

Soil fauna of Finland: Acarina, Collembola and Enchytraeidae

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This paper is a summary report of a study on the soil fauna of Finland, supported by the Ministry of Environment, in the framework of the Finnish “PUTTE-Project” (Research Programme of Deficiently Known and Threatened Forest Species). The material was collected systematically from 15 different habitat types in eleven sampling areas with geographical coverage of the country.

1. Introduction

The soil mesofauna of Finland has been investigated by a low number of specialists in each major faunal group. Thus, what we know about Oribatida is mainly based on the activity of Karppinen (1955, 1958 a,b, 1962, 1966, 1972, 1977), the main work on Enchytraeidae was done by Nurminen (1965a,b, 1967, 1970), and hardly any comprehensive reports on Collembola have been published since the classical work of Linnaniemi (Axelson) (1907, 1912). Much of the available data have been collected without systematic plans. As a result, our knowledge on the occurrence and distribution of species has been insufficient and geographically defective. More complete local data originate from certain ecological field experiments, such as Huhta *et al.* (1979, 1986, 2005), while little material has accumulated from other areas or habitats.

The Finnish “PUTTE-Project” (Research Programme of Deficiently Known and Threatened Forest Species), supported by the Ministry of Environment in 2003–2007 (Juslén *et al.* 2008), rendered possible a comprehensive basic analysis of the soil

fauna (Acarina, Collembola and Enchytraeidae) of Finland. The present paper is a summary report of this investigation.

2. Material and methods

15 different habitat types were listed, and eleven sampling areas were selected with geographical coverage of the country (Fig. 1). The sampling sites were chosen, if possible, at places intact from human influence, such as old-growth forests, national parks or other protected areas. Three or four samples were taken from most areas and habitats; in some areas/habitats the number of replicates was smaller due to technical reasons. Soil samples were taken with a cylindrical corer (area 25 cm²) with plastic rings inside.

The collected sample was the content of the topmost 4 cm ring. From materials such as compost, dead wood or ant hills, the same volume (100 cm³) was collected using a knife or spade. Each sample consisted of three such replicates, the data from which were pooled. Animals were extracted using the “high gradient” type Tullgren funnels for

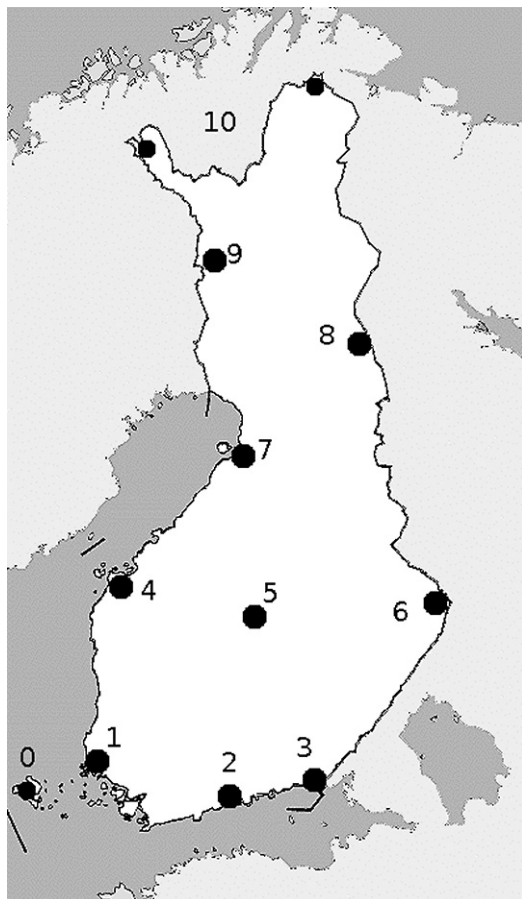


Fig. 1.

microarthropods, and “wet funnels” for enchytraeids. The sampling was carried out in 2004 (areas 2 to 7), 2005 (areas 1, 8 and 9), 2007 (area 0) and 2008 (area 10).

The sampling areas (Fig. 1) were:

0. Åland (Åhvenanmaa), the main island of the SW archipelago
1. Turku and surroundings
2. Helsinki and surroundings
3. Kotka and surroundings
4. Vaasa and surroundings (including the island Valassaaret)
5. Jyväskylä and surroundings (mainly N and S of the town)
6. Ilomantsi
7. Oulu and surroundings

8. Kuusamo
9. Kolari and surroundings (Forest Lapland)
10. Kilpisjärvi and Kevo (Alpine Lapland)

Areas 0 and 10 were sampled “incompletely”, covering only seashores, grasslands and other productive habitats in area 0, and only alpine habitats in area 10. Areas 8 and 9 include alpine habitats (fells) north of the main sampling area.

The explored habitats and microhabitats were:

- “Pine forest”, dry coniferous forests, mainly Scots pine
- “Spruce forest”, mesic coniferous forests, mainly Norway spruce
- “Deciduous forest”, fertile broad-leaved forests, different species
- “Swamp”, wet forests (“korpi”), spruce or alder
- “Pine bog”, mires (“räme”) growing mainly poor Scots pine
- “Open bog”, treeless, unproductive bogs (fens, “neva”)
- “Wetland”, fertile open bogs (fens, “letto”) and flooding grasslands (“luhta”), combined
- “Shore”, inland shores of lakes and rivers
- “Seashore”, soil samples and samples of seashore debris combined
- “Meadow”, mesic grasslands, including pastures
- “Dry meadow”, (“keto”)
- “Dead wood”, different species, including bark
- “Ant hills” (*Formica* spp.)
- “Alpine”, mountain birch stands, moors and grasslands above timberline, combined
- Bird nests (mainly small passerine birds)

3. Results

The results are presented in Tables 1 to 8. In the comparisons between areas and habitats one should consider the different numbers of samples taken, as well as the different times when the material was collected. In dry summer periods the average numbers are lower than in moist periods, and there are also differences between years (Huhta *et al.* 1967).

3.1. Mesostigmata

All adults and easily identified deutonymphs were determined to species. The systematics and nomenclature are according to Karg (1989, 1993), except the families Ascidae and Pachylaelapidae, which are revised after Gwiazdowicz (2007) and Mašán (2008). The genus name *Paragamasus* is used instead of *Lysigamasus*, according to Juvara-Bals (2002).

The data are shown in Tables 1 and 2. Rare species with less than three records are omitted; these will be presented in a checklist of Finnish Mesostigmata in near future. Old data from corresponding habitats, published earlier by Huhta *et al.* (1979, 1986, 2005) and Huhta (1996) have been inserted in the Tables in order to complete the data.

In all, 262 species were observed. About 140 of these were first records for Finland, but many species of Zerconidae and Uropodina were in fact found and identified earlier, mainly by Dr. P.T. Lehtinen, deposited in the Zoological Museum of Turku University, but remained unpublished.

The environments that show the highest species diversity are dry meadows, followed by mesic meadows, compost/dung, dead wood, deciduous forests and seashores (Table 2). The most species-poor habitats are bogs and other wetlands. (Row “corrected” in Table 2 omits records from previously more completely studied sites that could bias the comparison. “Single records” = nr of samples with the only record of a given species.)

3.2. Oribatida

The oribatids were identified using Weigmann (2006), Balogh & Mahunka (1983), Gilyarov & Krivolutsky (1975), Niedbala (1992, 2002) and some selected articles. If more than 100 specimens were found in a sample, the first 100 were identified and the figures were corrected to give an estimate for the whole sample. The families Suctobelbidae and Brachychthoniidae were not identified, and hence are not included in the species richness.

The data are shown in Tables 3 and 4. Rare species with less than three records are omitted; these will be presented in a checklist of Finnish Oribatida in near future (the previous catalogue was

published by Niemi *et al.* 1997). Data from bird nests and dung+compost are not included due to small numbers.

Altogether, 190 oribatid species were identified. 17 of them are new to the fauna of Finland: *Anachiptheria deficiens* Grandjean, 1932, *Belba corynopus* (Hermann, 1804), *Camisia solhoeyi* Colloff, 1993, *Ceratozetes sellnicki* Rajski, 1958, *Epidamaeus fortispinosus* Hammer, 1967, *Galumna dimorpha* Krivoluckaja, 1952, *Hydrozetes lemnae* (Coggi, 1899), *Maerkelotritia cryptopa* (Banks, 1904), *Nortonella helvetica* Woas, 1992, *Ophidio-trichus tectus* (Michael, 1884), *Passalozetes intermedius* (Berlese, 1910), *Phthiracarus bryobius* Jacot, 1930, *Podoribates longipes* Berlese, 1887, *Protoribotritia oligotricha* Märkel, 1963, *Trichoribates myrica* Gjelstrup & Solhoy, 1994, *Trichoribates novus* (Sellnick, 1928), and *Tritegeus bisulcatus* Grandjean, 1953. Some of these are in fact not rare, but belong to genera that were previously not studied in detail in Finland.

The numbers of oribatid species differ greatly between the habitats. The most diverse communities occur in dead wood and dry meadows. Ant hills and deciduous forests are also rich in species, whereas the most species-poor environments are open bogs and other wetlands. The diversity of forest environments, meadows, and alpine habitats is rather equal. The number of new records in different habitats (Table 4) indicates that more species are expected when more data accumulate from grasslands, shores and deciduous forests.

3.3. Collembola

Collembola were identified according to Fjellberg (1998, 2007). If more than 100 specimens were found in a sample, the first 100 were identified and the figures were corrected to give an estimate for the whole sample.

The data are summarized in Tables 5 and 6. The tables have been supplemented with earlier data from corresponding habitats (Huhta *et al.* 1986, 2005; Siira-Pietikäinen *et al.* 2001). Collembola were not identified from Alpine Lapland (area 10) and bird nests.

A total of 142 species of Collembola were recorded. Of different habitats or microhabitats, dead wood show the highest number of species

(68), followed by deciduous forests and inland shores. The most species-poor habitats are composts and swamps (Table 6).

One species was new to the Finnish fauna: *Parisotoma trichaetosa* (Martynova 1977), found in Muhos (decaying wood) and in Hailuoto, Oulu and Kuusamo (composts). Several other species can also be considered “new” after the revisions of Fjellberg (1998, 2007).

These include a complete list of all Collembola recorded in the Nordic countries, with separate columns for biogeographical provinces in each country. Synonymes used earlier can also be found therein.

3.4. Enchytraeidae

The enchytraeids were collected only from areas 2 to 7 in 2004. Identification and nomenclature are according to Nielsen & Christensen (1959, 1961, 1963). The results are shown in Tables 7 and 8, supplemented with earlier data from deciduous forests (Huhta *et al.* 2005). Immature specimens identified only to genera are not included.

36 species of Enchytraeidae were collected. The survey did not reveal new species to Finland. The undescribed *Fridericia* sp. was already found in the study of Huhta *et al.* (2005), where also two other species new to the country were recorded: *Fridericia connata* Bretscher 1902, and *Enchytronia annulata* Nielsen & Christensen 1959; both were collected in a birch plantation on agricultural soil, central Finland. Silfverberg (1998) has published a list of Enchytraeidae previously found in Finland.

There is a conspicuous difference in the species diversity of enchytraeids in different habitats: high numbers of species were found in deciduous forests, meadows and shore habitats, while coniferous forests, bogs, dead wood, ant hills and compost showed only few species (Table 8).

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Juvara-Bals for Mesostigmata, by Arne Fjellberg for Collembola and by Klara Dózsa-Farkas for Enchytraeidae.

References

- Axelsson, W. M. — See: Linnaniemi, W. M.
- Balogh, J. & Mahunka, S. 1983: Primitive oribatids of the Palaearctic Region. — In: *The Soil Mites of the World*, 1, Elsevier, Amsterdam: 1–372.
- Fjellberg, A. 1998: The Collembola of Fennoscandia and Denmark. Part I: Poduromorpha. — *Fauna Entomol. Scand.* 35: 1–179.
- Fjellberg, A. 2007: The Collembola of Fennoscandia and Denmark. Part II: Entomobryomorpha and Symphypleona. — *Fauna Entomol. Scand.* 42: 1–264.
- Gilyarov, M. S. & Krivolutsky, D.A. (Eds.) 1975: A key to soil-inhabiting mites. Sarcoptiformes (in Russian). — “Nauka”, Moscow, 491 pp.
- Gwiazdowicz, D. J. 2007: Ascid mites (Acari, Mesostigmata) from selected forest ecosystems and microhabitats in Poland. — *Wydawnictwo Akad. Roln. Augusta Cieszkowskiego w Poznaniu*. 248 pp.
- Huhta, V. 1996: Community of Mesostigmata (Acari) in experimental habitat patches of forest floor. — *Eur. J. Soil Biol.* 32: 99–105.
- Huhta, V., Karppinen, E., Nurminen, M. & Valpas, A. 1967: Effects of silvicultural practices upon arthropod, annelid and nematode populations of coniferous forest soil. — *Ann. Zool. Fennici* 4: 87–143.
- Huhta, V., Ikonen, E. & Vilkkamaa, P. 1979: Succession of invertebrate populations in artificial soil made of sewage sludge and crushed bark. — *Ann. Zool. Fennici* 16: 223–270.
- Huhta, V., Hyvönen, R., Kaasalainen, P., Koskeniemi, A., Muona, J., Mäkelä, I., Sulander, M. & Vilkkamaa, P. 1986: Soil fauna of Finnish coniferous forests. — *Ann. Zool. Fennici* 23: 345–360.
- Huhta, V., Rätty, M., Ahlroth, P., Hänninen, S.-M., Mattila, J., Penttinen, R. & Rintala, T. 2005: Soil fauna of deciduous forests in central Finland. *Mem. Soc. Fauna Flora Fennica* 81: 52–70.
- Juslén, A. *et al.* (eds.) 2008: Research Programme of Deficiently Known and Threatened Forest Species 2003–2007 (PUTTE). — *Suomen Ympäristö* 1/2008, 146 pp. (in Finnish, English summary).
- Juvara-Bals, I. 2002: A revision of the genus *Heteroparasitus* new status, with the description of *Heteroparasitus (Medioparasitus) athiasae* subgen.n., sp.n. from Spain and with a key to the genera of Pergamasinae (Acari, Gamasida, Parasitidae). — *Rev. Suisse Zool.* 109: 23–46.
- Karg, W. 1989: Acari (Acarina) Milben, Unterordnung Parasitiformes (Anactinochaeta). Uropodina Kramer, Schildkrötenmilben. — *Tierwelt Deutschlands* 67: 1–203.

