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Oribatid mites (Arachnida: Oribatida) in Estonia: A commented checklist

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Abstract

Although the first data on Estonian oribatid mites date back to 1859 with the work of A. E. Grube, the fauna has never been systematically revised since then. Data from all previous literature sources contain reliable records of 128 species, to which are added 172 new species records, based on 456 samples from different microhabitats from all parts of Estonia. The Estonian oribatid mite fauna has thus records of 300 species, which is a comparable number with the neighboring countries.

Three new combinations and three new synonyms are proposed: *Cymbaeremaeus venosus* (Grube, 1859) **comb. nov.** et **syn. nov.** = *Cymbaeremaeus cymba* (Nicolet, 1855), *Cepheus tricuspidatus* (Grube, 1859) **comb. nov.** et **syn. nov.** = *Cepheus latus* (C. L. Koch, 1835), *Oribatella quadricuspis* (Grube, 1859) **comb. nov.** and *Kaszabobates helveticus* Mahunka & Mahunka-Papp, 2000 = *Kaszabobates olbiopolitanus* Sergienko, 1980 = **syn. nov.**

Key words: Sarcoptiformes, new synonyms, Baltic countries, soil fauna, DNA barcodes

Introduction

Estonia is a small country in north-eastern Europe, bordered by the Baltic sea in the west and north. It is in the northern edge of temperate broadleaf and mixed forests ecoregion (also known as boreo-nemoral or hemiboreal). The climate is much influenced by the vicinity of Baltic sea and the northerly latitude, being classified as cold, with no dry season and warm summers (Köppen classification Dfb). The Estonian fauna is relatively young, being formed only after the last glacial period.

The first data on Estonian oribatid mites were published in 1859 by Adolph Eduard Grube in his monograph on Estonian, Livonian and Curonian arachnids (Grube 1859; the former province of Livonia included southern Estonia and northern Latvia). He described five species and one genus as new to science, but unfortunately almost all of his records are dubious (as the literature available at the time did not allow identification by modern standards and the majority of currently known Estonian species were as yet undescribed; cf Eglitis (1943)). Since the Grube's material, deposited in Wroclaw University Museum of Natural History, has never been re-examined (Jolanta Jurkowska, *pers. comm*.), all his described species are considered *species inquirendae* (Subías 2004, 2022, 2024; the type locality has been mistakenly given as "Germany"). The first modern work was done by M. Sellnick, who published an overview of material collected from Estonian bogs (Sellnick 1924). He identified 37 species and described two of them as new (one of which is still valid). The Lithuanian acarologist I. Eitminavičiūtė studied the Baltic sea coastal fauna of Estonia, Latvia and Lithuania (Eitminavičiūtė 1965, Eitminavičiūtė *et al*. 1976). Karppinen and Krivolutsky (1982) published an overview of northern European oribatid mite records, including also Estonia (site number 64), citing Eitminavičiūtė (1965) as the source of Estonian records (but overlooked the publication of Sellnick 1924). Unfortunately there seems to be some confusion in that work: it marks 103 species as present in Estonia that are not included in the Eitminavičiūtė (1965) publication, but fails to mention four records from the same work. A similar confusion has been noted with the Latvian records (*cf*. Kagainis 2011). To clarify this, we present the full list of species erroneously listed by Karppinen and Krivolutsky (1982) as occurring in Estonia (Table 1). Many of the erroneously cited species have later been found in Estonia, but the occurrence of others is doubtful.

Some previously unidentified mite material collected by the Estonian arachnologist Asta Vilbaste in 1961 and 1984 is deposited in the Estonian University of Life Sciences (IZBE) collection (and is included in the present work). Niedbała (2012) added records of 11 species of ptyctimous mites and previous publications of the third author (Vacht *et al*. 2018a, 2018b, 2019) made the total number of published species 134 (not including the questionable data of Karppinen & Krivolutsky 1982).

Material and methods

A full bibliography of known published Estonian records of Oribatid mites was compiled and Estonian natural history collections were contacted (but only IZBE had Estonian Oribatida material). Most material was extracted using standard Tullgren funnel, but some specimens were also obtained as non-target species using methods intended to catch other arthropods (pitfall traps, Malaise traps, vacuum collecting). All main Estonian habitat types, and a wide range of microhabitats were sampled (see below for details). Specimens were cleared in lactic acid and studied

in cavity slides with Leica DM 6000B compound microscope, some specimens were mounted onto permanent slides using Hoyer's medium or gold sputtered and photographed using SEM (Zeiss EVO LS15).

TABLE 1. The list of species erroneously cited by Karppinen and Krivolutsky (1982) as occurring in Estonia.

Family	Species
Palaeacaridae	*Palaeacarus hystricinus* (Trägårdh, 1932)
Brachychthoniidae	*Brachychthonius marginatus* Forsslund, 1942, *B. pilosetosus* Forsslund, 1942, *B. italicus* (Berlese, 1910), *B. immaculatus* Forsslund, 1942, *Eobrachychthonius borealis* Forsslund, 1942, *Liochthonius lapponicus* (Trägårdh, 1910), *Liochthonius sellnicki* (Thor, 1930), *Sellnickochthonius rostratus* (Jacot, 1936), *Sellnickochthonius zelawaiensis* (Sellnick, 1928), *Synchthonius crenulatus* (Jacot, 1938)
Eniochthoniidae	*Eniochthonius minutissimus* (Berlese, 1903)
Hypochthoniidae	*Hypochthonius rufulus* C. L. Koch, 1835
Parhypochthoniidae	*Parhypochthonius aphidinus* Berlese, 1904
Euphthiracaridae	*Acrotritia ardua* (C. L. Koch, 1841), *Euphthiracarus cribrarius* (Berlese, 1904), *E. monodactylus* (Willmann, 1919), *Microtritia minima* (Berlese, 1904),
Phthiracaridae	*Phthiracarus piger* (Scopoli, 1763), *P. pavidus* (Berlese, 1913), *P. lentulus* (C. L. Koch, 1841), *Steganacarus (Steganacarus) magnus* (Nicolet, 1855), *Steganacarus (Atropacarus) striculus* (C. L. Koch, 1836), *Steganacarus (Steganacarus) applicatus* (Sellnick, 1922)
Oribotritiidae	*Oribotritia decumana* (C. L. Koch, 1836)
Trhypochthoniidae	*Mucronothrus nasalis* (Willmann, 1929), *Trhypochthonius cladonicola* (Willmann, 1919), *T. tectorum* (Berlese, 1896), *T. nigricans* Willmann, 1928
Malaconothridae	*Malaconothrus egregius* (Berlese, 1904), *M. monodactylus* (Michael, 1888), *Trimalaconothrus foveolatus* Willmann, 1931, *T. glaber* (Michael, 1888)
Nanhermanniidae	*Nanhermannia coronata* Berlese, 1913, *Nanhermannia nana* (Nicolet, 1855)
Damaeidae	*Belba corynopus* (Hermann, 1804), *Metabelba pulverulenta* (C. L. Koch, 1840),
Damaeolidae	*Fosseremus laciniatus* (Berlese, 1905)
Eremaeidae	*Eueremaeus silvestris* Forsslund, 1957
Astegistidae	*Astegistes pilosus* (C. L. Koch, 1841)
Liacaridae	*Dorycranosus moravicus* (Willmann, 1954), *Liacarus xylariae* (Schrank, 1803), *Liacarus coracinus* (C. L. Koch, 1841), *Liacarus subterraneus* (C. L. Koch, 1844)
Peloppiidae	*Ceratoppia quadridentata* (Haller, 1882)
Tenuialidae	*Hafenrefferia gilvipes* (C. L. Koch, 1839)
Carabodidae	*Carabodes areolatus* Berlese, 1916, *Carabodes coriaceus* C. L. Koch, 1835, *Carabodes femoralis* (Nicolet, 1855), *Carabodes minusculus* Berlese, 1923
Autognetidae	*Conchogneta traegardhi* (Forsslund, 1947), *Conchogneta willmanni* (Dyrdowska, 1929)
Oppiidae	*Berniniella bicarinata* (Paoli, 1908), *Oppiella (Lauroppia) neerlandica* (Oudemans, 1900), *Oppiella (Morizoppia) translamellata* (Willmann, 1923), *Oppiella (Morizoppia) unicarinata* (Paoli, 1908), *Oppiella (Oppiella) subpectinata* (Oudemans, 1900)
Thyrisomidae	*Banksinoma lanceolata* (Michael, 1885)
Suctobelbidae	*Suctobelba trigona* (Michael, 1888), *Suctobelbella acutidens* (Forsslund, 1941), *Suctobelbella forsslundi* (Strenzke, 1950), *Suctobelbella hammeri* (Krivolutsky, 1965), *Suctobelbella intermedia* (Willmann, 1939), *Suctobelbella longirostris* (Forsslund, 1941), *Suctobelbella palustris* (Forsslund, 1953), *Suctobelbella subcornigera* (Forsslund, 1941)
Cymbaeremaeidae	*Cymbaeremaeus cymba* (Nicolet, 1855)
Licneremaeidae	*Licneremaeus licnophorus* (Michael, 1882)
Micreremidae	*Micreremus brevipes* (Michael, 1888)
Achipteriidae	*Achipteria nitens* (Nicolet, 1855), *Achipteria coleoptrata* (Linnaeus, 1758), *Achipteria sellnicki* (Hammen, 1952); *Campachipteria bella* (Sellnick, 1928), *Parachipteria fanzagoi* (Jacot, 1929) (as *Parachipteria willmanni* (Hammen, 1952))
Oribatellidae	*Oribatella meridionalis* Berlese, 1908, *Ophidiotrichus tectus* (Michael, 1884)

.....continued on the next page

TABLE 1. (Continued)

Family	Species
Haplozetidae	*Haplozetes vindobonesis* (Willmann, 1935), *Peloribates europaeus* Willmann, 1835, *Protoribates capucinus* Berlese, 1908, *Protoribates variabilis* Rajski, 1958
Oribatulidae	*Oribatula tibialis* (Nicolet, 1855), *Phauloppia lucorum* (C. L. Koch, 1841), *Phauloppia rauschenensis* (Sellnick, 1908)
Parakalummidae	*Neoribates aurantiacus* (Oudemans, 1914)
Scheloribatidae	*Dometorina plantivaga* (Berlese, 1895), *Liebstadia humerata* Sellnick, 1928, *Siculobata leontonycha* (Berlese, 1910) (as *Paraleius leontonychus* (Berlese, 1910)
Ceratozetidae	*Ceratozetoides cisalpinus* (Berlese, 1908), *Diapterobates notatus* (Thorell, 1871), *Edwardzetes edwardsi* (Nicolet, 1855), *Fuscozetes fuscipes* (C. L. Koch, 1844), *Fuscozetes sellnicki* Hammer, 1952, *Fuscozetes setosus* (C. L. Koch, 1840), *Melanozetes meridianus* Sellnick, 1928, *Sphaerozetes piriformis* (Nicolet, 1855), *Sphaerozetes tricuspidatus* Willmann, 1923, *Sphaerozetes orbicularis* (C. L. Koch, 1835)
Zetomimidae	*Heterozetes palustris* (Willmann, 1917)
Galumnidae	*Acrogalumna longipluma* (Berlese, 1904), *Galumna alata* (Hermann, 1804), *Galumna europaea* (Berlese, 1914), *Galumna lanceata* Oudemans, 1900, *Pergalumna nervosa* (Berlese, 1914)

The measurements given are rounded to the closest 5 µm. All voucher specimens were deposited in the entomological collection of Institute of Agricultural and Environmental Sciences, Estonian University of Life Sciences (former Institute of Zoology and Botany), Tartu, Estonia (with acronym IZBE) and entered into the PlutoF database (Abarenkov *et al*. 2010) and Edaphobase (Burkhardt *et al*. 2014) which provide data to the GBIF database (https://www.gbif.org/). The main source of identifications was Weigmann (2006), but other relevant keys to Palaearctic fauna (van der Hammen 1952, Kunst 1971, Bulanova-Zakhvatkina *et al*. 1975, Balogh & Mahunka 1983, Pérez Íñigo 1993, 1997, Niedbała 2008, 2011, Beck *et al*. 2014) where also used, as well as other taxonomic treatments (mentioned in comments).

DNA metabarcoding was carried out on some samlpes (from locality 82z). DNA was extracted using PowerMax Soil kit (Qiagen, Germany). COI gene was amplified using the LCO1490 ja HCO2198 primer set (Folmer *et al*. 1994) and sequencing was done using the PacBio platform. The raw data was processed using PipeCraft2 v1.0.0 software (Anslan *et al*. 2017).

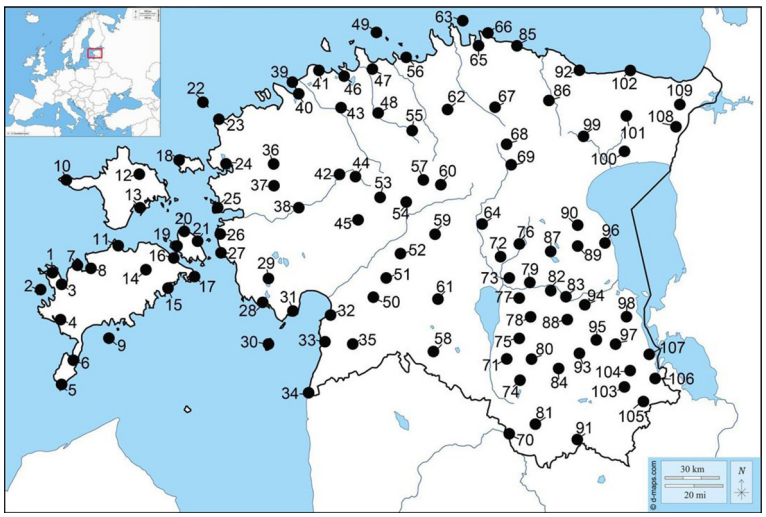

FIGURE 1. Collecting localities of Oribatida samples in Estonia. Localities closer than 10 km are designated by one number, but see also the following list of localities. Base maps of Europe and Estonia: © 2007–2023 https://d-maps.com (accessed on 15 May 2023).

The classification and sequence of families follows Schatz *et al*. (2011), the generic nomenclature follows generally Weigmann *et al*. (2015), with some updates from Murvanidze & Mumladze (2016), Ermilov & Klimov (2017), Subías (2022) and the species synonymics Laumann *et al*. (2007), Weigmann & Norton (2009) and Weigmann *et al*. (2015). Species with no reliable previous records are marked with an asterisk (*). Questionable references are preceded by a question mark [?]. Data on general distribution and occurrence in the neighbouring countries (Latvia, Finland) and adjacent parts of Russia—Leningrad and Pskov Regions (oblasts) is also given.

The list of collecting events and localities

In the following list, collecting date, locality or sub-locality text, substrate type, geographical coordinates, collector and collecting method and number of samples are provided. Localities' numbers for collected samples correspond to those on Fig. 1. Sub-localities within a range less than 10 km are separated by consecutive letters (except when they are on different islands). In total, 201 sub-localities represented by 109 locality-numbers on Fig. 1 are included.

1. 27.V. 2016, Saaremaa Island, Tagamõisa wooded meadow, topsoil and litter, 58.4630°N 21.9948°E, Kaarel Sammet leg., Tullgren funnel (one sample);

2a. 22.VII.2017, Vilsandi Island, dry *Pinus sylvestris* forest, topsoil and litter, 58.3810°N 21.8380°E, Olavi Kurina leg., Tullgren funnel (one sample);

2b. 23.VI.1987, Vilsandi Island (no other data), Aleksander Pototski leg (one sample);

3a. 24.VII.2019, Saaremaa Island, Tammese, 58.4092°N 22.0599°E, Mari Ivask leg., Tullgren funnel (one sample);

3b. 15.VIII.2023, Saaremaa Island, Viidumäe, mesic mixed forest, topsoil and litter 58.2942°N, 22.1032°E, Kaarel Sammet leg., Tullgren funnel (one sample);

4a. 10.VI.2017, Saaremaa Island, Koovi, *Pinus sylvestris* forest, topsoil and litter, 58.2404°N 22.0256°E, Tõnu Kesküla leg., Tullgren funnel (one sample);

4b. 10.VI.2017, Saaremaa Island, Kipi, fresh deciduous riverside forest, topsoil and litter, 58.2517°N 22.0277°E, Tõnu Kesküla leg., Tullgren funnel (one sample);

5a. 10.VI.2017, Saaremaa Island, Sõrve peninsula, stony seashore, topsoil and litter, 57.9069°N 22.05250°E, Tõnu Kesküla leg., Tullgren funnel (one sample);

5b. 29.V.2016, Saaremaa Island, Sõrve peninsula, seashore debris, 57.9095°N 22.0551°E, Kaarel Sammet leg., Tullgren funnel (one sample);

6. 25.VII.2019, Saaremaa Island, Vintri, dry heath forest with *Pinus sylvestris*, topsoil and litter, 58.0425°N 22.1935°E, Mari Ivask leg., Tullgren funnel (one sample);

7. 17.IX.2016, Saaremaa Island, Kugalepa, broadleaf forest (*Quercus robur*), topsoil and litter, 58.5006°N 22.2118°E, Erki Õunap leg., Tullgren funnel (one sample);

8. 28.V.2016, Saaremaa Island, Paatsa, calcareous fen, topsoil and litter, 58.5003°N 22.3062°E, Kaarel Sammet leg., Tullgren funnel (two samples);

9. 23.VII.2015, Abruka Island, dry mixed forest with *Pinus sylvestris*, topsoil and litter, 58.1559°N 22.5007°E, Olavi Kurina leg., Tullgren funnel (one sample);

10. 21.IV.2021, Hiiumaa Island, Kõpu peninsula, dry *Pinus sylvestris* forest, topsoil and litter, 58.9158°N 22.1996°E, Kaarel Sammet leg., Tullgren funnel (one sample);

11. 24.VII.2019, Saaremaa Island, Soela, seashore wrack, 58.6092°N 22.59918°E, Mari Ivask leg., Tullgren funnel (one sample);

12. 22.IV.2021, Hiiumaa Island, Määvli, mixed forest with *Pinus sylvestris,* topsoil and litter, 58.9347°N 22.7521°E, Kaarel Sammet & Jüri Sammet leg., Tullgren funnel (one sample);

13. 01.VIII.2021, Hiiumaa Island, Orjaku peninsula, juniper shrubland, topsoil and litter, 58.76215°N 22.8043°E, Tõnu Kesküla leg., Tullgren funnel (one sample);

14a. 30.X.2021, Saaremaa Island, Ratla, from *Tilia cordata* bark, 58.4867°N 22.8422°E, Olavi Kurina leg., Tullgren funnel (one sample);

14b. 29.V.2016, Saaremaa Island, edge of Koigi bog, mosses and litter, 58.5163°N 22.9994°E Olavi Kurina leg., Tullgren funnel (one sample);

