

SPECIES DIVERSITY AND DISTRIBUTION OF FREE-LIVING AND PLANT PARASITIC NEMATODES FROM ORDER DORYLAIMIDA (NEMATODA) IN DIFFERENT HABITATS OF THE REPUBLIC OF MOLDOVA

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Abstract. Species and trophic diversity of free-living and plant parasitic nematodes from order Dorylaimida and their distribution in different natural and agricultural habitats of the Republic of Moldova were studied. One hundred thirteen species of nematodes belonging to 43 genera and 13 families were identified. The highest species diversity (61 species) of nematodes were revealed in different types of forests and multiannual plantations such as grape, fruit and berry (47 - 54 species), followed by annual plantations of sugar beet and oil plants (14 - 32 species) and 23 - 43 species were found in river sediment and riverbanks. Most species of omnivores with cp 4 and 5 (Om4, Om5) were dominant in all observed habitats, while herbivores (He5) Longidoridae and Xiphinematidae were numerous in multiannual plantations including potential vectors of nepoviruses. Predatory Nematodes (Pr5) Nygolaimidae, Discolaimidae and partly fungivores (Fu4) Leptonchidae, Tylencholaimidae were present in all studied habitats with high species diversity, mostly in forests.

Keywords: free-living and plant parasitic nematodes, order Dorylaimida, species, trophic composition, distribution.

Rezumat. Diversitatea speciilor și distribuția nematodelor libere și fitoparazite din ordinul Dorylaimida (Nematoda) în diferite habitate ale Republicii Moldova. Studiul diversității speciilor și al spectrului trofic al nematodelor libere și fitoparazite din ordinul Dorylaimida din Republica Moldova, conform distribuției lor în ecosistemele naturale și antropizate, precizează 113 specii de fitonematode din 43 genuri, incluse în 13 familii. Variația numărului de specii de fitonematode, repartizate conform tipului de cenoze, a fost: 61 specii depistate în diverse ecosisteme forestiere, 47 - 54 specii în plantații horticoale multianuale, urmate apoi de culturile plantelor anuale tehnice (sfeclă de zahăr și plante oleaginoase), 14 - 32 specii și 23 - 43 specii în sedimentele râurilor și sectoarelor palustre. Conform clasificării după spectrul trofic, predomină speciile de fitonematode omnivore polifage cu cp 4 și 5 (Om4, Om5) colectate în toate sectoarele investigate din cenoze naturale și antropizate. Speciile de nematode fitofage (He5) din familiile Longidoridae și Xiphinematidae sunt mai frecvente în plantații perene, inclusiv și potențialii vectori ai nepo-virusurilor. Concomitent, s-au depistat și formele de nematode prădătoare (Pr5) Nygolaimidae, Discolaimidae și parțial micofagele (Fu4) Leptonchidae, Tylencholaimidae semnalate în toate cenozele investigate, o diversitate specifică majoră preponderent în cenozele ecotipice forestiere.

Cuvinte cheie: nematode libere și fitoparazite, ordinul Dorylaimida, specii, spectrul trofic, distribuție.

INTRODUCTION

Order Dorylaimida is one of the major taxonomic group of free-living and plant parasitic nematodes having an universal distribution (spread) in terrestrial (soil and moss) and freshwater habitats (DE LEY & BLAXTER, 2002). Order Dorylaimida includes about 2,000 species belonging to 250 genera (JAIRAJPURI & AHMAD, 1992) that are numerous and distributed from tropical soils and deciduous forests (LOOF & ZULLINI, 2000) to Dry Valleys of Antarctica (ANDRASSY, 2008). The average body size is a little over 1 mm, but certain species may be as small as 0.3-0.4 mm (*Dorylaimellus*) or larger, reaching even 12 mm (*Paralongidorus*) (JAIRAJPURI & AHMAD, 1992; LOOF, 1999). They form a very diverse, not only taxonomically, but also environmentally group, since there is almost no such habitats, which were not detected nematodes of this order; due to trophic diversity, they feed on plant and animal materials. Most of them are predators, feeding on Protozoa, small invertebrates and their eggs by piercing the veil of its victims by a special spear and sucking out their contents (ELIAVA, 1983). Some of dorylaimids eat the mycelium of fungi, algae or affect the tissues of healthy plants as parasites, while some families as Longidoridae are able to transmit the virus diseases of agricultural plants. Apparently, the ancient dorylaimids formed on the ground among mosses and lichens. Some of dorylaimids occupy the freshwater habitats and involve in nematode communities of meiobenthos. According to food specialization, they are plant parasites, fungivores, predators and omnivores. The stoma of dorylaimids is equipped with body piercing - a spear, which is within the unit features of a large structural diversity (JAIRAJPURI & AHMAD, 1992; GAGARIN, 2001; EYUALEM-ABEBE *et al.*, 2006).