- Karg, W. 1993: Acari (Acarina) Milben, Parasitiformes (Anactinochaeta) Cohors Gamasina Leach: Raubmilben. — Tierwelt Deutschlands 59: 1–523.
- Karppinen, E. 1955: Ecological and transect survey studies of Finnish Camisiids (Acar., Oribatei). — Ann. Zool. Soc. “Vanamo” 17(2): 1–80.
- Karppinen, E. 1958a: Über die Oribatiden (Acar.) der finnischen Waldböden. — Ann. Zool. Soc. “Vanamo” 19(1): 1–43.
- Karppinen, E. 1958b: Untersuchungen über die Oribatiden (Acar.) der Waldböden von Hylocomium-Myrtillus-Typ in Nordfinnland. — Ann. Entomol. Fennici 24(4): 149–168.
- Karppinen, E. 1962: Zur Kenntnis der Oribatidenfauna Nordfinnlands. — Arch. Soc. “Vanamo” 16(1): 36–48.
- Karppinen, E. 1966: Investigations on the oribatid fauna (Acar.) of the seashore and archipelago of Finland. — Ann. Entomol. Fennici 32(1): 22–43.
- Karppinen, E. 1972: Studies on the Oribatid fauna of spruce-hardwood peatlands in southern Finland. I. — Ann. Entomol. Fennici 38(2): 96–99.
- Karppinen, E. 1977: Studies on the Oribatid fauna of spruce-hardwood peatlands in southern Finland. II. — Ann. Entomol. Fennici 43(3): 81–86.
- Linnaniemi (Axelson), W. M. 1907: Die Apterygotenfauna Finnlands. I. Allgemeiner Teil. — Acta Soc. Sci. Fenn. 34 (7): 1–134.
- Linnaniemi, W. M. 1912: Die Apterygotenfauna Finnlands. II. Spezieller Teil. — Acta Soc. Sci. Fenn. 40 (5): 1–359.
- Mašán, P. 2008: A review of the family Pachylaelapidae in Slovakia, with systematics and ecology of European species (Acari: Mesostigmata: Eviphioidea). — Institute of Zoology, Slovak Academy of Sciences, Bratislava. 247 pp.
- Niedbala W. 1992: Phthiracaroida (Acari, Oribatida). Systematic Studies. — Elsevier, Amsterdam, 612 pp.
- Niedbala W. 2002: Ptyctimous mites (Acari, Oribatida) of the Nearctic Region. — Monogr. Upper Silesian Museum 4: 1–261.
- Nielsen, C. O., Christensen, B., 1959. The Enchytraeidae. Critical revision and taxonomy of European species. — Natura Jutlandica 8–9: 1–160.
- Nielsen, C. O., Christensen, B., 1961. The Enchytraeidae. Critical revision and taxonomy of European species. Suppl. 1. — Natura Jutlandica 10, suppl.: 1–23.
- Nielsen, C. O., Christensen, B., 1963. The Enchytraeidae. Critical revision and taxonomy of European species. Suppl. 2. — Natura Jutlandica 10, suppl.: 1–19.
- Niemi, R., Karppinen, E. & Uusitalo, M., 1997. Catalogue of the Oribatida (Acari) of Finland. — Acta Zool. Fennica 207: 1–39.
- Nurminen, M. 1965a: Enchytraeids (Oligochaeta) from northern Norway and western Lapland. — Ann. Zool. Fenn. 2: 11–15.
- Nurminen, M. 1965b. Preliminary notes on the Enchytraeids (Oligochaeta) of the Ahvenanmaa Islands, South Finland, — Ann. Zool. Fenn. 2: 16–17.
- Nurminen, M. 1967: Faunistic notes on North-European enchytraeids (Oligochaeta). Ann. Zool. Fenn. 4: 567–587.
- Nurminen, M. 1970: Four new enchytraeids (Oligochaeta) from southern Finland. — Ann. Zool. Fenn. 7: 378–381.
- Siira-Pietikäinen, A., Pietikäinen, J., Fritze, H. & Haimi, J. 2001: Short-term responses of soil decomposer communities to forest management: clear felling versus alternative forest harvesting methods. — Can. J. For. Res. 31: 88–99.
- Silfverberg, H. 1998: A provisional list of Finnish Annelida. — Mem. Soc. Fauna Flora Fennica 74: 79–88.
- Weigmann G. 2006: Hornmilben, Oribatida. — Tierwelt Deutschlands 76: 1–520.

Table 1. Total numbers of Mesostigmata in each sampling area (Fig. 1) (bird nests excluded, totals include rare species).

Area	0	1	2	3	4	5	6	7	8	9	10	Σ
Number of samples	19	51	59	49	64	60	50	51	42	46	14	505
<i>Eviphis ostrinus</i> (C.L.Koch 1836)	1	32	40	13	31	22	14	36	23	19	1	232
<i>Alliphis siculus</i> (Oudemans 1905)	7	–	65	2	3	101	–	5	–	–	–	183
<i>Geholaspis longispinosus</i> (Kramer 1876)	–	7	3	–	5	4	1	1	–	–	–	21
<i>Holostaspella subornata</i> Breget. & Korol. 1960	–	–	–	–	1	1	–	4	–	–	–	6
<i>Macrocheles subbadius</i> (Berl. 1904)	–	–	–	–	20	–	6	–	–	1	–	27
<i>Macrocheles merdarius</i> (Berl. 1889)	–	12	35	–	–	–	–	60	1	82	–	190
<i>Macrocheles glaber</i> (Müller 1860)	–	–	21	3	8	41	9	–	–	1	–	83
<i>Macrocheles rotundiscutis</i> Breget. & Korol. 1960)	–	–	18	1	12	–	–	–	–	–	–	31
<i>Macrocheles montanus</i> (Willmann 1951)	–	6	–	3	–	1	2	–	–	–	–	12
<i>Pachyseius wideventris</i> Affi & Nasr 1984	–	6	–	2	1	3	–	–	–	–	–	12
<i>Pachydellus problematicus</i> Masan 2007	7	–	12	1	1	–	–	–	–	–	–	21
<i>Pachydellus furcifer</i> (Oud. 1903)	–	5	6	–	7	3	3	1	–	–	–	25
<i>Onchodellus bibulous</i> Masan 2007	–	3	1	–	6	–	–	–	–	–	–	10
<i>Onchodellus alpines</i> (Willm. 1953)	1	–	1	1	8	–	–	–	–	–	–	11
<i>Pseudoparasitus sellnicki</i> (Breget. & Korol. 1964)	1	3	9	10	9	5	1	–	6	2	–	46
<i>Pseudoparasitus placentulus</i> (Berl. 1887)	–	3	4	3	2	–	1	5	2	1	–	21
<i>Hypoaspis neocuneifer</i> Evans & Till 1966	–	2	–	–	–	–	–	–	–	22	–	24
<i>Hypoaspis vacua</i> (Michael 1891)	2	3	10	7	62	8	8	3	–	13	–	116
<i>Hypoaspis oblonga</i> (Halbert 1915)	–	–	–	24	2	1	–	–	2	–	–	29
<i>Hypoaspis pratensis</i> Huhta & Karg 2010	–	1	9	3	13	–	–	–	–	–	–	26
<i>Hypoaspis similisetae</i> Karg 1965	10	–	1	4	3	–	–	–	–	3	–	21
<i>Hypoaspis nollii</i> Karg 1962	25	6	54	36	98	10	25	63	22	32	–	371
<i>Hypoaspis fishtowni</i> Ruf & Koehler 1993	–	–	–	–	–	6	–	–	–	–	–	6
<i>Hypoaspis aculeifer</i> (Canestrini 1883)	8	22	40	27	49	29	8	15	–	–	–	198
<i>Hypoaspis montana</i> (Berl. 1904)	–	–	–	–	–	1	–	–	–	2	–	3
<i>Hypoaspis curtispilis</i> Hirschm. 1969	–	–	–	–	–	1	4	3	–	–	–	8
<i>Hypoaspis lubricoides</i> Karg 1971	–	1	–	–	–	–	–	2	2	1	–	6
<i>Hypoaspis giffordi</i> Evans & Till 1966	–	2	–	1	8	3	1	3	19	–	–	37
<i>Hypoaspis saana</i> Huhta & Karg 2010	–	–	–	–	–	–	–	–	–	–	8	8
<i>Hypoaspis astronomica</i> (C.L.Koch 1839)	–	–	5	–	–	1	–	–	–	–	–	6
<i>Hypoaspis austriaca</i> Sellnick 1935	–	1	3	2	16	–	–	15	–	–	–	37
<i>Androlaelaps casalis</i> (Berl. 1887)	–	–	–	–	5	–	–	11	6	–	–	22
<i>Androlaelaps myrmecophila</i> (Evans & Till 1966)	–	–	–	–	4	–	–	1	–	42	–	47
<i>Proprioseiopsis jugurtus</i> (Athias-Henriot 1966)	–	1	3	–	–	1	–	1	1	2	1	10
<i>Amblyseius obtusus</i> (C.L.Koch 1839)	1	2	–	–	–	1	–	–	–	1	–	5
<i>Amblyseius similifloridanus</i> (Hirschm. 1962)	–	–	–	1	–	1	–	1	–	–	–	3
<i>Ameroseius corbiculus</i> (Sowerby 1806)	–	–	3	–	1	–	–	–	–	–	–	4
<i>Proctolaelaps pygmaeus</i> (Müller 1860)	–	–	1	–	–	–	–	–	2	–	–	3
<i>Proctolaelaps jüradeus</i> (Schweizer 1949)	–	–	1	–	–	4	–	–	–	–	–	5
<i>Epicrius resinae</i> Karg 1971	–	21	8	5	14	20	10	4	–	–	–	82
<i>Neojordensia meritricha</i> Athias-Henriot 1973	–	–	–	–	3	–	–	2	1	–	–	6
<i>Neojordensia sinuate</i> Athias-Henriot 1973	–	4	–	–	4	3	–	1	–	–	–	12
<i>Lasioseius lawrencei</i> Evans 1958	–	–	1	–	2	6	4	–	–	–	–	13
<i>Lasioseius ometes</i> (Oudemans 1903)	–	1	1	–	–	–	–	–	–	–	–	2
<i>Lasioseius bispinosus</i> Evans 1958	3	–	2	9	5	–	–	–	–	–	–	19
<i>Cheiroseius laelaptoides</i> (Berl. 1887)	–	–	–	–	–	–	2	1	1	–	1	5
<i>Cheiroseius necorniger</i> (Oudemans 1903)	–	–	4	–	11	–	–	3	–	–	2	20
<i>Cheiroseius cassiteridium</i> (Evans & Hyatt 1960)	20	–	8	12	1	–	–	3	–	2	–	46
<i>Cheiroseius curtipes</i> (Halbert 1923)	1	–	–	–	3	–	–	–	11	–	–	15
<i>Cheiroseius longipes</i> (Willmann 1951)	9	1	12	1	13	–	4	1	3	–	–	44
<i>Cheiroseius mutilus</i> (Berl. 1916)	–	–	–	–	1	–	1	5	–	–	–	7
<i>Cheiroseius borealis</i> (Berl. 1904)	5	1	13	3	8	7	6	12	5	1	–	61
<i>Plesiosejous italicus</i> (Berl. 1905)	–	–	–	–	–	–	–	10	4	–	–	14
<i>Gamasellodes bicolor</i> (Berl. 1918)	–	2	6	3	1	9	–	–	–	–	1	22

Table 1 continued

<i>Leioseius elongates</i> Evans 1958	–	–	1	3	–	2	–	1	–	–	–	7
<i>Zercoseius spathuliger</i> (Leonardi 1899)	14	–	–	–	–	–	–	–	–	–	–	14
<i>Arctoseius semiscissus</i> (Berl. 1892)	–	–	27	–	–	2	–	–	3	–	–	32
<i>Arctoseius cetratus</i> (Sellnick 1940)	1	1	13	–	9	8	–	17	1	17	–	67
<i>Arctoseius brevichelis</i> Karg 1969	–	–	1	–	7	–	–	3	–	–	–	13
<i>Arctoseius pristinus</i> Karg 1962	–	–	–	–	–	3	–	–	–	–	–	6
<i>Arctoseius insularis</i> (Willmann 1952)	–	1	3	–	11	9	2	9	2	–	–	37
<i>Iphidozercon gibbus</i> (Berl. 1903)	2	–	2	–	–	3	–	–	13	–	–	20
<i>Asca aphidioides</i> (Linné 1758)	1	15	14	4	8	5	25	–	–	1	–	73
<i>Saprosecans baloghi</i> Karg 1964	–	–	2	–	–	3	–	–	–	–	–	5
<i>Halolaelaps punctulatus</i> (Leitner 1946)	14	91	82	–	4	14	5	36	121	3	–	370
<i>Parazercon radiatus</i> (Berl. 1914)	–	102	126	134	138	308	94	88	370	249	127	1736
<i>Prozercon kochi</i> Sellnick 1943	16	168	164	156	179	122	104	69	115	22	1	1116
<i>Prozercon traegardhi</i> (Halbert 1923)	6	–	1	–	–	–	–	4	–	–	–	11
<i>Prozercon "serlachii"</i>	–	–	2	–	–	6	4	1	6	5	1	25
<i>Mixozzercon sellnicki</i> (Schweizer 1948)	1	1	–	1	4	17	–	10	7	18	11	70
<i>Zercon zelawaiensis</i> Sellnick 1944	–	–	4	6	6	16	16	3	23	14	12	100
<i>Zercon carpathicus</i> Sellnick 1958	4	1	5	7	31	–	–	62	–	5	–	115
<i>Zercon curiosus</i> Trägårdh 1910	11	41	36	111	43	26	7	89	8	12	–	384
<i>Zercon forsslundi</i> Sellnick 1958	–	4	–	–	–	–	8	13	1	6	3	35
<i>Zercon joduthae</i> Sellnick 1944	–	–	–	–	–	–	–	–	3	9	–	12
<i>Zercon triangularis</i> C.L.Koch 1836	15	7	47	5	27	2	–	1	3	–	–	107
<i>Rhodacarus mandibularis</i> Berlese 1921	–	–	–	–	2	1	–	2	–	–	–	5
<i>Rhodacarus coronatus</i> Berlese 1921	–	1	5	–	–	1	–	–	–	–	–	7
<i>Rhodacarus haarlovi</i> Scherbak 1977	–	2	–	–	4	9	–	5	–	–	–	20
<i>Rhodacarellus epigynalis</i> Sheals 1956	–	9	6	1	–	–	–	–	–	–	–	16
<i>Rhodacarellus silesiacus</i> Willmann 1935	–	–	12	3	3	–	–	–	–	–	–	18
<i>Rhodacarellus kreuzi</i> Karg 1961	–	2	1	–	–	2	–	–	–	–	–	5
<i>Dendrolaelaps oudemansi</i> Halbert 1915	–	2	–	1	3	–	–	–	–	–	–	6
<i>Dendrolaelaps zwoelferi</i> Hirschm. 1960	–	17	3	2	1	–	–	–	–	–	–	23
<i>Dendrolaelaps foveolatus</i> (Leitner 1949)	–	2	19	–	–	20	–	–	–	–	–	41
<i>Punctodendrolaelaps fallax</i> (Leitner 1949)	–	–	6	8	–	5	–	–	–	21	–	40
<i>Punctodendrolaelaps sellnicki</i> (Hirschm. 1960)	–	–	3	1	1	–	–	–	–	–	–	5
<i>Punctodendrolaelaps trapezoides</i> (Hirschm. 1960)	–	–	–	–	7	8	9	20	14	11	–	69
<i>Punctodendrolaelaps punctatulus</i> (Hirschm. 1960)	–	–	–	–	–	11	6	18	1	16	–	52
<i>Punctodendrolaelaps arvicolus</i> (Hirschm. 1960)	2	3	8	1	–	2	–	–	–	–	–	16
<i>Punctodendrolaelaps strenzkei</i> (Hirschm. 1960)	–	–	42	–	49	–	1	19	–	–	–	111
<i>Punctodendrolaelaps rotundus</i> (Hirschm. 1960)	–	1	9	8	29	46	30	12	47	11	42	235
<i>Punctodendrolaelaps formicarius</i>	–	9	1	–	2	2	–	–	–	–	–	14
Huhta & Karg 2010												
<i>Cornodendrolaelaps presepum</i> (Berl. 1918)	–	–	–	–	9	–	6	–	–	4	–	19
<i>Cornodendrolaelaps cornutus</i> (Hirschm. 1960)	1	–	19	–	8	–	–	1	–	–	–	29
<i>Gamasellus montanus</i> (Willmann 1936)	–	–	–	–	–	–	–	25	8	1	–	34
<i>Holoparasitus calcaratus</i> (C.L.Koch 1839)	6	12	5	4	11	–	5	–	–	–	–	43
<i>Amblygamasus stramensis</i> Karg 1971	–	2	3	1	–	–	–	–	–	–	–	6
<i>Leptogamasus suecicus</i> (Trägårdh 1936)	18	70	63	36	49	8	25	–	–	–	–	269
<i>Pergamasus norvegicus</i> (Berl. 1905)	–	5	2	–	2	4	9	5	–	–	–	27
<i>Pergamasus quisquiliarum</i> (G. & R. Canestrini 1882)	1	–	2	1	4	1	2	–	–	–	–	11
<i>Pergamasus brevicornis</i> Berl. 1903	7	17	8	9	32	20	12	37	25	24	7	198
<i>Pergamasus crassipes</i> (Linné 1758)	6	3	2	–	2	–	1	–	–	–	–	14
<i>Paragamasus similis</i> (Willmann 1953)	–	8	1	–	–	–	–	–	–	–	–	9
<i>Paragamasus robustus</i> (Oud. 1902)	–	–	–	–	–	–	–	–	–	–	5	5
<i>Paragamasus small</i> spp.	2	–	–	16	3	1	–	1	–	–	–	23
<i>Paragamasus truncus</i> (Schweizer 1961)	28	7	1	8	3	–	–	–	–	–	–	47
<i>Paragamasus pratincola</i> (Athias-Henriot 1967)	–	10	4	10	7	–	–	–	–	–	–	31
<i>Paragamasus misellus</i> (Berl. 1904)	7	33	21	8	1	10	4	8	–	–	–	92
<i>Paragamasus cf. digitulus</i> (Karg 1963)	–	11	–	6	–	–	–	–	–	–	–	17
<i>Paragamasus parrunciger</i> (Bhattacharyya 1963)	–	44	30	29	33	10	–	15	–	–	–	161