14c. 16.VIII.2023, Saaremaa Island, Koigi bog, *Sphagnum* moss, 58.4717°N 22.9716°E Kaarel Sammet leg., Tullgren funnel (one sample);
15. 25.XII.2020, Saaremaa Island, Asva, ex hollow *Sorbus intermedia,* soil and debris, 58.3979°N 23.0715°E, Olavi Kurina leg., Tullgren funnel (one sample);
16. 06.VIII.2021, Saaremaa Island, Orissaare, coastal meadow, topsoil and litter, 58.5538°N 23.1175°E, Kaarel Sammet leg., Tullgren funnel (five samples);
17a. 23.VII.2017, Saaremaa Island, Kübassaare, *Quercus robur* dominated forest, topsoil and litter, 58.4441°N 23.3061°E, Olavi Kurina leg., Tullgren funnel (one sample);
17b. 27.IV.2019, Saaremaa Island, Kübassaare, *Quercus robur* dominated forest, topsoil and litter, 58.4441°N 23.3061°E, Olavi Kurina leg., Tullgren funnel (one sample);
18. 23.VIII.2020, Vormsi Island, Saxby, dry *Pinus sylvestris* forest, topsoil and litter, 59.02692°N 23.1174°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
19a. 30.VI.2021, Muhu Island, Koguva, *Alnus incana* dominated forest, topsoil and litter, 58.59251°N 23.0822°E, Kaarel Sammet leg., Tullgren funnel (five samples);
19b. 06.VIII.2021, Muhu Island, Nautse coastal meadow, topsoil and litter, 58.5857°N 23.1489°E, Kaarel Sammet leg., Tullgren funnel (five samples);
19c. 30.X.2018, Muhu Island, Mõisaküla, Aadumaa, rural garden, decaying wood from *Malus domestica* tree, 58.6622°N 23.1717°E, Olavi Kurina leg., Tullgren funnel (one sample);
20a. 06.VIII.2021, Muhu Island, Pallasma, dry alvar grassland, topsoil and litter, 58.6770°N 23.1793°E, Kaarel Sammet leg., Tullgren funnel (five samples);
20b. 30.X.2021, Muhu Island, Hellamaa cemetery, bark of *Betula pendula,* 58.6131°N 23.2924°E Olavi Kurina leg., Tullgren funnel (one sample);
20c. 06.VIII.2021, Muhu Island, Koguva wooded meadow, topsoil and litter, 58.592°N 23.0820°E, Kaarel Sammet leg., Tullgren funnel (five samples);
21a. 06.VIII.2021, Muhu Island, Rannaniidi alvar grassland, topsoil and litter, 58.6423°N 23.3421°E, Kaarel Sammet leg., Tullgren funnel (five samples);
21b. 30.VI.2021, Muhu Island, Püssina, juniper shrubland, topsoil and debris, 58.6272°N 23.3566°E, Kaarel Sammet leg., Tullgren funnel (five samples);
22a. 03.VII.2021, Osmussaar Island, *Pinus sylvestris* dominated coastal forest, topsoil and debris, 59.3014°N 23.3611°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
22b. 03.VII.2021, Osmussaar Island, Hlantdappen, marshy grassland, topsoil and litter, 59.2816°N 23.4054°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
23. 04.VII.2021, Spithamn, *Pinus sylvestris* dominated coastal forest, topsoil and litter 59.22634°N 23.5140°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
24a. 31.X.2021, Vedra, from lichens and moss on *Alnus incana*, 59.0133°N 23.6786°E, Olavi Kurina leg., Tullgren funnel (one sample);
24b. 19.VII.2021 Saare, coastal grassland, topsoil and litter, 59.0089°N 23.5913°E, Indrek Melts & Kaarel Sammet leg., Tullgren funnel (ten samples);
25a. 03.VIII.2021 Puise, coastal grassland, topsoil and litter, 58.7794°N 23.4640°E, Kaarel Sammet & Indrek Melts leg., Tullgren funnel (five samples);
25b. 03.VIII.2021 Puise, deciduous forest, topsoil and litter, 58.7795N 23.4644°E, Kaarel Sammet & Indrek Melts leg., Tullgren funnel (five samples);
26. 03.VIII.2021, Metsa, forest edge on coastal grassland, topsoil and litter, 58.6632°N 23.5081°E, Kaarel Sammet & Indrek Melts leg., Tullgren funnel (ten samples);
27a. 14.VII.2014 Puhtu, broadleaf forest, topsoil and litter 58.5545°N 23.5511°E, Kaarel Sammet leg., Tullgren funnel (two samples);
27b. 02.VIII.2021, Rame, coastal grassland, topsoil and litter, 58.5606°N 23.5684°E, Indrek Melts & Kaarel Sammet leg., Tullgren funnel (ten samples);
28a. 22.VII.2021, Raespa, coastal grassland, topsoil and litter, 58.3604°N 23.8303°E, Indrek Melts & Hugo Prints leg., Tullgren funnel (ten samples);
28b. 26.VII.2021, Kastna, coastal grassland, topsoil and litter, 58.3321°N 23.9142°E Kaarel Sammet & Indrek Melts leg., Tullgren funnel (ten samples);

28c. 20.–24.VII.2016, Suti, coastal grassland, 4 58.3202°N 23.9700°E, Tõnu Talvi leg., pitfall trap (five samples);
28d. 21.VI.2022, Tõstamaa, coastal grassland, litter from the ground 58.3183°N 23.9730°E, Indrek Melts, vacuum collecting (ten samples);
29. 28.VIII.2019, Tõstamaa, deciduous forest, topsoil and litter, 58.4407°N 24.0123°E, Mari Ivask leg., Tullgren funnel (one sample);
30. 08.VIII.2020, Kihnu Island, Sääre, rural cemetery, topsoil and litter, 58.1387°N 23.9893, Tõnu Kesküla leg., Tullgren funnel (one sample);
31. 22.VII.2021, Kavaru, coastal grassland, topsoil and litter, 58.2687°N 24.1825°N, Indrek Melts leg., Tullgren funnel (ten samples);
32. 19.VII.2021, Metsaküla, coastal grassland, topsoil and litter, 58.2677°N 24.5347°E, Kaarel Sammet & Indrek Melts, Tullgren funnel (ten samples);
33a. 13.VII.2021, Kabli, coastal grassland, topsoil and litter, 58.0156°N 24.4490°E, Kaarel Sammet & Indrek Melts leg., Tullgren funnel (ten samples);
33b. 15.VII.2021, Rannametsa, coastal grassland, topsoil and litter, 58.1295°N 24.4866°E, Kaarel Sammet & Indrek Melts leg., Tullgren funnel (ten samples);
33c. 15.VII.2021, Piirumi, coastal grassland, topsoil and litter, 58.1528°N 24.4843°E, Kaarel Sammet & Indrek Melts leg., Tullgren funnel (ten samples);
34a. 13.VIII.2021, Ikla, coastal grassland, topsoil and litter, 57.8809°N 24.3612°E, Kaarel Sammet & Indrek Melts leg., Tullgren funnel (ten samples);
34b. 13.VIII.2021, Ikla, *Pinus sylvestris* forest, topsoil and litter, 57.8808°N 24.3618°E, Kaarel Sammet & Indrek Melts leg., Tullgren funnel (ten samples);
35. 29.VIII.2018, Kõveri, thin fresh deciduous forest, topsoil and litter, 58.1189°N 24.7410°E, Kaarel Sammet leg., Tullgren funnel (one sample);
36. 28.VIII.2018, Risti, mesic grassland, topsoil and litter, 58.9979°N 24.0519°E, Kaarel Sammet & Miina Oras leg., Tullgren funnel (two samples);
37a. 23.VII.2016, Kullamaa, edge of Marimetsa bog, topsoil and litter, 58.8907°N 24.0590°E, Kaarel Sammet leg., Tullgren funnel (one sample);
37b. 24.VII.2015, Kullamaa, mesic mixed forest, topsoil and litter, 58.8907°N 24.0590°E, Kaarel Sammet leg., Tullgren funnel (one sample);
37c. 04.XI.2020, Kullamaa cemetery, debris from a tree cavity, 58.8808°N 24.0755°E, Kaarel Sammet leg., Tullgren funnel (one sample);
37d. 25.VIII.2019, Kullamaa, mesic grassland, topsoil and litter, 58.86807°N 24.0879°E, Kaarel Sammet leg. Tullgren funnel, (one sample);
37e. 23.VII.2016, Kullamaa, compost heap in rural garden, 58.8675°N 24.0887°E, Kaarel Sammet leg. Tullgren funnel (one sample);
38. 25.X.2019, Vigala, rural garden, topsoil, 58.7755°N 24.2486°E, Mari Ivask leg. Tullgren funnel (one sample);
39. 22.VIII.2020, Lohusalu, dry *Pinus sylvestris* forest, topsoil and litter, 59.40016°N 24.2015°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
40. 23.VI.1938, Kõltsu manor [original label: Wellenhof bei Laulasmaa], 59.36°N 24.25°E, collector and collecting method unknown;
41. 23.V.2020, Muraste, mixed forest, topsoil and litter 59.4575°N 24.4291°E, Olavi Kurina leg., Tullgren funnel (one sample);
42. 04.IX.2020, near Riidaku, mixed mesic forest, moss and litter from the ground, 58.95°N 24.6100°E, Kaarel Sammet leg., Tullgren funnel (one sample);
43a. 22.VIII.–05.IX.2009 Üksnurme, rural garden, 59.2948°N 24.6280°E, Ene Ilumäe leg., Malaise trap (one sample);
43b. 27.XII.2016, south of Saku, mixed mesic forest, moss and litter from the ground, 59.2661°N, 24.6483°E, Olavi Kurina leg., Tullgren funnel (one sample);
44. 01.VI.2019, Raikküla, rural garden, topsoil and litter, 58.9377°N 24.7602°E, Mari Ivask & Kaarel Sammet leg., Tullgren funnel (one sample);

45. 29.VI.2015, Kõnnu, mesic *Pinus sylvestris* forest, topsoil and litter, 58.8983°N 24.7616°E, Siiri Jürgenstein leg., Tullgren funnel (one sample);
46a. 14.VI.2021, Tallinn, Tallinn zoo, mesic mixed forest, topsoil and litter, 59.4239°N 24.6553°E, Kaarel Sammet leg., Tullgren funnel (one sample);
46b. 14.VI.2021, Tallinn, Tallinn zoo, moss on a wall, 59.4239°N 24.6553°E, Kaarel Sammet leg., Tullgren funnel (one sample);
46c. 18.V.2022, Tallinn, Mustamäe, *Pinus sylvestris* dominated urban park, topsoil and litter, 59.3996°N 24.6759°E, Kaarel Sammetleg., Tullgren funnel (one sample);
46d. 18.V.2022, Tallinn, Mustamäe, *Tilia platyphyllos* dominated urban park, topsoil and litter 59.4161°N 24.6964°E, Kaarel Sammet leg., Tullgren funnel (one sample);
47a. 02.VI.2022, Tallinn, Botanical garden, topsoil and litter, 59.4695°N 24.8795°E, Kaarel Sammet leg., Tullgren funnel (three samples);
47b. 12.VII.2016, Maardu, *Pinus sylvestris* forest on dunes, topsoil and litter, 59.4669°N 24.9438°E, Kaarel Sammet, Allan Selin leg., Tullgren funnel (one sample);
48a. 25.IV.2023, Tuhala, debris from a tree cavity in a rural garden, 59.2004°N 24.9646°E, Kaarel Sammet leg., Tullgren funnel (one sample);
48b. 25.IV.2023, Tuhala, topsoil and moss in a *Picea abies* dominated mesic forest, 59.2004°N 24.9646°E, Kaarel Sammet leg., Tullgren funnel (one sample);
49a. 08.VIII.2021, Prangli island, Kelnase, rocky seashore, topsoil and litter, 59.6386°N 25.0092°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
49b. 19.IX.2022, Prangli island, marshy deciduous forest, topsoil and litter, 59.6197°N 25.0114°E, Heli Kirik leg., Tullgren funnel (one sample);
50. 18.IX.2018, Pääsma, *Pinus sylvestris* dominated mesic forest, bracket fungus from a dead tree, 58.3762°N 25.0384°E, Kadri Pärtel leg., Tullgren funnel (one sample);
51. 17.III. 2020, Kuuraniidu nature trail, fresh coniferous forest dominated by *Picea abies*, topsoil and litter, 58.4523°N 25.1678°E, Kaarel Sammet leg., Tullgren funnel (one sample);
52a. 17.III.2020, Hüpassaare nature trail, fresh forest dominated by *Picea abies,* topsoil and litter, 58.5306°N 25.2680°E, Kaarel Sammet, Miina Oras & Jüri Sammet leg., Tullgren funnel (one sample);
52b. 19.VI.1961, near lake Tammeveski, 58.47°N 25.44°E, Asta Vilbaste leg., no other data available;
52c. 17.III.2020. Hüpassaare bog, *Sphagnum* moss and litter on the ground 58.5299°N 25.2587°E, Kaarel Sammet, Miina Oras & Jüri Sammet leg., Tullgren funnel (one sample);
53. 25.III.2017, Käru, paludified forest dominated by *Picea abies,* topsoil and litter, 58.8293°N 25.1066°E, Mari Ivask leg., Tullgren funnel (one sample);
54. 01.VI.2019, Kolu, mesic mixed forest, topsoil and litter, 58.8036°N 25.2893°E, Kaarel Sammet leg., Tullgren funnel (one sample);
55. 30.III.2021, Paunküla, mesic mixed forest, topsoil and litter, 59.1503°N 25.2960°E, Kaarel Sammet leg., Tullgren funnel (three samples);
56a. 09.VIII.2015, Kaberneeme seashore, topsoil and litter, 59.5220°N 25.2767°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
56b. 28.IX.2022, Viru bog nature trail, fresh mixed forest, topsoil and litter, 59.4770°N 25.6661°E, Kaarel Sammet leg., Tullgren funnel (two samples);
57. 14.VI.2021, Vissuvere nature trail, raised bog, moss and litter, 58.9318°N 25.4496°E, Kaarel Sammet leg., Tullgren funnel (one sample);
58. 31.VII.–7.VIII.2016, Viivre, rural garden, 58.0799°N 25.5252°E, Heli Kirik leg., pitfall trap (three samples);
59. 05.V.2016, Võhma, mesic mixed forest, debris under the bark of a dead tree, 58.6250°N 25.5757°E, Kaarel Sammet leg., Tullgren funnel (one sample);
60a. 23.IX.2020, Paide, urban parkland, soil and moss at the base of a wall, 58.8893°N 25.5725°E, Kaarel Sammet leg., Tullgren funnel (one sample);
60b. 10.IX.2014, Mäo, mesic grassland, topsoil and litter, 58.9322°N 25.6091°E, Kaarel Sammet leg., Tullgren funnel (one sample);

61a. 14.III.2017, Viljandi, Lossimäed, debris from a decaying tree stump, 58.3591°N 25.5967°E, Kaarel Sammet leg., Tullgren funnel (one sample);

61b. 30.VIII.2017, Viljandi, Uueveski, topsoil and litter from a rural garden, 58.3738°N 25.6127°E, Miina Oras leg., Tullgren funnel (one sample);

62. 23.IV.2020, Aegviidu, mesic *Pinus sylvestris* dominated forest, topsoil, moss and litter 59.2558°N 25.6631°E, Kaarel Sammet leg., Tullgren funnel (one sample);

63. 17.VIII.2022, Mohni island, topsoil and litter 59.6801°N 25.7978°E, Heli Kirik leg., Tullgren funnel (one sample);

64a. 13.VII.2022, Tässi restored bog, *Sphagnum* moss, 58.5374°N 25.8605°E, Kaarel Sammet leg., Tullgren funnel (five samples);

64b. 25.XI.2013, Kaiu, mesic mixed forest, *Lactarius rufus* fruiting body, 58.6552°N 26.0750°E, Siiri Jürgenstein leg., Tullgren funnel (one sample);

65a. 09.V.2021, near Võsu, *Pinus sylvestris* dominated mesic forest, topsoil and litter, 59.5804°N 25.9173°E, Miina Oras leg., Tullgren funnel (one sample);

65b. 21.VIII.2015, Võsu, coastal dry *Pinus sylvestris* forest on dunes, topsoil and litter, 59.5801°N 25.9659°E, Kaarel Sammet leg. Tullgren funnel (one sample);

65c. 31.X.2021, Võsu, lichens on the trunk of *Pinus sylvestris* near seashore 59.5814°N 25.9670°E, Kaarel Sammet leg., Tullgren funnel (one sample);

65d. 10.VIII.2014, Võsu, dry *Pinus sylvestris* dominated forest, topsoil and litter, 59.5723°N 25.9476°E Kaarel Sammet leg., Tullgren funnel (one sample);

66. 22.IV.2020, Natturi, fresh nemoral forest, topsoil and litter 59.6211°N 26.0239°E, Kaarel Sammet leg., Tullgren funnel (one sample);

67a. 11.X.2018, Lasila, *Picea abies* forest with *Hepatica*, debris under bark of dead tree, 59.2612°N 26.2087°E, Kaarel Sammet leg., Tullgren funnel (one sample);

67b. 11.X.2018, Lasila, *Picea abies* forest with *Hepatica*, topsoil and litter 59.2612°N 26.2087°E, Kaarel Sammet leg., Tullgren funnel (three samples);

67c. 11.X.2018, Lasila, mixed mesic forest, topsoil and litter, 59.2721°N 26.2312°E, Kaarel Sammet leg., Tullgren funnel (three samples);

67d. 30.V.2015, Lasila, mixed mesic forest, topsoil and debris, 52 59.2721°N 26.2312°E, Märt Kruus, Kaarel Sammet leg., Tullgren funnel (three samples);

67e. 11.X.2018, Lasila, mixed mesic forest, topsoil and debris, 59.2768°N 26.2230°E, Kaarel Sammet leg., Tullgren funnel (three samples);

67f. 30.V.–02,VII.2015, Lasila, thin mixed forest, 59.2735°N 26.2337°E, Märt Kruus leg., pitfall trap (two samples);

67g. 02.VII.2015, Lasila, mesic *Pinus sylvestris* forest, topsoil and litter, 59.2786°N 26.2852°E, Märt Kruus leg., Tullgren funnel (three samples);

67h. 01.X.2018 Lasila, *Salix sp.* and *Betula pendula* dominated fresh forest, topsoil and litter, 26.1955°N 26.2587°E, Kaarel Sammet leg., Tullgren funnel (three samples);

67i. 24.VIII.–20.IX.2015, Lasila, mesic hillock forest, 59.2721°N 26.2312°E, Olavi Kurina leg., Malaise trap (one sample);

68. 31.X 2021, near lake Äntu Sinijärv, moss on rock, 59.0639°N 26.2396°E, Kaarel Sammet, Miina Oras, Maret Sammet leg., Tullgren funnel (one sample);

69. 27.X.2016, Rakke, mesic mixed forest, topsoil and debris, 58.9916°N 26.2587°E, Tõnu Kesküla leg., Tullgren funnel (one sample);

70. 02.VIII.2015, Vaitka, wooded meadow, topsoil and debris, 57.6833°N 26.2027°E, Märt Kruus leg., Tullgren funnel (three samples);

71. 07.XI.2015, Prange, moist *Picea abies* dominated forest, topsoil and debris, 58.0399°N 26.2065°E, Jaan Viidalepp leg., Tullgren funnel (one sample);

72. 21.VI.2017, Kirna nature trail, mesic meadow, topsoil and debris, 58.5447°N 26.2378°E, Tõnu Kesküla leg., Tullgren funnel (one sample);

73. 03.IX.2019, Selli-Sillaotsa nature trail, *Sphagnum* bog, moss and peat, 58.4385°N 26.2675°E, Kaarel Sammet leg., Tullgren funnel (one sample);

74a. 24.IV.2022, Lüllemäe, *Pinus sylvestris* dominated mesic forest, topsoil and debris, 57.7460°N 26.3820°E, Janika Oras leg., Tullgren funnel (one sample);
74b. 13.III.2022, Sangaste, rural parkland, debris from a tree cavity, 57.9018°N 26.2793°E, Kaarel Sammet leg., Tullgren funnel (one sample);
75. 09.X.2013, Miti, mesic *Pinus sylvestris* dominated forest, *Suillus bovinus* fruiting body 58.1002°N 26.3579°E, Siiri Jürgenstein leg., Tullgren funnel (one sample);
76. 05.XI.2021, Puurmani, mesic mixed forest, topsoil and debris, 58.5928°N 26.3613°E, Kaarel Sammet, Indrek Melts leg., Tullgren funnel (three samples);
77. 27.XI.2014, Puhja, mesic deciduous forest, topsoil and debris, 58.3444°N 26.3669°E, Kaarel Sammet leg., Tullgren funnel (one sample);
78a. 15.V.2015, Peedu, *Pinus sylvestris* dominated mesic forest, topsoil and debris, 58.2398°N 26.4473°E, Kaarel Sammet leg., Tullgren funnel (three samples);
78b. 22.XI.2015, Vapramäe, *Pinus sylvestris* dominated mesic forest, topsoil and debris, 58.2396°N 26.4476°E, Kaarel Sammet leg., Tullgren funnel (one sample);
78c. 18.X.2015, Peedu, *Pinus sylvestris* dominated mesic forest, topsoil and debris, 58.2396°N 26.4485°E, Kaarel Sammet leg., Tullgren funnel (one sample);
78d. 04.IX.2021, Vapramäe, mesic *Pinus sylvestris* dominated forest, topsoil and litter, 58.2428°N 26.4540°E, Miina Oras leg., Tullgren funnel (one sample);
78e. 19.IX.2019, Voika, arable field, topsoil, 58.2498°N 26.4925°E, Mari Ivask leg., Tullgren funnel (five samples);
78f. 13.III.2020, Peedu, lichens in a tree, 58.2402°N 26.4452°E, Kaarel Sammet leg., Tullgren funnel (one sample);
79. 10.X.2020, Alam-Pedja, Kärevere, periodically flooded grassland, topsoil and litter, 58.4145°N 26.4792°E, Mari Ivask, Katrin Heinsoo leg., Tullgren funnel (five samples);
80. 13.IX.2014, Miti, mesic *Pinus sylvestris* dominated forest, topsoil and litter, 58.0376°N 26.4813°E, Kaarel Sammet leg., Tullgren funnel (one sample);
81. 27.V.2018, north of Aähijärve, dry *Pinus sylvestris* dominated forest, topsoil and litter, 57.7198°N 26.5006°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
82a. 29.VIII.2018, Rõhu, rural garden, topsoil and litter, 58.3496°N 26.5238°E, Kaarel Sammet, Leho Tedersoo leg., Tullgren funnel (one sample);
82b. 16.X.2016, Tähtvere bog, mosses and litter 58.3967°N 26.6561°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
82c. 16.X.2016, Tiksoja, moist coniferous forest, topsoil and litter, 58.3999°N, 26.6291°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
82d. 10.I.2015, Tartu, moist meadow with *Salix* bushes, topsoil and litter, 58.4069°N 26.6601°E, Kaarel Sammet leg., Tullgren funnel (three samples);
82e. 26.VII.2021, Tähtvere, mesic mixed forest, topsoil, 58.3971°N 26.6626°E, Sten Anslan leg., Tullgren funnel (five samples);
82f. 07.V.2018, Tartu, Eerika, topsoil and litter, 58.3651°N 26.6663°E, Kaarel Sammet leg., Tullgren funnel (one sample);
82g. 29.VI.–06.VII.2020, Tartu, urban park, 58.3958°N 26.6911°E, Olavi Kurina leg., Malaise trap (one sample);
82h. 18.–25.V.2021, Tartu, urban park, 58.3958°N 26.6911°E, Olavi Kurin leg., Malaise trap (one sample);
82i. 05.IX.2014, Tartu, urban park, topsoil and litter, 58.3912°N 26.6939°E, Kaarel Sammet leg., Tullgren funnel (one sample);
82j. 10.VIII.2014, Tartu urban yard, topsoil and litter, 58.3889°N 26.6941°E, Kaarel Sammet leg., Tullgren funnel (one sample);
82k. 28.IX.2019, Tartu, Kreutzwaldi street, topsoil from lawn, 58.3878°N 26.6943°E, Kaarel Sammet leg., Tullgren funnel (one sample);
82l. 20.VIII.2019, Tartu, urban parkland, topsoil and moss on the ground, 58.3881°N 26.6948°E, Kaarel Sammet leg., Tullgren funnel (one sample);

