

Tylenchomorpha (Nematoda: Tylenchina) in Belgium, an updated list

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Received: 11 November 2002

Accepted for publication: 27 January 2003

Summary – The list of Tylenchomorpha known from Belgium is updated with observations from 32 locations. Forty two species are added, of which 11 are new records for the Belgium nematofauna. Five nominal species are removed because of synonymy and the list of 161 species is presented nomenclaturally.

Keywords – distribution, nematofauna, new records.

The Belgian nematofauna has been relatively well studied. Coomans (1989) reviewed the nematofauna from Belgium, with exclusion of the animal-parasitic nematodes. More recently, Bert and Geraert (2000) demonstrated that the tylenchid nematofauna in more natural habitats and non-conventional crops is less known and added ten new records for Belgium. Sampling in several biotopes and compilation of other data has given a better insight into the distribution of the Tylenchomorpha¹ in Belgium, thus allowing us to update the Tylenchomorpha division of Coomans' list (Coomans, 1989) and to adapt it to reflect recent taxonomical changes.

Sixty one different species were recovered from 30 locations and four additional samples². The most widespread species appeared to be *Aglenchus agricola*, *Coslenchus costatus*, *Filenchus vulgaris*, *Helicotylenchus pseudorobustus*, *Rotylenchus uniformis* and *Tylenchorhynchus dubius* (Table 1). Eleven species are new records for the Belgian nematofauna: *Aphelenchoides asterocaudatus*, *Aphelenchoides blastophthorus*, *Cephalenchus hexalineatus*, *Coslenchus andrassyi*, *Ditylenchus destructor*, *Filenchus sandneri*, *Helicotylenchus canadensis*, *Laimaphelenchus penardi*, *Pratylenchoides magnicauda*, *Psilenchus aestuarius* and *Tylenchus elegans*.

The nematofauna review by Coomans (1989) listed 119 Tylenchomorpha and to this another 42 species have now been added. Prior to the present study, 23 species were recorded as new by Bert and Geraert (2000) while

Coosemans (2002) mentioned 18 Tylenchomorpha from a forest soil study of which eight represented new records. Five nominal species have been removed from the 1989 list of Coomans because they have been synonymised with other species on the list (for details see: <http://www.tylench.be.tf>). In conclusion, a list of Tylenchomorpha recorded in Belgium is presented in Table 2. Information about the biotope of the listed species was obtained from the original publications and from the present study.

Acknowledgements

The authors thank Nancy de Sutter and Alex Ryss for their generous supply of samples.

¹ Aphelenchs and tylenchs *sensu* De Ley and Blaxter (2002): infraorder hosting the Superfamilies Aphelenchoidea Fuchs, 1937; Criconematoidea Taylor, 1936; Sphaerularoidea Lubbock, 1861; Tylenchoidea Örley, 1880 and Myenchoidea Pereira, 1931.

² Samples kindly supplied by Alexander Ryss (Russian Academy of Sciences, St Petersburg, Russia) during leave in Belgium, and Nancy de Sutter (Agricultural Research Centre, Department of Crop Protection, Merelbeke, Belgium).

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Table 1. Description of sampling locations, origin of samples and *Tylenchomorpha* studied.