Modern taxonomic system for nematodes in situation of lack of paleontological data is offset by a comparative analysis of morphological characters, ecological data and molecular phylogeny studies. The implication of SSUrDNA sequences into the classification by DE LEY & BLAXTER (2002) proposed that the class Enoplea appeared first, and it is even possible that subclass Dorylaimia could have originated within subclass Enoplia as they obtain the main morphological characters such as cylindrical pharynx, three glands opening close to stoma and amphidal fovea pocket-like. On other hand, SSU data allow for the possibility that Dorylaimia diverged first, because all known Dorylaimia are absent from marine habitats (DE LEY, 2006).

Order Dorylaimida sharply separated from the rest of Enoplea by some structural features: the cuticle is smooth, devoid of setae; tangoreceptors of the head are always in the form of papillae, amphids are like pocket-holes, mouth is reduced and always armed with a cuticle tube formation (spear), esophagus is cylindrical along the entire

length with very rarely basal thickening, female mostly with pair of tubes, antitrombic reflexed ovaries, caudal glands and spinneret always available (LOOF, 1999, ANDRASSY, 2009). Within the Order Dorylaimida the typical plant parasitic species, omnivores and predators have been developed on the ways to improve the perforating apparatus (ELIAVA, 1983; ANDRASSY, 2009). In parallel, within the two suborders Dorylaimina and Nygolaimina, the typical development of plant parasitic species and predators on ways to improve the punching machine apparatus such as “a spear-top box” with greatly elongate odontostyle and odontophore with basal flanges (Longidoridae), axial spear and spear prefix sometimes with heads (Leptonchoidea) and a spear wall (tooth) (Nygolaimoidea) have occurred (ELIAVA, 1983; PENA-SANTIAGO *et al.*, 2000; ANDRASSY, 2009).

Species of Dorylaimida have a permeable cuticle, permitting them to respond with a range of reactions to pollutants and reflect the restorative capacity of soil and freshwater ecosystems. On the scale colonizer-persister (*cp* 1 to 5) (BONGERS & FERRIS, 1999) dorylaimids are generally assigned a rank of 4 to 5, emphasizing their potential utility as bioindicators of ecosystem health. Using the functional guilds as combinations of feeding groups (YEATES *et al.*, 1993, YEATES, 2003) and life strategy with *cp* values from extremely *r*-strategy to *K*-strategy (BONGERS, 1990, 1999) supports the understanding of the position of dorylaimids as bioindicators in nematode communities (BONGERS & FERRIS, 1999; FERRIS *et al.*, 2001).

The general goal of the present study is the analysis of long-term accumulated taxonomic and ecological data on plant parasitic and free-living nematodes of the order Dorylaimida from different terrestrial and freshwater habitats of the Republic of Moldova and their importance in natural and agricultural ecosystems.

MATERIAL AND METHODS

Site description

The deciduous forests including “Codrii” Scientific Forest Reserve based on oak and beech, middle-European type, are formed by different types of forests such as beech (*Fagus sylvatica* L. with *Quercus* spp.), lime – ash (*Tilia tomentosa* MOENCH., *T. cordata* MILL., *Fraxinus excelsior* L.), maple – hornbeam (*Acer campestre* L., *A. platanoides* L., *Carpinus betulus* L.) and other mixed forests in Republic of Moldova. The sediment and soil samples of the river and riverbanks along the Prut River and the Dniester River were studied. Multiannual (grape, fruits and berries) and annual crops (sugar beet, corn, sunflower and wheat) were observed.

Sampling and processing

Taxonomic and ecological data on dorylaimids from different natural ecosystems such as forests, meadows, the Prut and the Dniester rivers and agricultural crops (vineyards, fruit and berry plantations and fields of sugar beet, corn and cereals) of the Republic of Moldova were accumulated during more than half of a century by the Moldavian nematologists: Nesterov P. I., Dementieva S. P., Lisetskya L. F., Stegarescu Olga P., Poiras Larisa N.