Table 1 continued

<i>Paragamasus nasellus</i> (Karg 1968)	—	—	—	—	3	1	—	—	—	—	—	—	—	—	—	—	—	—	4
<i>Paragamasus celticus</i> (Bhattacharyya 1963)	2	1	5	6	9	1	—	36	—	6	—	—	—	—	—	—	—	—	66
<i>Paragamasus runciger</i> (Berl. 1904)	26	—	5	5	2	1	11	5	—	—	—	—	—	—	—	—	—	—	55
<i>Paragamasus schweizeri</i> (Bhattacharyya 1963)	—	—	—	—	—	—	—	—	—	65	52	18	135	—	—	—	—	—	135
<i>Paragamasus lapponicus</i> (Trägårdh 1910)	4	97	10	3	127	64	80	135	33	34	3	590	—	—	—	—	—	—	65
<i>Paragamasus runcatellus</i> (Berl. 1903)	—	12	7	12	18	—	16	—	—	—	—	—	—	—	—	—	—	—	65
<i>Paragamasus vagabundus</i> (Karg 1968)	15	39	76	131	109	87	73	30	12	23	—	595	—	—	—	—	—	—	94
<i>Cornigamasus lunaris</i> (Berl. 1882)	—	10	9	—	—	46	15	—	14	—	—	94	—	—	—	—	—	—	6
<i>Trachygamasus ambulacris</i> Willmann 1949	—	—	—	—	1	1	—	—	4	—	—	6	—	—	—	—	—	—	3
<i>Trachygamasus gracilis</i> (Karg 1965)	—	—	1	—	—	2	—	—	—	—	—	3	—	—	—	—	—	—	5
<i>Gamasodes bispinosus</i> (Halbert 1915)	1	—	2	—	2	30	—	2	—	—	—	37	—	—	—	—	—	—	21
<i>Parasitus mammillatus</i> (Berl. 1905)	—	—	5	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	7
<i>Parasitus coleopratorum</i> Linné 1758	—	1	7	—	1	—	10	2	—	—	—	21	—	—	—	—	—	—	7
<i>Parasitus beta</i> (Oudemans & Voigts 1904)	—	—	1	—	1	—	—	5	—	—	—	7	—	—	—	—	—	—	7
<i>Parasitus fimetorum</i> (Berl. 1903)	22	31	54	22	7	111	101	5	5	24	—	382	—	—	—	—	—	—	161
<i>Vulgarogamasus kraepelini</i> (Berl. 1905)	6	13	12	20	24	14	18	32	4	13	5	161	—	—	—	—	—	—	123
<i>Veigaia kochi</i> (Trägårdh 1901)	—	—	4	2	17	9	17	20	16	33	5	123	—	—	—	—	—	—	5
<i>Veigaia sibiriba</i> Bregetova 1961	—	—	—	—	—	—	—	—	2	1	2	5	—	—	—	—	—	—	5
<i>Veigaia nemorensis</i> (C.L.Koch 1839)	19	193	146	142	135	306	141	163	142	134	32	1553	—	—	—	—	—	—	75
<i>Veigaia exigua</i> (Berl. 1917)	—	7	26	6	1	22	3	7	2	1	—	75	—	—	—	—	—	—	164
<i>Veigaia cervae</i> (Kramer 1876)	4	49	9	12	12	23	22	27	3	3	—	164	—	—	—	—	—	—	66
<i>Veigaia transisalae</i> Oudemans 1902)	—	14	7	10	5	8	7	7	4	4	—	66	—	—	—	—	—	—	12
<i>Sejus togatus</i> C.L.Koch 1836	1	4	1	—	—	—	2	2	—	2	—	12	—	—	—	—	—	—	37
<i>Microseius truncicola</i> Trägårdh 1942	—	—	1	—	12	—	3	13	1	7	—	37	—	—	—	—	—	—	31
<i>Microgynium rectangulatum</i> Trägårdh 1942	—	1	15	4	—	—	7	—	3	1	—	31	—	—	—	—	—	—	323
<i>Trachytes pauperior</i> (Berl. 1914)	2	16	15	33	31	96	26	11	77	16	—	323	—	—	—	—	—	—	38
<i>Trachytes hirschmanni</i> Hutu 1973	—	—	—	—	—	—	4	—	15	6	13	38	—	—	—	—	—	—	845
<i>Trachytes aegrota</i> (C.L.Koch 1841)	4	163	39	25	141	95	60	91	95	82	50	845	—	—	—	—	—	—	6
<i>Trachytes edleri</i> Hutu 1983	—	—	—	—	—	—	—	—	1	5	—	6	—	—	—	—	—	—	408
<i>Trichouropoda polycetenaphila</i> Wisn. & Hirschm. 1986	—	81	18	47	86	10	111	39	10	6	—	408	—	—	—	—	—	—	42
<i>Trichouropoda ovalis</i> (C.L.Koch 1839)	10	2	6	2	7	2	1	12	—	—	—	42	—	—	—	—	—	—	16
<i>Trichouropoda dialveolata</i> Hirschm. & Z.-Nicol 1961	—	—	—	2	9	5	—	—	—	—	—	16	—	—	—	—	—	—	19
<i>Nenteria breviunguiculata</i> Willmann 1949	—	—	18	—	1	—	—	—	—	—	—	19	—	—	—	—	—	—	130
<i>Nenteria stammeri</i> Hirschm. & Z.-Nicol 1969	20	4	60	—	3	33	—	8	—	2	—	130	—	—	—	—	—	—	33
<i>Dinychus septentrionalis</i> (Trägårdh 1943)	—	—	1	13	—	13	1	1	—	4	—	33	—	—	—	—	—	—	21
<i>Dinychus sublaevis</i> (Trägårdh 1943)	—	—	—	—	—	—	—	—	20	1	—	21	—	—	—	—	—	—	8
<i>Dinychus crassus</i> (Trägårdh 1910)	—	—	—	—	1	—	1	—	1	5	—	8	—	—	—	—	—	—	77
<i>Dinychus perforatus</i> Kramer 1882	—	15	7	10	21	11	—	6	1	6	—	77	—	—	—	—	—	—	49
<i>Dinychus arcuatus</i> (Trägårdh 1943)	—	—	4	1	—	6	5	24	2	6	1	49	—	—	—	—	—	—	48
<i>Dinychus undulatus</i> Sellnick 1945	—	—	1	4	—	40	—	2	—	1	—	48	—	—	—	—	—	—	123
<i>Dinychus inermis</i> (C.L.Koch 1841)	28	3	58	12	22	—	—	—	—	—	—	123	—	—	—	—	—	—	97
<i>Urodiaspis tecta</i> (Kramer 1876)	—	15	6	9	17	18	10	1	15	2	4	97	—	—	—	—	—	—	367
<i>Uroobovella pyriformis</i> (Berl. 1920)	1	37	129	—	39	100	60	1	—	—	—	367	—	—	—	—	—	—	35
<i>Uroobovella fimicola</i> (Berl. 1903)	—	—	4	—	13	—	—	—	—	18	—	35	—	—	—	—	—	—	36
<i>Uroobovella difoveolata</i> Hirschm. & Z.-Nicol 1962	—	—	36	—	—	—	—	—	—	—	—	36	—	—	—	—	—	—	25
<i>Trachyuropoda coccinea</i> (Michael 1891)	—	5	2	1	—	1	14	2	—	—	—	25	—	—	—	—	—	—	129
<i>Uropoda orbicularis</i> (Müller 1776)	8	26	22	3	7	36	11	3	13	—	—	129	—	—	—	—	—	—	24
<i>Uropoda minima</i> Kramer 1882	9	4	—	5	6	—	—	—	—	—	—	24	—	—	—	—	—	—	8
<i>Uropoda repleta</i> (Berl. 1903)	7	—	1	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	85
<i>Uropoda undulata</i> Hirschm. & Z.-Nicol 1969	—	31	20	18	4	2	10	—	—	—	—	85	—	—	—	—	—	—	4
<i>Uropoda cassidea</i> (Hermann 1804)	—	3	1	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	21
<i>Discourella modesta</i> Leonardi 1900	—	12	7	—	—	1	1	—	—	—	—	21	—	—	—	—	—	—	—

Total	461	1767	2155	1351	2132	2190	1384	1587	1462	1205	367	16061	—	—	—	—	—	—	—
Total species	61	99	144	92	121	104	79	97	68	73	30	262	—	—	—	—	—	—	—

Table 2. Frequencies (nr of samples in which the species was found) of Mesostigmata species in each habitat (see text for details). 1. Pine forest, 2. Spruce forest, 3. Decid forest, 4. Swamp, 5. Pine bog, 6. Open bog, 7. Wetland, 8. Shore, 9. Sea shore, 10. Meadow, 11. Dry meadow, 12. Dead wood, 13. Ant hills, 14. Compost, dung, 15. Alpine, 16. Bird nests, 17. Records total

Habitat	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
N	39	34	40	30	35	32	15	34	30	39	39	36	35	41	26	22	527
<i>Eviphis ostrinus</i>	7	15	21	15	3	—	—	9	3	14	3	1	1	2	2	1	97
<i>Alliphis sicalus</i>	—	—	1	1	—	—	1	—	2	5	—	—	1	7	—	—	18
<i>Geholaspis longispinosus</i>	3	4	1	5	1	—	—	2	—	—	—	—	—	—	—	1	17
<i>Holostaspella subornata</i>	—	—	—	—	—	—	—	2	—	1	—	—	—	—	—	—	3
<i>Macrocheles subbadius</i>	—	—	—	—	1	—	—	—	—	—	—	—	—	3	—	—	4
<i>Macrocheles merdarius</i>	—	—	—	—	—	1	—	—	—	1	1	—	1	5	—	—	9
<i>Macrocheles glaber</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	16	—	—	16
<i>Macrocheles rotundiscutis</i>	—	—	1	—	—	—	—	—	—	—	—	—	—	4	—	—	5
<i>Macrocheles montanus</i>	—	—	5	—	1	—	—	1	—	—	1	—	—	1	—	—	9
<i>Pachyseius wideventris</i>	—	—	3	—	—	—	—	—	—	2	1	—	—	—	—	—	6
<i>Pachydellus problematicus</i>	—	—	2	—	—	—	—	2	—	3	—	—	—	—	—	—	7
<i>Pachydellus furcifer</i>	—	—	4	—	—	—	—	—	—	6	4	—	—	—	—	—	14
<i>Onchodellus bibulus</i>	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	6
<i>Onchodellus alpinus</i>	—	—	—	—	—	—	—	—	2	1	3	—	—	1	—	—	7
<i>Pseudoparasitus sellnicki</i>	1	—	—	1	5	4	4	3	7	2	3	1	—	—	—	—	31
<i>Pseudoparasitus placentulus</i>	2	2	1	1	2	—	1	3	1	1	—	—	2	2	—	—	18
<i>Hypoaspis neocuneifer</i>	—	—	—	—	1	—	—	—	—	—	—	—	—	2	—	—	3
<i>Hypoaspis vacua</i>	1	—	1	—	1	—	—	—	1	1	1	—	16	—	—	—	22
<i>Hypoaspis oblonga</i>	1	—	—	—	—	—	—	—	—	—	1	—	3	—	—	—	5
<i>Hypoaspis pratensis</i>	—	—	—	—	—	1	—	—	1	1	5	1	—	—	—	—	9
<i>Hypoaspis similisetae</i>	—	—	—	—	—	—	1	2	1	3	2	—	—	—	—	—	9
<i>Hypoaspis nollii</i>	1	—	2	1	—	3	6	15	14	8	20	2	1	—	—	—	73
<i>Hypoaspis fishtownii</i>	—	—	2	—	—	—	—	—	—	—	2	—	—	—	—	—	4
<i>Hypoaspis aculeifer</i>	18	12	9	4	—	1	—	5	1	8	6	2	6	1	—	—	73
<i>Hypoaspis montana</i>	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	3
<i>Hypoaspis curtipilis</i>	—	—	—	—	—	—	—	—	—	—	—	3	1	1	—	—	5
<i>Hypoaspis lubricoides</i>	1	—	—	—	—	—	—	—	—	—	1	2	1	1	—	—	6
<i>Hypoaspis giffordi</i>	1	—	—	—	—	—	—	—	—	1	—	2	8	—	—	—	12
<i>Hypoaspis saana</i>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	3
<i>Hypoaspis astronomica</i>	—	—	—	—	—	—	—	—	—	—	2	—	—	1	—	—	3
<i>Hypoaspis austriaca</i>	1	—	—	—	—	—	—	1	1	1	7	—	—	—	—	—	11
<i>Androlaelaps casalis</i>	1	1	1	—	1	3	—	—	2	—	1	2	3	—	1	18	34
<i>Androlaelaps myrmecophila</i>	—	—	—	—	—	—	—	—	—	—	—	1	2	—	—	—	3
<i>Proprioseiopsis jugortus</i>	6	—	—	—	—	—	1	—	—	1	—	—	—	—	1	—	9
<i>Amblyseius obtusus</i>	—	—	1	—	—	—	—	—	1	1	—	—	—	—	1	—	4
<i>Amblyseius similifloridanus</i>	—	—	—	—	—	—	—	—	—	—	—	2	1	—	—	—	3
<i>Ameroseius corbiculus</i>	—	—	—	—	—	—	—	—	1	1	—	—	—	2	—	—	4
<i>Proctolaelaps pygmaeus</i>	—	—	1	—	—	—	—	1	—	—	—	—	—	1	—	—	3
<i>Proctolaelaps jüradeus</i>	2	1	1	—	—	—	—	—	—	—	—	1	—	—	—	—	5
<i>Epicrius resiniae</i>	3	4	4	7	17	—	1	—	—	1	—	1	1	—	—	—	39
<i>Neojordensia meritricha</i>	—	—	—	—	—	—	—	1	1	—	1	—	—	—	—	—	3
<i>Neojordensia sinuata</i>	—	—	—	—	—	—	—	1	4	1	1	1	1	—	—	—	9
<i>Lasioseius lawrencei</i>	1	2	1	2	—	—	—	1	—	1	—	—	—	—	—	—	8
<i>Lasioseius ometes</i>	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	2
<i>Lasioseius bispinosus</i>	—	1	—	—	1	—	—	—	—	3	2	1	2	3	—	—	13
<i>Cheiroseius laelaptoides</i>	—	—	1	—	1	1	1	—	—	—	—	—	—	—	—	—	4
<i>Cheiroseius necomiger</i>	—	—	—	—	—	—	—	—	4	—	—	—	—	—	2	—	6
<i>Cheiroseius cassiteridium</i>	—	—	—	—	—	—	1	2	4	1	1	—	—	—	—	—	9
<i>Cheiroseius curtipes</i>	—	—	1	—	—	1	—	4	2	—	—	—	—	—	—	—	8
<i>Cheiroseius longipes</i>	—	—	—	—	—	2	3	1	10	—	1	—	—	—	—	—	17
<i>Cheiroseius mutilus</i>	—	—	—	—	—	3	—	2	—	—	—	—	—	—	—	—	5
<i>Cheiroseius borealis</i>	—	—	1	—	—	—	—	1	5	11	7	—	—	—	1	—	26