Description of sampling locations	Location or origin of sample	Studied species*, numbers referring to Table 2
Apple orchard, clay loam soil	Lokeren	23, 52, 130
Apple orchard, sandy loam soil	Vliermaal	2, 54, 111, 130
Bank of river Scheldt	Destelbergen	7, 143
Canal bank dominated by <i>Crepis capillaries</i> (L.) Wallr., L., <i>Plantago major</i> L., <i>Trifolium repens</i> L., <i>Poa annua</i> L., light sandy loam	Ingelmunster, canal Roeselare-Leie	20, 51, 60, 141, 143, 148
Canal bank Moervaart dominated by <i>Arrhenatherum elatius</i> (L.) Presl and <i>Holcus lanatus</i> L., light sandy loam soil	Moervaart-canal, Lokeren	12, 18, 20, 52, 56, 57, 67, 104, 108, 129, 131
Corn	Lokeren	130
Football pitch	Destelbergen	25, 28, 57, 64, 145, 150
<i>Idem</i>	Heusden (Destelbergen)	12, 25, 51, 58, 64, 140, 150
Grassland dominated by <i>Holcus lanatus</i> L.	Destelbergen	1, 12, 143
Grassland on former domestic dump site	Bourgoyen-Ossemers nature reserve near Ghent	1, 17, 26, 64, 85, 130, 148
Grassland on former industrial dump site	Ghent city	17, 18, 104, 51, 54, 55, 56, 57, 137
Grassy border of pond	Botanical garden, Ghent University	26, 64
Hedge (<i>Ligustrum vulgare</i> L.)	Gentbrugge	143
Ivy	Botanical garden, Ghent University	1, 51, 64, 148, 150
Lawn in vicinity of a willow tree (<i>Salix matsudana</i> Koidz), sandy loam soil	Botanical garden, Ghent University	1, 2, 12, 20, 26, 104, 48, 51, 64, 123
Lawn, in vicinity of apple tree, sandy loam soil	Ingelmunster	1, 64, 118, 125, 143, 148, 151
Lawn, loamy sand soil	Geel	1, 6, 50, 92, 143
Lawn, sandy loam soil	Sint-Niklaas	26, 51, 52
<i>Idem</i>	Sint-Amands	1, 15, 25, 64, 119, 121, 143, 148
Meadow, in vicinity of plum, loam soil	Ingelmunster	130, 141
Mosses on rocks	Botanical garden, Ghent University	153, 155
Pine forest, open space with <i>Ammophila</i> sp., sandy soil	Herentals	49, 143, 151
Reed (<i>Phragmites australis</i> (Cav.) Steud), wet sandy loam soil with a high peat content	Bourgoyen-Ossemers, nature reserve near Ghent	27, 64, 110, 128, 148
Sand dune covered with sea buckthorn (<i>Hippophae rhamnoides</i> L.)	Knokke, Belgian coast	143, 154
Sand dune dominated by <i>Ammophila arenaria</i> (L.) Link. and <i>Geranium molle</i> L.	De Panne, Belgian coast	88
Sand dune with <i>Ammophila arenaria</i> (L.)	Ostend, Belgian coast	88, 120, 151
Sand hill on fallow, dominated by <i>Urtica dioica</i> L. and <i>Glechoma hederaceae</i> L., loamy sand soil	Ghent	116, 119, 155
Swamp with willow trees	Lokeren	130, 142
Uncovered soil in the vicinity of ivy and birch	Landegem	22, 28, 143, 155
Pea field	Limburg province, Merelbeke (samples obtained by Nancy de Sutter)	39, 125
<i>Pinus sylvestris</i>	Wachtebeke (samples obtained by Nancy de Sutter)	4
Bark of <i>Salix</i> sp.	Merelbeke (sample obtained by Alexander Ryss)	80
River bank (dominated by <i>Trifolium</i> sp. + <i>Quercus</i> sp. and <i>Salix</i> sp.)	Redu, Ardennes (sample obtained by Alexander Ryss)	124

* Only the dominant or subdominant species which were actually studied are given and therefore the results do not represent all inhabiting species.

Table 2. Nematode species belonging to the Tylenchomorpha recorded in Belgium. Sampling locations are classified in general biotope types; D: Dunes; G: Grassland (including all soils dominated by grasses, except meadows); A: Aquatic; B: Bark; C: Cultivated soils; F: Forest; Fa: Fallow; H: Hedges; M: Meadow; N: Semi-natural habitats (reed, wetland, etc.); Mo: Mosses; O: Orchard; U: Unknown. Numbers refer to studies where the species are mentioned; 1: Overview of Coomans (1989); 2: Data Bert and Geraert (2000); 3: Soil quality study Coosemans (2002); 4: Present data.