Most soil samples were collected from the depth of 15 - 30 cm, but in the case of nematodes belonging to the family Longidoridae, the samples were deeper than 50 cm; maximum 5 replications were included in each sample.

The Nematodes were extracted by sieving and decanting standard methods of brass screens and Baermann funnels and then fixed in 4% hot formaldehyde solution (VAN BEZOOIJEN, 2006).

Data analysis

The nematode specimens were identified on mass-slides to species, using the keys and species description by NESTEROV (1979), NICKLE (1991), JAIRAJPURI & AHMAD (1992), ANDRASSY (2009), etc. The species of nematodes were listed according to the taxonomic classification from “Fauna Europaea”.

The nematodes were assigned to the following feeding groups according to YEATS *et al.* (1993) characterized by feeding habitats: fungivores (Fu), bacterivores (Ba), omnivores (Om), predators (Pr) and herbivores (He). The functional guilds are defined as combination of feeding groups and life strategy using *cp* values (1-5) from extremely *r*-strategy to *K*-strategy (BONGERS, 1990, 1999; BONGERS & BONGERS, 1998; FERRIS *et al.*, 2001).

RESULTS AND DISCUSSIONS

As a result of long-term studies of free-living and plant parasitic nematodes from order Dorylaimida about 113 species were registered. The species belong to 43 genera and 13 families, collected from different natural and agricultural ecosystems of Republic of Moldova, which represent about a quarter of all the identified species (POIRAS, 2008b, POIRAS, *et al.*, 2008b). The species diversity according to families is Qudsianematidae (28 species), Dorylaimidae (27), Longidoridae (14) and Aporcelaimidae (10), Tylencholaimidae (8) and genera *Mesodorylaimus* (13 species), *Xiphinema* (11), *Eudorylaimus* (9), *Tylencholaimus* (8), *Aporcelaimellus* (7) and *Crassolabium* (4) (Table 1).

The highest species diversity of nematodes (61 species) from order *Dorylaimida* was found in different types of forests, especially with plant formations, such as *Fageto-Quercetum*, *Tilio-Fraxinetum* and mixed (*Populus* spp., *Salix* spp., *Ulmus* spp., *Sorbus* spp., *Malus* spp., *Cerasum* spp., *Prunus* spp. etc.). Thus, only in the “Scientific Forest Reserve “Codrii” 38 species of dorylaimids have been identified with large populations of some species belonging to genera: *Aporcelaimus*, *Aporcelaimellus*, *Eudorylaimus*, *Mesodorylaimus*, *Tylencholaimus* and others (POIRAS, 2008a; POIRAS *et al.*, 2008b). Most of these species are long-lived nematodes with medium body length, about 2 - 4 mm, to large body length, up to 12 mm (Longidoridae), the lowest gonad/body ratio and low reproductive rate, with few large

eggs and low motility. The dorylaimids revealed in forests belong to different functional guilds such as: omnivores (Om4, Om5), predators (Pr5), herbivores (He4, He5) and bacterivores (Ba3) with greater sensitivity to disturbance, preferring the highest food web structure and undisturbed conditions. The Bacterivores (Ba3) are represented by a single species *Auloilaimoides elegans* found only in the deciduous forest.

Table 1. Species diversity of nematodes from order Dorylaimida and their distribution in different natural and agricultural ecosystems of Republic of Moldova. / Tabel 1. Diversitatea speciilor de nematode din ordinul Dorylaimida și distribuția lor în diverse ecosisteme naturale și agricole din Republica Moldova.

