

# ZOOTAXA

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## Catalogue of oribatid mites (Acari: Oribatida) from Vorarlberg (Austria)

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## Abstract

A checklist of the oribatid mites from Vorarlberg (Austria) which covers all published records and hitherto unpublished results of additional collecting is presented. Several species are revised, doubtful and erroneous records from previous publications are discussed and corrected. At present a total of 327 described species are known from Vorarlberg, complemented by three subspecific taxa and two undetermined or undescribed species, altogether from 61 families. A total of 96 species (including 3 subspecific taxa) are newly reported from Vorarlberg, among them 16 species are new records for Austria. The compilation includes the occurrence of each species in different vegetation units and habitats of Vorarlberg, their known distribution in Austria and the neighbouring Alps, Switzerland and Southern Germany, as well as their general distribution. Occasional additional remarks give taxonomic and other information. A historical overview of the exploration of the oribatid mites in Vorarlberg is outlined. The general distribution of the oribatid mite fauna of Vorarlberg is analysed. Remarkable results are, among others, the findings of some mostly rare species which were described by Schweizer and Mahunka & Mahunka-Papp from Switzerland as well as species restricted to the Alps, mainly in higher montane regions.

**Key words:** Sarcoptiformes, taxonomy, Alps, soil fauna, faunistics, habitat relationships

## Introduction

Oribatid mites are among the most dominant arthropods in the organic layers of most soils. At present, almost 12.000 species are described (Subías 2004, electronic update 2020, Schatz *et al.* 2011, updated), the total species number is estimated to be five to ten times higher (Colloff & Halliday 1998, Schatz 2002, Walter & Proctor 2013). Oribatid mites are important agents in the decomposition of organic plant matter, soil formation, distribution of fungi and in the nutrient cycle (Walter & Proctor 2013). Many species have particular habitat requirements. The largest part lives in terrestrial habitats, plant litter, soil, dead wood and humus. Moist forest litter and mosses are particularly rich in species which occur in high abundances. A range of species tolerating dry conditions occur in xeric meadows, in lichen growth on rocks and on the bark of trees and shrubs. A small number of oribatid species is adapted to fresh water habitats where they can even live submersed, usually on aquatic plants (Schatz & Schuster 2009).

## Environmental framework

Vorarlberg is the second-smallest federal state in Austria with a surface of 2.601 km<sup>2</sup>. It is densely populated (almost 395.000 inhabitants) with highly industrialized areas, especially in the Rhine Valley. The country borders on Lake Constance (Bodensee, 395 m a.s.l.) and is surrounded by the Austrian federal state Tyrol in the east, Germany (Free state of Bavaria) in the north, the principality of Liechtenstein and Switzerland (cantons Grisons and St. Gallen) in the west and south.

The geological structure of Vorarlberg is characterized by its position on the border of the East and West Alps. The northwestern part (Bregenzerwald) is based on the west alpine Helvetic nappes, delimited by the flysch and molasse zone on the edge of the Penninic nappes. The Mesozoic sedimentary rocks of the Northern Limestone Alps stretch southeastwards to the mountain range of the Rätikon (highest peak Schesaplana 2964 m a.s.l.). The southeastern mountains of Vorarlberg are of Paleozoic crystalline metamorphic origin from the Silvretta nappe, overlaid by Permian-Carboniferous sediments. The highest peak in Vorarlberg is Piz Buin (3312 m a.s.l.) on the southern edge of this area. The Rhine Valley is shaped by alluvial sediments (Friebe 2004).

The climate in the northern part of Vorarlberg is humid continental, influenced by the Atlantic Ocean. The easterly located Allgäu Alps constitute a geographic barrier toward east causing large precipitation in the Bregenzerwald area (annual rainfall in the Fohramoos up to 2366 mm). Lake Constance causes moderate temperature differences with mild winters including frequent dense fogs and cool summers, especially in the Rhine Valley. In the higher southern and eastern part of Vorarlberg (Lechtal and Montafon) the continental influence increases and causes a cold temperate climate with sunny and snowy winters (Auer & Werner 2001/2002).