No.	Species of Tylenchomorpha	Biotope	Reference
1.	<i>Aglenchus agricola</i> (de Man, 1884) Andrassy, 1954	A, C, Fa, G, M, Mo	1, 4
2.	<i>Amplimerlinius icarus</i> (Wallace & Greet, 1964) Siddiqi, 1976	G, O	2, 4
3.	<i>Amplimerlinius macrurus</i> (Goodey, 1932) Siddiqi, 1976	M	1
4.	<i>Aphelenchoides asterocephalus</i> Das, 1960	C	4
5.	<i>Aphelenchoides bicaudatus</i> (Imamura, 1931) Filipjev & Schuurmans Stekhoven, 1941	C	1
6.	<i>Aphelenchoides blastophorus</i> Franklin, 1952	G	4
7.	<i>Aphelenchoides composticola</i> Franklin, 1957	C, G	1, 4
8.	<i>Aphelenchoides fragariae</i> (Ritzema Bos, 1890) Christie, 1932	C	1
9.	<i>Aphelenchoides parietinus</i> (Bastian, 1865) Steiner, 1932	A, Mo, D	1
10.	<i>Aphelenchoides ritzemabosi</i> (Schwartz, 1911) Steiner & Bühner, 1932	C	1
11.	<i>Aphelenchoides subtenuis</i> (Cobb, 1926) Steiner & Bühner, 1932	C	1
12.	<i>Aphelenchus avenae</i> Bastian, 1865	C, G, M	1, 4
13.	<i>Aprutides guidettii</i> Scognamiglio, 1974	F	3
14.	<i>Basiria aberrans</i> (Thorne, 1949) Siddiqi, 1963	C	1
15.	<i>Basiria duplexa</i> (Hagemeyer & Allen, 1952) Geraert, 1968	C, G	1, 4
16.	<i>Basiria flandriensis</i> Geraert, 1968	C, M	1
17.	<i>Basiria gracilis</i> (Thorne, 1949) Siddiqi, 1963	C, G	1, 4
18.	<i>Basiria graminophila</i> Siddiqi, 1969	C, G	2, 4
19.	<i>Boleodorus clavicaudatus</i> Thorne, 1941	U	1
20.	<i>Boleodorus thylactus</i> Thorne, 1941	C, G	1, 4
21.	<i>Boleodorus volutus</i> Lima & Siddiqi, 1963	C	1
22.	<i>Cephalenchus hexalineatus</i> (Geraert, 1962) Geraert & Goodey, 1964	Fa	4
23.	<i>Cephalenchus leptus</i> Siddiqi, 1963	O	2, 4
24.	<i>Coslenchus alacinatus</i> Siddiqi, 1981	U	2
25.	<i>Coslenchus andrassyi</i> Brzeski, 1987	G	4
26.	<i>Coslenchus costatus</i> (de Man, 1921) Siddiqi, 1978	M, C, G	1, 4
27.	<i>Coslenchus polonicus</i> Brzeski, 1982	N	2, 4
28.	<i>Criconema annuliferum</i> (de Man, 1921) Micoletzky, 1925	C, F, Fa, G, M	1, 4
29.	<i>Criconema demani</i> Micoletzky, 1925	G	2
30.	<i>Criconema longulum</i> Gunhold, 1953	G	1
31.	<i>Criconema loofi</i> (De Grisse, 1967) Raski & Luc, 1985	D	1
32.	<i>Criconema mutabile</i> (Taylor, 1936) Raski & Luc, 1985	F	3
33.	<i>Criconema princeps</i> (Andrassy, 1962) Raski & Luc, 1985	F, G	1
34.	<i>Criconema sphagni</i> Micoletzky, 1925	F, G, Mo	1
35.	<i>Criconemoides amorphus</i> (De Grisse, 1967) Luc & Raski, 1981	D	1
36.	<i>Criconemoides informis</i> (Micoletzky, 1922) Taylor, 1936	C, G, F, M,	1
37.	<i>Criconemoides morgensis</i> (Hofmänner in Hofmänner & Menzel, 1914) Taylor, 1936	M	1
38.	<i>Criconemoides parvus</i> Raski, 1952	G, D, N	1
39.	<i>Ditylenchus destructor</i> Thorne, 1945	C	4
40.	<i>Ditylenchus dipsaci</i> (Kühn, 1857) Filipjev, 1936	C, G	1
41.	<i>Ditylenchus intermedius</i> (de Man, 1880) Filipjev, 1936	M	1
42.	<i>Ecphyadophora tenuissima</i> de Man, 1921	M	1
43.	<i>Filenchus baloghi</i> (Andrassy, 1958) Siddiqi, 1986	C, M	1
44.	<i>Filenchus discrepans</i> (Andrassy, 1954) Raski & Geraert, 1986	F	3
45.	<i>Filenchus misellus</i> (Andrassy, 1958) Raski & Geraert, 1987	F	3

Table 2. (Continued).