No.	Order / Suborder / Family	Natural ecosystems				Agricultural ecosystems				
		Forest	Meadow	River	Riverbank	Multiann. crops		Annual crops		
						Grape	Fruit/ berry	Sugar beet	Oil	Grain
I. Suborder Nygolaimina, Superfam. Nygolaimoidea, Fam. Nygolaimidae										
1	<i>Aquatides aquaticus</i> (THORNE 1930)									
2	<i>Clavicaudoides clavicaudatus</i> (ALTHER 1953)									
3	<i>Nygolaimus bisexualis</i> (THORNE 1930)									
4	<i>N. brachyuris</i> (DE MAN, 1880) THORNE 1930									
5	<i>N. ferox</i> THORNE 1939									
6	<i>Solididens bisexualis</i> (THORNE 1930)									
II. Suborder Dorylaimina, Superfam. Belondiroidea, Fam. Belonidiridae										
7	<i>Belondira moldavica</i> NESTEROV 1976									
8	<i>Laurophragus lauri</i> NESTEROV 1976									
9	<i>Dorylaimellus catatracticus</i> ANDRASSY 1968									
10	<i>Oxydirus oxycephalus</i> (DE MAN, 1885) THORNE 1939									
11	<i>O. terramoldavicus</i> GHEBRE, NESTEROV 1994									
Superfamily Dorylaimoidea, Fam. Actinolaimidae										
12	<i>Paractinolaimus macrolaimus</i> (DE MAN 1880)									
Family Aporcelaimidae										
13	<i>Aporcelaimellus amplexor</i> (NESTEROV, LISETZKAJA 1965) HEYNS, 1965									
14	<i>A. krygeri</i> (DITLEVSEN, 1928) HEYNS 1965									
15	<i>A. obscurus</i> (THORNE, SWANGER 1936)									
16	<i>A. obtusicaudatus</i> (BASTIAN 1865) HEYNS 1965									
17	<i>A. papillatus</i> (BASTIAN 1865)									
18	<i>A. paraobtusicaudatus</i> (MICOLETZKY 1922)									
19	<i>A. simus</i> (ANDRÁSSY 1958)									
20	<i>Aporcelaimus regius</i> (DE MAN 1876)									
21	<i>A. superbus</i> (DE MAN 1880)									
22	<i>Paraxonchium laetificans</i> (ANDRASSY 1956)									
Family Dorylaimidae										
23	<i>Crocodylaimus flavomaculatus</i> (LINSTOW 1876)									
24	<i>C. fusus</i> ANDRÁSSY 1993									
25	<i>Dorylaimus helveticus</i> STEINER 1919									
26	<i>D. montanus</i> STEFANSKI 1923									
27	<i>D. stagnalis</i> DUJARDIN 1845									
28	<i>Laimydorus filiformis</i> (BASTIAN 1865)									
29	<i>Mesodorylaimus arvensis</i> COBB, THORNE, SWANGER 1936									
30	<i>M. bastiani</i> (BÜTSCHLI 1873)									
31	<i>M. centrocerus</i> (DE MAN 1880)									
32	<i>M. intermedius</i> DASSONVILLE & HEYNS 1984									
33	<i>M. litoralis</i> LOOF 1969									