Table 2 continued

<i>Paragamasus nasellus</i>	–	–	–	–	1	–	–	2	–	–	–	–	–	–	–	–	3
<i>Paragamasus celticus</i>	1	1	4	–	–	–	–	1	7	5	1	–	–	–	–	–	20
<i>Paragamasus runciger</i>	–	–	–	–	–	–	2	–	10	6	4	–	–	–	–	–	22
<i>Paragamasus schweizeri</i>	4	1	4	3	3	1	–	1	–	6	–	2	2	–	12	–	39
<i>Paragamasus lapponicus</i>	22	19	15	19	12	3	–	5	1	12	9	9	12	2	4	1	145
<i>Paragamasus runcatellus</i>	–	–	–	–	–	–	1	–	2	–	6	2	–	–	6	–	17
<i>Paragamasus vagabundus</i>	5	4	18	9	7	3	3	21	11	16	17	6	7	3	4	–	134
<i>Cornigamasus lunaris</i>	–	–	–	–	–	–	–	–	–	–	–	–	–	11	–	1	12
<i>Trachygamasus ambulacris</i>	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	3
<i>Trachygamasus gracilis</i>	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	3
<i>Gamasodes bispinosus</i>	–	–	–	–	–	–	–	–	4	–	–	–	–	2	–	–	6
<i>Parasitus mammillatus</i>	–	–	–	–	–	–	–	–	1	–	–	–	–	2	–	–	3
<i>Parasitus coleopratorum</i>	–	–	–	–	–	–	–	–	–	–	–	–	–	8	–	–	8
<i>Parasitus beta</i>	–	–	–	–	–	–	–	–	1	1	–	–	–	1	–	–	3
<i>Parasitus fimetorum</i>	–	–	1	–	–	–	–	–	5	–	1	–	–	22	–	–	29
<i>Vulgarogamasus kraepelini</i>	11	20	16	8	2	–	1	5	2	10	3	3	5	3	4	1	94
<i>Veigaia kochi</i>	12	10	12	6	3	1	2	6	2	5	–	2	–	2	9	1	73
<i>Veigaia sibiriba</i>	1	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–	4
<i>Veigaia nemorensis</i>	36	34	39	27	27	5	5	16	1	21	18	8	15	5	18	–	275
<i>Veigaia exigua</i>	4	3	15	5	–	–	–	5	–	6	3	–	1	–	–	–	42
<i>Veigaia cervia</i>	15	17	10	10	7	2	1	7	–	9	3	3	4	1	–	–	89
<i>Veigaia transisalae</i>	–	–	1	2	3	12	5	4	–	–	–	–	–	–	1	–	28
<i>Sejus togatus</i>	–	–	–	–	–	–	–	–	–	–	–	6	1	–	1	–	8
<i>Microseius truncicola</i>	1	–	–	–	–	–	–	–	–	–	–	6	5	–	–	–	12
<i>Microgynium rectangulatum</i>	–	–	–	–	–	–	–	–	–	–	–	7	1	–	1	–	9
<i>Trachytes pauperior</i>	12	15	21	12	10	–	–	3	–	3	1	1	–	–	6	–	84
<i>Trachytes hirschmanni</i>	1	–	5	1	–	–	–	–	–	–	–	–	–	–	6	–	13
<i>Trachytes aegrota</i>	24	29	24	22	22	2	–	8	1	8	7	4	4	1	11	1	168
<i>Trachytes edleri</i>	–	1	–	1	–	–	–	–	–	–	–	–	–	–	1	–	3
<i>Trichouropoda polycytenaphila</i>	1	–	–	–	–	–	–	–	–	–	–	1	25	1	–	–	28
<i>Trichouropoda ovalis</i>	–	–	2	–	–	–	–	–	1	–	–	–	12	–	1	–	16
<i>Trichouropoda dialveolata</i>	1	3	1	1	–	–	–	–	–	–	–	–	–	–	–	–	6
<i>Nenteria breviunguiculata</i>	–	–	–	–	–	–	–	1	2	1	–	–	–	2	–	–	6
<i>Nenteria stammeri</i>	–	–	–	–	–	–	–	–	–	–	1	–	–	12	–	–	13
<i>Dinychus septentrionalis</i>	–	–	1	–	–	–	–	–	–	–	–	5	2	–	–	–	8
<i>Dinychus sublaevis</i>	–	–	1	–	–	–	–	–	–	–	–	1	–	1	–	–	3
<i>Dinychus crassus</i>	–	–	1	2	–	–	–	–	–	–	–	–	–	–	1	–	4
<i>Dinychus perforatus</i>	1	1	10	4	–	–	–	6	2	4	2	3	–	–	–	–	33
<i>Dinychus arcuatus</i>	1	1	4	–	–	–	–	1	–	–	1	8	1	4	1	–	22
<i>Dinychus undulatus</i>	–	–	–	–	–	–	2	1	2	–	–	–	–	–	1	–	6
<i>Dinychus inermis</i>	–	–	–	–	–	1	–	–	13	–	–	–	–	–	–	–	14
<i>Urodiaspis tecta</i>	2	8	16	7	2	1	–	1	–	5	2	–	–	–	3	1	48
<i>Uroobovella pyriformis</i>	–	–	1	1	–	–	–	–	–	–	–	–	–	18	–	–	20
<i>Uroobovella fimicola</i>	–	–	–	–	–	–	–	–	–	–	–	–	–	5	–	–	5
<i>Uroobovella difoveolata</i>	–	–	–	–	–	–	–	–	1	–	–	–	–	2	–	–	3
<i>Trachyuropoda coccinea</i>	–	–	–	–	–	–	–	–	–	–	–	–	7	–	–	–	7
<i>Uropoda orbicularis</i>	–	–	–	–	–	–	–	–	5	3	1	–	–	16	–	–	25
<i>Uropoda minima</i>	–	–	1	–	–	–	–	–	1	1	3	1	–	–	–	–	7
<i>Uropoda repleta</i>	–	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–	4
<i>Uropoda undulata</i>	–	–	–	1	1	5	4	5	1	–	–	–	–	–	–	–	17
<i>Uropoda cassidea</i>	–	–	2	–	–	–	–	1	–	–	–	–	–	–	–	–	3
<i>Discourella modesta</i>	–	–	–	–	–	–	–	–	3	3	–	–	–	–	–	–	6
Total species	67	50	83	48	37	32	26	65	71	84	91	76	70	101	42	22	–
Single records	33	20	36	19	16	15	13	29	29	35	40	32	29	51	20	18	–
Total, corrected	62	44	71	48	37	32	26	64	71	76	89	73	68	75	42	22	–

Table 3. Total numbers of Oribatida in each sampling area (Fig. 1). Bird nests and composts excluded totals include rare species.

Area	0	1	2	3	4	5	6	7	8	9	10	Σ
Number of samples	19	38	44	33	41	43	29	34	33	32	18	364
<i>Achipteria coleoptrata</i> (Linnaeus 1758)	12	102	90	31	200	14	19	38	–	–	–	506
<i>Achipteria sellnicki van der Hammen</i> 1951	20	–	–	–	–	–	–	–	–	–	–	20
<i>Acrogalumna longipluma</i> (Berlese 1904)	4	4	1	8	4	–	–	–	–	–	–	21
<i>Adoristes ovatus</i> (C. L. Koch 1839)	2	25	8	16	64	37	58	16	55	23	16	320
<i>Anachipteria deficiens Grandjean</i> 1932	–	–	4	–	–	10	–	–	12	–	–	26
<i>Astegistes pilosus</i> (C. L. Koch 1841)	3	4	2	1	–	–	–	2	10	–	–	21
<i>Autogneta longilamellata</i> (Michael 1885)	–	–	11	5	100	7	8	4	98	–	–	233
<i>Autogneta parva Forsslund</i> 1947	–	4	2	–	2	112	76	12	66	32	–	307
<i>Banksinoma lanceolata</i> (Michael 1885)	–	48	22	42	111	7	3	109	15	16	14	386
<i>Belba compta</i> (Kulczynski 1902)	–	1	–	–	–	–	4	–	22	23	7	57
<i>Brachyctoniidae</i>	2	243	161	277	162	611	276	53	49	52	9	1896
<i>Caenobelba montana</i> (Kulczynski 1902)	–	2	2	–	–	–	–	22	–	–	–	26
<i>Caleremaeus monilipes</i> (Michael 1882)	–	48	6	2	1	11	4	9	11	15	–	107
<i>Camisia biurus</i> (C. L. Koch 1839)	–	11	1	–	5	4	–	–	10	–	6	36
<i>Carabodes areolatus Berlese</i> 1916	–	176	–	2	2	–	–	–	–	–	–	181
<i>Carabodes femoralis</i> (Nicolet 1855)	–	4	27	1	–	23	3	14	13	4	–	89
<i>Carabodes ornatus Storkan</i> 1925	6	1	6	28	23	10	–	8	8	3	11	104
<i>Carabodes labyrinthicus</i> (Michael 1879)	5	52	12	33	23	46	13	59	32	81	45	402
<i>Carabodes marginatus</i> (Michael 1884)	1	2	2	–	–	2	2	5	13	63	2	93
<i>Carabodes subarcticus Trägårdh</i> 1902	15	96	25	30	39	190	51	72	70	226	198	1011
<i>Carabodes tenuis Forsslund</i> 1953	–	–	7	3	6	121	27	–	19	–	–	182
<i>Carabodes willmanni Bernini</i> 1975	–	65	–	2	–	–	–	–	–	–	–	67
<i>Cepheus cepheiformis</i> (Nicolet 1855)	–	7	11	9	15	16	–	1	–	3	–	62
<i>Ceratoppia bipilis</i> (Hermann 1804)	–	7	–	1	–	17	4	5	–	2	2	39
<i>Ceratozetes gracilis</i> (Michael 1884)	–	6	3	–	2	–	–	3	–	25	1	40
<i>Ceratozetes mediocris Berlese</i> 1908	54	64	4	30	24	–	–	16	–	–	–	192
<i>Ceratozetes minimus Sellnick</i> 1928	–	40	–	–	16	–	–	–	–	–	–	56
<i>Ceratozetes parvulus Sellnick</i> 1922	–	2	1	17	8	–	–	5	1	1	67	102
<i>Ceratozetes sellnicki Rajski</i> 1958	13	5	5	55	34	–	–	–	–	–	8	120
<i>Ceratozetes thienemanni Willmann</i> 1943	–	3	231	101	173	84	50	82	309	153	21	1208
<i>Chamobates borealis</i> (Trägårdh 1902)	8	20	101	52	101	67	72	138	173	131	110	973
<i>Chamobates cuspidatus</i> (Michael 1884)	7	7	28	8	5	–	7	3	–	–	27	93
<i>Chamobates spinosus Sellnick</i> 1928	–	–	–	–	5	1	1	3	–	–	–	10
<i>Conchogneta traegardhi</i> (Forsslund 1947)	27	79	258	279	84	152	442	278	401	654	97	2750
<i>Damaeus clavipes</i> (Hermann 1804)	1	1	3	1	1	–	1	2	–	1	–	11
<i>Damaeus onustus</i> C. L. Koch 1844	1	1	15	–	–	14	–	–	–	–	–	32
<i>Damaeus riparius Nicolet</i> 1855	5	–	2	1	–	–	–	–	–	–	–	8
<i>Diapterobates humeralis</i> (Hermann 1804)	–	6	–	1	9	–	–	4	21	1	8	50
<i>Dissorhina ornata</i> (Oudemans 1900)	1	42	51	25	78	29	32	28	66	309	89	748
<i>Edwardzetes edwardsii</i> (Nicolet 1855)	–	–	–	–	–	–	–	–	–	2	89	92
<i>Eniochthonius minutissimus</i> (Berlese 1903)	–	1	32	13	–	8	–	–	4	–	–	58
<i>Epidamaeus bituberculatus</i> (Kulczynski 1902)	–	1	3	–	49	–	4	–	–	–	–	57
<i>Epidamaeus kamaensis</i> (Sellnick 1926)	–	4	11	1	2	–	3	11	13	2	–	47
<i>Eueremaeus silvestris</i> (Forsslund 1957)	2	22	21	31	29	31	33	6	22	30	21	247
<i>Eulohmannia ribagai Berlese</i> 1910	–	–	–	–	–	–	–	3	24	11	9	47
<i>Eupelops acromios</i> (Hermann 1804)	–	–	51	–	5	–	–	4	–	4	2	66
<i>Eupelops plicatus</i> (C.L.Koch 1835)	–	–	–	–	9	–	–	–	–	–	–	9
<i>Eupelops torulosus</i> (C. L. Koch 1839)	6	25	35	42	74	21	4	15	1	15	1	239
<i>Euphthiracarus cribrarius</i> (Berlese 1904)	–	17	11	–	–	–	5	89	–	–	2	124
<i>Euphthiracarus monodactylus</i> (Willmann 1919)	2	19	21	–	11	–	–	11	–	–	–	64
<i>Euzetes globulus</i> (Nicolet 1855)	4	25	5	1	7	1	–	–	–	–	–	43
<i>Furcoribula furcillata</i> (Nordenskiöld 1901)	5	22	72	22	39	–	7	8	–	–	–	175
<i>Fuscozetes fuscipes</i> (C. L. Koch 1844)	48	10	5	22	150	–	–	–	25	9	–	269
<i>Galumna dimorpha Krivoluckaja</i> 1952	–	–	17	12	4	19	3	15	–	4	–	74