No.	Species of Tylenchomorpha	Biotope	Reference
46.	<i>Filenchus helenae</i> (Szczygiel, 1969) Raski & Geraert, 1987	F	3
47.	<i>Filenchus terrestris</i> Raski & Geraert, 1987	F	3
48.	<i>Filenchus quartus</i> Szczygiel, 1969	C, G	1, 4
49.	<i>Filenchus sandneri</i> (Wasilewska, 1965) Raski & Geraert, 1987	F	4
50.	<i>Filenchus thornei</i> (Andrássy, 1954) Andrásy, 1963	G, M	1, 4
51.	<i>Filenchus vulgaris</i> (Brzeski, 1963) Lownsbery & Lownsbery, 1985	G, Fa	2, 4
52.	<i>Geocenamus brevidens</i> (Allen, 1955) Brzeski, 1991	C, G, M	1, 4
53.	<i>Geocenamus joctus</i> (Thorne, 1949) Brzeski, 1991	M	1
54.	<i>Geocenamus microdorus</i> (Geraert, 1966) Brzeski, 1991	C, G, Fa, O	1, 4
55.	<i>Geocenamus nanus</i> (Allen, 1955) Brzeski, 1991	C, G, M	1, 4
56.	<i>Geocenamus nothus</i> (Allen, 1955) Brzeski, 1991	C, G, M	1, 4
57.	<i>Geocenamus quadrifer</i> (Andrássy, 1954) Brzeski, 1991	G, M	1, 4
58.	<i>Geocenamus tessellatus</i> (Goodey, 1952) Brzeski, 1991	G, M	1
59.	<i>Globodera rostochiensis</i> (Wollenweber, 1923) Skarbilovich, 1959	C	1
60.	<i>Helicotylenchus canadensis</i> Waseem, 1961	G	4
61.	<i>Helicotylenchus exallus</i> Sher, 1966	U	2
62.	<i>Helicotylenchus minzi</i> Sher, 1966	C, M	1
63.	<i>Helicotylenchus multicinctus</i> (Cobb, 1893) Golden, 1956	U	1
64.	<i>Helicotylenchus pseudorobustus</i> (Steiner, 1914) Golden, 1956	C, Fa, G, M, N	1, 4
65.	<i>Helicotylenchus varicaudatus</i> Yuen, 1964	G	2
66.	<i>Hemicriconemoides pseudobrachyurus</i> De Grisse, 1964	C, G	1
67.	<i>Hemicycliophora conida</i> Thorne, 1955	C, G, M	1, 4
68.	<i>Hemicycliophora similis</i> Thorne, 1955	C	1
69.	<i>Hemicycliophora triangulum</i> Loof, 1968	G	2
70.	<i>Heterodera avenae</i> Wollenweber, 1924	C, M	1
71.	<i>Heterodera cruciferae</i> Franklin, 1945	C	1
72.	<i>Heterodera goettingiana</i> Liebscher, 1892	C	1
73.	<i>Heterodera humuli</i> Filipjev, 1934	C	1
74.	<i>Heterodera schachtii</i> Schmidt, 1871	C	1
75.	<i>Heterodera trifolii</i> Goffart, 1932	M	1
76.	<i>Hirschmanniella gracilis</i> (de Man, 1880) Luc & Goodey, 1964	N	2
77.	<i>Hirschmanniella loofi</i> Sher, 1968	N	2
78.	<i>Hoplotylus femina</i> s' Jacob, 1959	F	3
79.	<i>Irantylenchus vicinus</i> (Szczygiel, 1970) Brzeski & Sauer, 1983	C	1
80.	<i>Laimaphelenchus penardi</i> (Steiner, 1914) Filipjev & Schuurmans Stekhoven, 1941	B	4
81.	<i>Lelenchus leptosoma</i> (de Man, 1880) Andrásy, 1954	C, G, M	1
82.	<i>Macrotrophurus arbusticola</i> Loof, 1958	C	1
83.	<i>Malenchus acarayensis</i> Andrásy, 1968	U	2
84.	<i>Malenchus andrassyi</i> Merny, 1970	F	3
85.	<i>Malenchus bryophilus</i> (Steiner, 1914) Andrásy, 1980	G, M, Mo	1, 4
86.	<i>Meloidogyne ardenensis</i> Santos, 1968	G	1
87.	<i>Meloidogyne chitwoodi</i> Golden, O'Bannon, Santo & Finley, 1980	C	2
88.	<i>Meloidogyne duytsi</i> Karssen, Van Aelst & Van Der Putten, 1998	D	2, 4
89.	<i>Meloidogyne fallax</i> Karssen, 1996	C	2
90.	<i>Meloidogyne hapla</i> Chitwood, 1949	C	1
91.	<i>Meloidogyne maritima</i> Jepsen, 1987	D	2
92.	<i>Meloidogyne naasi</i> Franklin, 1965	C, G	1, 4
93.	<i>Mesocriconema axeste</i> (Fassuliotis & Williamson, 1959) Loof & De Grisse, 1989	U	1