34	<i>M. luci</i> BRZESKI, SZCZYGEI 1961										
35	<i>M. mesonyctius</i> (KREIS 1930)										
36	<i>M. meyli</i> (ANDRÁSSY 1958)										
37	<i>M. orientalis</i> (KREIS 1930)										
38	<i>M. pendschikenticus</i> (TULAGANOV 1949)										
39	<i>M. potus</i> HEYNS 1963										
40	<i>M. pseudobastiani</i> LOOF 1969										
41	<i>M. recurvus</i> ANDRÁSSY 1964										
42	<i>Opisthodorylaimus sylphoides</i> (WILLIAMS 1959)										
43	<i>Prodorylaimus acris</i>										
44	<i>Prodorylaimus dolichurus</i> (LOOF 1946)										
45	<i>P. longicaudatoides</i> ALTHERR 1968										
46	<i>P. vixamictus</i> (ANDRÁSSY 1962)										
47	<i>Thornenema baldum</i> (THORNE 1939)										
48	<i>T. lissum</i> (THORNE 1939)										
49	<i>T. mauritanium</i> (WILLIAMS 1959)										
Family Longidoridae THORNE 1935											
50	<i>Longidorus elongatus</i> (DE MAN 1876) THORNE, SWANGER 1936										
51	<i>L. euonymus</i> MALI & HOOPER 1974										
52	<i>L. macrosoma</i> HOOPER 1961										
53	<i>Xiphinema brevicolle</i> LORDELLO & DA COSTA 1961										
54	<i>X. dentatum</i> STURHAN 1978										
55	<i>X. diversicaudatum</i> (MICOLETZKY 1927)										
56	<i>X. index</i> THORNE & ALLEN 1950										
57	<i>X. italiae</i> MEYL 1953										
58	<i>X. pachtaicum</i> (TULAGANOV 1938)										
59	<i>X. rivesi</i> DALMASSO 1969										
60	<i>X. rotundatum</i> STEKHOVEN & TEUNISSEN 1938										
61	<i>X. simile</i> LAMBERTI & al. 1983										
62	<i>X. turcicum</i> LUC & DALMASSO 1964										
63	<i>X. vuittenezi</i> LUC & al.,1964										
Family Nordiidae JAIRAJPURI & SIDDIQI 1964											
64	<i>Enchodelus macrodorus</i> (DE MAN 1880)										
65	<i>E. microdorus</i> SCHIEMER 1965										
66	<i>Longidorella microdora</i> (DE MAN 1880)										
67	<i>L. parva</i> THORNE 1939										
68	<i>Pungentus marietani</i> ALTHERR 1950										
Family Qudsianematidae JAIRAJPURI 1963, Subfamily Qudsianematinae JAIRAJPURI 1969											
69	<i>Allodorylaimus bokori</i> (ANDRÁSSY 1959)										
70	<i>A. diadematus</i> (COBB 1936)										
71	<i>A. granuliferus</i> (COBB 1893)										
72	<i>Dorydorella bryophila</i> (DE MAN 1880)										
73	<i>D. pratensis</i> (DE MAN 1880)										
74	<i>Ecumenicus monohystera</i> (DE MAN 1880)										
75	<i>Epidorylaimus humilior</i> (ANDRÁSSY 1960)										
76	<i>E. lugdunensis</i> (DE MAN 1880)										
77	<i>E. muscorum</i> (SKWARRA 1921)										
78	<i>Eudorylaimus acuticauda</i> (DE MAN 1880)										
79	<i>E. balticus</i> (SCHULTZ 1934)										
80	<i>E. brunetti</i> (MEYL 1953) ANDRASSY 1959										

81	<i>E. bureshi</i> (ANDRASSY 1958) ANDRASSY 1959										
82	<i>E. carteri</i> (BASTIAN 1865)										
83	<i>E. curvatus</i> (THORNE, SWANGER 1938) ANDRASSY 1959										
84	<i>E. iners</i> (BASTIAN 1865)										
85	<i>E. maritus</i> ANDRÁSSY 1959										
86	<i>E. similis</i> (DE MAN 1876)										
87	<i>Labronema vulvapapillatum</i> (MEYL 1954)										
88	<i>Microdorylaimus miser</i> (THORNE & SWANGER 1936)										
89	<i>M. modestus</i> (ALTHERR 1952)										
90	<i>M. parvus</i> (DE MAN 1880)										
91	<i>Nygolaimoides gubernaculifer</i> (ANDRÁSSY 1957)										
92	<i>Crassolabium ettersbergensis</i> (DE MAN 1885)										
93	<i>C. laticollis</i> (DE MAN 1906)										
94	<i>C. minutus</i> (BÜTSCHLI 1873)										
95	<i>C. solus</i> (ANDRÁSSY 1962)										
96	<i>Thornia steatopyga</i> (THORNE & SWANGER 1936)										
Subfamily Discolaiminae SIDDIQI 1969											
97	<i>Discolaimium cylindricum</i> THORNE 1939										
98	<i>Discolaimoides bulbiferus</i> (COBB 1906)										
99	<i>Discolaimus major</i> THORNE 1939										
Superfamily Tylencholaimoidea FILIPIJEV 1934; Family Aulolaimoididae JAIRAJPURI 1964											
100	<i>Aulolaimoides elegans</i> MICOLETZKY 1915										
Family Leptonchidae THORNE 1935											
101	<i>Leptonchus granulatus</i> COBB 1920										
102	<i>Proleptonchus amphidius</i> JAIRAJPURI 1964										
Family Tylencholaimidae FILIPIJEV 1934											
103	<i>Tylencholaimus maritus</i> LOOF et JAIRAJPURI 1968										
104	<i>T. mirabilis</i> (BÜTSCHLI 1873) DE MAN 1876										
105	<i>T. nanus</i> THORNE 1939										
106	<i>T. paradoxus</i> LOOF et JAIRAJPURI 1968										
107	<i>T. pacificus</i> NESTEROV 1979										
108	<i>T. pusillus</i> LOOF et JAIRAJPURI 1968										
109	<i>T. stecki</i> STEINER 1914										
110	<i>T. teres</i> THORNE 1939										
Family Tylencholaimellidae JAIRAJPURI 1964											
111	<i>Doryllium uniforme</i> COBB 1920										
112	<i>Tylencholaimellus affinis</i> (BRAKENHOFF 1914)										
113	<i>T. coronatus</i> THORNE 1939										