82m. 08.VIII.2016, Tartu, mesic grassland, topsoil and moss on the ground, 58.3923°N 26.6949°E, Kaarel Sammet leg., Tullgren funnel (one sample);

82n. 21.X.2021, Tartu, urban parkland, moss from a tree trunk, 58.3921°N 26.6950°E, Kaarel Sammet leg., Tullgren funnel (one sample);

82o. 11.III.2020, Tartu, mesic grassland, moss on a tree stump, 58.3939°N 26.6964°E, Kaarel Sammet leg., Tullgren funnel (one sample);

82p. 26.X.2021, Tartu, Näituse street, moss and lichens from trees, 58.3778°N 26.7029°E, Kaarel Sammet leg., Tullgren funnel (three samples);

82r. 25.VI.2020, Tartu, grassland near river Emajõgi, topsoil and litter, 58.3892°N 26.7136°E, Kaarel Sammet, Sirle Varusk leg., Tullgren funnel (three samples);

82s. 30.VII.2019, Tartu, Supilinn, urban parkland, topsoil and litter, 58.3889°N 26.7137°E, Kaarel Sammet leg., Tullgren funnel (five samples);

82t. 26.VI.2020, Tartu, Supilinn, urban parkland, topsoil and litter, 58.3891°N 26.714°E, Kaarel Sammet, Sirle Varusk leg., Tullgren funnel (one sample);

82u. 10.VII.2019, Tartu, Tartu University Botanical garden, topsoil and litter, 58.3848°N 26.7209°E, Kaarel Sammet, Sirle Varusk leg., Tullgren funnel (five samples);

82v. 09.V.2021, Kaarel Sammet Tartu, Tartu University Botanical Garden, topsoil and litter, 58.3845°N 26.7209°E, Kaarel Sammet leg., Tullgren funnel (two samples);

82x. 16.VI.2019, Tartu, "Bauhof" imported flowering plants, 58.3608°N 26.67463E, Kaarel Sammet, Sirle Varusk leg., Tullgren funnel (five samples);

82y. 29.VIII.2023 Tartu, Tähtvere park, debris from a hollow tree 58.3861°N, 26.7016°E, Kaarel Sammet leg., Tullgren funnel (two samples);

82z. 15.VII.2022 Tartu, Ränilinn, deciduous forest, topsoil and litter, 58.3447°N 26.6856°E, Sirle Varusk leg., Tullgren funnel (twelve samples);

83a. 18.IX.2020, Tartu, Ihaste, urban parkland, topsoil and litter, 58.3487°N 26.7709°E, Kaarel Sammet leg., Tullgren funnel (two samples);

83b. 15.V.2018, Tartu, Juhani arboretum, topsoil, 58.3686°N 26.7964°E, Leho Tedersoo, Kaarel Sammet leg., Tullgren funnel (one sample);

84. 01.X.2014, Jõksi, lake shore, topsoil and litter, 58.0001°N 26.7333°E, Kaarel Sammet leg., Tullgren funnel (one sample);

85. 05.IX. 2015, Rutja, seashore wrack 59.5556°N 26.3533°E, Olavi Kurina leg., Tullgren funnel (three samples);

86. 02.VII.2015, Nurkse, mesic mixed forest, topsoil and litter, 59.2836°N 26.6008°E, Kaarel Sammet leg., Tullgren funnel (one sample);

87a. 05.V.2014, near lake Saadjärv, fresh deciduous forest, topsoil and litter, 58.5522°N 26.6302°, Kaarel Sammet leg. Tullgren funnel (one sample);

87b. 01.X.2019, Soitsjärve, stems and leaves of blackberry (infected with *Acalitus essigi*), 58.5527°N 26.6746°E, Luule Metspalu leg., Tullgren funnel (one sample);

87c. 26.III.2020, Elistvere, grassland near a parking lot, topsoil and litter, 58.5759°N 26.6854°E, Kaarel Sammet leg., Tullgren funnel (one sample);

88a. 25.X.2015, Ignase, debris in a barn in rural household, 58.2513°N 26.8325°E, Märt Kruus leg., Tullgren funnel (one sample);

88b. 09.VIII-2022, Nõo, *Populus tremula* dominated mixed forest, topsoil and litter,58.3027°, 26.5486°E, Sirle Varusk leg., Tullgren funnel (six samples);

89a. 01.X.2013, Mustametsa, mesic mixed forest, topsoil and litter, 58.5833°N 26.8667°E, Siiri Jürgenstein leg., Tullgren funnel (five sample);

89b. 01.X.2013, Mustametsa, mesic *Pinus sylvestris* dominated forest, *Albatrellus ovinus* fruiting body, 58.5868°N 26.8721°E, Siiri Jürgenstein leg., Tullgren funnel (one sample);

90a. 25.IX.2013, Kaiu, mesic *Pinus sylvestris* dominated forest, *Cortinarius armillatus* fruiting body, 58.6552°N 26.8719°E, Siiri Jürgenstein leg., Tullgren funnel (one sample);

90b. 09.X.2013, Soontaga, mesic *Pinus sylvestris* dominated forest, *Lactarius helvus* fruiting body, 58.6552°N 26.8780°E, Siiri Jürgenstein leg., Tullgren funnel (one sample);

91a. 07.IV.2021, Luhasoo nature trail, mesic *Pinus sylvestris* dominated forest, topsoil and litter, 57.6404°N 26.8872°E, Miina Oras leg., Tullgren funnel (one sample);
91b. 27.III.2020, Luhasoo nature trail, mesic *Pinus sylvestris* dominated forest, 57.6410°N 26.8889°E, Kaarel Sammet leg., Tullgren funnel (two samples);
92. 05.V.2016, near Aseri, broadleaved forest under limestone cliffs, 59.4443°N 26.9047°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
93. 20.IX.2014, Ihamaru, mesic *Pinus sylvestris* dominated forest, topsoil and litter, 58.1000°N 26.9319°E, Kaarel Sammet leg., Tullgren funnel (four samples);
94. 08.XI.2015, Sudaste, rural garden, topsoil and litter, 58.3287°N 26.9443°E, Olavi Kurina leg., Tullgren funnel (one sample);
95a. 19.III.2020, Kiidjärve, mesic mixed forest, moss and lichens on a tree, 58.1300°N 26.9935°E, Kaarel Sammet leg., Tullgren funnel (one sample);
95b. 05.V.2021, Saessaare Savimägi, thin mesic mixed forest, decaying wood, 58.1182°N 27.0250°E, Miina Oras leg., Tullgren funnel (one sample);
95c. 21.IX.2022, Taevaskoja, decaying wood and moss on it, in rural garden, 58.1081°N 27.0683°E, Kaarel Sammet leg., Tullgren funnel (one sample);
95d. 21.IX.2022, Taevaskoja, moss and soil on sandstone outcrop, 58.1081°N 27.0683°E, Kaarel Sammet leg., Tullgren funnel (one sample);
95e. 16.X.2019, Valgesoo nature trail, moss from tree trunk, 58.1515°N 27.0676°E, Kaarel Sammet leg., Tullgren funnel (one sample);
95f. 16.X.2019, Valgesoo nature trail, paludified forest, topsoil and litter, 58.1515°N 27.0676°E, Kaarel Sammet leg., Tullgren funnel (one sample);
96. 26.XI.2020, Alatskivi, rural park, debris from hollow trees, 58.6038°N 27.1323°E, Kaarel Sammet leg., Tullgren funnel (two samples);
97. 14.VIII.2016, Liispõllu, mesic mixed forest, topsoil and litter, 58.1295°N 27.2615°E, Olavi Kurina leg., Tullgren funnel (one sample);
98a. 27.IV.2018, Järvselja Nature Reserve, bog, *Sphagnum* mosses and debris; 58.2698°N 27.3125°E, Kaarel Sammet leg., Tullgren funnel (one sample);
98b. 14.VIII.2016, Järvselja, *Pinus sylvestris* dominated mesic forest, topsoil and litter, 58.2765°N 27.3178°E, Olavi Kurina leg., Tullgren funnel (one sample);
98c. 30.VIII.2014, Järvselja, *Pinus sylvestris* dominated mesic forest, topsoil and litter, 58.2633°N 27.3178°E, Kaarel Sammet leg., Tullgren funnel (one sample);
98d. 28.IX.2014, Järvselja, *Pinus sylvestris* dominated mesic forest, topsoil and litter, 58.2633°N 27.3178°E, Olavi Kurina leg., Tullgren funnel (one sample);
98e. 30.VIII.2014, Järvselja, mesic mixed forest, topsoil and litter, 58.2633°N 27.3178°E, Kaarel Sammet leg., Tullgren funnel (one sample);
99. 21.X.2015, Kaukvere, *Pinus sylvestris* dominated mesic forest, topsoil and litter, 59.1654°N 26.8942°E, Kaarel Sammet leg., Tullgren funnel (one sample);
100. 09.VIII.2015, Iisaku, mesic grassland, topsoil and moss, 59.0810°N 27.3047°E, Kaarel Sammet leg., Tullgren funnel (one sample);
101. 21.X.2015, Mäetaguse Nature Reserve, mesic mixed forest, topsoil and debris, 59.2289°N 27.3247°E, Märt Kruus and Tõnu Kesküla leg., Tullgren funnel (one sample);
102a. 23.X 2020, near Valaste Waterfall, broad-leaved forest, topsoil and debris, 59.4448°N 27.3348°E Miina Oras and Maret Sammet leg., Tullgren funnel (one sample);
102b. 05.V.2016, near Valaste Waterfall, broad-leaved forest, topsoil and debris, 59.4438°N, 27.3350°E, Kaarel Sammet leg., Tullgren funnel (one sample);
103. 22.X.2021, edge of Meenikunna bog, topsoil and moss, 57.9450°N 27.3317°E, Miina Oras leg., Tullgren funnel (one sample);
104. 15.II.2015, Veriora, mesic *Pinus sylvestris* dominated forest, topsoil and litter, 58.0010°N 27.3648°E, Kaarel Sammet leg., Tullgren funnel (one sample);
105a. 19.XII.2017, Piusa, cave in sandstone cliff, soil and debris, 57.8427°N 27.4580°E, Anita Makarevitš and Tõnu Kesküla leg., Tullgren funnel (one sample);

105b. 14.VIII.2015, Hannuse near Piusa, mesic grassland, topsoil and moss, 57.8375°N 27.4791°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
105c. 14.VIII.2015, Piiroja, mesic mixed forest, topsoil and litter, 57.8368°N 27.5581°E, Tõnu Kesküla leg., Tullgren funnel (one sample);
106a. 28.VI.2015, near Värska, mesic grassland, topsoil and litter, 57.9588°N 27.6183°E, Miina Oras leg., Tullgren funnel (one sample);
106b. 01.IX.2012, Mustoja Nature Reserve, old mesic mixed forest, topsoil, 57.9047°N 27.6604°E, Piret Vacht leg., Tullgren funnel (one sample);
107. 29.IX. 2019, Võõpsu, mesic grassland, topsoil and litter, 58.0852°N 27.5358°E, Sirle Varusk leg., Tullgren funnel (one sample);
108. 05.V.2016, Poruni, paludified forest, topsoil and litter, 59.1749°N 27.7969°E, Kaarel Sammet leg., Tullgren funnel (one sample);
109. 23.X.2013, Mustanina, recultivated oil shale mines, *Pinus sylvestris* forest, topsoil, 59.2522°N 27.8386°E, Annely Kuu leg., Tullgren funnel (one sample).

Results

Palaeosomata
Palaeacaridae
**Palaeacarus hystricinus* Trägårdh, 1932
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 65d, 109.
Distribution: Holarctic (Subías 2022), present also in Latvia (Kagainis *et al*. 2014) and Finland (Niemi *et al*. 1997).

Enarthronota
Brachychthoniidae
Brachychthonius berlesei Willmann, 1928
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Sample: 20a.
Distribution: Holarctic (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Eobrachychthonius borealis* Forsslund, 1942
Sample: 33b.
Distribution: Holarctic (Subías 2022), present also in Finland (Niemi *et al.* 1997). First record of the species from the Baltic countries.

**Eobrachychthonius latior* (Berlese, 1910)
Sample: 12.
Distribution: Holarctic (Subías 2022), present also in Finland (Niemi *et al.* 1997). First record of the species from the Baltic countries.

**Eobrachychthonius oudemansi* Hammen, 1952
Sample: 48a.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: There are several slightly different descriptions of the species (Forsslund 1957, Niedbała 1974, Seniczak & Seniczak 2017) and the studied specimens match best that of Forsslund (1957). Seniczak & Seniczak (2017) depict a specimen with an undevided aggenital shield, whereas the Estonian specimens have clearly divided aggenital shields.

Liochthonius brevis (Michael, 1888)
Literature sources: Vacht *et al*. (2018b).
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Liochthonius furcillatus (Willmann, 1942)
Literature sources: Vacht *et al*. (2018a).
Comments: Palaearctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

**Liochthonius lapponicus* (Trägårdh, 1910)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 95a, 99.
Distribution: Holarctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997). First record of the species from the Baltic countries.

**Liochthonius muscorum* Forsslund, 1964
Sample: 47a.
Distribution: Holarctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997). First record from the Baltic countries.

Liochthonius sellnicki (Thor, 1930)
Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Sample: 27b.
Distribution: Holarctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

**Liochthonius simplex* (Forsslund, 1942)
Sample: 109.
Distribution: Semicosmopolitan species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

**Liochthonius strenzkei* Forsslund, 1963
Samples: 20c, 25.
Distribution: Holarctic species (Subías 2022), present also in Finland (Niemi *et al.* 1997). First record of the species from the Baltic countries.

**Neobrachychtonius marginatus magnus* Moritz, 1976
Sample: 21a.
Distribution: Holarctic species (Subías 2022). First record of the species from the Baltic countries.

**Sellnickochthonius cricoides* (Weis-Fogh, 1948)
Sample: 8.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis & Spuņģis 2013).

**Sellnickochthonius hungaricus* (Balogh, 1943)
Samples: 34, 98b, 109.
Distribution: Palaearctic and northern Neotropical species (Subias 2022), present also in Latvia (Kagainis & Spuņģis 2013).
Taxonomic remarks: Niedbała (1974) synonymized the species with *Sellnickochthonius rostratus* (Jacot, 1936) (with the illustration clearly depicting *S. hungaricus*), but Weigmann (2006) did not accept the synonymy. It is possible that Niemi (1988) record of *S. rostratus* from Finland refers to the same species. Subías (2022) treats *S. hungaricus* as a valid subspecies of *Sellnickochthonius rostratus*.

**Sellnickochthonius immaculatus* (Forsslund, 1942)
Samples: 47a, 76, 81.

Distribution: Holarctic and Neotropical species (Subías 2022), present also in Finland (Niemi *et al*. 1997). First record from the Baltic countries.

**Sellnickochthonius zelawaiensis* (Sellnick, 1928)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Sample: 97.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Synchthonius elegans* Forsslund, 1956
Sample: 66.
Distribution: Holarctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997). First record from the Baltic countries.

**Verachthonius laticeps* (Strenzke, 1951)
Sample: 19c.
Distribution: Palaearctic and Neotropical species (Subías 2022). Single finding (2 specimens) from moss and lichens on a tree trunk. First record from the Baltic countries.

Pterochthoniidae
**Pterochthonius angelus* (Berlese, 1910)
Sample: 82o.
Distribution: Semicosmopolitan species (Subías 2022), with no records from the neighbouring countries.

Eniochthoniidae
Eniochthonius minutissimus (Berlese, 1903)
Literature sources: [?] Karppinen & Krivolutsky (1982) ; Vacht *et al*. (2018a).
Samples: 9, 12, 15, 17a, 20a, 21a, 25b, 34b, 37a, 44, 45, 66, 82j, 101.
Distribution: Cosmopolitan species (Subías 2022), found also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Hypochthoniidae
**Hypochthonius luteus* Oudemans, 1917
Samples: 47a, 82u, 82z.
Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al.* 1997).
Taxonomic remarks: The Estonian specimens belong to *H. luteus var. septentrionalis* Berlese, 1910.

Hypochthonius rufulus C. L. Koch, 1835
Literature sources: Grube (1859); [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 4b, 9, 12, 17a, 19a, 32, 34, 37d, 43b, 45, 47a, 49b, 51, 54, 60a, 62, 66, 67e, 67h, 72, 74a, 82a, 90a, 95d, 101, 105a, 108.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Mesoplophoridae
**Mesoplophora pulchra* Sellnick, 1928
Samples: 15, 96.
Distribution: Palaearctic and Afrotropical species (Subías 2022), present also in Finland (Elo *et al.* 2016). First record from the Baltic countries.

Cosmochthoniidae

**Cosmochthonius lanatus* (Michael, 1885)

Sample: 88a.

Distribution: Cosmopolitan species (Subías 2022), present also in Latvia (Kagainis *et al*. 2014) and Finland (Niemi *et al*. 1997). Rare species in Estonia, found from debris in a barn in a rural household.

Parhyposomata

Parhypochthoniidae

**Parhypochthonius aphidinus* Berlese, 1904

Literature sources: [?] Karppinen & Krivolutsky (1982).

Sample: 44.

Distribution: Semicosmopolitan species (Subías 2022), present also in Finland (Niemi *et al*. 1997). Rare species in Estonia, so far only found in a topsoil and litter sample in a rural garden.

Mixonomata

Eulohmanniidae

Eulohmannia ribagai (Berlese, 1910)

Literature sources: Vacht *et al*. (2018a).

Sample: 76.

Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Euphthiracaridae

Euphthiracarus cribrarius (Berlese, 1904)

Literature sources: [?] Karppinen & Krivolutsky (1982); Niedbała (2012); Niedbała & Liu (2018); Vacht *et al*. (2018a).

Samples: 12, 25, 34, 54, 73, 82b, 101, 102a, 103.

Distribution: Holarctic species (Niedbała & Liu 2018), found also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Euphthiracarus monodactylus (Willmann, 1919)

Literature sources: [?] Karppinen & Krivolutsky (1982); Niedbała (2012); Niedbała & Liu (2018).

Samples: 19c, 78a, 82u, 82t.

Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis *et al*. 2014), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

**Microtritia fissurata* Märkel, 1968

Sample: 95d.

Distribution: Niedbała (2012) and Niedbala & Liu (2018) list Altai (Russian Federation) as the only finding locality, but the species is also included in the species list of Slovakia (Starý 2006b). The Estonian record is the northernmost for this species.

Microtritia minima (Berlese, 1904)

Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).

Samples: 81, 102a, 103.

Comments: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Acrotritia ardua (C. L. Koch, 1841)

Literature sources: [?] Karppinen & Krivolutsky (1982); Niedbała (2012); Vacht *et al*. (2018b); Niedbała & Liu (2018).

Samples: 3a, 15, 20c, 44, 51, 57, 77, 81.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Oribotritiidae

**Mesotritia nuda* (Berlese, 1887)
Samples: 5b, 19c, 55, 61b, 82u, 102a.
Distribution: Semicosmopolitan species (Subías 2022), present also in Finland (Niemi *et al*. 1997). First record from the Baltic countries.

Protoribotritia aberrans (Märkel & Meyer, 1959)
Literature sources: Vacht et al 2018a.
Distribution: Palaearctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Phthiracaridae

Sellnick (1924) mentions a finding of *Phthiracarus borealis* (Träg.) from Jõõpre bog near Pärnu. Nowadays, this species is considered as a *species inquirenda*, and is possibly a synonym of *P. longulus* (Weigmann 2006) or *P. bryobius*, *P. clavatus*, *P. crenophilus* or *P. opacus* (Niedbała 2008). Beck *et al*. (2014) treat it as a valid species (and *P. clavatus* Parry, 1979 as its synonym), but Niedbała & Liu (2018) do not recognize this. Subías (2022) considers it a synonym of *P. longulus* (Koch, 1841).

Atropacarus striculus (C. L. Koch, 1836)
Literature sources: Sellnick (1924) [as *Phthiracarus striculus*]; [?] Karppinen & Krivolutsky (1982); Niedbala (2012); Vacht *et al*. (2018b); Niedbała & Liu (2018).
Samples: 14c, 19b, 21a, 28a, 34, 47a, 49b, 82a, 92o, 82s, 108, 109.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Atropacarus csiszarae (Balogh & Mahunka, 1979)
Literature sources: Niedbała (2012); Niedbała & Liu (2018).
Distribution: Western Palaearctic species (Subías 2022) with no records from the neighbouring countries or territories. The records from Estonia are the northernmost findings of the species (*cf*. Niedbała & Liu 2018).