Table 2. (Continued).

No.	Species of Tylenchomorpha	Biotope	Reference
94.	<i>Mesocriconema crenatum</i> (Loof, 1964) Andr�ssy, 1965	F	1
95.	<i>Mesocriconema curvatum</i> (Raski, 1952) Loof & De Grisse, 1989	C, M	1
96.	<i>Mesocriconema dherdei</i> (De Grisse, 1967) Loof & De Grisse, 1989	C, O	1
97.	<i>Mesocriconema irregulare</i> (De Grisse, 1964) Loof & De Grisse, 1989	F, G	1
98.	<i>Mesocriconema kirjanovae</i> (Andr�ssy, 1962) Loof & De Grisse, 1989	U	2
99.	<i>Mesocriconema maritimum</i> (De Grisse, 1964) Loof & De Grisse, 1989	D	1
100.	<i>Mesocriconema ornatum</i> (Raski, 1952) Loof & De Grisse, 1989	U	1
101.	<i>Mesocriconema pseudosolivagum</i> (De Grisse, 1964) Loof & De Grisse, 1989	M, G	1
102.	<i>Mesocriconema raskiense</i> (De Grisse, 1964) Andr�ssy, 1965	C	1
103.	<i>Mesocriconema rotundicauda</i> (Loof, 1964) Loof, 1989	D	1
104.	<i>Mesocriconema rusticum</i> (Micoletzky, 1915) Loof & De Grisse, 1989	G, M, F	1, 4
105.	<i>Mesocriconema solivagum</i> (Andr�ssy, 1962) Loof & De Grisse, 1989	F, G	1
106.	<i>Mesocriconema sphaerocephala</i> (Taylor, 1936) Loof, 1989	M, N	1
107.	<i>Mesocriconema vadense</i> (Loof, 1964) Loof & De Grisse, 1989	F, G	1
108.	<i>Mesocriconema xenoplax</i> (Raski, 1952) Loof, 1989	C, F, G, N	1, 4
109.	<i>Miculenchus salvus</i> Andr�ssy, 1959	C	1
110.	<i>Nagelus obscurus</i> (Allen, 1955) Powers, Baldwin & Bell, 1983	A, N	2, 4
111.	<i>Neopsilenchus magnidens</i> (Thorne, 1949) Thorne & Malek, 1968	C, M, O	1, 4
112.	<i>Ogma cobbi</i> (Micoletzky, 1925) Siddiqi, 1986	C, D	1
113.	<i>Ogma menzeli</i> (Stefanski, 1924) Schuurmans Stekhoven & Teunissen, 1938	F	1
114.	<i>Paratylenchus aculentus</i> Brown, 1959	G	2
115.	<i>Paratylenchus goodeyi</i> Oostenbrink, 1953	M	1
116.	<i>Paratylenchus hamatus</i> Thorne & Allen, 1950	C, Fa	1, 4
117.	<i>Paratylenchus macrodorus</i> Brzeski, 1963	C	1
118.	<i>Paratylenchus microdorus</i> Andr�ssy, 1959	C, G, M	1, 4
119.	<i>Paratylenchus nanus</i> Cobb, 1923	Fa, G, M	1, 4
120.	<i>Paratylenchus projectus</i> Jenkins, 1956	O, D	1, 4
121.	<i>Paratylenchus similis</i> Khan, Prasad & Mathur, 1967	G	2
122.	<i>Paratylenchus straeleni</i> (De Coninck, 1931) Oostenbrink, 1960	Mo	1
123.	<i>Pratylenchoides crenicauda</i> Winslow, 1958	G, M	1, 4
124.	<i>Pratylenchoides magnicauda</i> (Thorne, 1953) Baldwin, Luc & Bell, 1983	G	4
125.	<i>Pratylenchus crenatus</i> Loof, 1960	C, G, M	1, 4
126.	<i>Pratylenchus delattrei</i> Luc, 1958	C	1
127.	<i>Pratylenchus fallax</i> Seinhorst, 1968	C	1
128.	<i>Pratylenchus flakkensis</i> Seinhorst, 1968	G, N	2, 4
129.	<i>Pratylenchus neglectus</i> (Rensch, 1924) Filipjev & Schuurmans Stekhoven, 1941	C	1
130.	<i>Pratylenchus penetrans</i> (Cobb, 1917) Filipjev & Schuurmans Stekhoven, 1941	C, G, M, N, O	1, 4
131.	<i>Pratylenchus pratensis</i> (de Man, 1876) Filipjev, 1936	C, G, M	1, 4
132.	<i>Pratylenchus pseudopratensis</i> Seinhorst, 1968	C	1
133.	<i>Pratylenchus thornei</i> Sher & Allen, 1953	C, M	1
134.	<i>Pratylenchus vulnus</i> Allen & Jensen, 1951	C, O	1
135.	<i>Prothallonema consobrinum</i> (de Man, 1907) Siddiqi, 1986	U	1
136.	<i>Pseudhalenchus minutus</i> Tarjan, 1958	C, M	1
137.	<i>Psilenchus aestuarius</i> Andr�ssy, 1962	G	4
138.	<i>Psilenchus clavicaudatus</i> (Micoletzky, 1922) Thorne, 1949	M	1
139.	<i>Psilenchus hilarulus</i> de Man, 1921	C, M	1
140.	<i>Punctodera punctata</i> (Thorne, 1928) Mulvey & Stone, 1976	G, M	1, 4
141.	<i>Rotylenchus goodeyi</i> Loof & Oostenbrink, 1958	C, G, M	1, 4
142.	<i>Rotylenchus robustus</i> (de Man, 1876) Filipjev, 1936	C, M, N	1, 4
143.	<i>Rotylenchus uniformis</i> (Thorne, 1949) Loof & Oostenbrink, 1958	C, D, F, G, H, M	1, 4
144.	<i>Seinura diversa</i> (Paesler, 1957) Goodey, 1960	C	1