Table 3 continued

<i>Phthiracarus globosus</i> (C. L. Koch 1841)	33	56	46	–	41	2	1	22	1	2	–	204
<i>Phthiracarus longulus</i> (C. L. Koch 1841)	69	77	61	–	142	54	60	60	27	25	2	577
<i>Phthiracarus nitens</i> Nicolet 1855	4	6	–	–	5	5	9	3	3	8	4	47
<i>Pilogalumna tenuiclava</i> (Berlese 1908)	–	–	11	1	–	63	–	13	66	2	–	157
<i>Platynothrhus peltifer</i> (C. L. Koch 1839)	21	37	24	10	84	28	21	38	27	7	5	302
<i>Platynothrhus thori</i> (Berlese 1904)	30	–	–	–	75	–	–	–	3	–	–	108
<i>Porobelba spinosa</i> (Sellnick 1920)	–	25	31	58	83	21	25	14	7	23	6	294
<i>Protrobotritia oligotricha</i> Märkel 1963	–	–	–	–	–	–	–	–	2	2	–	4
<i>Punctoribates hexagonus</i> Berlese 1908	12	–	20	10	63	–	–	–	–	–	–	105
<i>Punctoribates punctum</i> (C. L. Koch 1839)	28	31	88	6	–	5	–	–	–	–	–	158
<i>Punctoribates sellnicki</i> Willmann 1928	–	–	10	1	–	1	5	5	–	–	–	22
<i>Quadroppia quadricarinata</i> (Michael 1885)	1	68	59	113	26	4	6	5	6	11	–	300
<i>Rhysotritia ardua</i> (C. L. Koch 1841)	3	54	22	–	75	44	71	31	19	22	7	348
<i>Schelorbates initialis</i> (Berlese 1908)	10	69	47	29	194	61	64	117	105	61	46	804
<i>Schelorbates laevigatus</i> (C. L. Koch 1836)	117	134	156	124	250	51	89	159	107	30	9	1226
<i>Schelorbates latipes</i> (C. L. Koch 1844)	4	45	84	118	49	124	90	116	57	39	3	729
<i>Schelorbates pallidulus</i> (C. L. Koch 1840)	33	87	26	89	269	70	110	421	88	99	–	1292
<i>Spatiodamaeus boreus</i> (Bulan.-Zachv. 1957)	1	16	7	–	20	–	1	15	5	4	–	69
<i>Steganacarus applicatus</i> (Sellnick 1920)	–	38	46	–	50	12	–	–	–	–	–	146
<i>Steganacarus carinatus</i> (C. L. Koch 1841)	6	294	144	–	106	51	2	3	–	–	42	648
<i>Steganacarus striculus</i> (C. L. Koch 1836)	111	318	305	–	368	221	156	48	161	31	44	1763
<i>Subiasella quadrimaculata</i> (Evans 1952)	3	–	3	113	99	95	6	84	27	283	–	712
Suctobelbelbidae	–	862	487	969	499	576	587	219	400	561	297	5458
<i>Tectocepheus velatus velatus</i> (Michael 1880)	40	498	736	997	1355	1799	961	872	1152	791	520	9720
<i>Tegorbates latirostris</i> (C. L. Koch 1844)	–	–	–	–	–	–	–	2	3	–	3	8
<i>Trhypochthonius tectorum</i> (Berlese 1896)	–	4	7	1	–	7	28	22	2	–	–	72
<i>Trichoribates incisellus</i> (Kramer 1897)	3	1	4	2	–	–	–	15	4	8	–	38
<i>Trichoribates novus</i> (Sellnick 1928)	–	–	–	1	1	5	–	–	–	–	–	7
<i>Trichoribates trimaculatus</i> (C. L. Koch 1835)	–	–	–	5	62	–	–	–	–	–	2	69
<i>Trimalaconothrus maior</i> (Berlese 1910)	13	21	40	49	1	15	18	42	3	2	–	204
<i>Tritegeus bisulcatus</i> Grandjean 1953	–	–	13	–	–	–	–	–	–	–	–	13
<i>Xenillus tegeocranus</i> (Hermann 1804)	5	8	1	–	–	1	15	–	–	–	–	30
<i>Zetomimus furcatus</i> (Warburton & Pearse 1905)	–	–	–	–	–	–	–	3	20	–	–	23
<i>Zygoribatula exilis</i> (Nicolet 1855)	–	–	–	–	4	5	–	–	–	–	–	9
Total	887	7480	7562	7917	9162	9132	7119	6026	6029	5452	2387	69152
Total species	80	110	113	99	105	88	84	98	85	83	72	190

Table 4. Frequencies (number of samples in which the species was recorded) of oribatid species in each habitat. 1. Pine, 2. Spruce, 3. Decid., 4. Swamp, 5. Pine bog, 6. Open bog, 7. Wetland, 8. Shore, 9. Sea-shore, 10. Meadow, 11. Dry meadow, 12. Dead wood, 13. Ant hills, 14. Alpine, 15. Records Tot.

Habitat	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
N	28	29	29	16	29	27	8	29	20	32	35	32	29	26	369
<i>Achipteria coleoptrata</i>	–	9	3	3	–	–	–	4	7	6	15	3	6	2	58
<i>Achipteria sellnicki</i>	–	–	–	–	–	–	–	–	1	–	–	2	–	–	3
<i>Acrogalumna longipluma</i>	–	1	2	–	–	1	–	–	–	–	–	3	1	–	8
<i>Adoristes ovatus</i>	12	14	4	4	10	1	–	2	3	–	2	8	12	11	83
<i>Anachiptheria deficiens</i>	–	–	–	–	–	2	–	1	–	–	–	–	1	–	4
<i>Astegistes pilosus</i>	–	–	–	–	–	–	1	3	4	–	–	–	–	–	8
<i>Autogneta longilamellata</i>	–	–	–	–	–	–	–	–	–	–	–	10	–	–	10
<i>Autogneta parva</i>	6	3	–	1	–	–	–	1	–	1	–	8	1	–	21
<i>Banksinoma lanceolata</i>	1	–	–	2	5	6	–	9	3	3	4	9	1	1	44
<i>Belba compta</i>	2	2	6	3	1	–	–	2	–	–	1	–	–	3	20
<i>Brachyctonidae</i>	18	18	14	7	13	13	5	6	2	7	7	10	18	6	144
<i>Caenobelba montana</i>	–	–	–	1	–	–	–	1	–	–	1	–	–	–	3
<i>Caleremaeus monilipes</i>	1	–	–	–	–	–	–	–	–	–	–	10	1	–	12
<i>Camisia biurus</i>	4	1	–	–	1	–	–	–	–	–	–	1	–	6	13
<i>Carabodes areolatus</i>	–	–	–	–	–	–	–	–	–	–	–	4	–	–	4
<i>Carabodes femoralis</i>	1	3	1	2	2	–	–	–	–	–	–	9	2	–	20
<i>Carabodes ornatus</i>	8	–	1	–	1	–	–	–	–	1	2	12	3	5	33
<i>Carabodes labyrinthicus</i>	2	11	1	3	2	–	–	–	–	–	–	23	8	6	56
<i>Carabodes marginatus</i>	3	–	–	–	1	–	–	–	–	–	1	8	2	4	19
<i>Carabodes subarcticus</i>	19	4	–	3	8	–	–	–	–	1	–	22	10	17	84
<i>Carabodes tenuis</i>	3	–	–	–	–	–	–	–	–	–	2	5	1	–	11
<i>Carabodes willmanni</i>	2	–	–	–	–	–	–	–	–	–	1	–	–	–	3
<i>Cepheus cepheiformis</i>	–	–	–	–	4	–	–	–	–	–	–	10	–	–	14
<i>Ceratoppia bipilis</i>	1	–	1	–	3	–	–	1	–	6	–	–	–	2	14
<i>Ceratozetes gracilis</i>	–	2	2	–	–	–	–	1	–	1	1	–	–	1	8
<i>Ceratozetes mediocris</i>	–	2	–	–	–	–	–	1	2	5	6	–	–	–	16
<i>Ceratozetes minimus</i>	1	3	–	–	–	–	–	–	–	–	1	–	–	–	5
<i>Ceratozetes parvulus</i>	–	–	–	–	–	7	1	–	–	1	–	–	–	2	11
<i>Ceratozetes sellnicki</i>	–	–	1	–	–	–	–	1	2	3	2	–	1	4	14
<i>Ceratozetes thienemanni</i>	15	13	9	8	3	2	–	2	–	–	8	1	6	5	72
<i>Chamobates borealis</i>	13	22	11	10	9	2	1	4	3	3	7	10	15	17	127
<i>Chamobates cuspidatus</i>	–	4	2	–	–	–	–	3	–	–	1	8	1	4	23
<i>Chamobates spinosus</i>	–	–	–	–	–	–	–	–	–	–	–	2	1	2	5
<i>Conchogneta traegardhi</i>	19	23	11	9	19	1	–	10	3	1	4	7	9	10	126
<i>Damaeus clavipes</i>	1	2	2	–	2	–	–	–	–	–	–	1	2	–	10
<i>Damaeus onustus</i>	–	2	2	1	2	–	–	–	–	–	4	1	–	–	12
<i>Damaeus riparius</i>	–	–	4	–	–	–	–	–	–	–	–	–	–	–	4
<i>Diapterobates humeralis</i>	2	–	–	–	3	1	–	–	–	–	1	3	3	4	17
<i>Dissorhina ornata</i>	6	9	3	2	5	–	1	1	–	8	6	8	14	11	74
<i>Edwardzetes edwardsii</i>	–	–	–	–	1	–	–	–	–	–	–	–	–	2	3
<i>Eniochthonius minutissimus</i>	–	–	–	–	1	–	–	–	1	1	5	1	–	–	9
<i>Epidamaeus bituberculatus</i>	–	–	–	–	–	–	–	–	–	–	–	2	2	–	4
<i>Epidamaeus kamaensis</i>	3	2	5	2	–	–	–	2	–	5	3	–	1	–	23
<i>Eueremaeus silvestris</i>	12	9	–	–	2	–	–	–	2	–	1	10	16	4	56
<i>Eulohmannia ribagai</i>	2	2	4	1	–	–	–	–	–	–	1	–	–	6	16
<i>Eupelops acromios</i>	1	4	1	1	–	–	–	–	1	1	4	–	–	4	17
<i>Eupelops plicatus</i>	–	–	–	–	–	–	–	–	–	1	–	–	–	3	4
<i>Eupelops torulosus</i>	6	5	4	3	2	2	1	2	7	1	9	2	4	1	49
<i>Euphthiracarus cribrarius</i>	–	–	1	–	–	–	–	–	–	–	–	7	–	1	9
<i>Euphthiracarus monodactylus</i>	2	7	3	1	1	–	–	3	–	–	2	1	–	–	20
<i>Euzetes globulus</i>	–	4	3	2	1	–	–	1	2	4	1	–	–	–	18
<i>Furcoribula furcillata</i>	7	–	–	–	–	–	–	3	3	2	4	7	6	–	32
<i>Fuscozetes fuscipes</i>	–	–	2	2	–	1	1	8	6	0	–	–	–	–	20

Table 4 continued

<i>Galumna dimorpha</i>	—	—	1	—	—	—	1	—	—	—	2	—	8	—	12
<i>Galumna elimata</i>	—	—	1	—	—	1	—	4	2	4	6	1	—	—	19
<i>Galumna lanceata</i>	1	—	2	—	1	—	—	1	—	1	1	—	4	—	11
<i>Galumna obvia</i>	—	—	—	—	—	—	—	—	4	1	1	—	—	—	6
<i>Gustavia microcephala</i>	—	—	1	—	—	—	—	4	3	2	2	—	—	—	12
<i>Hafenrefferia gilvipes</i>	—	1	—	—	—	—	—	—	—	—	—	—	5	—	6
<i>Heminothrus longisetosus</i>	18	16	2	8	7	1	—	—	1	—	—	4	3	14	74
<i>Hermannia subglabra</i>	—	—	—	—	—	—	—	—	3	—	—	—	—	—	3
<i>Hermanniella dolosa</i>	—	—	2	1	—	—	—	3	—	1	2	1	1	—	11
<i>Hoplophthiracarus illinoisensis</i>	—	—	—	1	12	19	4	3	—	—	1	1	1	2	44
<i>Hydrozetes lemnae</i>	—	—	—	—	—	—	—	3	4	2	—	—	—	—	9
<i>Hypochthonius rufulus</i>	—	5	11	10	24	7	2	9	3	5	3	3	1	1	84
<i>Hypodamaeus brevitibialis</i>	1	1	—	—	1	—	—	—	—	1	—	6	1	4	15
<i>Lagenobates lagenulus</i>	—	—	—	—	—	—	—	—	1	—	1	2	—	—	4
<i>Liacarus coracinus</i>	10	13	5	2	10	—	—	5	—	6	10	7	12	2	82
<i>Liacarus subterraneus</i>	—	5	3	1	—	—	—	1	—	—	2	1	1	—	14
<i>Licneremaeus licnophorus</i>	—	—	—	—	1	—	—	—	—	—	1	2	11	—	15
<i>Liebstadia similis</i>	—	—	4	—	—	1	—	2	3	11	8	1	1	—	31
<i>Limnozetes ciliatus</i>	—	—	—	—	1	5	1	1	—	—	—	—	—	1	9
<i>Mainothrus badius</i>	—	—	—	—	3	7	2	—	—	—	—	—	—	—	12
<i>Malaconothrus monodactylus</i>	1	2	4	6	17	15	5	9	4	2	3	—	—	2	70
<i>Melanozetes mollicomus</i>	5	2	—	1	—	2	—	2	—	1	—	11	—	11	35
<i>Mesotritia flagelliformis</i>	2	1	1	—	—	—	—	—	—	—	—	12	2	—	18
<i>Mesotritia nuda</i>	—	—	—	1	1	—	—	—	—	—	—	—	4	1	7
<i>Metabelba pulverosa</i>	—	8	8	1	—	—	—	1	—	5	9	2	8	—	42
<i>Micropoppia minus</i>	4	2	2	1	1	—	—	1	3	9	4	12	2	—	41
<i>Microtritia minima</i>	1	—	—	—	—	—	—	1	—	—	—	1	—	—	3
<i>Minunthozetes semirufus</i>	—	1	1	1	—	—	—	1	—	—	1	—	—	—	5
<i>Mucronothrus nasalis</i>	—	—	—	—	—	2	—	—	—	1	—	—	—	—	3
<i>Multioppia glabra</i>	—	1	5	1	1	1	—	1	1	—	1	1	1	—	14
<i>Nanhermannia nana</i>	4	6	7	9	25	25	4	10	1	2	2	2	1	1	99
<i>Nanhermannia sellnicki</i>	13	11	1	4	3	—	1	1	—	—	—	4	1	12	51
<i>Neonothrus humicolus</i>	1	4	—	1	—	—	—	—	—	—	—	—	—	—	6
<i>Neoribates aurantiacus</i>	1	—	—	—	—	—	—	—	3	2	3	1	—	5	15
<i>Nothrus palustris</i>	—	1	9	2	1	1	—	3	—	1	1	—	1	—	20
<i>Nothrus pratensis</i>	1	2	6	—	25	23	5	3	—	2	1	3	1	6	78
<i>Nothrus silvestris</i>	12	16	8	7	2	1	1	7	—	1	3	5	3	2	68
<i>Oppiella unicarinata</i>	3	2	—	—	2	—	—	—	—	—	—	7	9	—	23
<i>Oppiella keilbachi</i>	2	—	—	—	—	—	—	—	—	—	—	—	—	3	5
<i>Oppiella maritima</i>	3	5	3	5	9	6	3	1	—	—	1	6	6	7	55
<i>Oppiella neerlandica</i>	—	—	—	—	—	—	—	—	—	1	—	1	—	4	6
<i>Oppiella nova</i>	26	27	20	16	28	25	8	21	8	13	20	21	25	16	274
<i>Oppiella splendens</i>	1	—	—	2	—	—	—	—	—	—	1	1	2	1	8
<i>Oppiella subpectinata</i>	21	26	20	15	25	11	4	10	2	16	15	10	17	15	207
<i>Oppiella translamellata</i>	2	4	6	2	6	2	1	4	—	3	1	3	5	9	48
<i>Oribatella calcarata</i>	—	—	1	—	—	—	—	—	2	1	1	2	—	—	7
<i>Oribatella sexdentata</i>	—	—	—	—	—	—	—	—	1	—	—	4	—	—	5
<i>Oribatula tibialis</i>	6	2	2	—	2	1	—	7	3	1	—	12	5	17	58
<i>Oribella pectinata</i>	—	—	—	1	—	—	1	—	2	—	—	—	—	—	4
<i>Pantelozetes paolii</i>	—	—	1	—	—	—	—	1	3	—	—	—	—	—	5
<i>Parachipteria bella</i>	—	—	1	—	—	—	—	—	3	2	2	1	—	—	9
<i>Parachipteria punctata</i>	6	13	2	9	10	1	1	2	1	1	1	7	1	1	56
<i>Pergalumna altera</i>	—	—	4	—	—	3	1	1	3	1	3	1	2	—	19
<i>Pergalumna nervosa</i>	10	7	3	2	15	4	1	1	—	3	2	10	13	—	71
<i>Phauloppia lucorum</i>	—	—	1	—	—	—	—	—	—	—	—	4	—	—	5
<i>Phauloppia nemoralis</i>	—	—	1	—	—	—	—	—	—	—	—	3	1	—	5
<i>Phthiracarus boresetosus</i>	5	18	8	8	10	—	—	3	—	1	3	2	10	2	70
<i>Phthiracarus bryobius</i>	6	5	7	1	5	—	1	1	1	1	—	15	1	1	45
<i>Phthiracarus crinitus</i>	—	—	3	2	—	—	—	—	—	—	—	1	1	—	7

