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## Ecological Grouping of Nematodes of Nut Crops in the Surkhandarya Region of Uzbekistan

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**Abstract:** The article provides data on the fauna of phytonematodes in the root soil and the root system of nut crops in the conditions of the Surkhandarya region of Uzbekistan. As a result of the research, 76 species of plant nematodes belonging to 46 genera, 30 families, 9 orders and 2 subclasses were identified. The fauna of phytonematodes of walnut crops was dominated by species *Heterocephalobus elongatus*, *H.filiformis*, *Acrobeloides nanus*, *Chiloplacus propinquus*, *Panagrolaimus rigidus*, *Rhabditis brevispina*, *R.filiformis*, *Aphelenchus avenae*, *Filenchus filiformis* and *Meloidogyne incognita*.

**Keywords:** nut crops, phytonematodes, Surkhandarya region, detachment, fauna, root soil, root system, ecological groups.

**Introduction.** In our time, fruit growing is an important branch of agriculture and is of great national economic importance.

Walnuts are a very valuable food product. Nut crops (walnut and pecan) are important food crops and they are widely distributed in mountainous and foothill regions of Uzbekistan.

The walnut and pecan family contains fat (45-77%) and vitamins - C, B, A which are used to make soaps, paints, varnishes, printing ink, inks. Their wood, leaves and peel are used in furniture, aviation, agricultural engineering, medical and perfume industries.

Walnut crops, like other plants, are infected with various pests, including parasitic nematodes. Therefore, to determine the nematode fauna of this valuable plant, the development of measures to combat parasitic species is of great practical importance in the fruit growing of Uzbekistan.



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On the territory of Uzbekistan, in particular the Surkhandarya region, phytonematodes of fruit and nut crops were studied by E.T. Turaev, T.S. Skarbilovich [2, P. 58-61.], Sh.Kh. Khurramov, E.T. Turaev [3, S. 115-124.], Sh.Kh.Khurramov, A.S.Bekmuradov [4, P.98-102], A.S.Bekmuradov, M.T. Mamarajabova, E.A.Saidova [1, P. 42-46.].

**Material and methods of research.** To study the faunal complex of phytonematodes of nut crops in the period from 2009-2022. we collected phytonematodes from the root soil and the root system of fruit crops (walnut and pecan) from the territory of the Surkhandarya region of the Republic of Uzbekistan. The studies were carried out by the generally accepted route method [7, p.3-11.].

During the phytohelminthological study, 1400 samples of soil and root system of nut crops were collected and analyzed.

Phytonematodes were extracted by the Berman funnel method and fixed with 4% formalin solution. The nematodes were clarified in a mixture of glycerol and alcohol (1:3), and permanent preparations were prepared on glycerol according to the method of Seinhorst [12, P. 67-69.] for in-office processing of the material. Soil samples for the presence of cyst-forming nematodes were usually analyzed according to the standard Dekker method [6, 445 pp.].

The species composition of nematodes was studied under an MBR-3 microscope. Species were identified using morphometric parameters obtained according to the generally accepted De Man formula [9, 104 p.] in its modification according to Micoletzky [11, 650 p.]. The degree of dominance of plant nematodes in plant and soil samples was determined from the percentage of individuals of individual species to the number of all detected by Witkowsky [10, 53 p.].

**Research results.** As a result of the phytohelminthological studies carried out in the Surkhandarya region of Uzbekistan, we found a total of 76 species of plant nematodes belonging to 46 genera, 30 families, 9 orders and 2 subclasses.

Phytonematodes identified from the roots and rhizosphere of nut crops, according to the ecological classification of A.A. Paramonov [7, pp. 338-369.], belong to 5 ecological groups: *pararhizobionts*, *devisaprobionts*, *eusaprobionts*, *phytohelminths of non-specific pathogenic effect*, *phytohelminths of specific pathogenic effect*.

**Ecological grouping of walnut nematodes.** Representatives of the group of pararhizobionts were found mainly in the root soil of the walnut. Species *Proteroplectus inquirendus*, *Heterocephalobus elongatus*, *H.filiformis* are found in the rhizosphere of plants in large numbers.

Devisaprobionts were found in the root system and rhizosphere of the walnut. Species *Cephalobus persegnis*, *Acrobelides labiatus*, *A.nanus*, *Chiloplacus propinquus*, *Panagrolaimus rigidus* found in the rhizosphere and root system of plants are the most numerous in terms of the number of individuals.

Of the eusaprobionts *Rhabditis brevispina* and *R. filiformis* found in a large number of walnut root system and root soil.

In the roots and rhizosphere of fruit crops, the group of phytohelminths with a nonspecific pathogenic effect was the most numerous in terms of the number of species and individuals.



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Species *Aphelenchus avenae*, *Filenchus filiformis* were found in the rhizosphere and root system of plants, and were the most numerous in terms of the number of individuals.

*Helicotylenchus erythrinae*, *Pratylenchus pratensis*, *Meloidogyne incognita* dominated from the group of phytohelminths with a specific pathogenic effect. They were found in the rhizosphere and the root system of the walnut, and were the most numerous in terms of the number of individuals.

**Ecological grouping of the pecan nematode.** From the group of pararhizobionts *Heterocephalobus elongatus* were found in a large number of rhizosphere and root soil of the pecan.

Representatives of the group of devisaprobionts species *Acrobelides nanus*, *Panagrolaimus rigidus* were found in the root system and rhizosphere of the pecan.

Of the eusaprobionts *Rhabditis brevispina* and *R. filiformis*, it was found in the root system and root soil of the pecan.

From the group of phytohelminths of non-specific pathogenic effect - *Aphelenchus avenae* was found in the rhizosphere and the root system of the pecan, and were the most numerous in terms of the number of individuals.

*Helicotylenchus erythrinae* and *Pratylenchus pratensis* dominated in the rhizosphere and root system of pecans from the group of phytohelminths with a specific pathogenic effect.

**Conclusion.** The results of the research showed that the fauna of plant nematodes of nut crops in the conditions of the Surkhandarya region of the republic is insufficient. Therefore, conducting large-scale phytohelminthological studies, determining the faunistic complex of plant nematodes of nut crops in a given territory and substantiating measures to combat parasitic species are of great scientific and practical importance.

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