders and 60 species. Of these, 41 species (815 specimens) were recorded in spring, 49 species (1400 specimens) in summer, 26 species (654 specimens) in autumn and 22 species of nematodes in winter, 559 specimens.

During the year, representatives of the orders Tylenohida and Rhabditida dominated. Representatives of the order Araeolaimida were observed only in summer. Such orders as Caromadorida and Mononohida were found only in spring, summer and autumn; in winter they were not found. Nematodes belonging to the order Enoplida were recorded in summer and winter, and members of the order Dorylaimida were found throughout all seasons of the year.

From the ecological-trophic groups, polytrophs dominated in spring and summer, and potential parasites in autumn and winter.

*Aohromadora rurioola* was found in very large numbers in spring and summer. This species is an aquatic nematode. Its very frequent detection is probably associated with the flooding of the Akdarya tugays. In autumn, the species *Acgobeloides butsohlii* and *Longidorella parva* were recorded in large numbers, but in the rest of the seasons they almost never occurred. In winter, *Paratylenchus macrophallus* was found in large numbers. It was found that the populations of this species increase in spring and summer, while in autumn they decrease significantly, but in winter they again increase. It can be assumed that this phenomenon is associated with the development cycle of this species. It should also be noted that nematodes were more often found in the root system and root soil of willow at a depth of 10-20 cm, in summer and autumn - 0-10 cm; in winter -20-30 cm. Consequently, the deeper the soil horizons, the lower the species and quantitative composition of nematodes.

The nematodofauna of turanga salifolia.

As a result of the analysis of the nematodofauna of the root system and basal soil of turanga sizolistny, 1196 specimens were found. nematodes belonging to 55 species. In particular, 249 specimens were recorded in the tugai of Akdarya, Karadarya and Dzhambaysky reserve. (33 species), respectively, 634 specimens. (30 species) and 313 specimens. (24 species) nematodes. It was also found that nematode species such as *Mesorhabditis monhystra* (28.7%), *Cephalobus persegnia* (16.7%), *Aphelenchus avenae* (16.7%) became eudominants, and *Cephalobus parvus* (5.9%), *Acrobeloides nanus* (2.3%), *A. labiatus* (2.3%), *Aporoelaimellus obtusloaudatus* (3.7%), *Leptomohus obtusus* (3.1%), *Zeldia satosa* (2.6%) dominated.

Among the ecological-trophic groups, typical saprobionts and mycotrophs, which occupied a dominant position, were noted in large numbers; from the groups of typical parasites, *Helicotylenohus multicinotus*, *Ditylenohus dipsasi* were found.

Seasonal dynamics of the nematodofauna of the turanga sifolia poplar.

In the process of studying the seasonal dynamics of the nematodofauna of the root system and basal soil of turanga sizolistny, growing in the Akdarya tugai, 2574 specimens were found. nematodes belonging to 75 species. In particular, 45 species and 389 specimens were recorded in the spring. nematodes, in summer - 65 species and 1424 specimens. nematodes, in autumn - 36 species and 442 specimens. nematodes and in winter - 30 species and 297 specimens. nematodes. Moreover, if in the spring and winter the order Tylenohida dominated, then in the summer and autumn the order Rhabditida. In winter, species such as *Heliootylenobus buxophilus* and *Aphelenohus avenae* were also found in large numbers.

From the ecological-trophic groups, potential parasites dominated in spring and winter, typical saprobionts in summer, and polytrophs in autumn. It was found that the number of nematode species population belonging to the ecological-trophic group of typical parasites reaches its highest point in spring (20%), and in summer (7.6%), autumn (6.9%) and winter (1.6%). ) there is a noticeable decrease. It can be assumed that the most favorable seasons for typical parasites in tugai conditions are spring and summer.

The prevalence of nematodes in the depths of the basal soil of the turanga poplar looked as follows: in spring, summer and autumn, nematodes were more often found at depths of 0-10 cm, 10-20 cm, and in winter - 10-20 cm and 40-50 cm. This, of course, may be associated with the location of the root system of the turanga poplar, as well as with other environmental factors.

#### Discussion and conclusions:

It follows from everything that in the Akdarya, Karadarya tugai landscapes and the Dzhambay reserve, which are located along the Zarafshan River, there are different types of soils. To study the seasonal dynamics of the nemato-fauna population, samples of the root system and root soil of sugar cane, sea buckthorn, licorice, gray poplar (turanga) and willow were taken. A total of 2000 samples were collected (500 in each season), in which 19324 specimens of nematodes were found. In total, 152 species of nematodes were registered, belonging to 29 families, 63 genera and 7 orders. When studying the seasonal dynamics of the wild sugarcane nematode fauna in the Akdarya tugai biotope, 34 species were recorded in spring, 43 species in summer, 23 species in autumn, and 33 nematode species in winter. When studying the seasonal dynamics of the licorice nematode fauna, 2485 specimens of nematodes belonging to 4 orders, 62 species were registered. In particular, 35 species were found in spring, 46 in summer, 16 in autumn and 20 in winter. It should be noted that the distribution of nematodes in the root soil of licorice is peculiar and varies depending on climatic factors. If in spring and summer nematodes were often found in large numbers at a depth of 0-20 cm, then in autumn and winter they were found in such numbers only at a depth of 20-30 cm of soil. Therefore, it can be assumed that in autumn and winter in the upper soil horizons, nematodes migrate from 0-20 cm depth to its deeper layers. In the process of studying the seasonal dynamics of nematodes found in the root system and root soil of sea buckthorn, 4132 specimens of nematodes belonging to 7 orders, 93 species were observed. Their occurrence in seasons is as follows: 41 species in spring, 64 in summer, 30 in autumn and 50 in winter.

Analysis of the results of studying the seasonal dynamics of nematodes in the root system and basal soil of willow showed 3475 specimens of nematodes belonging to 7 orders, 60 species. In

the spring there were 41 species, in the summer -49, in the fall - 26, in the winter - 22 species of nematodes. In the process of studying the seasonal dynamics of the turanga nematode fauna, 75 species were found. In particular, according to the seasons, they were distributed as follows: in spring - 45 species, in summer - 65 species, in autumn - 36 and in winter 30 species of nematodes.

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