Multiannual plantations create favorable conditions for nematodes. 47 species from order Dorylaimida were registered in vineyards; 54 species in orchards and berry plantations (POIRAS, 2008b; POIRAS *et al.*, 2008a). Most of the species belonging to omnivores with long life span (Om5), genera *Aporcelaimellus*, *Aporcelaimus* and omnivores (Om4), genera *Epidorylaimus*, *Eudorylaimus* were diverse and numerous. Among plant parasitic nematodes, the ectoparasites (He5) from genera *Longidorus* and *Xiphinema* are able to be a vector of nepo-viruses (TAYLOR & BROWN, 1997), such as *Xiphinema diversicaudatum* associate with yellow dwarf disease of raspberry, also mosaic and yellow crinkle of strawberry (arabis mosaic virus ArMV), *X. index* – grapevine fanleaf virus (GFLV), *X. rivesi* – tomato ringspot virus (ToRSV), peach rosette mosaic virus (PRMV), cherry rasp leaf virus (CLRV), tobacco ringspot virus (TRSV), *X. vuittenezi* – (CLRV), *Longidorus macrosoma* and *L. elongates* – raspberry ringspot virus (RRSV). In addition to virus transmission, these nematodes cause the formation of galls, necrotic areas of growth of plant roots; they can remain viable for a long time after the uprooting of vineyards and berry bushes, even when the content of the soil under fallow or in crop rotation with is unfavorable for their development on host plants (POIRAS, 2005; POIRAS *et al.*, 2008a). Populations of vector virus nematodes are able to create the foci of viral diseases directly at perennials such as grapes, fruit and berry crops.

The dorylaimid families composed of small-sized species with body length less than 1cm (guilds Om4, Fu4 and He4) such as *Longidorella parva* (Nordiidae), *Microdorylaimus parvus*, *Dorydorella bryophila*, *Crassolabium ettersbergense* (Qudsianematidae) are able to colonize rapidly poor habitats (YEATES, 2003), probably in some cases by migration over soil surface covered with unicellular algae.

The species composition of nematode communities of meiobenthos depends on the structure of the river channel, flow velocity and type of benthic sediments. The range of power of some major freshwater dorylaimids vary widely, they are often predatory, feeding on small protozoa, being feeders of bacteria and fungi. In the meiobenthos of both studied rivers, the Dniester and the Prut, the large freshwater species (Om4, Om5) dominate – *Dorylaimus stagnalis* (this species prefers waste water), *D. montanus*, *Mesodorylaimus litoralis*, *M. mesonyctius*, *Crocodylaimus fusus* and others.

The riverbanks of the Prut and the Dniester, sporadically flooded, affect the freshwater nematode communities increasing the number of amphibionts such as: *Mesodorylaimus bastiani*, *Aporcelaimellus krygeri*, *A. obtusicaudatus*, *Dorydorella pratensis*, *Ecumenicus monhystra*, *Thornia steatopyga*, various species of the genera *Eudorylaimus* and *Crassolabium* (POIRAS, 2010) and some species vectors of nepo-viruses such as *Xiphinema rivesi* and the *X. index*. Most of these species are typical for the terrestrial habitats; however, they have the ability to survive on the terrestrial sites covered with water or on the real aquatic habitats.

According to the ratio of trophic groups of nematodes from order Dorylaimida, the omnivorous species (Om4, Om5) were dominant in all studied habitats; however, they are numerous in natural ecosystems. Nematode herbivores (He4, He5) are more diverse as species and sometimes they form numerous populations in the root system of agricultural plants. Nematode predators (Pr5) and fungivores (Fu4) are present in all studied habitats; however, they are diverse and numerous mostly in forests.