Hoplophthiracarus illinoisensis (Ewing, 1909)
Literature sources: Sellnick (1924) [as *Phthiracarus pavidus*]; Niedbała (2012); Niedbała & Liu (2018).
Samples: 52a, 64a, 73, 95d.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Phthiracarus boresetosus Jacot, 1930
Literature sources: Niedbała (2012); Niedbała & Liu (2018).
Samples: 3a, 37a, 39, 102a.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis *et al*. 2014) and Finland (Niemi *et al*. 1997).

**Phthiracarus bryobius* Jacot, 1930
Samples: 39, 48b, 88b, 93, 95d, 108.
Distribution: A semicosmopolitan species (Subías 2022), present also in Latvia and Finland (Niedbała 2012).

**Phthiracarus crinitus* (C.L. Koch, 1841)
Sample: 82l.
Distribution: Palaearctic species (Subías 2022), with no records from the neighbouring countries and territories.

Phthiracarus ferrugineus (C.L.Koch, 1841)
Literature sources: Vacht *et al*. (2018a).
Sample: 32.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Phthiracarus globosus (C.L. Koch, 1841)
Literature sources: Niedbała (2012); Vacht *et al*. (2018a); Niedbała & Liu (2018).
Sample: 34.
Distribution: Holarctic, Oriental and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Phthiracarus laevigatus (C. L. Koch, 1844)
Literature sources: Sellnick (1924); Vacht *et al*. (2018a).
Sample: 60b.
Distribution: Palaearctic species (Niedbała & Liu 2018), present also in Latvia (Kagainis 2011), Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995, Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Phthiracarus longulus (C. L. Koch, 1841)
Literature sources: Niedbała (2012); Niedbała & Liu (2018).
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Phthiracarus nitens (Nicolet, 1855)
Literature sources: Niedbała (2012); Niedbała & Liu (2018).
Sample: 35.
Distribution: Palaearctic species (Niedbała & Liu 2018), present also in Latvia and Finland (Niedbała 2012).
Taxonomic remarks: The species is a synonym of *Ph. laevigatus* according to Subías (2022), but Niedbała & Błoszyk (2022) consider it a valid species.

Phthiracarus opacus Niedbała, 1986
Literature sources: Niedbała (2012).
Samples: 32, 75.
Distribution: Palaearctic species (Niedbała & Liu 2018), present also in Finland (Niedbała & Liu 2018).

**Steganacarus* (*Tropacarus*) *brevipilus* (Berlese, 1923)
Samples: 3a, 32.
Distribution: Western Palaearctic species (Niedbała & Liu 2018), with no records from the neighbouring countries or territories (Niedbała & Liu 2018).

Steganacarus (*Tropacarus*) *carinatus* (C. L. Koch, 1841)
Literature sources: Grube (1859) [as: *Hoplophora carinata* Koch]; Niedbała (2012); Vacht *et al*. (2018b); Niedbała & Liu (2018).
Samples: 12, 14a, 14b, 20a, 35, 37d, 45, 47a, 56h, 78c, 81, 90b, 91b, 93, 95d, 100, 103, 108.
Distribution: Palaearctic and Mexican species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Steganacarus (*Steganacarus*) *magnus* (Nicolet, 1855)
Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Sample: 19a.
Distribution: Holarctic species (Subías2011), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Steganacarus (Steganacarus) applicatus (Sellnick, 1922)
Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a); Niedbała & Liu (2018).
Samples: 12, 43b, 51, 65, 90b, 99, 101, 102a, 108.
Distribution: Western Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Desmonomata
Trhypochthoniidae
**Mainothrus badius* (Berlese, 1905)
Samples: 14c, 64a.
Distribution: Holarctic species (Subías 2022), also found in Finland (Huhta *et al*. 2010). First record from the Baltic countries.

**Trhypochthoniellus longisetus* (Berlese, 1904)
Sample: 21b.
Distribution: Cosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997, as *T. excavatus*).

**Trhypochthonius cladonicola* (Willmann, 1919)
Literature sources: [?] Karppinen & Krivolutsky (1982); [?] Starý (2006a).
Sample: 103.
Distributions: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997). The source of Starý's (2006) record is unclear, but we assume it is Karppinen and Krivolutsky (1982).
Taxonomic remarks: The species was originally described as *Camisia cladonicola* and later transferred to *Trhypochthonius* as *Trhypochthonius cladonicola*. Szywilewska-Szczykutowicz & Olszanowski (2007) changed the species name to *cladonicolus* to make it agree with the masculine gender of the new genus name, but this was an unjustified emendation because *cladonicola* is not an adjective but a noun in apposition (this applies also to *Trhypochthonius sphagnicola*) (ICZN 31.2 and 34.2.1).

**Trhypochthonius tectorum* (Berlese, 1896)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Sample: 46c.
Distribution: Semicosmopolitan species (Subías 2022), present also in Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Trhypochthonius nigricans* Willmann, 1928
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 56b, 57.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Crotoniidae
**Camisia biurus* (C. L. Koch, 1839)
Samples: 65c, 75, 95b.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2012) and Finland (Niemi *et al*. 1997).

Camisia segnis (Hermann, 1804)
Literature sources: Sellnick (1924); Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 43a, 82n.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Camisia solhoeyi* Colloff, 1993
Sample: 52a.
Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2012).

Camisia spinifer (C. L. Koch, 1835)
Literature sources: [?] Grube (1859); Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 12, 22a, 30, 56b, 63, 65b, 65c, 58, 70, 83a.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Heminothrus thori (Berlese, 1904)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 28b, 52b.
Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Heminothrus longisetosus (Willmann, 1925)
Literature sources: Vacht *et al*. (2018a).
Samples: 68, 93, 105a.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Heminothrus targionii* (Berlese, 1885)
Samples: 3a, 4b, 14b, 15, 17, 19c, 41, 47a, 48, 55, 82u.
Distribution: Holarctic and Oriental species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Platynothrus peltifer (C. L. Koch, 1839)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Samples: 2a, 6, 9, 10a, 14c, 22b, 25, 28a, 30, 35, 37a, 39, 42, 43b, 49b, 66, 81, 82u, 98c, 100.
Distribution: A semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad and Pskov Regions of Russia (Sitnikova 1975; Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Hermanniidae
Hermannia convexa (C. L. Koch, 1839)
Literature sources: Vacht *et al*. (2019).
Distribution: A Holarctic species (Subías 2022), with no records from the neighbouring countries.

Hermannia subglabra Berlese, 1910
Literature sources: Eitminavičiūtė (1965) [as *Hermannia scabra*]; Karppinen & Krivolutsky (1982) [as *Hermannia scabra*].
Sample: 28d.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Hermannia gibba (C. L. Koch 1839)
Literature sources: Vacht *et al*. (2018a).
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Malaconothridae
Malaconothrus monodactylus (Michael, 1888)

Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al.* 2018a; [?] Sellnick (1924) [as *Malaconothrus globiger*]; [?] Eitminavičiūtė, (1965) [as *Malaconothrus globiger*]; [?] Karppinen & Krivolutsky (1982) [as *Malaconothrus globiger*]
Samples: 14c, 16, 25, 28a, 32, 34, 49b, 57, 64a, 73, 82e, 90b, 98d.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov and Leningrad Regions of Russia (Krivolutsky *et al*. 1995, Zaitsev 2013) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: The only difference between *M. globiger* described from Sweden and *M. monodactylus* is the width of palp tarsus. Seniczak & Seniczak (2009) give a diagnosis of *M. monodactylus* that does not include the palpal shape, thus probably accepting the assumption of Weigmann (2006) and Weigmann *et al*. (2015) that the two species are synonyms. According to our observations, the last palpal article is slightly flat, so its apparent width depends on viewing angle (Fig. 2). *Malaconothrus globiger* is treated as *sp. inq*. by Balogh & Mahunka (1983) and Subías (2022) but treated as valid species by Colloff & Cameron (2013). Eitminavičiūtė (1965) stated that *M. globiger* is the dominant species in Estonian coastal areas, and we have found abundant typical *M. monodactylus* in coastal grasslands, so it can be assumed that her mites belonged to the same species.

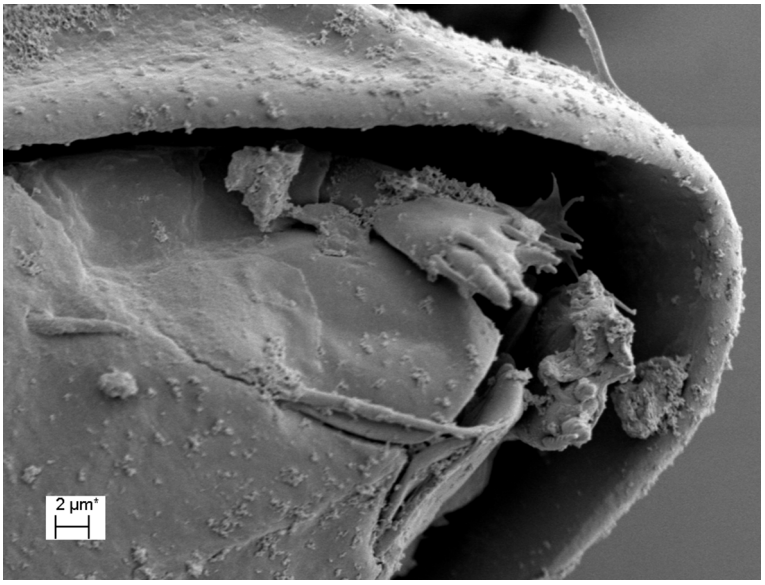

FIGURE 2. SEM of palps of *M. monodactylus* (from locality 25).

**Tyrphonothrus* cf. *glaber* (Michael, 1888)
Sample: 28a.
Distribution: Holarctic species (Subías 2022), present also in Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: The sizes of Estonian specimens are slightly smaller than those given by Weigmann (2006) (535–560 µm *vs.* 550–670 µm) but otherwise they agree with the species specific characters.

**Tyrphonothrus angulatus* (Willmann, 1931)
Samples: 32, 33a, 33b.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Nanhermanniidae
**Nanhermannia komareki* Kunst, 1956
Samples: 14c, 90b.
Distribution: Central and East European species (Subías 2022), present also in the neighbouring Leningrad Region of Russia (Sitnikova 1975, Krivolutsky *et al*. 1995). First record of the species from the Baltic countries.
Taxonomic remarks: *Nanhermannia forsslundi* Karppinen, 1958 was described from Finland as very similar to

N. komareki, differing mainly by having wider central prodorsal field (but the illustration shows the field only slightly wider than that depicted by Kunst (1956), possibly being within a range of intraspecific variability) and longer rostral setae. Unfortunately, neither numerical value of the length, nor a figure of these was given, so the identification of the species (if valid) is difficult.

**Nanhermannia* cf. *coronata* Berlese, 1913 (*sensu* Weigmann 2006)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 52a, 56b, 73, 82k, 103.
Distribution: A Palaearctic (or Holarctic?) species (Weigmann 2006), present also in neighbouring Latvia (Kagainis 2012), Leningrad and Pskov Regions of Russia (Sitnikova 1975, Zaitsev 2013, as *N. dorsalis*) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: Subías (2004, 2022) treats *N. coronata* as a junior synonym of *Nanhermannia dorsalis* (Banks, 1895) probably based on Jackot (1937) but Weigmann (2006), Weigmann *et al*. (2015) and Norton & Ermilov (2014) have not accepted the synonymy.

**Nanhermannia comitalis* Berlese, 1916
Samples: 8, 30, 33a, 34.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Leningrad Region of Russia (Krivolutsky *et al*. 1995).

Nanhermannia elegantula Berlese, 1913
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Distribution: Holarctic species (Subías 2022), with records from the neighbouring Latvia (Kagainis & Eitminavičiūtė 2011), Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995).
Taxonomic remarks: There are no recent findings, although similar habitats as studied by Eitminavičiūtė have been extensively sampled. Misidentification of *Nanhermannia nana* is not impossible, as these species have been confused in the past (Balogh & Mahunka 1983).

Nanhermannia nana (Nicolet, 1855)
Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 28a, 32, 34, 64b, 68, 82e, 90b, 95d, 98b, 108.
Distribution: Cosmoploitan species (Subías 2022), with records from the neighbouring Latvia (Kagainis 2011), Finland (Niemi *et al*. 1997), Pskov and Leningrad Regions of Russia (Sitnikova 1975, Zaitsev 2013).

**Nanhermannia sellnicki* Forsslund, 1958
Samples: 12, 64a, 57.
Distribution: Palaearctic species (Subías 2022), with records from the neighbouring Finland (Niemi *et al*. 1997). First record of the species from the Baltic countries.

Nothridae

Nothrus anauniensis Canestrini & Fanzango, 1876
Literature sources: Sellnick (1924); Eitminavičiūtė (1965) [as *Nothrus biciliatus* Koch, 1841]; Karppinen & Krivolutsky (1982).
Samples: 13, 44, 47a, 60a, 82a, 82l, 82t.
Distribution: Cosmopolitan species (Subías 2022), with records from the neighbouring Latvia (Kagainis 2011), Pskov and Leningrad Regions of Russia (Sitnikova 1975, Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Nothrus borussicus Sellnick, 1928
Literature sources: Vacht *et al*. (2018a).
Samples: 2b, 21a, 21b, 63, 83a.
Distributions: A Holarctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Nothrus palustris C. L. Koch, 1839
Literature sources: Grube (1859); Vacht *et al*. (2018a).
Samples: 4b, 6, 17a, 34, 42, 43b, 46a, 47a, 62, 67b, 67e, 82e, 82m, 91a, 98c, 108.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Nothrus pulchellus* (Berlese, 1910)
Sample: 61b.
Distribution: Palaearctic species (Subías 2022), with no records from northern Europe. The closest findings are from Poland and Germany (Olszanowski *et al.* 1996; Weigmann 2015, as *Nothrus parvus* Sitnikova, 1975) and the Estonian record seems to be the northernmost known.

Nothrus pratensis Sellnick, 1928
Literature sources: Vacht *et al*. (2018a).
Sample: 14c, 57.
Distribution: Holarctic (Subías 2022), present also in neighbouring Latvia (Kagainis & Spuņģis 2013) and Finland (Niemi *et al*. 1997).

Nothrus silvestris Nicolet, 1855
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Samples: 2a, 12, 17a, 43b, 45, 49b, 56b, 64b, 82u, 103, 108.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Sitnikova 1975) and Finland (Niemi *et al*. 1997)

Hermanniellidae
Hermanniella granulata (Nicolet, 1855)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Distribution: Cosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Hermanniella dolosa Grandjean, 1931
Literature sources: Vacht *et al*. (2018a).
Samples: 3a, 4b, 15, 19a, 27a, 32, 44, 46a, 63, 66, 72, 82d, 86, 101.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Hermanniella punctulata* Berlese, 1908
Samples: 9, 17a, 20c, 41, 48b, 52a, 60a, 60b, 65a, 67b.
Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011).
Taxonomic remarks: Sellnick (1928) considered *H. punctulata* as junior synonym of *Nothrus piceus* C.L.Koch, 1839, and many authors have accepted the synonymy (*e.g*. Subías 2004 and many updates thereof, Norton & Ermilov 2014). There is, however, little evidence for the synonymization—the type material is lost, and the illustration and short description leave a lot of room for different interpretations (Koch 1839). Michael (1898) considered *N. piceus* a synonym of *Hermannia convexa* (C.L. Koch, 1839), and Weigmann (2006) guessed it might be a *Hermannia* species too. We agree with van der Hammen (1952) and Weigmann *et al*. (2015) in that it is impossible to unambiguously identify as any particular species of *Hermanniella* (or confirm it being a member of the genus at all). Subías (2022) treats *H. punctulata* as a valid species and has transferred *N. piceus* to the genus *Hermannia* as *sp. inq*.

Neoliodidae
**Poroliodes farinosus* (C. L. Koch, 1839)
Samples: 2b, 3, 4a, 6, 47a, 63, 72, 95b, 98d.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Gymnodamaeidae

**Arthrodamaeus* cf. *rossicus* (Bulanova-Zachvatkina, 1967) (*sensu* Bulanova-Zachvatkina 1975)

Samples: 37b, 69, 105a, 106a.

Distribution: Eastern European species (Subías 2022), with no records from the Baltic or Nordic countries.

Taxonomic remarks: The species was described by Bulanova-Zachvatkina (1967) in a key to the genus *Allodamaeus,* with no illustrations, and no type material has been preserved. Bayartogtokh & Ermilov (2014) redescribed the species based on material collected from European Russia and Crimea, and also designated a neotype. They stated that the only diagnosis of the species is that of the original vague description (Bulanova-Zachvatkina 1967) which is also repeated in a later key by the same author (Bulanova-Zachvatkina 1975), and that their putative identification of the studied material fits that. The two keys are in fact not identical, as the 1975 key contains two additional characters (trochanters IV with a terminal spike and length 0.8 mm), but no such projection can be seen on the illustrations of the trochanter in the redescription and the lengths of the studied specimens varied between 567–659 µm (Bayartogtokh & Ermilov 2014), so it is not unambiguously clear, whether the redescribed species is identical with *A. rossicus sensu* Bulanova-Zachvatkina (Fig. 3).

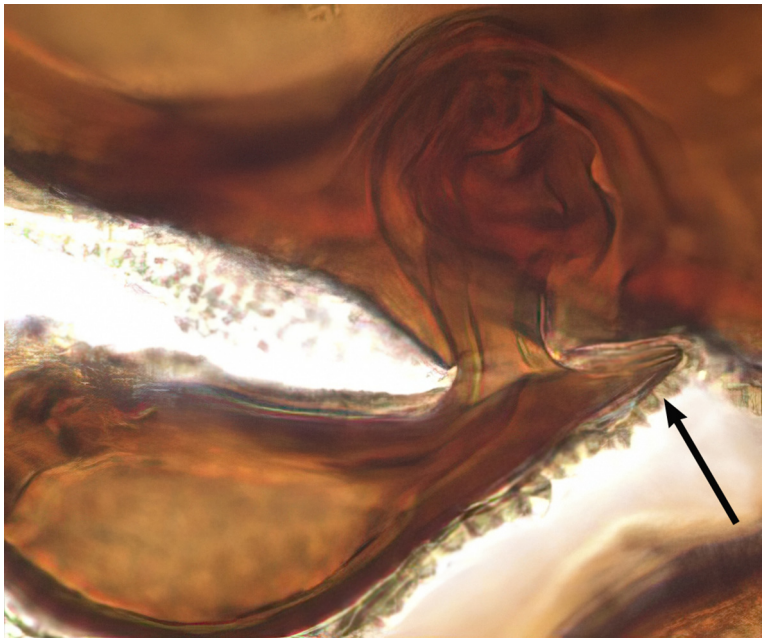

FIGURE 3 *Arthrodamaeus* cf. *rossicus* trochanter IV (specimen from sample 37b).

Gymnodamaeus bicostatus (C. L. Koch, 1835)

Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).

Samples: 3a, 13, 46b, 47b, 67d, 105b.

Distribution: Holarctic and Afrotropical species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Licnodamaeidae

**Licnodamaeus pulcherrimus* (Paoli, 1908)

Samples: 13, 21a.

Distribution: Palaearctic and Neotropical species (Subías 2022), present also in Finland (The International Barcode of Life Consortium 2023). First record of the species from the Baltic countries.

Damaeidae

**Belba compta* (Kulczynski, 1902)

Samples: 81, 93.

Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Belba corynopus* (Hermann, 1804)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 32, 35.
Distribution: Holarctic and Oriental species (Subías 2022), with records from Leningrad Region of Russia (Krivolutsky *et al*. 1995).

**Damaeobelba minutissima* (Sellnick, 1920)
Sample: 12.
Distribution: Holarctic species (Subías 2022), also found in Latvia (Kagainis *et al*. 2014), Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

**Damaeus auritus* C. L. Koch, 1825
Literature sources: [?] Grube (1859).
Sample: 19a.
Distribution: A Holarctic species (Subías 2022), also found in Finland (Niemi *et al.* 1997). This is the first record of the species from the Baltic countries.
Taxonomic remarks: Grube (1859) mentions the finding of *Damaeus auritus* Koch (as being synonym of *Damaeus riparius* Nic.) from Estonia, so the identity of his species is unclear.

**Damaeus onustus* C. L. Koch, 1841
Samples: 19a, 51, 60b, 108.
Distribution: Western Palaearctic and Afrotropical species (Subías 2022), also found in Latvia (Kagainis 2011), Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995, as *Belba geniculosa*) and Finland (Niemi *et al*. 1997).

**Damaeus clavipes* (Hermann, 1804)
Samples: 2a, 90b, 95d, 105a.
Distribution: Western Palaearctic species (Subías 2022), also found in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Damaeus gracilipes (Kulczynski, 1902)
Literature sources: Vacht *et al*. (2018a).
Sample: 35.
Distribution: Holarctic species (Subías 2022), also found in Finland (Niemi *et al*. 1997).