Table 4 continued

<i>Phthiracarus ferrugineus</i>	–	–	–	2	–	–	–	4	1	–	–	1	–	1	9
<i>Phthiracarus globosus</i>	3	5	15	3	–	–	–	6	3	7	8	4	7	–	61
<i>Phthiracarus longulus</i>	24	18	15	8	11	–	–	2	1	3	9	8	12	5	116
<i>Phthiracarus nitens</i>	10	1	1	1	3	–	1	1	–	–	1	4	4	2	29
<i>Pilogalumna tenuiclava</i>	–	–	1	1	2	–	3	2	1	–	1	–	2	–	13
<i>Platynothrus peltifer</i>	–	8	8	6	2	–	–	11	11	5	11	–	4	3	69
<i>Platynothrus thori</i>	–	–	–	–	–	–	–	1	5	–	–	–	–	–	6
<i>Porobelba spinosa</i>	15	12	4	1	4	–	–	–	–	1	2	3	9	8	59
<i>Protoribotritia oligotricha</i>	1	–	1	–	–	–	–	–	–	–	–	1	–	–	3
<i>Punctoribates hexagonus</i>	–	–	–	1	–	–	–	–	5	1	–	–	–	–	7
<i>Punctoribates punctum</i>	–	1	3	–	–	–	–	1	4	8	5	1	2	–	25
<i>Punctoribates sellnicki</i>	–	–	–	–	–	–	2	1	–	–	–	–	–	–	3
<i>Quadroppia quadricarinata</i>	5	7	6	6	2	–	–	3	–	2	9	3	3	2	48
<i>Rhysotritia ardua</i>	14	3	2	5	23	–	2	5	1	1	1	1	5	2	65
<i>Scheloribates initialis</i>	19	22	14	10	12	–	–	8	6	11	14	10	12	6	144
<i>Scheloribates laevigatus</i>	2	1	4	2	16	–	4	15	17	26	27	–	6	2	122
<i>Scheloribates latipes</i>	15	9	3	4	19	–	1	3	1	2	3	16	14	1	91
<i>Scheloribates pallidulus</i>	1	–	–	1	1	–	–	1	–	–	–	18	24	–	46
<i>Spatiodamaeus boreus</i>	1	1	3	2	1	–	–	5	5	6	5	2	1	–	32
<i>Steganacarus applicatus</i>	–	10	2	5	–	–	–	1	–	–	–	1	4	–	23
<i>Steganacarus carinatus</i>	9	13	5	5	3	–	–	1	1	1	1	3	11	1	54
<i>Steganacarus striculus</i>	5	9	17	11	24	–	5	15	4	6	5	3	4	4	112
<i>Subiasella quadrimaculata</i>	–	1	–	2	–	–	–	–	1	–	–	13	11	–	28
<i>Suctobelbelbidae</i>	23	26	23	15	27	–	5	16	1	13	15	17	17	24	222
<i>Tectocephus velatus velatus</i>	26	27	13	13	27	–	8	11	12	19	30	27	25	23	261
<i>Tegoribates latirostris</i>	–	–	–	–	–	–	–	1	–	1	–	–	–	1	3
<i>Trhypochthonius tectorum</i>	2	–	–	1	–	–	1	–	2	–	–	–	–	–	6
<i>Trichoribates incisellus</i>	–	–	–	–	2	–	1	–	1	3	11	2	–	1	21
<i>Trichoribates novus</i>	–	–	–	–	2	–	–	–	–	–	3	–	–	–	5
<i>Trichoribates trimaculatus</i>	–	–	–	–	–	–	–	2	–	–	2	–	–	2	6
<i>Trimalaconothrus maior</i>	1	–	–	2	1	–	5	8	3	1	2	–	–	–	23
<i>Tritegeus bisulcatus</i>	–	–	1	–	–	–	–	1	–	–	3	–	1	–	6
<i>Xenillus tegeocranus</i>	–	1	3	1	–	–	–	1	–	1	–	2	1	–	10
<i>Zetomimus furcatus</i>	–	1	–	–	–	–	–	1	–	–	–	1	–	–	3
<i>Zygoribatula exilis</i>	–	–	–	–	–	–	–	–	–	–	–	3	–	–	3
Total species	77	77	90	77	72	36	40	85	69	77	92	106	89	79	190
Single records	19	15	22	25	19	13	20	33	20	32	29	25	28	16	–
New to Finland	2	1	5	2	2	2	2	5	6	4	6	3	6	2	–

Table 5. Total numbers of Collembola in each sampling area (Fig. 1).

Area	0	1	2	3	4	5	6	7	8	9	Σ
Number of samples	18	39	46	36	34	49	33	39	41	39	374
<i>Allacma fusca</i> (Linnaeus 1758)	–	6	5	–	–	1	–	–	–	–	309
<i>Anurida ellipsoides</i> Stach 1949	2	14	4	–	4	–	–	3	–	–	14
<i>Anurida granaria</i> (Nicolet 1847)	–	4	4	–	–	–	–	–	–	–	103
<i>Anurida tullbergi</i> Schött 1891	4	4	50	–	–	–	–	–	–	–	12
<i>Anurophorus atlanticus</i> Fjellberg 1974	–	–	2	–	–	–	–	–	–	–	3
<i>Anurophorus septentrionalis</i> Palissa 1966	–	22	104	34	18	168	80	23	246	269	41
<i>Appendisotoma abiskoensis</i> (Agrell 1939)	–	–	19	–	18	–	–	–	–	–	489
<i>Arrhopalites caecus</i> (Tullberg 1871)	–	–	4	–	–	–	–	–	–	–	53
<i>Arrhopalites cochlearifer</i> Gisin 1947	–	–	2	2	–	–	–	–	–	–	1
<i>Arrhopalites principalis</i> Stach 1945	–	–	1	2	–	3	30	–	13	13	11
<i>Ballistura borealis</i> (Axelson 1905)	–	10	–	–	–	–	–	–	–	–	445
<i>Ballistura schoetti</i> (Dalla & Torre 1895)	–	10	6	3	3	4	7	2	–	–	380
<i>Bourletiella hortensis</i> (Fitsch 1863)	–	–	3	–	–	–	–	–	–	–	6
<i>Brachystomella parvula</i> (Schäffer 1896)	4	–	–	–	–	–	–	–	–	–	2
<i>Ceratophysella bentgssoni</i> (Ågren 1904)	–	2183	–	27	–	5	–	–	–	–	35
<i>Ceratophysella denticulata</i> (Bagnall 1941)	–	380	21	74	613	1440	–	421	14	20	3
<i>Ceratophysella engadinensis</i> (Gisin 1949)	–	–	–	1	–	5	–	–	–	–	4
<i>Ceratophysella scotica</i> (Carpenter & Evans 1899)	–	–	–	2	–	10	2	3	–	2	10
<i>Choreutinula inermis</i> (Tullberg 1871)	–	–	5	–	–	–	6	14	–	2	13
<i>Cryptopygus bipunctatus</i> (Axelson 1903)	–	35	102	7	–	–	–	–	–	–	3
<i>Desoria blekeni</i> (Leinaas 1980)	1	–	2	–	–	–	–	–	–	–	159
<i>Desoria blufusata</i> (Fjellberg 1978)	–	–	–	–	–	–	2	–	–	–	4117
<i>Desoria divergens</i> (Axelson 1900)	–	–	–	–	2	11	–	10	18	–	1045
<i>Desoria fennica</i> (Reuter 1895)	–	–	–	–	–	–	–	–	–	2	1
<i>Desoria grisea</i> (Lubbock 1869)	1	4	18	10	2	–	19	8	–	–	2245
<i>Desoria hiemalis</i> (Schött 1893)	–	–	5	43	11	53	39	10	81	115	6
<i>Desoria intermedia</i> (Schött 1902)	–	1	–	–	–	–	–	–	–	–	63
<i>Desoria neglecta</i> (Schäffer 1900)	–	–	6	–	–	3	2	10	1	2	56
<i>Desoria olivacea</i> (Tullberg 1871)	–	8	–	–	24	3	–	–	–	–	14
<i>Desoria potapovi</i> Fjellberg 2007	–	–	2	–	–	–	–	–	–	–	37
<i>Desoria propinqua</i> (Axelson 1902)	–	–	–	9	–	–	–	3	–	–	141
<i>Desoria tigrina</i> Nicolet 1842	–	–	–	–	–	–	–	4	–	–	47
<i>Desoria tolya</i> Fjellberg 2007	8	4	–	–	–	15	11	6	98	33	18
<i>Dicyrtoma fusca</i> (Lubbock 1873)	–	7	3	2	–	1	1	–	–	–	6
<i>Entomobrya corticalis</i> (Nicolet 1842)	4	17	3	55	5	13	1	5	–	–	1
<i>Entomobrya marginata</i> (Tullberg 1871)	–	–	–	10	–	–	–	2	–	–	99
<i>Entomobrya nicoleti</i> (Lubbock 1868)	–	–	–	–	–	1	1	–	–	–	20
<i>Entomobrya nivalis</i> (Linnaeus 1758)	3	6	4	–	2	–	–	–	–	–	22
<i>Folsomia bisetosa</i> Gisin 1953	–	–	–	–	–	–	–	–	–	141	204
<i>Folsomia candida</i> (Willem 1902)	–	–	1	–	–	–	–	–	–	–	468
<i>Folsomia dovrensis</i> Fjellberg 1976	–	4	9	9	4	44	–	–	–	10	161
<i>Folsomia fimetaria</i> (Linnaeus 1758)	–	202	2	264	–	1	–	–	4	–	20
<i>Folsomia fimetarioides</i> (Axelson 1903)	–	724	317	–	601	298	–	545	7	283	5
<i>Folsomia litsteri</i> Bagnall 1939	6	–	–	–	–	–	–	31	–	–	45
<i>Folsomia manolachei</i> Bagnall 1939	12	23	–	–	–	–	–	190	13	254	36
<i>Folsomia palaeartica</i> Potapov & Babenko 2000	–	–	–	–	–	–	–	6	–	517	5
<i>Folsomia quadrioculata</i> (Tullberg 1871)	–	–	675	–	508	428	371	–	–	–	111
<i>Folsomia quadrioculata/manolachei</i>	329	530	–	1052	–	36	–	210	740	353	7408
<i>Folsomia sensibilis</i> Kseneman 1936	–	2	–	–	–	9	–	–	58	92	186
<i>Friesea mirabilis</i> (Tullberg 1871)	12	–	295	–	169	63	143	–	–	–	2
<i>Friesea mirabilis/truncata</i>	–	151	3	196	–	–	–	151	156	214	40
<i>Friesea truncata</i> Cassagnau 1958	4	–	–	–	–	–	–	–	–	–	63
<i>Gisnianus flammeolus</i> (Gisin 1957)	–	2	10	–	4	6	–	–	–	–	48
<i>Heterosminthurus</i> Claviger Gisin 1958	–	1	2	–	–	–	–	–	–	–	270
<i>Hymenaphorura polonica</i> Pomorski 1990	–	1	6	1	–	–	–	–	6	–	1