Based on these geological and climatological conditions originally a wide variety of habitat types were formed: different types of deciduous forest at lower and medium altitudes, dwarf-shrub heaths and alpine grassland at higher elevations up to cushion plants in the summit region of the mountains. Notable elements in the landscape are more than 500 bogs and fens. At present the original vegetation in the densely populated areas is only sparsely preserved and frequently replaced by gardens, orchards, fertilized meadows and pastures or commercial forests. It is remarkable that very few dry grasslands are still present in Vorarlberg (Holzner 1986).

## History

Until few years ago Vorarlberg was a „*terra incognita*“ regarding the knowledge of its oribatid mite fauna. A first report of an oribatid species (*Belba granulata*) was given by Janetschek (1956) from collections in the Ifenstock area, Bregenzerwald. Mihelčić (1957) summarized the samplings from Janetschek at Ifenstock (13 spp.) and described one new species (*Mycobates debilis*) from that material. Schweizer (1956) reported another species (*Conoppia microptera*) from Pfänder area near Bregenz, also mentioned by Janetschek (1961, sub *Phyllogeus palmicinctus*). These hitherto known 15 species from Vorarlberg were summarized in the “*Catalogus Faunae Austriae*“ (Schatz 1983, erroneously reported 16 spp.). Thus, the oribatid mite fauna from Vorarlberg was the least known from all Austrian federal states (Schatz 1983). To fill this gap the author had started an extensive collecting project covering numerous habitats throughout Vorarlberg in 1981. This hitherto unpublished material has been evaluated only recently. In the meantime, results of further faunistic investigations on oribatid mites in Vorarlberg were published („Jagdberg“: Schatz & Fischer 2013—195 spp., „Fohramoos“: Schatz 2015—151 spp.) which enlarged the number of known species in Vorarlberg considerably. An Austrian-wide study on the occurrence of rare oribatid species with special ecological demands also covered some places in Vorarlberg, resulting in additional species records for this country (Krisper & Schuster 2016—7 spp.). In a recent „*Checklist of the Fauna of Austria—Oribatida*“ (Krisper *et al.* 2017) a total of 247 species (including subspecies) are listed from Vorarlberg. Nevertheless, the oribatid mite fauna was still unexplored in the majority of this federal state. This catalogue presents all published species of Vorarlberg as well as a large number of unpublished data from previous and recent collections.

## Materials and methods

This catalogue contains all published records of oribatid mites in Vorarlberg and provides an update of the checklist of Krisper *et al.* (2017). Parts of the material from previous publications were redetermined (a list of corrections is given following the species list, see Table 2). It includes also the hitherto unpublished results of a large-scale collecting by the author.

### Unpublished data

Between 1981–1985 and complemented in 2019 (Brandnertal—Lünersee), altogether 277 soil and organic litter samples were taken by the author and Irene Schatz in most parts of Vorarlberg and in different habitats and vegetation structures (details in the species list). The animals were extracted by heat in a modified Tullgren-Berlese extraction apparatus in the Institute of Zoology, University of Innsbruck and stored in 75% ethanol until recent identification. A total of about 67.000 adult oribatid mites specimens were studied. The determination was mainly carried out using the key of Weigmann (2006), for several species original descriptions, redescriptions or specific keys were used, particularly for species of the genus *Phthiracarus* (Beck *et al.* 2014, Niedbała 2008). The material is presently stored in the author’s collection and will finally be deposited in the collection of the Senckenberg Museum Görlitz, Germany.

## Structuring of the species list

The arrangement of the families follows the classification used in Schatz *et al.* (2011, updated). Subgenera as applied in Subías (2004, electronic updates 2006–2020), which were mainly proposed as identifications tools, were generally not considered (some widely accepted exceptions are added after the author name of the species). The arrangement of genera in families and that of species in genera are alphabetized. I follow Behan-Pelletier & Lindo (2019) in excluding the Hyporder *Astigmata* in this catalogue because their life-history traits differ from those of other Oribatida (Norton 1998, Norton & Behan-Pelletier 2009).