Table 2. Functional guilds and families of Nematodes of the order Dorylaimida in different habitats of the Republic of Moldova. / Tabel 2. Ghildilele functionale și familiile de nematode ale ordinului Dorylaimida în diferite habitate ale Republicii Moldova.

Functional guilds	Families
Ba3 (bacterivorous family with cp value 2)	Aulolaimoididae
Fu4 (fungivorous families with cp value 4)	Leptonchidae, Tylencholaimidae, Tylencholaimellidae
Om4 (omnivorous family with cp value 4)	Qudsianematidae (<i>Allodorylaimus</i> , <i>Dorydorella</i> , <i>Epidorylaimua</i> , <i>Eudorylaimus</i> , <i>Microdorylaimus</i> , <i>Crassolabium</i>), Nordiidae (<i>Enchodelus</i> , <i>Pungentus</i>), Dorylaimidae (<i>Dorylaimus</i> , <i>Crocodylaimus</i> , <i>Thornenema</i>)
Om5 (omnivorous family with cp value 5)	Qudsianematidae (<i>Mesodorylaimus</i> , <i>Laimydorus</i>), Aporcelaimidae, Thornenematidae, Dorylaimidae (<i>Laimydorus</i> , <i>Mesodorylaimus</i> , <i>Opishodorylaimus</i> , <i>Prodorylaimus</i>), Paraxonchidae
Pr5 (predatory family with cp value 5)	Nygalaimidae, Discolaimidae, Swangeriidae, Belondiridae (<i>Oxydirus</i>)
He4 (herbivorous family with c-p value 4)	Nordiidae (<i>Longidorella</i>)
He5 (herbivorous family with c-p value 5)	Longidoridae, Xiphinematidae, Belondiridae (<i>Belondira</i> , <i>Dorylaimellus</i>)

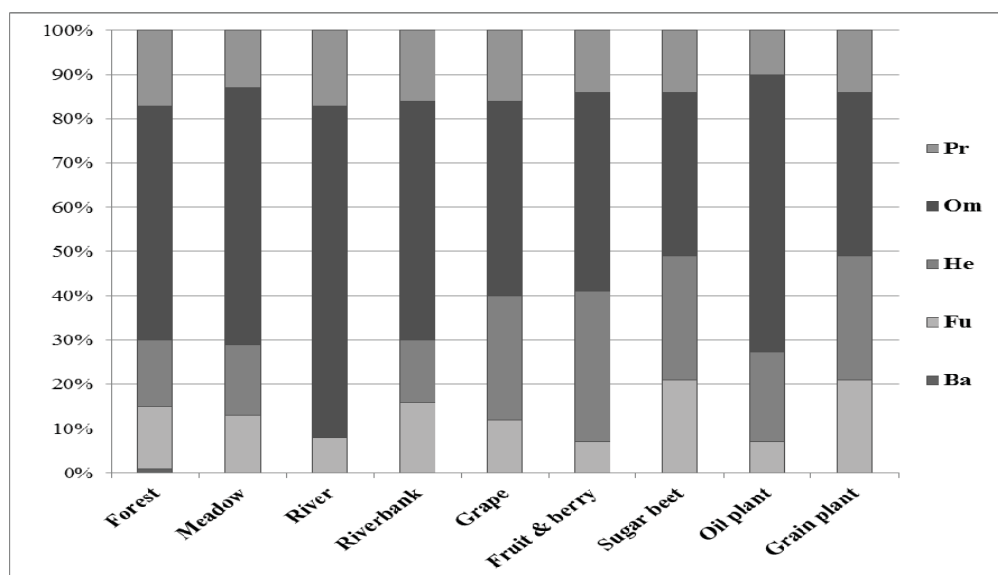


Figure 1. Percentages (Ratio) (%) of trophic groups of nematodes (Ba – bacterivores, Fu – fungivores, He – herbivores, Om – omnivores, Pr – predators) from order Dorylaimida collected from different ecosystems (forest, meadow, river sediment, riverbank, grape, fruit and berry, sugar beet, oil plants and grain plants). / Figura 1. Procentele (%) grupelor trofice ale nematodelor (Ba – bacterifage, Fu – micofage, He – fitofage, Om – polifage, Pr – prădătoare) din ordinul Dorylaimida, colectate din diverse ecosisteme naturale și antropizate (pădure, pajiște, sediment de râu, mal de râu Nistru și Prut, sfeclă de zahăr, plante oleaginoase, plante cerealiere (horticole multianuale, plante anuale tehnice – sfeclă de zahăr, plante oleaginoase și sedimentul râurilor, sectoare palustre).