**Damaeus riparius* Nicolet, 1855
Samples: 26, 67a.
Distribution: Palaearctic species (Subías 2022), also found in Latvia (Kagainis 2012) and Finland (Niemi *et al*. 1997).

**Epidamaeus bituberculatus* (Kulczynski, 1902)
Sample: 48.
Distribution: Palaearctic species (Subías 2022), also found in Finland (Niemi *et al*. 1997).

**Epidamaeus glabrisetus* (Willmann, 1930)
Samples: 49b, 78f.
Distribution: European species (Subías 2022), with no records from the neighbouring countries or territories.

**Epidamaeus kamaensis* (Sellnick, 1925)
Samples: 86, 99.
Distribution: Palaearctic species (Subías 2022), with no records from the neighbouring countries or territories.

**Kunstidamaeus nidicola* (Willmann, 1936)
Sample: 95c.
Distribution: European species (Subías 2022), with no records from the Baltic countries.

**Kunstidamaeus* cf. *tecticola* (Michael, 1888)
Samples: 20b, 48a.
Distribution: A European species (Subías 2022), found also in Finland (Niemi *et al*. 1997). First record of the species from the Baltic countries.
Taxonomic remarks: The Estonian specimens are slightly smaller than the size given by Miko in Weigmann (2006) (620–630 μm vs. 630–810 μm) and the prodorsal tubercle *La* is very weakly developed.

**Metabelba papillipes* (Nicolet, 1855)
Samples: 25, 92u.
Distribution: Holarctic species (Subías 2022), with no records from the neighbouring countries or territories.

**Metabelba rohdendorfi* Bulanova-Zachvatkina, 1965
Sample: 87c.
Distribution: European species (Subías 2022), with no records from the neighbouring countries or territories.

**Metabelba sphagni* Strenzke, 1950
Sample: 52c.
Distribution: European and Afrotropical species (Subías 2022), with no records from the neighbouring countries or territories.

**Metabelba pulverosa* Strenzke, 1953
Samples: 19a, 32, 76, 82e, 7b, 100.
Distribution: Holarctic species (Subías 2022), also found in Finland (Niemi *et al*. 1997, as *Metabelba pulverulenta*).

**Porobelba spinosa* (Sellnick, 1920)
Samples: 45, 56b, 82e, 82z, 108.
Distribution: Palaearctic species (Subías 2022), also found in Latvia (Kagainis 2012) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: This is a highly variable species (Grandjean 1954). Weigmann (2006) describes the spinae adnatae as rod-shaped or horn-shaped, or missing. Bulanova-Zakhvatkina (1975) depicts them as having a blunt or slightly concave apex. One of Estonians specimens (sample from 82z) has clearly bifurcate spinae adnatae (cleft in two parallel apices in the last ¼).

Spatiodamaeus verticillipes (Nicolet, 1855)
Literature sources: Vacht *et al*. (2018a).
Sample: 19b.
Distribution: Holarctic species (Subías 2022), also found in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Spatiodamaeus boreus* (Bulanova-Zachvatkina, 1957)
Samples: 2a, 12, 82r.
Distribution: Western Palaearctic species (Subías 2022), also found in Finland (Niemi *et al*. 1997) and Leningrad Region of Russia (Bulanova-Zakhvatkina 1975, Krivolutsky *et al*. 1995). First record from the Baltic countries.

Cepheusidae
Cepheus cepheiformis (Nicolet, 1855)
Literature sources: Grube (1859) [as *Pelonia foliosa*]; Vacht *et al*. (2018).

Samples: 38, 43b, 65a, 75, 82e, 87c, 98e, 108.
Distribution: Holarctic species (Subías 2022), also found in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: Grube (1859) described the species *Pelonia foliosa*, but gave no illustration and the type material is apparently lost. It was described as having leaf-like setae and it is mentioned in the description of *Pelonia tricuspidata* that the latter is very similar to *P. foliosa* („*P. foliosae* simillima“) so there is no doubt that the synonymy first tentatively proposed by Oudemans (1900) is correct (and there is little reason to consider it a *sp. inq.* as in Subías 2022). This also corroborates the proposed synonymy of the genera *Pelonia* Grube, 1859 and *Cepheus* C. L. Koch, 1835 (clearly stated in Shtanchaeva & Subías 2010) since they have the same type species; see Norton & Ermilov (2014) for a comprehensive taxonomic history.

Cepheus latus (C. L. Koch, 1835)
Literature sources: Grube (1859) [as *Pelonia tricuspidata*].
Samples: 82b, 108.
Distribution: Holarctic and Oriental species (Subías 2022) found also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: A. E. Grube described *Pelonia tricuspidata* from three localities in Estonia and Latvia (Grube 1859). There are two specimens in one vial in the collection of Wroclaw University Museum of Natural History labelled as *Pelonia tricuspidata* by Grube. These are tritonymphs of *Cepheus latus*. The better preserved one was designated as lectotype (Fig. 4) and the other paralectotype (both now in separate microvials). Thus, *Cepheus tricuspidatus* (Grube, 1859) **comb. nov.** should not be considered a *sp. inq.* (and does not belong to the genus *Liacarus*, as in Subías 2022) but is a junior synonym of *Cepheus latus* (C.L.Koch, 1835). The type locality is Soontaga (58°0'N, 26°5'E, on label as Sondeck) near Arula (Arrol) in southern Estonia.

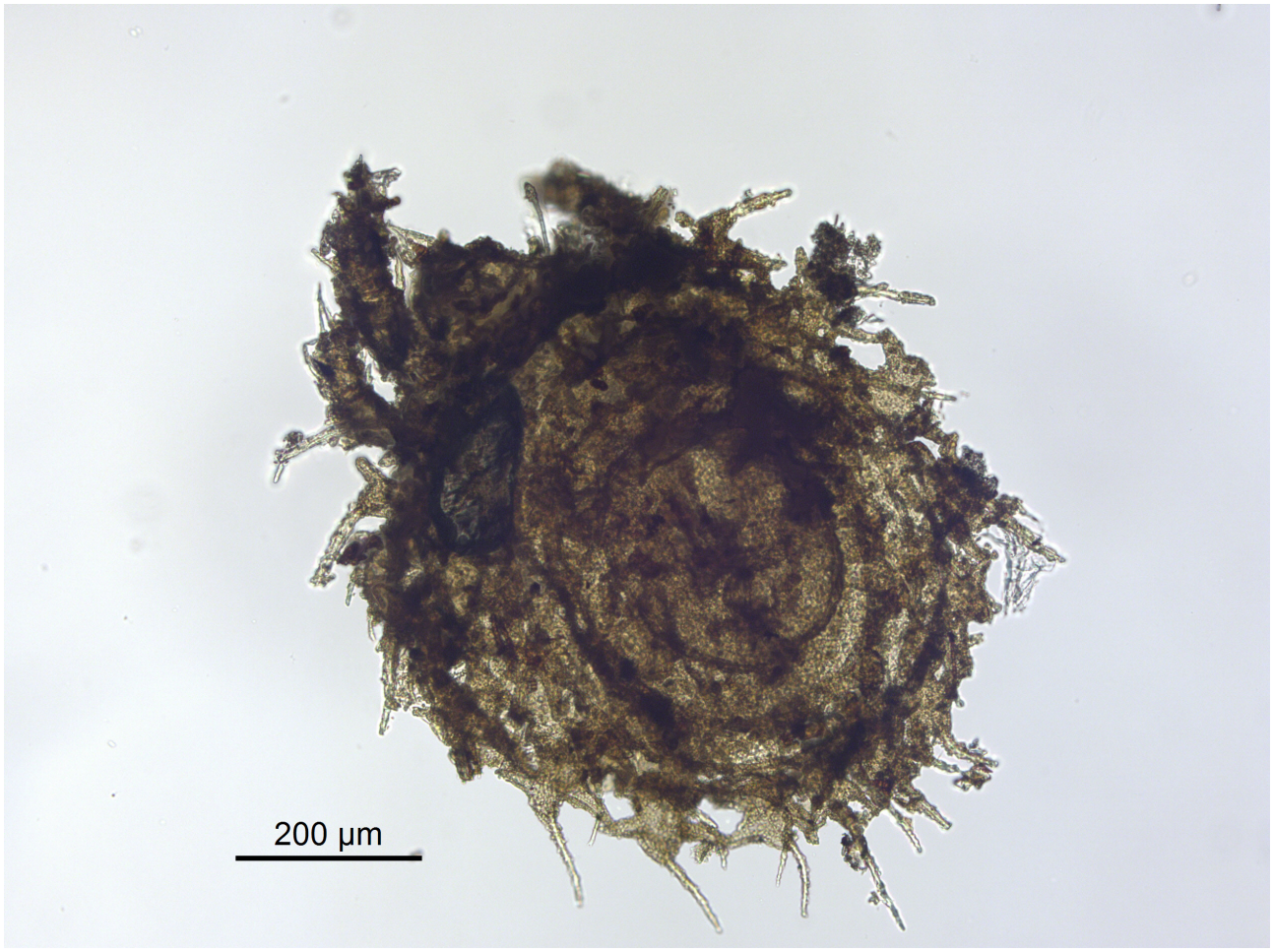

FIGURE 4. *Pelonia tricuspidata* Grube, 1859, lectotype.

**Tritegeus bisulcatus* Grandjean, 1953

Samples: 4b, 35; 60b.

Distribution: Western Palaearctic species (Subías 2022), found also in Finland (Huhta *et al*. 2010).

Taxonomic remarks: This species is the third Estonian species of the family, and may be a junior synonym of *Pelonia crinita* Grube, 1859. The latter was described as having dorsal shield consisting of four shields (very likely scalps) surrounded by very long, shortly barbed marginal setae projecting over the shields and only a single specimen was found by Grube. The appearence of *Tritegeus bisulcatus* tritonymph (only described in Michael 1888), generally matches the description of *Pelonia crinita* and it is less frequent in Estonia than the other two Cepheusidae species. The Grube's species has been currently tentatively transferred to the genus *Eupelops* Ewing, 1917 (Subías 2022, 2024), which is unlikely because of the four layers of dorsal shield surrounded by very long marginal setae do not match any *Eupelops* species. The only ohter Estonian species bearing multiple scalps belong to Neoliodidae (which do not fit the description of „the lowest layer surrounded by 20 long marginal setae") and Damaeidae, but the latter were known to Grube and placing *P. crinita* in his genus *Pelonia* indicates that he found it similar to the nymphae of *Cepheus* species. However, because of some ambiguity of the description and lack of hard evidence, we do not formally propose the synonymy here.

Caleremaeidae

Caleremaeus monilipes (Michael, 1882)

Literature sources: Vacht *et al*. (2018a).

Samples: 1, 53, 56b, 68, 98e.

Distribution: Holarctic species (Subías 2022) found also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Damaeolidae

**Fosseremus laciniatus* (Berlese, 1905)

Literature sources: [?] Karppinen & Krivolutsky (1982).

Samples: 13, 21b, 67f.

Distribution: A cosmopolitan species (Subías 2022), found also in Finland (Niemi *et al*. 1997).

Eremaeidae

**Eremaeus hepaticus* C. L. Koch, 1835

Sample: 105a.

Distribution: Holarctic species (Subías 2022), found also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Eueremaeus intermedius* (Mihelcic, 1955)

Samples: 24a, 47a, 82p, 95d, 107.

Distribution: European species (Subías 2022). First record of the species from the Baltic countries.

Taxonomic remarks: Eitminavičiūtė (1965) identified *Eremaeus fossulatus* Kunst, 1959 from Estonia, which may be a misidentification of this or the following species, as both are quite variable (Seniczak *et al.* 2014).

**Eueremaeus oblongus* (C. L. Koch, 1835)

Samples: 14a, 82r, 86, 98e.

Literature sources: [?] Eitminavičiūtė (1965) [as *Eremaeus fossulatus*]; Karppinen & Krivolutsky (1982) [as *Eremaeus fossulatus*].

Distribution: A Holarctic and Oriental species (Subías 2022) found also in Latvia (Kagainis 2011) and in Finland (Niemi *et al*. 1997).

Taxonomic remarks: We follow Subías (2022) who treats *Eremaeus fossulatus* as synonym of *Eueremaeus oblongus quadrilamellatus* (Hammer, 1952).

**Eueremaeus silvestris* Forsslund, 1957

Literature sources: [?] Karppinen & Krivolutsky (1982).

Samples: 2a, 3a, 23, 62, 68, 95b, 95c, 105a.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis & Eitminavičiūtė 2011) and Finland (Niemi *et al*. 1997, as *Eueremaeus oblongus silvestris* (Forsslund, 1956)).

Astegistidae

Astegistes pilosus (C. L. Koch, 1841)
Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Furcoribula furcillata (Nordenskiöld, 1901)
Literature sources: Eitminavičiūtė (1965) [as *Fureoribula furcillata*]; Karppinen & Krivolutsky (1982).
Samples: 5a, 13, 15, 19c, 20a, 20b, 21a, 37d, 52a, 68, 81, 82u, 87c, 91a, 95b, 95c, 105a.
Distribution: Holarctic and Afrotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Gustaviidae

Gustavia microcephala (Nicolet, 1855)
Literature sources: Sellnick (1924); [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 28a, 33a, 34, 46a, 51, 67e, 74, 82a, 105c.
Distribution: Palaearctic, Oriental and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Liacaridae

Adoristes ovatus (Oudemans, 1906)
Literature sources: Eitminavičiūtė (1965) [as *Adoristes poppei*]; Karppinen & Krivolutsky (1982) [as *Adoristes poppei*]; Vacht *et al*. (2018a).
Samples: 6, 19a, 23, 34, 39, 42, 43b, 46b, 49b, 51, 55, 56b, 60a, 66, 70, 82n, 89a, 95c, 98e, 100, 102a, 105a, 105c, 108.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Liacarus coracinus* (C. L. Koch, 1841)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 12, 14b, 34, 60b, 63, 67e, 82h, 84, 98e, 105a, 105c, 108.
Distribution: Palaearctic, Oriental and Afrotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Liacarus subterraneus* (C. L. Koch, 1844)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 61b, 67a, 76, 82x, 95c.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2012) Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

**Xenillus clypeator* Robineau-Desvoidy, 1839
Sample: 63.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis & Eitminavičiūtė 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Xenillus tegeocranus (Hermann, 1804)
Literature sources: [?] Grube (1859) [as *Notaspis tegeocranus* Herm.]; Sellnick (1924); Eitminavičiūtė (1965); Karppinen & Krivolutsky 1982; Vacht *et al*. (2018a).

Samples: 7, 12, 19c, 20a, 35, 37a, 46b, 47a, 52a, 60b, 69, 84, 91a, 99, 105a, 108.
Distribution: Palaearctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Peloppiidae

Ceratoppia bipilis (Hermann, 1804)
Literature sources: [?] Grube (1859) [as *Notaspis bipilis* Herm.]; Sellnick (1924); Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 23, 24b, 47a, 55, 82g, 82u, 98c, 105a.
Distribution: Holarctic, Oriental and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Ceratoppia quadridentata* (Haller, 1882)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Sample: 106b.
Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Tenuialidae

**Hafenrefferia gilvipes* (C. L. Koch, 1839)
Literature sources: [?] Grube (1859) [as *Oribates gilvipes* Koch]; [?] Karppinen & Krivolutsky (1982).
Samples: 23, 30, 38, 40, 46a.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Carabodidae

Carabodes areolatus Berlese, 1916
Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Carabodes coriaceus* C. L. Koch, 1835
Literature sources: [?] Grube (1859); [?] Karppinen & Krivolutsky (1982).
Samples: 12, 67a.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995, Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Carabodes femoralis* (Nicolet, 1855)
Literature sources: [?] Grube (1859); [?] Karppinen & Krivolutsky (1982).
Samples: 78c, 81, 89b, 101.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Carabodes labyrinthicus (Michael, 1879)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 42, 46b, 47a, 55, 65c, 67c, 68, 75, 78d, 81, 90b, 95b, 105a.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Carabodes marginatus (Michael, 1884)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 20b, 46b.

Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995, Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Carabodes ornatus* Storkán, 1925
Samples: 6, 19c, 23, 43b, 55, 57, 64b, 67b, 76, 84, 86, 91a, 95c, 100, 101.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Huhta *et al*. 2010).

Carabodes rugosior Berlese, 1916
Literature sources: Vacht *et al*. (2018a).
Samples: 56b, 78c, 82u.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Carabodes subarcticus* Trägårdh, 1902
Samples: 12, 56b, 60b, 62, 68, 82b, 90a, 103, 105a.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Carabodes tenuis* Forsslund, 1953
Samples: 92, 95b, 103.
Distribution: A Palaearctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Carabodes willmanni Bernini, 1975
Literature sources: Vacht *et al*. (2018a).
Samples: 49a, 56b, 103.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Autognetidae
**Autogneta longilamellata* (Michael, 1885)
Sample: 101.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997)

Conchogneta traegardhi (Forsslund, 1947)
Literature sources: [?] Karppinen & Krivolutsky (1982) [as *Autogneta trägårdhi*]; Vacht *et al*. (2018b).
Samples: 45, 60b, 89b, 91b, 95c, 100, 103.
Distribution: A Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997)

**Conchogneta willmanni* (Dyrdowska, 1929)
Literature sources: [?] Karppinen & Krivolutsky (1982) [as *Conchogneta dalecarlica*].
Samples: 34, 44, 47a.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995, Zaitsev 2013).

Oppiidae
**Berniniella bicarinata* (Paoli, 1908)
Literature sources: [?] Karppinen & Krivolutsky (1982) [as: *Oppia bicarinata*])
Samples: 25, 34.
Distribution: Palaearctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997)

**Berniniella hauseri* (Mahunka, 1974)
Samples: 28a.
Distribution: Palaearctic and Oriental species (Subías 2022; as *Berniniella serratirostris hauseri*), with no records from the neighbouring countries or territories.

Dissorhina ornata (Oudemans, 1900)
Literature sources: Eitminavičiūtė (1965) [as *Oppia ornata*]; Vacht *et al*. (2018a).
Samples: 6, 14a, 15, 19c, 25, 34, 35, 61a, 68, 95a, 101, 105a.
Distribution: Palaearctic and Afrotropcal species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Microppia minus minus (Paoli, 1908)
Literature sources: Eitminavičiūtė (1965) [as *Oppia minutissima* Sellnick]; Karppinen & Krivolutsky (1982) [as *Oppia minus* (Paoli, 1908)].
Samples: 3a, 20c, 25, 29, 86.
Distribution: Cosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Microppia minus longisetosa* Subías & Rodríguez, 1988
Samples: 25.
Distribution: Originally described from Spain, the taxon has later been found in Italy (Migliorini 2009), Iran (Mirazie & Akrami 2012), Argentina (Subías 2022) and United Kingdom (original data).
Taxonomic remarks: The Estonian material agrees very well with the original description and illustration (including the length of setae and shape of sensillus; the length of the studied specimens is 180–185 μm (n=3). Mahunka & Mahunka-Papp (2007) synonymize the subspecies with *Oppia hungarica* Bayoumi, 1978, but Subías & Shtanchaeva 2012 reject the synonymization, arguing that the apparent differences between the original description and the types studied by Mahunka suggest mislabelling the type material.

**Multioppia glabra* (Michelcic, 1955)
Samples: 2a, 6, 20c, 47a, 82u.
Distribution: Palaearctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

**Oppia nitens* C.L. Koch, 1836
Samples: 37a, 44, 96.
Distribution: Holarctic and Antarctic species (Subías 2022), present also in the Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

**Oppiella* (*Oppiella*) *maritima* (Willmann, 1929).
Samples: 38.
Distribution: Holarctic species (Subías 2022, as *Lauroppia maritima*), present also in Finland (Niemi *et al*. 1997).

Oppiella (*Oppiella*) *nova* (Oudemans, 1902)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Samples: 2a, 6, 17b, 19b, 20a, 21b, 25, 28a, 32, 33b, 34, 36, 52a, 56b, 77, 82b, 82u, 90b, 91a, 91b, 95c, 99, 101, 103, 109.
Distribution: Cosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Oppiella* (*Oppiella*) *propinqua* Mahunka & Mahunka-Papp, 2000
Samples: 67e, 87c.
Distribution: European species, found also in Hawaii (Subías 2022; as *Oppiella nova propinqua*), with no records from the neighbouring countries or territories.

**Oppiella* (*Oppiella*) *splendens* (C. L. Koch, 1841)
Sample: 63.
Distribution: Holarctic and Australian species (Subías 2022, as *Moritzoppia* (*Pentoppia*) *splendens*), present also in Finland (Niemi *et al*. 1997).

Oppiella (*Rhinoppia*) *hygrophila* Mahunka, 1987
Literature sources: Vacht *et al*. (2018a).
Sample: 33c.
Distribution: European species (Subías 2022, as *Rhinoppia hygrophila*), present also in Latvia (Kagainis 2011) and Pskov Region of Russia (Zaitsev 2013, as *Medioppia hygrophila*).

Oppiella (*Rhinoppia*) *obsoleta* (Paoli, 1908)
Literature sources: Eitminavičiūtė (1965) [as *Oppia fallax v. obsoleta*]; Karppinen & Krivolutsky (1982) [as *Oppia obsoleta*].
Distribution: A Holarctic and Australian species (Subías 2022; as *Rhinoppia obsoleta*), present also in Finland (Niemi *et al*. 1997).

