

# SPATIO-TEMPORAL CHANGES OF SOIL NEMATODE COMMUNITIES IN NORTHERN MEADOWS

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Research on the dynamics of plant communities, soil cover and nematode fauna, as a large and diverse group of pedobionts in the North, provides information on the functioning of natural ecosystems and agrocenoses during their post-agrogenic restoration. There were studied abundance, diversity and soil nematode community structure of five meadow biocenoses (Republic of Karelia, Russia, 62°13'41.41"N; 34°2'17,09"E), differing in origin, vegetation, soil type, degree of moisture and land use history. Based on archival data there were estimated the changes in soil nematode communities during long (50 yrs) meadow succession.

Modern plant communities were presented with dominated species:



Site 1 was subjected to agricultural use (arable land and hayfield)

Site 5 had never been plowed and was primary meadow

## Results

1964

Parameter	Site 1	Site 2	Site 3	Site 4	Site 5
Nematode density, ind./100 g soil	628	1668	1903	1429	263
Number of genera	22	34	35	22	15
H'gen	3,57	3,91	3,88	2,7	3,04
Proportions of the nematode eco-trophic groups, %					
<b>B</b>	19,3	54,4	47,1	54,8	68,1
<b>F</b>	15,3	4,8	4,4	10,4	5,7
<b>Om</b>	18,3	9,3	11,1	1,3	5,7
<b>Pr</b>	0,5	0,4	2,4	0	1,9
<b>Asp</b>	29,3	3,7	9,3	33,2	12,2
<b>Pp</b>	17,3	27,4	25,7	0,3	6,4

2015

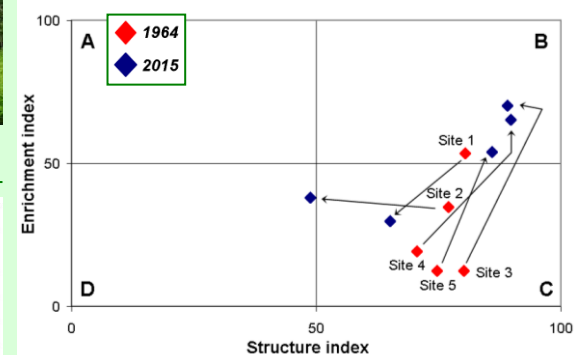
Parameter	Site 1	Site 2	Site 3	Site 4	Site 5
Nematode density, ind./100 g soil	1893	1819	653	2831	804
Number of genera	30	34	34	31	36
H'gen	3,9	3,7	4,1	4,1	4,1
Proportions of the nematode eco-trophic groups, %					
<b>B</b>	34,9	67,2	38,3	32,9	41,0
<b>F</b>	11,2	5,7	9,5	6,0	10,7
<b>Om</b>	7,7	8,4	20,8	27,2	9,0
<b>Pr</b>	1,1	0	4,9	2,4	7,8
<b>Asp</b>	16,0	3,8	10,1	10,9	20,2
<b>Pp</b>	29,1	14,9	16,4	20,6	11,3

It was established that differences in use intensity and plant composition determined the multidirectional changes: some of sites developed according to the meadow type, others gradually grew into forests. Analysis of nematological parameters revealed two groups of sites: in the first one (**sites 1,2**) the abundance of bacterial feeders increased (tab.), SI decreased (fig.); in the second one (**sites 3-5** that were forming under high soil moisture and longer post-agrogenic development) nematode communities possessed parameters characterised for stable undisturbed biocenoses;

in their structure the total **B** abundance decreased, and, at the same time, the number of **B1** increased that caused the increasing in EI index (fig.). SI enlarged due to the enhanced K-strategist's contribution to the fauna, which can be interpreted as an indicator of the "naturalization" of biocenoses: the further course of succession will possibly end with deciduous forest formation.

**Materials and methods.** Nematode extraction from the soil, fixation and identification were performed according to standard methods (van Bezooijen, 2006). Each nematode taxon was referred to one of six eco-trophic groups: bacterial feeders, **B**; fungal feeders, **F**; omnivores, **Om**; predators, **Pr**; plant parasites, **Pp** (obligate plant feeders); nematodes associated with plants, **Asp** (facultative plant feeders) (Yeates et al., 1993).

**Fig. Faunal profile characterizing the condition of the soil food web of meadow biocenoses (Ferris et al., 2001)**



**Table. Characteristics of soil nematode communities of meadow biocenoses during long-term (50 yrs) succession**