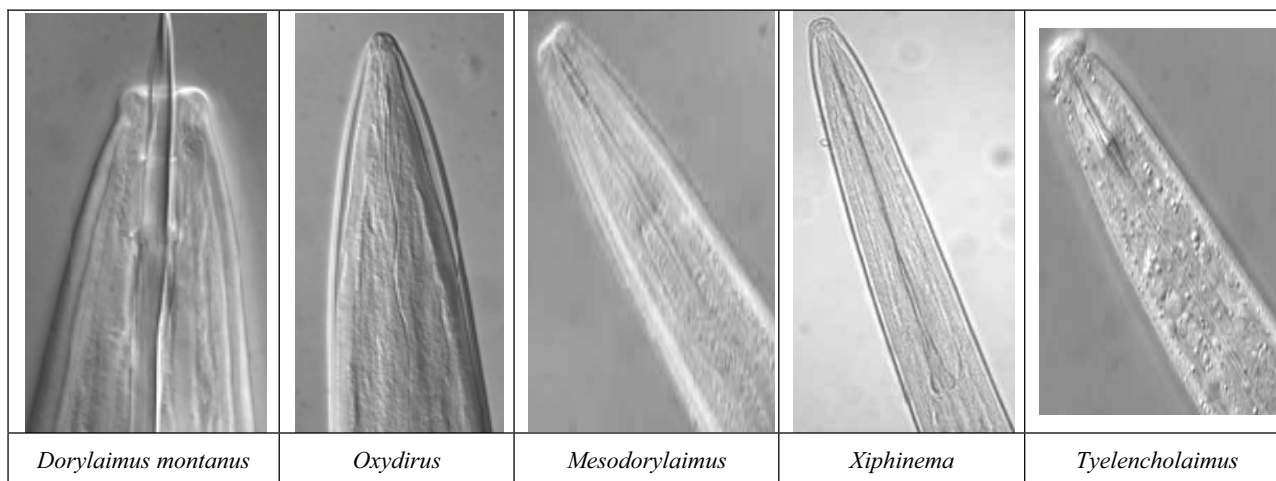


Photo 1. The structure of the head of nematodes from order Dorylaimida with different feeding types.

Foto 1. Structura părții anterioare a cavității bucale a nematodelor din ordinul Dorylaimida, cu diferite tipuri de hrănire (original).

CONCLUSIONS

The free-living and plant parasitic nematodes from order Dorylaimida are represented (presented) by 113 species belonging to 43 genera and 13 families with wide distribution within different natural and agricultural habitats in the Republic of Moldova. The highest species diversity of dorylaimids has been revealed in different types of forests. Thus, in the Nature Forest Reserve "Codrii" the large populations of nematodes were formed by the genera: *Aporcelaimus*, *Aporcelaimellus*, *Eudorylaimus* and *Tylencholaimus*. Most predatory species belonging to the families Nygolaimidae and Discolaimidae were diverse mostly in forests. In the meiobenthos of the rivers Dniester and the Prut the large dorylaimids such as: *Dorylaimus stagnalis*, *D. montanus*, *Mesodorylaimus litoralis*, *M. mesonyctius*, *Crocodylaimus fusus* were dominant. In the sporadically flooded riverbanks, the amphibionts such *Mesodorylaimus bastiani*, *M. mesonyctius*, *Aporcelaimellus krygeri*, *A. obtusicaudatus* and various species from genera *Mesodorylaimus*, *Eudorylaimus* and *Crassolabium* were common. Multiannual plantations of grape and fruit trees create favorable conditions for dorylaimids. Thus, 47 species were registered in vineyards and 54 species - in orchards and berry plantations. Some of ectoparasites with long life span from the genera *Longidorus* and *Xiphinema* are able to be vectors of nepo-viruses for multi-annual plants such as: grape, fruit trees and berries. Some specimens of *Xiphinema dentatum*, *X. index* and *X. rivesi* were found in the riverbanks. Most species of dorylaimids are sensitive to environmental changes and can serve as good bioindicators using (of) functional guilds as combination of trophic groups and life strategy.

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