Oppiella (*Rhinoppia*) *subpectinata* (Oudemans, 1900)
Literature sources: Sellnick (1924); [?] Karppinen & Krivolutsky (1982).
Samples: 12, 17b, 19a, 21b, 34, 45, 47a, 51, 52a, 56b, 60b, 62, 67h, 82f, 82r, 82u, 87c, 90b, 95c, 102a, 108.
Distribution: Holarctic and Afrotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Oppiella* (*Moritzoppia*) *neerlandica* (Oudemans, 1900)
Literature sources: [?] Karppinen & Krivolutsky 1982.
Sample: 51.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Oppiella* (*Morizoppia*) *keilbachi* Moritz, 1969
Samples: 55, 67c, 74b, 95b, 98c.
Distribution: Palaearctic, Afrotropical and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2014) and Finland (Niemi *et al*. 1997).

Oppiella (*Morizoppia*) *translamellata* (Willmann, 1923)
Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Distribution: Holarctic species (Weigmann 2006), present also in Latvia (Kagainis *et al*. 2014) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: Subías (2022) considers this species a synonym of *Oppiella neerlandica*.

**Oppiella* (*Morizoppia*) *unicarinata* (Paoli, 1908)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 14a, 50, 82v.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2014) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: The studied specimens are most close to *ssp. clavigera* Hammer, 1952 (treated as a separate species in Niemi *et al*. 1997). According to Akrami (2014) that subspecies has lamellar setae at costulae, but according to Colloff & Seyd (1991) either adjacent to apices of costulae or less than 5µm anterior of them, and the Estonian specimens have rostral setae on small bumps (or depressions?) separate from costulae.

**Ramusella clavipectinata* (Michael, 1885)
Sample: 83b.

Distribution: Semicosmopolitanl species (Subías 2022), present also in Latvia (Kagainis 2014) and Finland (Niemi *et al*. 1997).

**Ramusella elliptica* (Berlese, 1908)
Sample: 27b.
Distribution: Holarctic, Oriental and Neotropical species (Subías 2022), found also in Finland (FinBIF 2024).

**Ramusella fasciata* (Paoli, 1908)
Samples: 37c, 48.
Distribution: Semicosmopolitanl species (Subías 2022), present also in Finland (Niemi *et al*. 1997). First record of the species from the Baltic countries.

**Ramusella furcata* (Willmann, 1928)
Samples: 19b, 20a, 76.
Distribution: European species (Subías 2022), found also in Pskov Region of Russia (Krivolutsky *et al*. 1995) and Finland (FinBIF 2024).

**Subiasella quadrimaculata* (Evans, 1952)
Sample: 72.
Distribution: Palaearctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Quadroppiidae

Quadroppia quadricarinata (Michael, 1885)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 6, 14a, 18, 20b, 48, 62, 68, 74b, 82u, 87c, 88b, 90a, 95c, 105a, 109.
Distribution: Semicosmopolitanl species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Quadroppia hammerae* Mínguez, Ruíz & Subías, 1985
Samples: 56b, 82z.
Distribution: Semicosmopolitanl species (Subías 2022), present also in Latvia (Kagainis 2011).

**Coronoquadroppia monstruosa* (Hammer, 1979)
Samples: 20a, 45, 51, 62, 78a.
Distribution: Holarctic and Oriental species (Subías 2022), with no records from the neighbouring countries or territories.

Thyrisomidae

Banksinoma lanceolata (Michael, 1885)
Literature sources: Sellnick (1924); [?] Karppinen & Krivolutsky (1982).
Samples: 25, 27b, 83a, 87c.
Distribution: Holarctic and Oceanian species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Pantelozetes forsslundi* Moritz, 1965
Sample: 37c.
Distribution: Central European species (Subías 2022), with no previous records from northern Europe.

Pantelozetes paolii (Oudemans 1913)
Literature sources: Eitminavičiūtė (1965) [as *Pantelozetes paoli*]; Karppinen & Krivolutsky (1982) [as *Oribella paolii*].
Samples: 21b, 25, 26, 28a, 32, 34.

Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Kaszabobates olbiopolitanus* Sergienko, 1980

Samples: 82y, 96;

Distribution: Palaearctic species (Subías 2022), with no previous records from the Baltic or Nordic countries.

Taxonomic remarks: The type material of this species (deposited in the Schmalhausen Institute of the Ukrainian Academy of Sciences) is mounted onto slides and currently the specimens are crushed (probably due to the shrinkage of the medium), yet clearly observable. Mahunka and Mahunka-Papp (2000) described *Kaszabobates helveticus* Mahunka & Mahunka-Papp, 2000 from Switzerland. They were apparently unaware of the Sergienko's species (stating that "The genus *Kaszabobates* Balogh, 1972 (= *Gobiella* Balogh et Mahunka, 1965) so far has exclusively been known from Mongolia as monotypic"). However, comparing Sergienko's description and the (less accurate) illustration with the Estonian specimens and Mahunka's description, and detailed photographs of the type material of *K. olbiopolitanus* (Fig 5, 6, 7), we could find no differences between them (comparing the two descriptions, there seems to be a difference between the proximal parts of costulae and cerotegument, but both are quite variable, and the sculpture between costulae often seems to form an onion-shaped structure as described by Sergienko (Fig. 8)). Therefore, *Kaszabobates helveticus* Mahunka & Mahunka-Papp, 2000 should be treated as junior synonym of *Kaszabobates olbiopolitanus* Sergienko, 1980 (**syn. nov.**).

FIGURE 5: *Kaszabobates olbiopolitanus* Sergienko, 1980, holotype. Photo by V. Korneyev & L. Kolodochka.

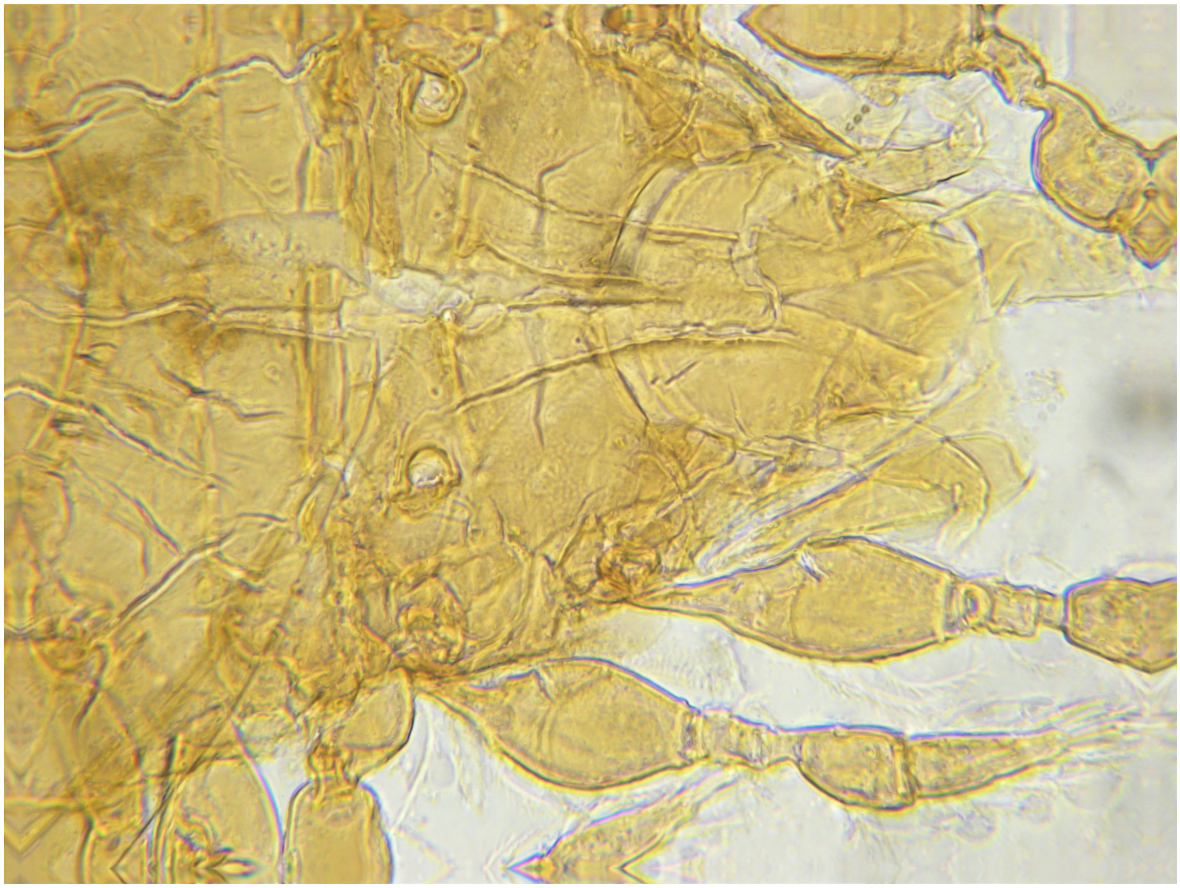

FIGURE 6: *Kaszabobates olbiopolitanus* (holotype), details of prodorsum. Photo by V. Korneyev & L. Kolodochka.

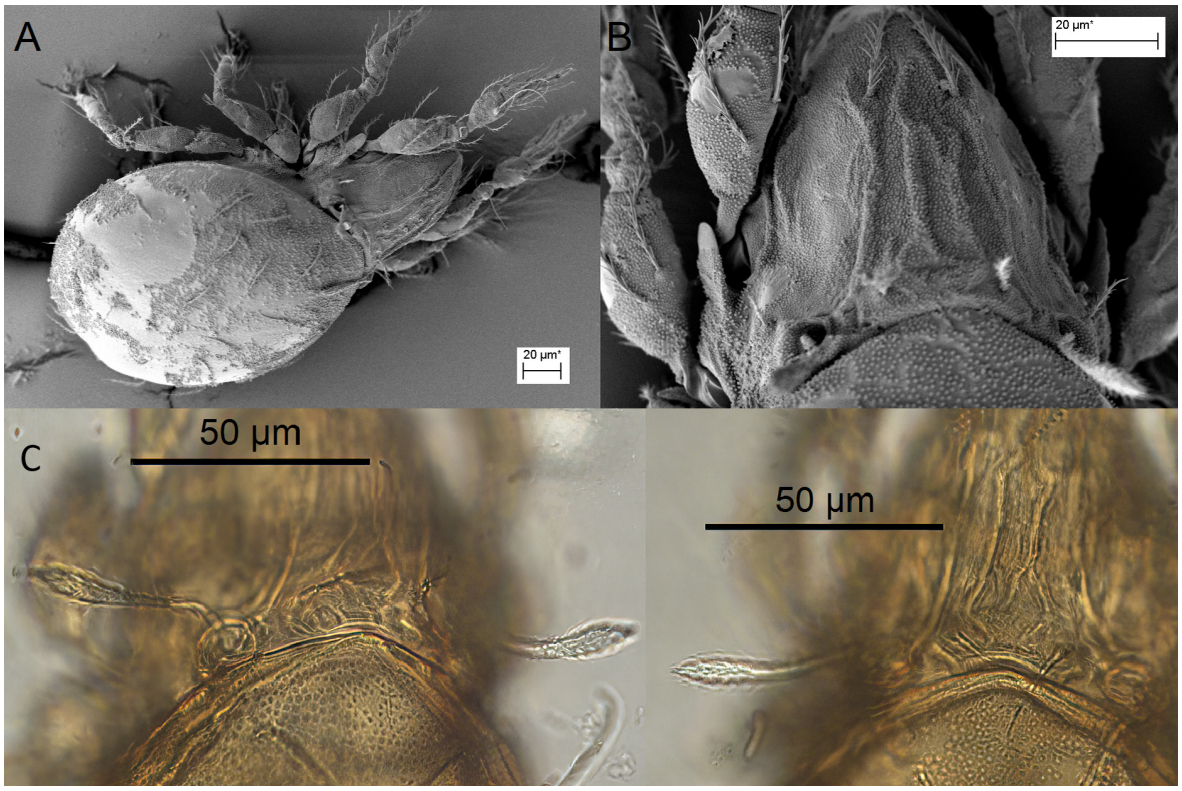

FIGURE 7: *Kaszabobates olbiopolitanus* Sergienko, 1980, Estonian specimens from sample 96. A—general view, B—prodorsum of a different specimen C—Variability of the prodorsal sculpture and cerotegument of diferent specimens of *Kaszabobates olbiopolitanus*.

*_Oribella citelli_ (Karppinen & Poltavskaja, 1990)
Sample: 96.
Distribution: Eastern Mediterranean species (Subías 2022), with no previous records from northern Europe.

Suctobelbidae

*_Suctobelba granulata_ Hammen, 1952
Samples: 20c, 34.
Distribution: Palaearctic species (Subías 2022), with no previous records from neighbouring countries or territories.

*_Suctobelba regia_ Moritz, 1970
Sample: 91b.
Distribution: European species (Subías 2022), also present in Latvia (Kagainis *et al*. 2014) and Finland (Elo *et al*. 2016).

*_Suctobelba reticulata_ Moritz, 1970
Samples: 88b.
Distribution: European species (Subías 2022), with no records from north-eastern Europe.

*_Suctobelba trigona_ (Michael, 1888)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Sample: 98c.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

*_Suctobelbella acutidens_ (Forsslund, 1941)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 14c, 84.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

*_Suctobelbella arcana_ Moritz, 1970
Samples: 14b, 21a.
Distribution: Holarctic species (Subías 2022), with no previous records from the Baltic countries.

*_Suctobelbella falcata_ (Forsslund, 1941)
Samples: 32, 46a, 62, 68, 73, 82z.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2012) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: Subías (2022) considers it a synonym of *Suctobelbella longicuspis* Jacot, 1937.

*_Suctobelbella forsslundi_ (Strenzke, 1950)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 20c, 33b, 82s.
Distribution: Palaearctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Leningrad Region of Russia (Krivolutsky *et al*. 1995).

*_Suctobelbella moritzi_ Mahunka, 1987
Samples: 17b.
Distribution: European species (Subías 2022), with no previous records from the Baltic countries.
Taxonomic remarks: Subías (2022) considers it a subspecies of *Suctobelbella forsslundi* (Strenzke, 1950).

**Suctobelbella palustris* (Forsslund, 1953)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 19b, 64a.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis & Spungis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Suctobelbella sarekensis* (Forsslund, 1941)
Samples: 21a, 88b, 100, 108.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2012) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: Subías (2022) considers it a subspecies of *Suctobelbella acutidens* (Forsslund, 1941).

**Suctobelbella similis* (Forsslund, 1941)
Samples: 47a, 62.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis *et al*. 2014), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

**Suctobelbella subcornigera* (Forsslund, 1941)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 2a, 12, 21a, 28a, 49b, 67e, 82e, 82u, 91b, 99.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Suctobelbella subtrigona (Oudemans, 1900)
Literature sources: Eitminavičiūtė (1965).
Samples: 20c, 21b, 34, 46b, 49b, 98c.
Distribution: Holarctic, Oriental and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Tectocepheidae
Tectocepheus minor (Berlese, 1903)
Literature sources: Vacht *et al*. (2018a).
Samples: 45, 105a, 82z, 108.
Distribution: Holarctic, Oriental and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997)

**Tectocepheus sarekensis* Trägårdh, 1910
Samples: 14a, 24a, 25, 27b, 28a, 32, 33b, 33c, 45, 48, 55, 69, 78e, 82z, 83b, 87c, 95c, 98c, 100, 109.
Distribution: Semicosmopolitan (Subías 2022).
Taxonomic remarks: The taxonomic history of the parthenogenetic genus *Tectocepheus* is complicated. Many species have been described and subsequently synonymized with previously known species or given a subspecies rank. Laumann *et al*. (2007) studied the genetic variability of three (sub)species, and found differences comparable to interspecific differences between sexual species. *Tectocepheus concurvatus* Knülle, 1954 was synonymized with *Tectocepheus velatus velatus* by Nübel-Reidelbach (1994) and with *Tectocepheus sarekensis* by Weigmann (2006), but without studying type material. Estonian material from locality 28a agrees well with the description of *Tectocepheus concurvatus* and clearly differs from *T. velatus* by depressions on notogaster and by shape of lamellae from *T. sarekensis* (Fig. 8).

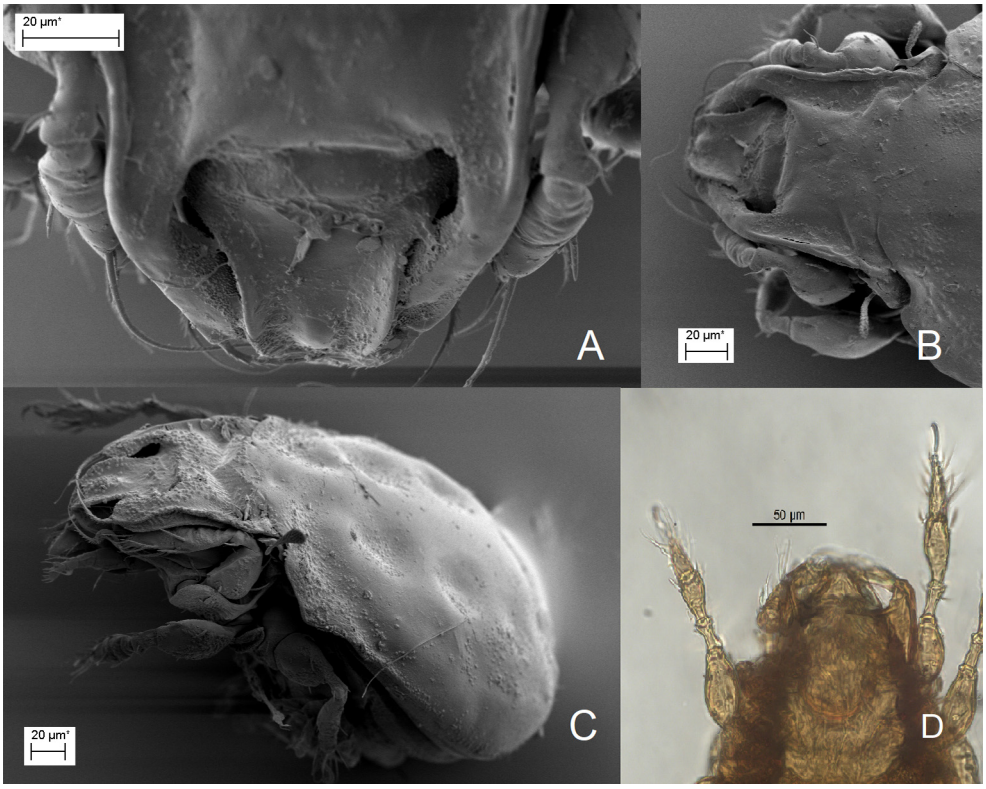

FIGURE 8. Habitus and morphological details of „*T. concurvatus*“ from Estonia. A, B—prodorsum, C—lateral view, D—view of prodorsum in transmitted light.

**Tectocepheus knullei* Vanek, 1960
Samples: 99.
Distribution: Holarctic and Oriental species (Subías 2022), with no records from neighbouring countries or territories.

Tectocepheus velatus (Michael, 1880)
Literature sources: Sellnick (1924); Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Samples: 6, 12, 23, 29, 44, 46b, 57, 62, 68, 82u, 83b, 91b, 95a, 95c, 105c, 109.
Distribution: Cosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Tectocepheus tenuis* Knülle, 1954
Samples: 64a.
Distribution: European species (Weigmann 2006).
Taxonomic remarks: Subías (2004) recognized this taxon as a separate species but synonymized it later with *Tectocepheus velatus velatus* (Subías 2022). We follow Weigmann *et al*. (2015) treating it as a valid species. The samples with this species was found contained adults of only one *Tectocepheus* species and several, probably conspecific *Tectocepheus* nymphs. As the immature stages of *Tectocepheus tenuis* have not been described, we note that we could find no differences from the immatures of *T. sarekensis* and *T. velatus*, as described by Pfingstl and Krisper (2011).

Limnozetidae
**Limnozetes ciliatus* (Schranck, 1803)
Samples: 14c, 73.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

**Limnozetes rugosus* (Sellnick, 1923)

Samples: 82u.

Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Hydrozetidae

Hydrozetes lacustris (Michael, 1882)

Literature sources: Järvekülg (2001).

Samples: 14c, 64a, 79;

Distribution: Holarctic species (Subías 2022), also found in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Taxonomic remarks: The specimens from sample 64a agree well with the characters given by Weigmann (2006), except the larger size (lengths according to Weigmann (2006) 450–510 μm, vs. 515–535 μm in three measured specimens). However, Weigmann & Deichsel (2006) give the size range as 480–560 μm, where they fit in.

**Hydrozetes lemnae* (Coggi, 1897)

Samples: 11.

Distribution: Semicosmopolitan species (Subías 2022), also found in Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Huhta *et al*. 2010).

Cymbaeremaeidae

Scapheremaeus palustris (Sellnick, 1924)

Literature sources: Sellnick (1924).

Distribution: Holarctic species (Subías 2022), found also in Finland (Niemi *et al*. 1997).