For each species the following information is presented:

- (1) **Species name** and author, occasionally subgenus.
- (2) **Records in Vorarlberg:** Habitats are given according to the respective reference, references are given in square brackets (referring to the information given in the following chapter „Bibliographical sources“), and the name by which the species was reported in the reference (if different), unpublished records are marked as “[unpubl.]”, arrangement of records according to regions (Bodensee area—Rheintal / Rhine Valley—Leiblachtal area (northeast of Bregenz)—Bregenzerwald area (including Kleinwalsertal, Hochtannberg, Laternsertal)—Walgau—Großes Walsertal—Klostertal—Arlberg area—Montafon—Brandnertal), altitudes are given in m a.s.l.
- (3) **Vorarlberg habitats:** Habitats in which the species was recorded are summarized and arranged according to habitat requirements (referred to findings) and altitude (**colline**—forests (incl. riverine forests), meadows, pastures, wetlands; **low montane**—forests (incl. riverine forests), meadows, pastures, wetlands; **montane**—forests, meadows, pastures, wetlands; **subalpine**—dwarf shrubs, pastures, wetlands; **alpine**—dwarf shrubs, grassland; **subnival**—cushion plants).
- (4) **Distribution:** The known distribution in the federal states of Austria, cantons of Switzerland, federal states of Southern Germany, and provinces of Italian Alps (abbreviations and references listed in table 1), and general known distribution (based on own data, Subías 2004, electronic update 2020, and other sources, e.g. Shtanchaeva & Subías 2010 and Murvanidze & Mumladze 2016 for Caucasus records, Ermilov & Martens 2014 for Nepal, Halliday *et al.* 2018 for Pakistan) is listed. Also, noteworthy general habitat preferences (e.g. alpine habitats) or rareness is occasionally given here.
- (5) **Remarks** (occasionally): giving *ad hoc* taxonomic information about the respective species, possible synonomies, varieties, uncertainties, etc., or specific comments or references for determination.

**TABLE 1.** Used abbreviations of countries, cantons and provinces of the states mentioned as well as references

**Austria** (federal states): **B**—Burgenland, **K**—Kärnten / Carinthia, **N**—Niederösterreich / Lower Austria, **O**—Oberösterreich / Upper Austria, **S**—Salzburg, **St**—Steiermark / Styria, **Ti**rol (**nT**—Nordtirol / North Tyrol, **oT**—Osttirol / East Tyrol), **V**—Vorarlberg, **W**—Wien / Vienna. Data from Krisper *et al.* (2017).

**Switzerland** (cantons): **AG**—Aargau / Argovia, **AR**—Appenzell Ausserrhoden, **AI**—Appenzell Innerrhoden, **BL**—Basel-Landschaft / Basle-Land, **BS**—Basel-Stadt / Basle, **BE**—Bern / Berne, **FR**—Freiburg / Fribourg, **GE**—Genf / Geneva, **GL**—Glarus / Glarus, **GR**—Graubünden / Grisons, **JU**—Jura, **LU**—Luzern / Lucerne, **NE**—Neuenburg / Neuchâtel, **NW**—Nidwalden, **OW**—Obwalden, **SH**—Schaffhausen, **SZ**—Schwyz, **SO**—Solothurn, **SG**—St. Gallen / St. Gall, **TI**—Tessin / Ticino, **TG**—Thurgau / Thurgovia, **UR**—Uri, **VD**—Waadt / Vaud, **VS**—Wallis / Valais, **ZG**—Zug, **ZH**—Zürich / Zurich, cantons with question mark: older records doubtful according to authors or detailed assignment of locality not possible. Data from Baur *et al.* 1996, Borcard 1990–1996, Borcard & Vaucher-von Ballmoos 1997, Bühlmann 1978, Mahunka 1993, 2001, Mahunka & Mahunka-Papp 1999–2003, 2006–2009a, Schenker 1983, 1984, Schenker & Streit 1980, Schweizer 1922–1956, Steiner 1994, and unpublished records.

**Southern Germany** (federal states): **BW**—Baden-Württemberg, **BY**—Bayern / Bavaria. Data from Beck *et al.* (2018), Weigmann *et al.* (2015).

**Italian Alps** (provinces): **BG**—Bergamo, **BL**—Belluno, **BS**—Brescia, **BZ**—Bolzano / Bozen (South Tyrol), **CO**—Como, **GO**—Gorizia, **PN**—Pordenone, **SO**—Sondrio, **TN**—Trento (Trentino), **TO**—Torino, **TS**—Trieste, **UD**—Udine, **TV**—Treviso, **VI**—Vicenza, **VR**—Verona. Data from Schatz (2018a, b).