Table 5 continued

<i>Hypogastrura assimilis</i> Krausbauer 1898	—	—	190	—	6	—	—	—	—	—	2
<i>Hypogastrura distincta</i> (Axelson 1902)	—	8	34	6	3647	2341	2126	305	414	—	4
<i>Hypogastrura litoralis</i> (Axelson 1907)	—	—	—	—	—	10	—	208	—	—	8
<i>Hypogastrura manubrialis</i> (Tullberg 1869)	—	—	—	—	—	—	—	—	—	18	964
<i>Hypogastrura purpurescens</i> (Lubbock 1867)	38	—	—	—	—	3	—	—	—	—	4
<i>Hypogastrura socialis</i> (Uzel 1891)	—	—	—	—	3	—	—	—	—	—	61
<i>Hypogastrura vernalis</i> (Carl 1901)	3	17	—	—	—	—	—	—	—	—	37
<i>Hypogastrura viatica</i> (Tullberg 1872)	468	—	—	—	—	—	—	—	—	—	58
<i>Isotoma anglicana</i> Lubbock 1862	3	34	7	3	1	110	—	—	—	3	6
<i>Isotoma caerulea</i> Bourlet 1839	44	14	1	14	69	8	—	52	—	2	18
<i>Isotoma riparia</i> (Nicolet 1842)	9	—	—	24	4	—	—	9	—	—	853
<i>Isotoma viridis</i> Bourlet 1839	—	9	26	31	1	6	13	40	37	23	2698
<i>Isotomiella minor</i> (Schäffer 1896)	22	665	1131	593	364	1361	310	234	1500	1227	3
<i>Isotomurus antennalis</i> Bagnall 1940	—	—	45	65	—	—	—	—	—	—	411
<i>Isotomurus balteatus</i> (Reuter 1876)	—	—	11	—	22	—	3	—	—	—	626
<i>Isotomurus graminis</i> Fjellberg 2007	—	—	—	—	—	—	—	5	—	—	926
<i>Isotomurus italicus</i> Carapelli et al. 1995	5	—	—	—	—	—	—	—	—	—	333
<i>Isotomurus palustris</i> (Müller 1776)	—	—	—	—	—	1	—	—	2	—	139
<i>Karlstejnina norvegica</i> Fjellberg 1974	—	—	3	—	—	—	—	—	—	—	196
<i>Lepidocyrtus cyaneus</i> Tullberg 1871	—	445	—	6	—	1	—	14	11	11	401
<i>Lepidocyrtus lignorum</i> (Fabricius 1793)	1	34	151	111	39	21	34	5	30	18	21
<i>Lepidocyrtus violacea/cyaneus</i>	—	—	15	—	338	—	28	—	—	—	74
<i>Lepidocyrtus violaceus</i> (Geoffroy 1762)	1	1	—	2	—	41	—	—	—	—	917
<i>Lipothrix lubbocki</i> (Tullberg 1872)	8	—	—	—	—	—	—	—	—	—	35
<i>Megalothorax minimus</i> Willem 1900	2	20	60	45	71	25	21	4	39	52	64
<i>Mesaphorura critica</i> Ellis 1976	—	—	28	—	—	2	—	3	1	91	3
<i>Mesaphorura italica</i> (Rusek 1971)	—	—	—	—	—	—	—	—	139	—	4
<i>Mesaphorura krausbaueri</i> Börner 1901	—	41	—	—	18	—	—	2	271	—	682
<i>Mesaphorura macrochaeta</i> Rusek 1976	33	29	67	524	89	86	22	63	—	13	161
<i>Mesaphorura sylvatica</i> (Rusek 1971)	—	32	24	4	204	19	—	54	273	16	22
<i>Mesaphorura tenuisensillata</i> Rusek 1974	2	50	9	—	67	1	1	32	106	142	14
<i>Mesaphorura yosii</i> (Rusek 1967)	—	255	352	298	164	82	581	122	170	470	872
<i>Metaphorura affinis</i> (Börner 1902)	74	—	1	—	—	—	—	—	702	—	492
<i>Micranurida forsslundi</i> Gisin 1949	—	22	4	26	5	—	—	5	—	16	175
<i>Micranurida granulata</i> (Agrell 1943)	—	—	2	8	—	14	—	—	4	7	12
<i>Micranurida pygmaea</i> Börner 1901	—	57	141	112	90	133	147	26	12	111	4
<i>Micranurida absoloni</i> (Börner 1901)	2	159	121	129	226	665	220	449	134	593	141
<i>Neanura muscorum</i> (Templeton 1835)	2	36	22	59	36	41	92	28	515	22	2
<i>Neelides minutus</i> (Folsom 1901)	—	—	—	—	—	—	—	—	17	1	3
<i>Onychiurus nervosus</i> Stach 1954	—	1	5	—	—	—	—	—	—	—	37
<i>Orchesella bifasciata</i> Bourlet 1839	—	—	—	4	9	—	—	—	—	—	3
<i>Orchesella cincta</i> (Linnaeus 1758)	1	—	—	—	—	—	—	—	—	—	941
<i>Orchesella flavescens</i> Bourlet 1840	—	—	4	1	5	4	—	—	1	3	4
<i>Paratullbergia callipygos</i> (Börner 1902)	4	2	—	—	—	—	—	—	—	—	523
<i>Parisotoma ekmani</i> (Fjellberg 1977)	—	—	—	—	—	—	20	15	13	8	34
<i>Parisotoma notabilis</i> (Schäffer 1896)	65	488	540	691	313	525	442	556	318	178	78
<i>Parisotoma trichaeotosa</i> (Martynova 1977)	—	—	—	—	—	—	—	111	48	—	829
<i>Pogonognathellus flavescens</i> (Tullberg 1871)	—	9	10	4	5	27	—	9	—	—	3
<i>Proisotoma clavipila</i> (Axelson 1903)	—	—	—	5	21	—	—	10	—	1	8
<i>Proisotoma minima</i> Absolon 1901	—	2	27	—	27	1	—	—	84	—	338
<i>Proisotoma minuta</i> (Tullberg 1871)	5	—	5	296	738	—	1	—	—	—	45
<i>Proisotoma ripicola</i> Linnaniemi 1912	46	1	—	—	—	—	—	—	—	—	124
<i>Protaphorura armata</i> (Tullberg 1869)	183	295	350	254	238	193	97	225	154	256	79
<i>Protaphorura tricampata</i> (Gisin 1956)	—	—	—	—	—	3	2	2	8	—	472
<i>Protaphorura subuliginata</i> (Gisin 1956)	—	2	—	—	—	—	—	—	6	91	2776
<i>Pseudachorutella asigillata</i> (Börner 1901)	—	—	—	—	1	—	—	—	—	—	356
<i>Pseudachorutes corticicolus</i> (Schäffer 1896)	—	2	—	12	—	—	2	6	—	—	2
<i>Pseudachorutes dubius</i> Krausbauer 1898	—	7	1	—	2	3	3	2	2	—	1
<i>Pseudachorutes parvulus</i> Börner 1901	—	—	—	—	—	1	11	9	—	—	35

Table 5 continued

<i>Pseudachorutes subcrassus</i> Tullberg 1871	–	7	2	–	–	6	3	56	–	–	24
<i>Pseudanurophorus binoculatus</i> Kseneman 1934	–	3	1	3	4	204	28	87	223	363	18
<i>Pseudosinella alba</i> (Packard 1873)	2	34	55	–	302	8	–	–	–	–	1
<i>Ptenothrix atra</i> (Linnaeus 1758)	–	–	–	–	1	–	–	–	–	–	279
<i>Schoettella ununguiculata</i> (Tullberg 1869)	–	–	–	–	–	64	–	–	–	–	27
<i>Sinella tenebricosa</i> Folsom 1902	–	–	–	10	912	–	19	–	–	–	15
<i>Sminthurides malmgreni</i> (Tullberg 1876)	–	–	–	1	–	1	1	–	–	–	5
<i>Sminthurides niger</i> -group	–	–	–	–	–	–	–	–	4	–	85
<i>Sminthurides parvulus</i> (Krausbauer 1898)	1	–	–	–	–	2	–	–	–	–	613
<i>Sminthurides schoetti</i> Axelson 1903	–	–	13	4	–	6	3	–	–	2	10
<i>Sminthurinus alpinus</i> Gisin 1953	–	–	17	–	–	–	–	–	–	–	1394
<i>Sminthurinus aureus</i> (Lubbock 1862)	1	8	10	34	–	2	–	2	2	4	5
<i>Sminthurus viridis</i> (Linnaeus 1758)	–	–	–	3	–	–	–	–	–	–	1203
<i>Sphaeridia pumilis</i> (Krausbauer 1898)	–	14	–	5	5	37	–	–	–	12	73
<i>Stenaphorura lubbocki</i> Börner 1901	–	–	5	–	–	–	–	–	–	–	3249
<i>Stenaphorura quadrispina</i> Börner 1901	–	10	–	–	–	–	–	–	–	–	1983
<i>Tetracanthella wahlgreni</i> Linnaniemi 1907	–	–	–	–	2	–	–	–	49	34	218
<i>Tomocerina minuta</i> (Tullberg 1876)	1	–	1	5	–	–	–	4	18	25	17
<i>Tomocerus vulgaris</i> (Tullberg 1871)	–	–	–	1	604	–	8	–	–	–	27
<i>Wankeliella peterseni</i> Rusek 1975	–	–	–	–	–	–	–	–	1	–	8880
<i>Vertagopus cinereus</i> (Nicolet 1842)	–	–	–	–	–	–	–	4	6	1	2495
<i>Vertagopus haagvari</i> Fjellberg 1996	5	–	–	–	–	–	–	–	–	–	777
<i>Willemia anophthalma</i> Börner 1901	1	49	86	86	58	191	82	108	481	253	144
<i>Willemia denisi</i> Mills 1932	–	–	2	2	2	9	2	–	2	28	3
<i>Willowsia buskii</i> (Lubbock 1870)	–	4	–	–	–	2	–	–	–	–	64
<i>Xenylla boernerii</i> Axelson 1905	18	60	–	–	77	15	103	6	–	–	6
<i>Xenylla brevicauda</i> Tullberg 1869	–	–	–	–	261	4	–	–	–	5	19
<i>Xenylla humicola</i> (O.Fabricius 1780)	2	–	–	–	–	–	–	4	–	–	2215
<i>Xenylla maritima</i> Tullberg 1869	–	–	–	17	2	16	–	–	–	–	27
<i>Xenylla mucronata</i> Axelson 1903	–	–	–	–	–	2	–	307	–	–	2984
<i>Xenyllodes armatus</i> Axelson 1903	–	386	26	154	–	18	41	94	473	11	15
Total	1441	7667	5304	5453	11038	8936	5181	4936	7728	6432	64116
Total species	44	65	74	60	59	69	46	61	52	53	144

Table 6. Frequencies (nr of samples in which the species was found) of Collembola species in each habitat (see text for details). Species with less than records omitted. 1. Pine forest, 2. Spruce forest, 3. Decid. forest, 4. Swamp, 5. Pine bog, 6. Open bog, 7. Wetland, 8. Shore, 9. Seashore, 10. Meadow, 11. Dry meadow, 12. Dead wood, 13. Ant hills, 14. Compost, dung, 15. Alpine, 16. Records total

Habitat	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
N	27	28	31	14	29	26	9	29	18	31	33	31	28	26	14	374
<i>Allacma fusca</i>	1	–	–	2	2	–	–	–	–	–	2	1	–	–	–	8
<i>Anurida ellipsoides</i>	–	–	–	–	–	1	–	2	2	–	–	–	–	–	–	5
<i>Anurida tullbergi</i>	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	5
<i>Anurophorus septentrionalis</i>	19	15	–	–	1	3	1	–	–	–	1	11	6	–	12	69
<i>Appendisotoma abiskoensis</i>	–	–	2	–	–	–	–	–	–	–	–	2	1	–	–	5
<i>Arrhopalites cochlearifer</i>	2	1	–	–	–	–	–	–	–	–	–	–	–	–	–	3
<i>Arrhopalites principalis</i>	3	5	3	1	3	3	–	1	–	2	–	3	–	–	–	24
<i>Ballistura schoetti</i>	–	–	–	2	–	8	2	–	1	–	–	–	–	–	–	13
<i>Choreutinula inermis</i>	–	–	–	–	–	–	–	–	–	–	–	4	2	–	–	6
<i>Cryptopygus bipunctatus</i>	1	–	2	–	–	–	–	–	1	–	5	–	–	–	–	9
<i>Desoria blekeni</i>	2	–	–	–	–	–	–	–	1	–	–	–	–	–	–	3
<i>Desoria divergens</i>	1	–	6	–	–	1	–	–	–	–	–	1	1	–	–	10
<i>Desoria grisea</i>	–	–	–	–	–	–	–	1	–	3	–	–	–	6	–	10
<i>Desoria hiemalis</i>	12	16	4	5	9	1	–	1	–	2	–	9	1	1	5	66
<i>Desoria neglecta</i>	–	–	1	–	1	1	2	3	1	–	–	–	1	–	–	10
<i>Desoria olivacea</i>	–	–	–	–	1	2	2	1	–	1	–	–	–	–	–	7
<i>Desoria propinqua</i>	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	2
<i>Desoria tolya</i>	3	–	1	1	3	–	–	–	–	1	2	9	5	–	4	29
<i>Dicyrtoma fusca</i>	3	–	2	–	1	–	–	–	–	1	1	–	–	–	–	8
<i>Entomobrya corticalis</i>	–	–	–	–	1	–	–	2	–	–	–	16	4	1	–	24
<i>Entomobrya marginata</i>	–	–	–	–	–	–	–	–	–	–	–	1	2	1	–	4
<i>Entomobrya nivalis</i>	1	–	–	–	1	–	–	–	1	3	2	2	1	–	–	11
<i>Folsomia dovrensis</i>	2	–	5	–	–	–	1	–	1	–	4	2	–	–	–	16
<i>Folsomia fimetaria</i>	3	3	2	–	–	–	–	1	1	2	3	–	–	1	–	16
<i>Folsomia fimetarioides</i>	14	9	13	9	5	2	2	4	–	1	1	2	–	–	–	62
<i>Folsomia manolachei</i>	1	2	1	–	2	–	–	3	6	4	5	–	1	–	–	25
<i>Folsomia palaeartica</i>	–	–	2	–	–	–	–	–	–	2	–	–	1	–	–	5
<i>Folsomia quadrioculata/manolachei</i>	5	9	12	4	3	2	2	12	2	8	12	5	7	–	–	83
<i>Folsomia quadrioculata</i>	7	11	15	4	2	–	–	7	8	12	14	7	8	3	11	109
<i>Folsomia sensibilis</i>	2	3	3	2	–	–	–	–	–	–	–	1	–	–	–	5
<i>Friesea mirabilis/truncata</i>	7	6	6	4	11	7	2	11	2	6	8	9	6	5	–	90
<i>Friesea mirabilis</i>	10	10	6	3	7	8	2	10	6	10	4	10	9	2	8	105
<i>Ceratophysella bentgssoni</i>	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	3
<i>Ceratophysella denticulata</i>	1	–	1	1	2	2	–	8	1	3	1	1	2	10	–	33
<i>Ceratophysella scotica</i>	–	2	–	–	–	2	1	1	–	–	–	–	–	–	–	6
<i>Gisinianus flammeolus</i>	–	–	–	2	–	–	1	–	–	2	3	–	–	–	–	8
<i>Hymenaphorura polonica</i>	2	1	1	–	–	–	–	–	–	–	–	2	1	–	–	7
<i>Hypogastrura assimilis</i>	–	–	–	–	–	1	1	1	–	–	–	–	–	2	–	5
<i>Hypogastrura distincta</i>	1	1	2	1	1	1	2	4	–	2	2	1	2	11	–	31
<i>Hypogastrura litoralis</i>	–	1	–	–	–	–	–	–	3	–	–	–	1	–	–	5
<i>Hypogastrura purpurescens</i>	1	1	1	–	–	–	–	–	1	–	–	3	–	–	–	7
<i>Isotoma anglicana</i>	–	–	3	–	–	2	–	1	6	4	2	–	–	1	–	19
<i>Isotoma caerulea</i>	1	–	–	–	–	–	–	3	3	2	14	–	–	–	–	23
<i>Isotoma riparia</i>	–	–	–	–	–	1	–	1	4	3	1	–	–	–	–	10
<i>Isotoma viridis</i>	7	5	3	–	5	5	2	2	1	7	3	3	2	1	7	53
<i>Isotomiella minor</i>	27	28	30	14	25	8	5	19	6	21	17	11	10	2	13	236
<i>Isotomurus balteatus</i>	–	–	–	–	–	1	1	1	–	2	–	–	–	–	–	5
<i>Isotomurus antennalis</i>	–	–	1	1	–	–	2	–	–	–	–	–	–	–	–	4
<i>Lepidocyrtus lignorum</i>	13	8	13	3	4	5	2	6	–	13	16	7	8	2	3	103
<i>Lepidocyrtus violacealcyaneus</i>	–	–	1	–	–	1	–	2	–	1	4	3	3	5	–	20
<i>Lepidocyrtus cyaneus</i>	–	–	–	–	–	2	–	1	2	3	4	4	4	7	1	28
<i>Lepidocyrtus violaceus</i>	1	–	1	–	1	–	–	3	–	–	1	1	1	2	–	11