Taxonomic remarks: Sellnick described the species based on material (partially) collected from Estonia.

Cymbaeremaeus cymba (Nicolet, 1855)

Literature sources: Grube (1859) [as *Nothrus venosus*]; [?] Karppinen & Krivolutsky (1982).

Samples: 47a, 51, 60a, 78a, 82m, 82v, 95e.

Distribution: Palaearctic, Oriental and Neotropical species, found also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Taxonomic remarks: Grube (1859) described *Nothrus venosus* that was tentatively synonymized with *Platyliodes doderleini* (Berlese, 1883) by Subías (2004, 2022) but the latter is a mediterranean species with no northern European or Baltic records, so the synonymy was very unlikely. The single specimen of *Nothrus venosus* Grube, 1959 in the collection of Wroclaw University Museum of Natural History was examined (marked as SYNTYPUS?, now marked as lectotype). It turned out to be in good condition (but partially covered with some amorphous grey substance), and is morphologically identical to what is traditionally known as *Cymbaeremaeus cymba* (Nicolet, 1855) (Fig. 9). However, Schäffer *et al*. (2019a, b) described three cryptic species that are considered morphologically indistinguishable from *C. cymba*: *Cymbaeremaeus frequens* Schäffer, Kerschbaumer & Koblmüller, 2019, *Cymbaeremaeus styriacus* Schäffer, Kerschbaumer & Koblmüller, 2019 and *Cymbaeremaeus montanus* Schäffer, Kerschbaumer & Koblmüller, 2019, based on DNA sequences (Schäffer *et al*. 2019a, b). If any morphological differences between those species and *C. cymba* would be found in the future, it is possible that one of these turns out to be a junior synonym of *Cymbaeremaeus venosus* (Grube, 1859) **comb. nov.**, and the latter is actually a valid species. This is even more possible because, based on DNA evidence, the real *Cymbaeremaeus cymba* does not occur in eastern Europe (Schäffer *et al*. 2019a). The type locality of *Cymbaeremaeus venosus* is Lielkangari in central Latvia (56°56'N, 24°39'E) (Grube 1859). Subías does not accept these cryptic species and considers them synonyms of *C. cymba* (Subías 2022, 2024).

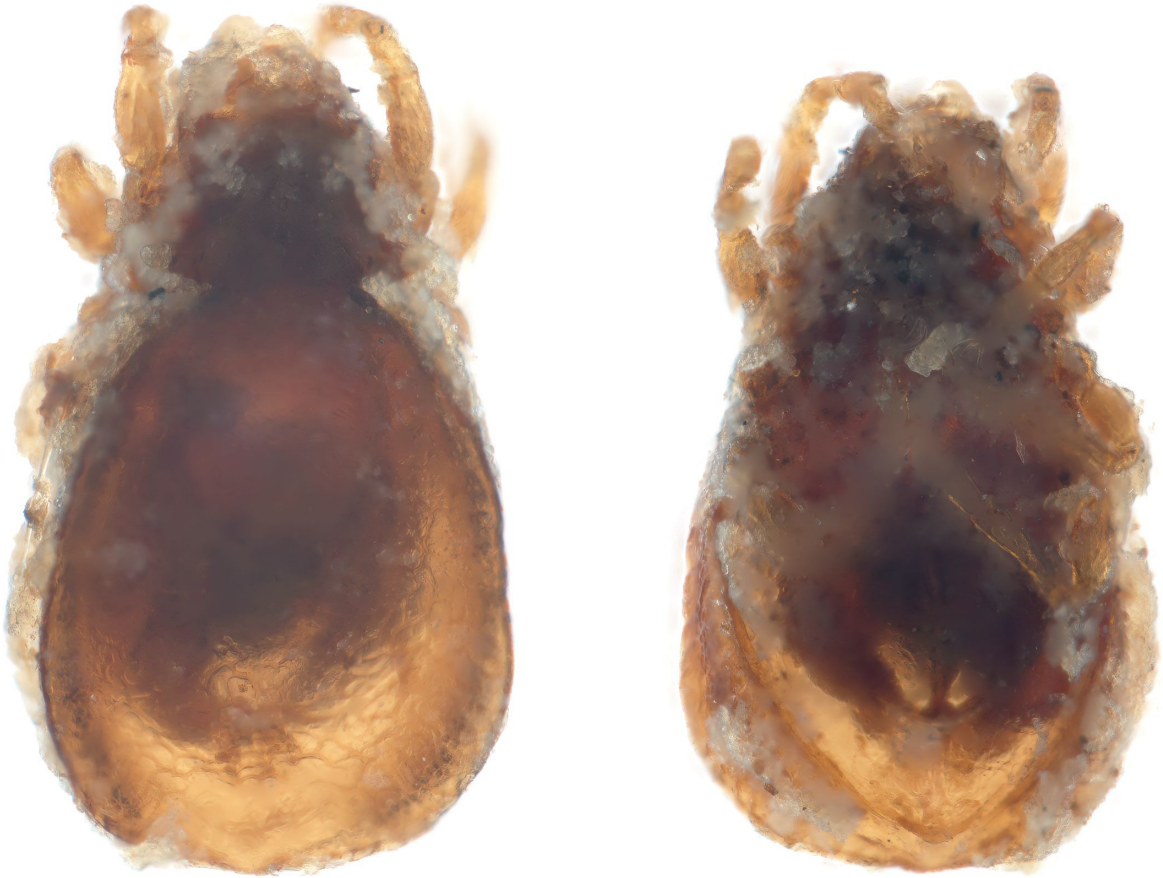

FIGURE 9. *Cymbaeremaeus venosus* (Grube, 1859), lectotype, dorsal and ventral views.

Eremellidae

**Eremella kaszabi* Csiszár, 1962

Samples: 37c, 82y.

Distribution: European species that was so far only known from southern and central Europe (Subías 2022).

Licneremaeidae

**Licneremaeus licnophorus* (Michael, 1882)

Literature sources: [?] Karppinen & Krivolutsky (1982).

Samples: 12, 46a, 47a, 74b, 76.

Distribution: Holarctic, Oriental and Neotropical species (Subías 2022), also found in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Micreremidae

**Micreremus brevipes* (Michael, 1888)

Literature sources: [?] Karppinen & Krivolutsky (1982).

Samples: 95e.

Distribution: Palaearctic species (Subías 2022), also found in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Passalozetiidae

**Passalozetes perforatus* (Berlese, 1910)

Samples: 49a, 67d, 85.

Distribution: Palaearctic species (Subías 2022), also found in Latvia (Kagainis 2012) and Finland (Niemi *et al*. 1997).

Scutoverticidae

Scutovertex minutus (C. L. Koch, 1836)

Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b), Vacht *et al*. (2019).

Samples: 67d.

Distribution: Holarctic species (Subías 2022), also found in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Scutovertex sculptus* Michael, 1879

Samples: 56a, 95a, 106.

Distribution: Palaearctic and New Zealand species (Subías 2022), also found in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Phenopelopidae

Eupelops acromios (Hermann, 1804)

Literature sources: Sellnick (1924); Vacht *et al*. (2018b).

Samples: 82d.

Distribution: Semicosmopolitan species (Subías 2022), also found in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Eupelops claviger (Berlese, 1916)

Literature sources: Eitminavičiūtė (1965) [as *Eupelops geminus* Berl.]; Karppinen & Krivolutsky (1982) [as *Eupelops geminus* (Berlese, 1916)].

Samples: 82t.

Distribution: Palaearctic species (Subías 2022), with records from Leningrad Region of Russia (Krivolutsky *et al.* 1995, as *E. geminus*).

Taxonomic remarks: We follow Weigmann's (2006) information that *Eupelops geminus* sensu Willmann and Sellnick is *E. claviger*.

Eupelops hirtus (Berlese, 1916)

Literature sources: Vacht *et al*. (2018a).

Distribution: Holarctic species (Subías 2022), with no previous records from the neighbouring countries or territories.

Eupelops hygrophilus (Knülle, 1954)

Literature sources: Vacht *et al*. (2018b); Vacht *et al*. (2019).

Distribution: Central European species (Subías 2022), with no previous records from the neighbouring countries or territories.

Eupelops occultus (C. L. Koch, 1836)

Literature sources: [?] Grube (1859) [as *Pelops occultus* Koch]; Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al.* (2018b).

Samples: 13, 36, 46a, 48, 76, 100, 106.

Distribution: Palaearctic and Afrotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Eupelops plicatus* (C. L. Koch, 1835)
Samples: 19a, 19b, 39, 47a, 67e, 82e.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Eupelops tardus (C. L. Koch, 1835)
Literature sources: Vacht *et al*. (2018b).
Samples: 14b, 19c, 21a, 82j, 91a, 95a.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Eupelops torulosus (C. L. Koch, 1839)
Literature sources: Eitminavičiūtė 1965 [as *Eupelops duplex*]; Karppinen & Krivolutsky 1982 [as *Eupelops duplex*]; Vacht *et al*. (2018a).
Samples: 6, 12, 18, 30, 43b, 45, 56b, 63, 75, 84, 86, 98d, 100, 104, 105a, 105c.
Distribution: Palaearctic and Afrotropical species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Eupelops uraceus* (C. L. Koch, 1839)
Sample: 36.
Distribution: Palaearctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997). First record of the species from the Baltic countries.

Peloptulus phaeonotus (C. L. Koch, 1841)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Samples: 12, 25, 46c, 95a.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Achipteriidae
**Achipteria acuta* Berlese, 1908
Literature sources: [?] Karppinen & Krivolutsky (1982) [as *Achipteria nitens*].
Samples: 13, 14a, 19b, 19c, 20a, 21a, 24a, 25, 47b, 56b, 74a, 74b, 75, 90a, 98c, 99.
Distribution: Holarctic species (Subías 2022), present also in Leningrad and Pskov Regions of Russia (Zaitsev 2019) and Lithuania (Eitminavičiūtė 2003, as *A. nitens*).

Achipteria coleoptrata (Linnaeus, 1758)
Literature sources: Sellnick (1924); [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 2a, 6, 15, 16, 19a, 23, 32, 33b, 37b, 44, 45, 46b, 47a, 48, 58, 60a, 60b, 63, 82e, 82f, 83b, 87c, 95c, 100, 107, 108.
Distribution: Holarctic, Oriental and Afrotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Achipteria italica* (Oudemans, 1914)
Sample: 47b.
Distribution: European species (Subías 2022), present also in the Leningrad Region of Russia (Krivolutsky *et al.* 1995). First record from the Baltic countries.
Taxonomic remarks: The Estonian specimens agree well with the redescription by Cancela da Fonseca & Stamou (1987). According to Weigmann (2006), the *A. italica sensu* Willmann (1931) is actually *Parachipteria punctata*, so the earlier records need revision.

Achipteria sellnicki (van der Hammen, 1952)
Literature sources: [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2019).
Distribution: Palaearctic species (Subías 2022), present also in the Leningrad Region of Russia (Krivolutsky *et al*. 1995).

**Anachipteria deficiens* Grandjean, 1932
Sample: 98c.
Distribution: Palaearctic species (Subías 2022), also present in Latvia (Kagainis 2011) and Finland (Huhta *et al*. 2010).

**Campachipteria bella* (Sellick, 1928)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 17b, 28a, 47b, 82z.
Distribution: Holarctic species (Subías 2022), also present in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Campachipteria nivalis* (Hammer, 1952)
Sample: 101.
Distribution: Holarctic species (Subías 2022), with no records in the neighbouring countries or territories.

**Parachipteria fanzagoi* (Jacot, 1929)
Samples: 14b, 82u.
Distribution: Holarctic and Neotropical species (Subías 2022), also present in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: The specimens from sample 82u are provisionally identified as this species, but differ slightly from typical *C. fanzangoi*, having length up to 705 μm, pteromorphs almost angular, not clearly rounded as per Weigmann (2006; under the name *Parachipteria willmanni* Hammen, 1952).

Parachipteria punctata (Nicolet, 1855)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 3a, 18, 21b, 27b, 35, 37a, 42, 43b, 70, 73, 76, 81, 82x, 84, 86, 87, 102a.
Distribution: Holarctic species (Subías 2022), also present in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Oribatellidae
**Ophidiotrichus tectus* (Michael, 1884)
Literature sources: [?] Karppinen & Krivolutsky (1982) [as *Ophidiotrichus connexus* (Berlese, 1904)].
Sample: 95b.
Distribution: Western Palaearctic species (Subías 2022), present also in Finland (Huhta *et al*. 2010).

Oribatella calcarata (C. L. Koch, 1836)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 4b, 12, 66, 87c, 95b.
Distribution: A Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: Grube (1859) described *Oribates quadricuspis* from Estonia which Subías (2004, 2022) tentatively synonymized with *O. quadricornuta* (as *sp. inq*), perhaps based on the fact that Grube himself doubted whether his species was new or *Oribates flammula* (another *sp. inq.* synonymized with *O. quadricornuta*). Grube's original description seems indeed to apply to an *Oribatella* species, but the type locality (Arrol = Arula in South-Eastern Estonia) makes it less likely being *O. quadricornuta*, which is a rare species in Estonia and has been only found on Western Estonia and islands. There are three specimens of *Oribatella calcarata* identified as *Oribates flammula* by Grube in the Wroclaw University Museum of Natural History collection. So the synonymy of *Oribates*

quadricuspis under *Oribatella calcarata*, which is also the most common species in Estonia, is more likely (as *Oribatella quadricuspis* (Grube, 1859), **comb. nov.**). However, we do not propose the synonymy here due to lack of hard evidence and since a third, more rare *Oribatella* species is known from Estonia (*O. sexdentata*), and Kagainis (2011) also reports *Oribatella ornata* (Coggi, 1990 [sic!]) from Latvia.

**Oribatella quadricornuta* (Michael, 1880)
Samples: 5a, 15, 19c, 28d.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011).
Taxonomic remarks: Three specimens from sample 28d agree well with the redescription of the species given by Bernini (1975), except the absence of translamellar tubercle (body lengths 440–530 μm, n=3).

**Oribatella sexdentata* Berlese, 1916
Samples: 38, 68.
Distribution: Holarctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997). First record from the Baltic countries.

Haplozetidae
Haplozetes vindobonesis (Willmann, 1935)
Literature sources: [?] Sellnick (1924) [as *Protoribates* (*Scheloribates*) *fusifer* Berl.], [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Distribution: Palaearctic, Oriental, Neotropical and Afrotropical species (Subías 2022; as *Indoribates* (*Haplozetes*) *vindobonesis*).
Taxonomic remarks: We assume that the Sellnick's (1924) record of *Protoribates* (*Scheloribates*) *fusifer* from Estonia refers to this species, as it was undescribed at the time, and the true *Haplozetes fusifer* is a southern Palaearctic and Oriental species (Subías 2022).

Peloribates longipilosus Csiszár, 1962
Literature sources: Vacht *et al*. (2018b).
Distribution: Southern Palaearctic species (Subías 2022), with no records from the neighbouring countries or territories.

Protoribates lophothrichus (Berlese, 1904)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Distribution: Semicosmopolitan species (Subías 2022), found also in Finland (Niemi *et al*. 1997).

**Protoribates capucinus* Berlese, 1908
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 3a, 17b, 20a, 20c, 25, 26, 28a, 61b, 82i.
Distribution: Cosmopolitan species (Subías 2022), found also in Finland (Niemi *et al*. 1997).

Mochlozetidae
Podoribates longipes (Berlese, 1887)
Literature sources: Sellnick (1924) (*as Podoribates gratus* Sellnick, 1921).
Distribution: Holarctic species (Subías 2022), found also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Oribatulidae
**Oribatula interrupta* (Willmann, 1939)
Sample: 82p.
Distribution: Holarctic and Afrotropical species (Subías 2022), found also in Finland (Niemi *et al*. 1997). First record from the Baltic countries.

Oribatula tibialis (Nicolet, 1855)
Literature sources: [?] Grube (1859) [as: *Notaspis tibialis* Nic.]; [?] Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 19a, 21a, 21b, 22a, 23, 25, 32, 34, 46a, 57, 63, 67c, 67e, 70, 82u, 84, 90b, 95a, 95b, 100, 103.
Distribution: Holarctic and Neotropical species (Subías 2022), found also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Oribatula* cf. *pallida* Banks, 1906 (*sensu* Bulanova-Zakhvatkina (1975) and Iordansky (1991) (Fig. 12)
Specimens: 87a, 95c, 108.
Distribution: The species has no previous records from Baltic or nordic countries, but has many records from European Russia (Zaitsev 2019, as *O. pallida*).
Taxonomic remarks: The identity of the species is unclear. *Oribatula pallida* Banks, 1906 is a *sp. inq*. or tentatively a synonym of *Oribatula tibialis amblyptera* Berlese, 1916 according to Subías (2022). Bulanova-Zakhvatkina (in Ghilyarov & Krivolutsky 1975) and Iordansky (1991) treat the species as conspecific with North American *Oribatula pallida*, but the latter needs a modern redescription in addition to the rather superficial descriptions by Hammer (1952) and Woolley (1961) (Fig. 10).

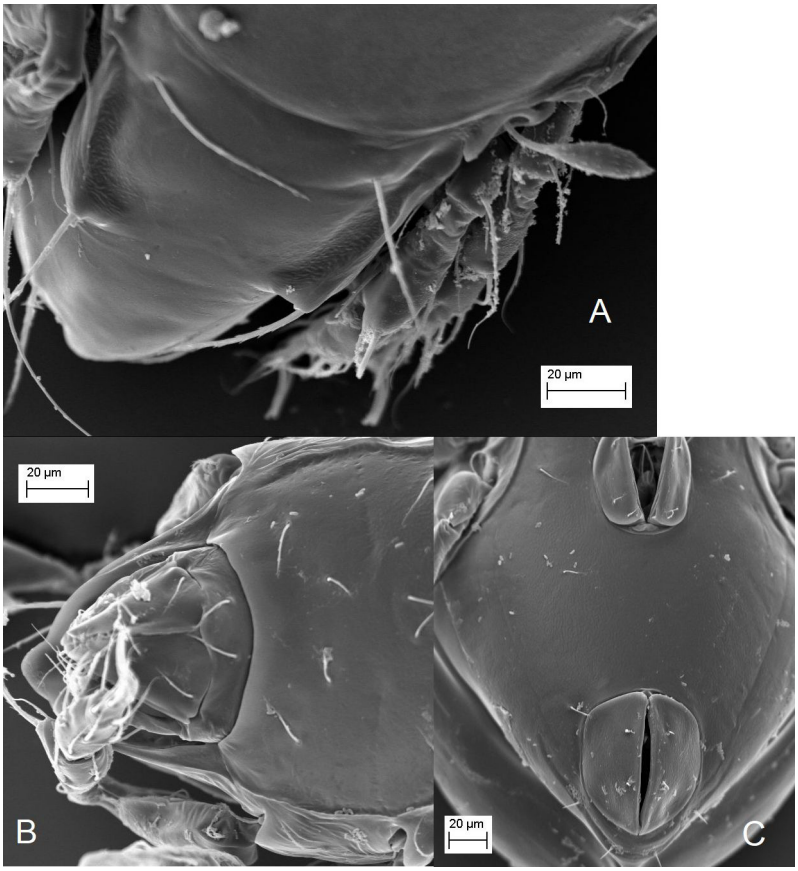

FIGURE 10. *Oribatula* cf. *pallida* A—prodorsum , B—ventral anterior, and C—ventral posterior view.

Oribatula (*Zygoribatula*) *exilis* (Nicolet, 1855)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 14a, 15, 19c, 21a, 24a, 28a, 36, 47a, 61b, 67b, 67f, 68, 74a, 82o, 105a.
Distribution: Holarctic species (Subías 2022), found also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Oribatula* (*Zygoribatula*) *frisiae* (Oudemans, 1900)
Sample: 21b, 82p.
Distribution: Holarctic species (Subías 2022), found also in Latvia (Kagainis 2011).

**Phauloppia coineaui* Travé, 1961

Samples: 14a, 68;

Distribution: Rare in northern Europe, but present also in Finland (Niemi *et al*. 1997). First record from the Baltic countries.

Taxonomic remarks: The Estonian specimens agree well with the original description and diagnostic characters given by Weigmann (2006, 2014). The only difference from *P. nemoralis* (Berlese, 1916) is the length of the notogastral setae, the variability of which is unknown (Weigmann 2014). Subías (2004) considered *P. coineaui* a synonym of *P. nemoralis* without presenting any arguments.

**Phauloppia lucorum* (C. L. Koch, 1841)

Literature sources: [?] Karppinen & Krivolutsky (1982) [as *Phauloppia conformis* (Berlese, 1895)].

Samples: 41, 45, 47a, 58, 65c, 67i,78f, 81, 87b.

Distribution: Holarctic and Oriental species (Subías 2022), found also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Phauloppia nemoralis* (Berlese, 1916)

Samples: 82u, 95b.

Distribution: A European species (Subías 2022), found also in Latvia (Kagainis 2011).

Taxonomic remarks: The Estonian specimens agree well with the redescription of the species given by Weigmann (2014), but a single specimen collected from 82u differs slightly: all areae porosae round, Aa only about 7 µm; the notogastral seta c_2 (l=40µm) does not reach Aa; sensillus with head less clearly delimited from stalk. Body length 405 µm.