Table 2. (Continued).

No.	Species of Tylenchomorpha	Biotope	Reference
145.	<i>Subanguina radiculicola</i> (Greeff, 1872) Paramonov, 1968	C, G	1, 4
146.	<i>Tylenchorhynchus capitatus</i> Allen, 1955	C	1
147.	<i>Tylenchorhynchus claytoni</i> Steiner, 1937	C	1
148.	<i>Tylenchorhynchus dubius</i> (Bütschli, 1873) Filipjev, 1936	M, C, Fa, G, N	1, 4
149.	<i>Tylenchorhynchus lamelliferus</i> (de Man, 1880) Filipjev, 1936	C, M	1
150.	<i>Tylenchorhynchus maximus</i> Allen, 1955	C, Fa, G, M	1, 4
151.	<i>Tylenchorhynchus microphasmis</i> Loof, 1960	C, D, F, M	1, 4
152.	<i>Tylenchorhynchus ventralis</i> (Loof, 1963) Fortuner & Luc, 1987	C, M	1
153.	<i>Tylenchus arcuatus</i> Siddiqi, 1963	G, Mo, O	2, 4
154.	<i>Tylenchus davainei</i> Bastian, 1865	C, G, D	1, 4
155.	<i>Tylenchus elegans</i> de Man, 1876	Fa, Mo	4
156.	<i>Xenocriconemella macrodora</i> (Taylor, 1936) De Grosse & Loof, 1965	F	1

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