## Bibliographical sources

- [1] Schweizer (1956): Pfänder area near Bregenz (community Lochau) (single record).
- [2] Janetschek (1956): Bregenzerwald—Ifenstock area (community Egg): Schneckenloch cave (1270 m).

- [3] Mihelčič (1957): Bregenzerwald—Ifenstock area (communities Egg, Sibratgfäll): Ifenstock mountain, Schneckenloch cave (1240–1270 m), sinkhole (doline) in „Gottesackerplateau“ north of Ifenstock (1780 m) (coll. Janetschek).
- [4] Janetschek (1961): Pfänder area near Bregenz (community Lochau), Bregenzerwald—Ifenstock area.
- [5] Schatz (1983): all previous records from Vorarlberg listed in „Catalogus Faunae Austriae“.
- [6] Schatz & Fischer (2013): Walgau—Jagdberg (communities Düns, Dünserberg, Röns, Schlins, Schnifis), southwest exposed slope at the entrance of the Walsertal: river Ill, riverine forest; hay and xeric meadows; colline mixed forests; fens; montane spruce forest; subalpine pastures; dwarf shrubs; Hochgerach summit: alpine grassland (490–1980 m).
- [7] Schatz (2015): Bregenzerwald—Fohramoos (communities Dornbirn and Schwarzenberg), large bogs and forests in the Bregenzerwald above Dornbirn: dry Nardetum; moorland forest, in dry litter, in moist and wet moss; rivulet in moorland forest, in wet moss; wet Molinetum; fen, in wet moss; raised bog, in wet leaf litter, grass and *Sphagnum* (1140–1150 m).
- [8] Krisper & Schuster (2016): New findings („Erstnachweise“) of rare species in different sites and habitats of Vorarlberg.
- [9] Krisper, Schatz & Schuster (2017): all previous records from Vorarlberg listed in „Checklisten der Fauna Österreichs“.

[unpubl.] additional unpublished records.

## Species list

### Fam. Brachychthoniidae Thor, 1934

*Brachychthonius berlesei* Willmann, 1928

**Vorarlberg:** **Bregenzerwald**—near Sulzberg: wet meadow, moss (805 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest; fen, wet moss; raised bog (1145 m) [7]; Ebniter Tal, near Emser Hütte: pasture (1260 m); Kanisfluh: above Wurzach Alm, dwarf shrub with *Juniperus communis* (1660 m). Kleinwalsertal—above Wal-mendinger Alpe: dwarf shrubs, grass and moss (1860 m) [unpubl.]. **Walgau**—Jagdberg: subalpine pastures with rocks, lichens and rotten wood (1555–1790 m) [6]. **Montafon**—Silbertal, near Fellimännle: pasture, moss (1100 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m) [unpubl.].

**Vorarlberg habitats:** low montane forests, pastures and wetlands, subalpine dwarf shrubs and pastures; xeric to wet (altitude 805–1860 m).

**General distribution:** Austria (B N nT oT V), Switzerland (AG BL GR? JU LU NE SO UR VD), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, western Oriental (Pakistan).

*Brachychthonius pius* Moritz, 1976

**Vorarlberg:** **Rheintal**—between Hohemems and Lustenau: wet meadow, reed (410 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m). **Bregenzerwald**—Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: *Juniperus communis*, moss and decayed litter (1660 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows (590 m) [6]; Gamperdonatal, south of Vasalpe: pasture (1180 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Spullersee: Rhododendretum (1840 m). **Montafon**—Untervermunt, near bridge across river Ill: spruce forest (1520 m); ibid., west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m). **Brandnertal**—Lünersee, path to Totalphütte: under *Salix*, dry leaf litter (2050 m); ibid., dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** colline and montane forests and meadows, colline wetlands, subalpine and alpine dwarf shrubs; xeric to moist (altitude 410–2050 m).

**General distribution:** Austria (N nT V), Switzerland (GR VS), Southern Germany (BW BY), Italian Alps (BZ); Holarctic (Central, South, West Europe, Canada).

*Eobrachychthonius borealis* Forsslund, 1942

**Vorarlberg: Bregenzerwald**—Fohramoos: raised bog (1150 m) [7]; Ebniter Tal, near Kobelealpe: birch stand, wet *Juncus* with moss (1040 m); Ifenstock area, west of Schönenbach Alm: raised bog (1020 m) [unpubl.].