**Phauloppia rauschenensis* (Sellnick, 1908)

Literature sources: [?] Karppinen & Krivolutsky (1982) [as *Eporibatula rauschenensis*].

Samples: 82u.

Distribution: Palaearctic, Afrotropical and Neotropical species (Subías 2022), found also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Parakalummidae

**Neoribates aurantiacus* (Oudemans, 1914)

Literature sources: [?] Karppinen & Krivolutsky (1982) [as *Protokalumma aurantiaca*].

Samples: 17a, 60b.

Distribution: Holarctic and Oriental species (Subías 2022), found also in Finland (Niemi *et al*. 1997)

**Neoribates borealis* Vladimirova, 2009

Samples: 27b, 32, 34, 52a, 82u, 99.

Distribution: Eurosiberian species (Subías 2022), found also in the Leningrad Region of Russia and Finland (Grishina & Vladimirova 2009). First record from the Baltic countries.

**Neoribates gracilis* Travé, 1972

Samples: 95b.

Distribution: Palaearctic and Oriental species (Subías 2022) with no records from neighbouring countries or regions.

Scheloribatidae

Hemileius initialis (Berlese, 1908)

Literature sources: Eitminavičiūtė (1965) [as *Scheloribates confundatus* Sell.].

Sample: 2a, 6, 18, 28a, 41, 42, 43b, 47a, 51, 55, 56b, 57, 67e, 74a, 76, 82e, 82f, 82k, 82r, 82u, 86, 87c, 99, 100.

Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Liebstadia humerata* Sellnick, 1928
Literature sources: [?] Karppinen & Krivolutsky (1982).
Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis *et al*. 2014), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997). We assume that Bayatorgtokh's (2003) record is based on Karppinen and Krivolutsky (1982).

**Liebstadia longior* (Berlese, 1908)
Samples: 95b.
Distribution: Holarctic species (Subías 2022), with no records from the neighbouring countries or territories.

Liebstadia pannonica (Willmann, 1951)
Literature sources: [?] Bayartogtokh 2003; Vacht *et al*. (2018b).
Samples: 37a, 37b.
Distribution: Holarctic and Oriental species (Subías 2022), also found in Latvia (Kagainis 2012).

Liebstadia similis (Michael, 1888)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 19a, 25, 35, 46a, 74, 90b.
Distribution: Holarctic, Oriental and New Zealand species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: The Estonian specimens agree well with the description of Miko & Weigmann (1996) and illustration by Wunderle *et al*. (1990), except in having slightly smaller size (body length 470–550 µm *vs*. 500–565 µm), but coinciding with the range given by Bayartogtokh (2001).

**Scheloribates* (*Scheloribates*) *ascedens* Weigmann & Wunderle, 1990
Samples: 95d.
Distribution: European species (Subías 2022), originally described from Germany and has also been found in Öland, Sweden (Fröberg *et al*. 2003), but no records are known from Estonia's immediate neigbouring countries.

**Scheloribates* (*Scheloribates*) cf. *clavilanceolatus* (Ewing, 1907)
Samples: 82z.
Distribution: Hitherto known as Nearctic species (Subías 2022), with no records from Europe.
Taxonomic remarks: The specimens are superficially similar to the common European *S. laevigatus*, but lack the characteristic fine reticulate surface pattern and have a slightly procurved depression at the distal half of prodorsum (difficult to notice in dorsal view with transmitted light, as it is obscured by the front edge of subcapitulum) (Fig. 12). DNA metabarcoding (using the COI gene) of the same soil sample produced a sequence identified as *Scheloribates clavilanceolatus*. The generated 658 bp COI sequence (GenBank accession number PP898336) had sequence identity of 97.74% against *S. clavilanceolatus* sequence from Canada (BOLD:AAI0689) in the BOLD database (Ratnasingham & Hebert 2007). We failed to amplify the COI gene directly from the mite specimens, but morphologically they agree with the rather superficial original description of *S. clavilanceolatus* (Ewing 1907), and do not agree with any European *Scheloribates* (s.s.), so we provisionally identified them as *S. clavilanceolatus.*

Scheloribates (*Scheloribates*) *laevigatus* (C. L. Koch, 1836)
Literature sources: Eitminavičiūtė 1965; Karppinen & Krivolutsky 1982; Vacht *et al.* 2018b.
Samples: 3a, 20a, 21a, 27a, 28a, 33a, 34, 45, 54, 56b, 66, 73, 78b, 82i, 83b, 94, 107.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Scheloribates (*Scheloribates*) *latipes* (C. L. Koch, 1844)
Literature sources: Eitminavičiūtė 1965; Karppinen & Krivolutsky 1982; Vacht *et al.* 2018b.
Samples: 16, 22a, 23, 33a, 39, 55, 68, 82v, 90a, 91b, 103, 105c, 108.
Distribution: Semicosmopolitan species (Subías 2022, as *Scheloribates* (*S.*) *pallidulus latipes*), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

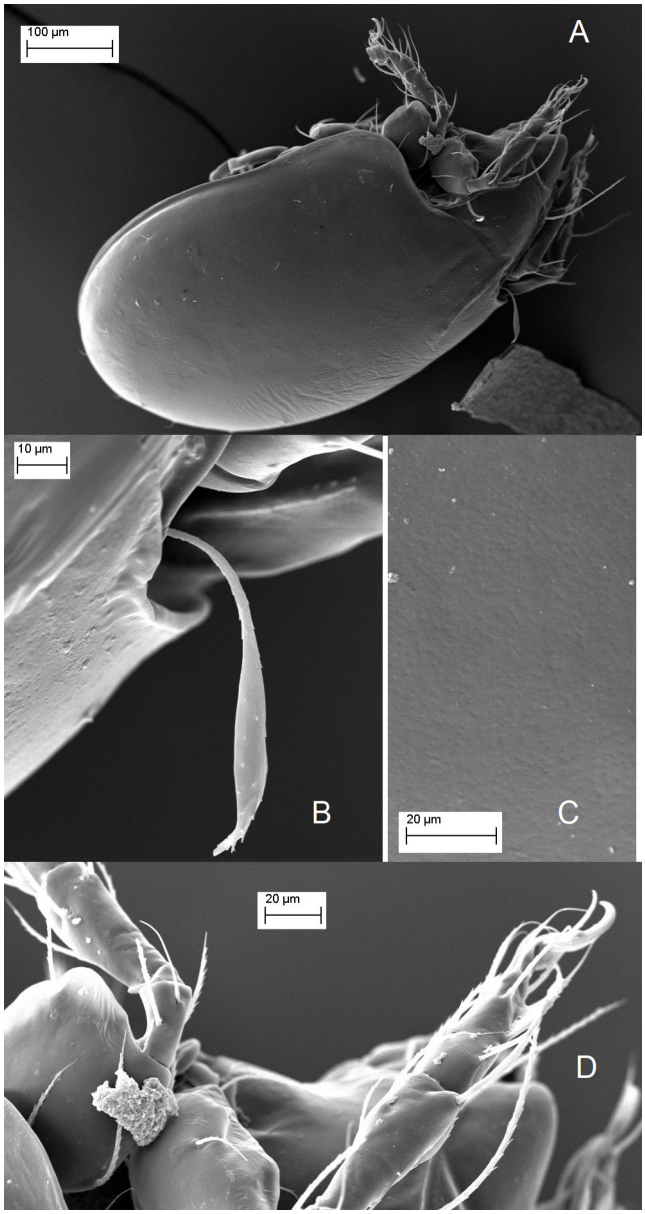

FIGURE 11. *Scheloribates* cf. *clavilanceolatus* (Ewing, 1907). A—dorsal view, B—right sensillus, C dorsal body surface, D—leg I and part of prodorsum.

**Scheloribates* (*Scheloribates*) *pallidulus* (C. L. Koch, 1841)
Samples: 3b, 17b, 101.
Distribution: Cosmopolitan species (Subías 2022, as *Scheloribates* (*S.*) *pallidulus pallidulus*), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Scheloribates* (*Topobates*) *circumcarinatus* Weigmann & Miko, 1998
Samples: 32, 45, 79.
Distribution: European species (Subías 2022), present also in Latvia (Kagainis 2011).

Ceratozetidae

Ceratozetella minima (Sellnick, 1928)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 82i, 90b, 103.

Distribution: Palaearctic species (Subías 2022), present also in Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997). First record from the Baltic countries.

**Ceratozetella sellnicki* Rajski, 1958
Samples: 21a, 25, 34.
Distribution: Palaearctic species (Subías 2022), present also in Finland (Huhta *et al*. 2010).

*Ceratozetes gracili*s (Michael, 1884)
Literature sources: Vacht *et al*. (2018b).
Samples: 20a, 32, 37a, 47a, 67h, 82e, 82k, 82u, 82x.
Distribution: Cosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Ceratozetes mediocris (Berlese,1908)
Literature sources: Vacht *et al*. (2018b).
Samples: 16, 20a, 25, 28a, 32, 76.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011).

Ceratozetes minutissimus (Willmann, 1951)
Literature sources: Vacht *et al*. 2019.
Distribution: Central and southern Palaearctic species (Subías 2022), with no records from neighbouring countries or territories.

Ceratozetes parvulus (Sellnick, 1922)
Literature sources: Vacht *et al*. (2018b).
Samples: 64a, 95c.
Distribution: Boreoalpine Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Diapterobates dubinini* Shaldybina, 1971
Sample: 95d.
Distribution: A western Palaearctic species (Subías 2022), also found in Leningrad Region of Russia (type locality), and to our knowledge the Estonian finding is the westernmost record of the species. Little is known about its ecology, but it may be a xerophile, as the first findings were from „under roots of a hazel tree on dry slope“ and „vegetation of a coniferous forest“ (Shaldybina 1971), and the only Estonian finding was from moss polster growing on almost vertical wall of a Devonian sandstone outcrop in a Scot's pine (*Pinus sylvestris*) forest.
Taxonomic remarks: The specimens agree well with the original description, except the slightly larger size of one specimen (400 μm vs. 361–387 μm in Shaldybina, 1971).

Diapterobates humeralis (Hermann, 1804)
Literature sources: Sellnick (1924) [as *Sphaerozetes* (*Trichoribates*) *numerosus* Sellnick, 1924].
Samples: 2b, 21b, 32, 47a, 59, 60a, 63, 64a, 82g, 98a, 107, 109.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Fuscozetes fuscipes* (C. L. Koch, 1844)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Sample: 33c.
Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Melanozetes mollicomus* (C. L. Koch, 1839)
Samples: 37a, 68, 95a, 95b, 95c, 78b, 82u, 108.
Distribution: A boreoalpine Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Trichoribates berlesei Jacot, 1929
Literature sources: Sellnick (1924); Vacht *et al*. (2018a) [as *Trichoribates trimaculatus* (C. L. Koch, 1836).
Samples: 58, 67i, 68, 69, 82n, 82u, 91a.
Distribution: Holarctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Trichoribates incisellus (Kramer, 1897)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht (2018b).
Samples: 27b, 28a.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Trichoribates novus (Sellnick, 1928)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982).
Samples: 67d, 68, 76.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Huhta *et al*. 2010).

Sphaerozetes orbicularis (C. L. Koch, 1835)
Literature sources: Sellnick (1924); [?] Karppinen & Krivolutsky (1982).
Samples: 47a, 87a, 99, 102b.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Huhta *et al*. 2010).

Chamobatidae
Chamobates cuspidatus (Michael, 1884)
Literature sources: Sellnick (1924); Vacht *et al*. (2018a).
Samples: 2a, 4b, 14a, 14b, 14c, 28a, 32, 34, 41, 43b, 47a, 48b, 52a, 57, 66, 67h, 68, 76, 82c, 84, 87c, 90b, 91b, 95a, 95c, 99, 103, 108.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Huhta *et al*. 2010).

**Chamobates* cf. *interpositus* Pschorn-Walcher, 1953
Samples 15, 19c, 60a.
Distribution: Mediterranean Palaearctic and central European species (Weigmann *et al*. 2015, Subías 2022), with no records from the neighbouring countries or territories.
Taxonomic remarks: The specimens from Muhu Island (sample 19c) agree well with Weigmann (2006), except for larger size (420–440 μm) and end of tutorium with 3–4 clear teeth.

Chamobates pusillus (Berlese, 1895)
Literature sources: Vacht *et al*. (2018a); Eitminavičiūtė (1965) [as *Chamobates borealis*]; Vacht *et al*. 2018a [as *Chamobates borealis*].
Samples: 6, 14b, 21b, 27a, 45, 60b, 62, 63, 66, 67h, 76, 81, 82r, 82u, 86, 87c, 91b, 98c, 98e, 101.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997, as *Ch. borealis*).

**Chamobates rastratus* (Hull, 1914)
Samples: 12, 45, 81, 98e, 105a.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011, as *Chamobates spinosus*) and Finland (Niemi *et al*. 1997, as *Chamobates spinosus*).

**Chamobates subglobulus* (Oudemans, 1900)
Samples: 28a, 34.
Distribution: Palaearctic species (Subías 2022), with no records from neighbouring countries or territories.

Chamobates voigtsi (Oudemans, 1902)
Literature sources: Vacht *et al*. (2018b).
Samples: 82r, 88b, 98e, 108.
Distribution: Palaearctic species (Subías 2022), present also in Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Euzetidae

Euzetes globulus (Nicolet, 1855)
Literature sources: Eitminavičiūtė (1965) [as *Euzetes seminulum*]; Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 12, 19b, 34, 35, 40, 43b, 46a, 47a, 49b, 51, 54, 60b, 66, 67g, 74a, 81, 82f, 82r, 87a, 98e, 108.
Distribution: Palaearctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Humerobatidae

Humerobates rostrolamellatus Grandjean, 1936
Literature sources: Eitminavičiūtė (1965) [as *Humerobates fungorum* (L.)]; Karppinen & Krivolutsky (1982) [as *Humerobates fungorum*].
Distribution: Semicosmopolitan species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Punctoribatidae

**Minunthozetes pseudofusiger* (Schweizer, 1922)
Samples: 2a, 21a, 32, 46a, 51, 67g, 78d, 78e, 82c, 82e, 82r, 82u, 87c, 91b, 95a, 99.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

Minunthozetes semirufus (C. L. Koch, 1841)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 28a, 45, 47a, 52a, 67e, 71, 82x, 87c, 99.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad and Pskov Regions of Russia (Krivolutsky *et al*. 1995, Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Mycobates bicornis (Strenzke, 1954)
Literature sources: Vacht *et al*. (2018a).
Distribution: Central southern Palearctic species (Subías 2022) with no records from neighbouring countries or territories.

**Mycobates parmeliae* (Michael, 1884)
Samples: 19c.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Mycobates sarekensis (Trägårdh, 1910)
Literature sources: Vacht *et al*. (2018b).
Distribution: Boreoalpine Holarctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

Mycobates tridactylus (Willmann, 1929)
Literature sources: Vacht *et al*. (2018b); Vacht *et al*. (2019).
Distribution: Holarctic and Oriental species (Subías 2022), with no records from neighbouring countries or territories.

**Semipunctoribates zachvatkini* (Shaldybina, 1969)
Samples: 16, 27b.
Distribution: Southern Palearctic species (Subías 2022) with no records from neighbouring countries or territories.

Punctoribates hexagonus Berlese, 1908
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018a).
Samples: 49a, 83b, 98a.
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Punctoribates punctum (C. L. Koch, 1839)
Literature sources: Eitminavičiūtė (1965); Karppinen & Krivolutsky (1982); Vacht *et al*. (2018b).
Samples: 14b, 20c, 21b, 25, 49b. 60a, 76, 82e, 82r, 82z.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

**Punctoribates sellnicki* Willmann, 1928
Samples: 79, 108.
Distribution: Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).
Taxonomic remarks: One specimen from sample 79 was smaller (290 μm) than the size range (320–380 μm) given by Weigmann (2006), but agreed well with the species in other characters.

Zetomimidae
**Heterozetes palustris* (Willmann, 1917)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Sample: 79.
Distribution: Palaearctic species (Subías 2022), present also in Finland (Niemi *et al*. 1997).

**Zetomimus furcatus* (Pearce & Warburton, 1906)
Sample: 82a.
Distribution: Palaearctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Galumnidae
**Acrogalumna longipluma* (Berlese, 1904)
Literature sources: [?] Karppinen & Krivolutsky (1982).
Samples: 4b, 19c, 48, 49b, 82l, 82u, 90b, 96, 105a.
Distribution: Semicosmopolitan species (Subías 2022, as *Allogalumna* (*Acrogalumna*) *longipluma*), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

**Galumna alata* (Hermann, 1804)
Literature sources: [?] Grube (1859) (as *Notaspis alatus* Herm.); [?] Karppinen & Krivolutsky (1982) [as *Galumna alatus*])
Samples: 60b, 96.
Distribution: Semicosmopolitan species (Subías 2022), present also in Leningrad Region of Russia (Krivolutsky *et al*. 1995).

Galumna flagellata Willmann, 1925
Literature sources: Vacht *et al*. (2018a).
Distribution: Central and southern Palaearctic species (Subías 2022), present also in Latvia (Kagainis 2011).

Galumna lanceata Oudemans, 1900
Literature sources: Sellnick (1924); [?] Karppinen & Krivolutsky (1982) [as *Galumna lanceatus*]; Vacht *et al*. (2018b).
Samples: 2a, 25, 28c, 37e, 43b, 52a, 56b, 60a, 75, 78d, 82e, 87a, 99, 108.
Distribution: Palaearctic and Oriental species (Subías 2022), present also in Latvia (Kagainis 2011) and Finland (Niemi *et al*. 1997).

**Pergalumna altera* (Oudemans, 1915)
Samples: 95c.
Distribution: Semicosmopolitan species (Subías 2022), present also in Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997). This is the first record of the species from the Baltic countries.

Pergalumna formicaria (Berlese, 1914)
Literature sources: Vacht *et al*. (2018a).
Distribution: Holarctic species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

**Pergalumna minor* (Willmann, 1928)
Samples: 108.
Distribution: Holarctic species (Subías 2022), with no records from neighbouring countries or territories.

Pergalumna nervosa (Berlese, 1914)
Literature sources: [?] Karppinen & Krivolutsky (1982) [as *Pergalumna nervosus*]; Vacht *et al*. (2018b).
Samples: 2a, 6, 12, 13, 14a, 14b, 19c, 20c, 22b, 25, 30, 34, 38, 42, 43b, 52a, 68, 70, 75, 77, 81, 86, 95c, 97c, 91b, 100, 105a.
Distribution: Holarctic and Afrotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Niemi *et al*. 1997).

Pergalumna obvia (Berlese, 1914)
Literature sources: Sellnick (1924) [as *Galumna obvia*]; Vacht *et al*. (2018b) [as *Galumna obvia*].
Samples: 19a, 32, 34, 36, 46a, 60a, 67h, 76, 77, 101, 107.
Distribution: Semicosmopolitan species (Subías 2022), present also in Latvia (Kagainis 2011), Pskov Region of Russia (Zaitsev 2013) and Finland (Huhta *et al*. 2010).

**Pergalumna willmanni* (Zachvatkin, 1953)
Samples: 73, 82b.
Distribution: Palaearctic species (Subías 2022), present also in in Finland (Elo *et al*. 2016). First record from the Baltic countries.

Pilogalumna crassiclava (Berlese, 1914)
Literature sources: Vacht *et al*. (2018a).
Distribution: Central and southern Palaearctic species (Subías 2022), with no records from neighbouring countries or territories.

Pilogalumna tenuiclava (Berlese, 1908)
Literature sources: Sellnick (1924).
Samples: 57, 73, 91a.
Distribution: Holarctic and Neotropical species (Subías 2022), present also in Latvia (Kagainis 2011), Leningrad Region of Russia (Krivolutsky *et al*. 1995) and Finland (Niemi *et al*. 1997).

Discussion

Many rare species are likely still undetected. However, when considering the checklists of neighbouring countries, the number of currently known species is comparable. The more recent northern European checklists of oribatid mites have 232 species for Denmark (Gjelstrup 1978), Sweden 287 (Lindberg *et al*. 2004), Norway 244 (Mehl 1979), Finland 357 (Niemi *et al*. 1997, Elo 2019), Lithuania 312 (Eitminavichute 2003), Latvia 227 (Kagainis 2011, Kagainis & Spungis 2013, Kagainis *et al*. 2014) and Belarus 266 (Chikilevskaja *et al*. 1998). Several species found in our study, but not in neighbouring countries, probably indicate undersampling of non-soil habitats, as 62 of the Estonian species are new records for the Baltic countries.

The distribution ranges of most species are European, Palaearctic or Holarctic, and the fauna is essentially a subset of central European fauna. Estonia appears to be the northern limit of the distribution range for 52 species (17% of the total), eastern limit of five species (1.6%) and western limit of six species (2%). The findings of several species new to the region highlights the importance of sampling non-soil habitats. Finding of additional species in the future is expected, as there are several species found in both Latvia and Finland, but not in Estonia.

Additionally, the finding of *Scheloribates* cf. *clavilanceolatu*s demonstrates the utility of using modern DNA-based methods combined with traditional methods, as the species is superficially similar to *S. laevigatus*, and may have been overlooked also in other European studies.

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