Table 6 continued

<i>Megalothorax minimus</i>	13	17	11	8	9	2	1	5	1	5	5	2	1	–	4	84
<i>Mesaphorura critica</i>	–	2	3	–	2	1	–	1	–	2	1	1	2	–	–	15
<i>Mesaphorura italica</i>	–	–	–	–	–	–	–	–	–	1	2	–	–	–	–	3
<i>Mesaphorura krausbaueri</i>	–	2	2	–	–	–	–	3	1	2	2	1	–	–	–	13
<i>Mesaphorura macrochaeta</i>	4	5	13	2	–	1	–	4	1	16	17	–	–	–	–	63
<i>Mesaphorura sylvatica</i>	2	7	7	1	1	–	–	2	–	8	9	–	2	–	–	39
<i>Mesaphorura tenuisensillata</i>	3	3	10	4	–	–	–	4	–	4	9	1	–	–	6	44
<i>Mesaphorura yosii</i>	20	17	7	7	12	–	2	6	–	6	6	7	6	1	6	103
<i>Metaphorura affinis</i>	3	2	1	2	–	–	–	–	1	3	1	1	2	–	4	20
<i>Micranurida forsslundi</i>	5	3	2	3	2	–	–	3	1	1	–	1	2	–	–	23
<i>Micranurida granulata</i>	2	4	–	2	–	–	–	–	–	–	–	1	–	–	2	11
<i>Micranurida pygmaea</i>	22	18	9	6	15	7	6	7	–	7	7	9	7	1	7	128
<i>Micraphorura absoloni</i>	19	25	17	11	16	2	2	11	1	8	11	16	18	2	12	171
<i>Neanura muscorum</i>	17	15	11	7	16	10	2	6	3	10	8	11	7	4	7	134
<i>Neelides minutus</i>	–	–	1	–	1	–	–	–	–	–	–	–	2	–	1	5
<i>Orchesella bifasciata</i>	1	1	–	–	–	–	–	1	–	–	–	2	–	–	–	5
<i>Orchesella flavescens</i>	3	3	1	–	1	–	–	1	–	–	–	–	–	–	–	9
<i>Paratullbergia callipygos</i>	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	3
<i>Parisotoma ekmani</i>	1	–	–	–	1	–	–	4	–	–	–	1	–	–	1	8
<i>Parisotoma notabilis</i>	23	26	25	14	23	5	1	19	6	26	26	7	17	4	7	229
<i>Parisotoma trichaetosa</i>	–	–	–	–	–	–	–	–	–	–	1	–	3	–	–	4
<i>Pogonognathellus flavescens</i>	5	2	3	2	9	3	–	4	–	1	–	–	–	–	–	29
<i>Proisotoma clavipila</i>	–	–	–	–	–	–	–	–	–	–	–	4	–	–	–	4
<i>Proisotoma minima</i>	1	–	2	–	–	–	–	1	–	1	–	3	–	2	–	10
<i>Proisotoma minuta</i>	–	–	1	–	–	–	–	–	1	2	–	2	–	5	–	11
<i>Proisotoma ripicola</i>	–	–	1	–	–	–	–	–	3	1	1	–	–	–	–	6
<i>Protaphorura armata</i>	14	7	18	6	10	8	1	18	9	20	29	2	9	4	1	156
<i>Protaphorura tricampata</i>	–	1	–	–	–	–	–	–	–	–	4	–	–	1	–	6
<i>Protophorura subuliginata</i>	–	–	–	1	–	–	–	1	1	1	–	–	1	–	–	5
<i>Pseudosinella alba</i>	–	–	3	–	–	–	1	1	–	3	8	1	1	3	–	21
<i>Pseudachorutes corticicolus</i>	–	–	–	1	1	–	–	–	–	–	–	2	1	–	–	5
<i>Pseudachorutes dubius</i>	4	3	–	–	1	–	–	1	–	–	–	–	1	–	1	11
<i>Pseudachorutes parvulus</i>	–	–	–	–	3	–	–	–	1	–	1	–	–	–	–	5
<i>Pseudachorutes subcrassus</i>	3	–	2	–	–	–	–	–	–	–	1	1	–	–	–	7
<i>Pseudanurophorus binoculatus</i>	10	16	10	7	6	–	–	–	–	2	1	–	2	–	10	64
<i>Schoettella ununguiculata</i>	–	2	2	–	–	1	–	–	–	–	–	1	2	–	–	8
<i>Sinella tenebricosa</i>	–	–	2	–	–	–	–	–	–	3	1	–	1	2	–	9
<i>Sminthurinus aureus</i>	2	1	1	2	1	–	1	1	2	2	5	1	–	–	–	19
<i>Sminthurides malmgreni</i>	–	–	–	–	1	–	1	–	–	–	1	–	–	–	–	3
<i>Sminthurides schoetti</i>	–	1	–	–	1	–	1	4	–	2	1	1	–	–	–	11
<i>Sminthurinus alpinus</i>	–	–	–	–	–	–	–	1	–	2	1	–	–	–	–	4
<i>Sphaeridia pumilis</i>	1	2	1	–	2	1	–	1	4	6	6	–	–	–	–	24
<i>Tetracanthella wahlgreni</i>	–	–	–	–	–	1	–	–	–	–	–	–	–	–	7	8
<i>Tomocerina minuta</i>	1	4	1	–	1	–	–	2	2	2	1	1	–	–	2	17
<i>Tomocerus vulgaris</i>	2	–	–	–	1	–	–	2	–	–	1	–	–	2	–	8
<i>Willemia anophthalma</i>	21	22	10	8	18	1	–	3	–	2	4	10	14	–	11	124
<i>Willemia denisi</i>	3	3	4	2	3	–	–	1	–	–	–	2	–	–	2	20
<i>Xenylla boemeri</i>	1	–	–	–	–	–	–	–	–	–	1	7	4	1	–	14
<i>Xenylla brevicauda</i>	–	–	–	–	–	–	–	–	–	–	1	–	3	–	–	4
<i>Xenylla humicola</i>	–	–	1	–	1	1	–	–	1	–	–	–	–	–	–	4
<i>Xenylla maritima</i>	–	–	–	–	–	1	–	–	–	–	–	3	–	1	–	5
<i>Xenylla mucronata</i>	–	–	1	–	–	–	–	–	–	–	1	–	–	1	–	3
<i>Xenyllodes armatus</i>	1	1	3	1	5	2	1	13	1	1	4	2	1	–	–	36
Total species	59	47	63	37	48	40	29	61	50	57	58	68	49	34	27	142

Table 7. Total numbers of Enchytraeidae in each sampling area (Fig. 1).

Area	2	3	4	5	6	7	Total
	Helsinki	Kotka	Vaasa	Jyväskylä	Ilom.	Oulu	
Number of samples	54	51	54	51	50	51	311
<i>Achaeta eiseni</i> Vejdovský 1877	7	4	7	–	23	14	55
<i>Mesenchytraeus armatus</i> (Levinsen 1884)	1	6	–	5	2	–	14
<i>Mesenchytraeus flavus</i> (Levinsen 1884)	8	5	1	22	4	–	40
<i>Mesenchytraeus pelicensis</i> Isnel 1905	–	–	1	4	–	–	5
<i>Cernosvitoviella atrata</i> (Bretschner 1903)	–	–	–	3	–	–	3
<i>Stercutus niveus</i> Michaelsen 1884	–	–	–	1	–	–	1
<i>Buchholzia appendiculata</i> (Buchholz 1862)	4	4	4	–	11	–	23
<i>Buchholzia fallax</i> Michaelsen 1887	–	–	–	–	–	2	2
<i>Bryodrilus ehlersi</i> Ude 1892	11	20	4	50	14	10	109
<i>Cognettia sphagnetorum</i> (Vejdovský 1877)	760	1024	335	1455	701	542	4817
<i>Cognettia glandulosa</i> (Michaelsen 1888)	20	23	43	49	65	18	218
<i>Cognettia lapponica</i> Nurminen 1965	–	2	3	3	8	5	21
<i>Fridericia bulbosa</i> (Rosa 1887)	9	19	–	4	6	–	38
<i>Fridericia bulboides</i> Nielsen & Christensen 1959	45	37	71	77	33	17	280
<i>Fridericia callosa</i> (Eisen 1878)	6	7	14	–	–	–	27
<i>Fridericia paroniana</i> Isnel 1904	37	12	6	16	12	14	97
<i>Fridericia bisetosa</i> (Levinsen 1884)	91	57	28	128	28	51	383
<i>Fridericia maculata</i> Isnel 1904	–	–	8	–	12	–	20
<i>Fridericia perrieri</i> (Vejdovský 1877)	–	–	–	3	–	–	3
<i>Fridericia galba</i> (Hoffmeister 1843)	–	–	3	1	–	–	4
<i>Fridericia nemoralis</i> Nurminen 1970	–	9	–	2	–	–	11
<i>Fridericia ratzeli</i> (Eisen 1872)	13	14	5	39	5	4	80
<i>Fridericia n.sp.</i>	–	–	–	2	–	6	8
<i>Enchytraeus albidus</i> Henle 1837	435	121	83	109	122	131	1001
<i>Enchytraeus buchholzi</i> Vejdovský 1879	6	–	3	34	4	6	53
<i>Enchytraeus lacteus</i> Nielsen & Christensen 1963	–	3	–	12	–	–	15
<i>Echytraeus minutus</i> Nielsen & Christensen 1961	–	–	4	4	3	–	11
<i>Lumbricillus fennicus</i> Nurminen 1964	2	–	2	–	–	–	4
<i>Lumbricillus lineatus</i> (Müller 1774)	5	–	5	–	–	6	16
<i>Lumbricillus rivalis</i> Levinsen 1883	16	28	14	–	–	20	78
<i>Henlea perpusilla</i> Friend 1911	10	23	20	13	18	20	104
<i>Henlea nasuta</i> (Eisen 1878)	27	9	–	60	3	–	99
<i>Henlea ventriculosa</i> (d'Udekem 1854)	3	–	2	1	1	–	7
<i>Henlea similis</i> Nielsen & Christensen 1959	9	3	5	11	5	2	35
<i>Enchytronia parva</i> Nielsen & Christensen 1959	40	17	17	77	3	15	169
<i>Enchytronia annulata</i> Nielsen & Christensen 1959	–	–	–	–	–	1	1
Total	1565	1447	688	2185	1083	884	7852
Total species	23	22	25	27	22	19	36

Table 8. Frequencies (nr of samples in which the species was found) of Enchytraeidae in each habitat (see text for details). 1. Pine forest, 2. Spruce forest, 3. Decid. forest, 4. Swamp, 5. Pine bog, 6. Open bog, 7. Wetland, 8. Shore, 9. Seashore, 10. Meadow, 11. Dry meadow, 12. Dead wood, 13. Ant hills, 14. Compost, dung, 15. Records total

Habitat	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
N	23	23	25	19	24	24	14	24	16	25	25	24	24	22	312
<i>Achaeta eiseni</i>	–	–	1	–	–	–	–	1	3	2	1	–	–	–	8
<i>Mesenchytraeus armatus</i>	–	–	3	–	–	–	1	1	–	1	–	–	–	–	6
<i>Mesenchytraeus flavus</i>	1	–	6	–	1	–	–	2	–	4	3	–	–	–	17
<i>Mesenchytraeus pelicensis</i>	–	–	1	–	–	–	–	1	1	–	–	–	–	–	3
<i>Cermosvitoviella atrata</i>	–	–	3	–	–	–	–	–	–	–	–	–	–	–	3
<i>Stercutus niveus</i>	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1
<i>Buchholzia appendiculata</i>	–	–	–	1	–	–	–	2	–	2	2	–	–	–	7
<i>Buchholzia fallax</i>	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
<i>Bryodrilus ehlersi</i>	4	5	6	5	2	1	–	–	–	2	6	–	4	–	35
<i>Cognettia sphagnetorum</i>	21	21	16	17	20	11	5	16	7	17	12	7	11	1	182
<i>Cognettia glandulosa</i>	–	–	13	–	1	–	1	6	–	12	14	–	–	1	48
<i>Cognettia lapponica</i>	–	–	2	–	–	–	–	1	–	3	4	–	–	–	10
<i>Fridericia bulbosa</i>	–	–	3	–	–	–	1	3	–	1	3	–	–	–	11
<i>Fridericia bulboides</i>	–	–	10	–	–	–	1	9	6	12	14	–	–	–	52
<i>Fridericia callosa</i>	–	–	–	–	–	–	–	–	3	2	1	1	–	–	7
<i>Fridericia paroniana</i>	–	–	9	–	1	–	1	3	–	6	7	–	–	–	27
<i>Fridericia bisetosa</i>	–	–	7	–	–	–	1	10	2	11	18	–	–	–	49
<i>Fridericia maculata</i>	–	–	2	–	–	–	–	2	–	–	2	–	–	–	6
<i>Fridericia perrieri</i>	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1
<i>Fridericia galba</i>	–	–	1	–	–	–	–	–	1	–	–	–	–	–	2
<i>Fridericia nemoralis</i>	–	–	1	–	–	–	–	–	–	–	3	–	–	–	4
<i>Fridericia ratzeli</i>	–	–	10	–	1	–	–	1	–	9	11	–	–	1	33
<i>Fridericia n.sp.</i>	–	–	3	–	–	–	–	–	–	–	1	–	–	–	4
<i>Enchytraeus albidus</i>	–	–	–	–	–	–	–	5	1	6	9	1	–	14	36
<i>Enchytraeus buchholzi</i>	–	–	5	–	–	–	–	–	1	2	–	–	–	–	8
<i>Enchytraeus lacteus</i>	–	–	1	–	–	–	–	–	–	–	1	–	–	–	2
<i>Echytraeus minutus</i>	–	–	3	–	–	–	–	–	–	1	–	–	–	–	4
<i>Lumbricillus fennicus</i>	–	–	–	–	–	–	–	–	2	–	–	–	–	–	2
<i>Lumbricillus lineatus</i>	–	–	–	–	–	–	–	1	1	–	1	–	–	–	3
<i>Lumbricillus rivalis</i>	–	–	1	–	–	–	–	6	7	–	1	–	–	–	15
<i>Henlea perpusilla</i>	–	–	7	–	–	–	1	–	2	6	7	–	–	–	23
<i>Henlea nasuta</i>	–	–	5	–	1	–	–	4	–	1	4	–	–	–	15
<i>Henlea ventriculosa</i>	–	–	3	–	–	–	–	1	–	–	1	–	–	–	5
<i>Henlea similis</i>	–	–	4	–	–	–	–	1	1	3	–	–	–	–	9
<i>Enchytronia parva</i>	–	–	9	–	–	–	–	–	–	4	7	1	–	–	21
<i>Enchytronia annulata</i>	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1
Total species	3	2	29	3	7	2	9	20	16	21	23	4	2	4	–