**Vorarlberg habitats:** low montane wetlands; rare (altitude 1020–1040 m).

**General distribution:** Austria (nT V), Southern Germany (BW); Holarctic.

*Eobrachychthonius latior* (Berlese, 1910)

**Vorarlberg:** New record for Vorarlberg. **Leiblachtal**—Eichenberg, cut of small rivulet near Schüssellehen: spruce forest (850 m). **Bregenzerwald**—Ebniter Tal, near Vorderschauern: spruce forest (970 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane forests (altitude 850–970 m).

**General distribution:** Austria (O S nT oT), Switzerland (NE), Italian Alps (BL BZ); Holarctic.

*Eobrachychthonius oudemansi* Hammen, 1952

**Vorarlberg: Walgau**—Jagdberg: river Ill, riverine forest, leaf litter with rotten bark (490 m) [6].

**Vorarlberg habitats:** single record in colline riverine forest (altitude 490 m).

**General distribution:** Austria (B O nT oT V W), Switzerland (GR? NE TG), Southern Germany (BW BY), Italian Alps (BZ); semicosmopolitan.

*Liochthonius alpestris* (Forsslund, 1958)

**Vorarlberg:** New record for Vorarlberg and Austria. **Brandnertal**—Lünersee, near Totalphütte: subnival region, *Ranunculus alpestris* cushion, moist herbs with soil (2320 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** single records in subnival cushion plants (altitude 2320, 2410 m).

**General distribution:** Switzerland (GR NE TG), Southern Germany (BW); Palaearctic.

*Liochthonius brevis* (Michael, 1888)

**Vorarlberg: Bregenzerwald**—Sulzberg, near Falz: mixed forest, rotten wood from tree stump (990 m) [unpubl.]; Fohramoos: fen, wet moss (1150 m) [7]; north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Ifenstock area, Schneckenloch cave: entrance region (1270 m) [3 sub *Brachychthonius brevis*, 5]. **Arlberg area**—beside road to Stuben: spruce forest (1705 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** low to montane forests and wetlands, alpine dwarf shrubs; moist (altitude 705–2030 m).

**General distribution:** Austria (B N S St nT oT V), Switzerland (GR? GL LU TG TI VS), Southern Germany (BW BY), Italian Alps (BG BZ TN); Holarctic.

*Liochthonius horridus* (Sellnick, 1928)

**Vorarlberg:** New record for Vorarlberg. **Leiblachtal**—Gören near Hohenweiler: mixed forest, needle litter with moss (570 m). **Bregenzerwald**—above Schnepfegg: mixed forest (880 m); Subersachtal: spruce forest (1200 m) [unpubl.].

**Vorarlberg habitats:** single records in colline to montane forests (altitude 570–1200 m).

**General distribution:** Austria (St nT), Switzerland (TG), Southern Germany (BW BY), Italian Alps (BZ); Palearctic.

*Liochthonius hystricinus* (Forsslund, 1942)

**Vorarlberg:** New record for Vorarlberg. **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m). **Walgau**—above Thüringen, near Quadern: mixed forest (615 m); Gamperdonatal, at road bridge: mixed forest (930 m); ibid., near Alpe Gamperdona: pasture (1320 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane meadows; moist to wet; rare (altitude 615–1320 m).

**General distribution:** Austria (nT), Switzerland (GR? SO TI VS), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Neotropical (Chile).

*Liochthonius lapponicus* (Trägårdh, 1910)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (490 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Hohenems, „Old Rhine“: riverine forest (405 m); between Hohemems and Lustenau: wet meadow, reed (410 m). **Leiblachtal**—Eichenberg near Schüssellehen: spruce forest (850 m). Bregenz—Pfänder, Fluh: mixed forest (750 m). **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: fen, wet *Sphagnum* (1150 m) [7]; Ebniter Tal, near Emser Hütte: pasture (1260 m); ibid., Briedler Alpe: spruce forest (1450 m); ibid., below Hohe Kugel: subalpine grassland, Nardetum (1635 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m) [unpubl.]. **Walgauf**—Jagdberg: hay and xeric meadows; fen, wet moss and reed; dwarf shrubs with grass, herbs and lichens; Hochgerach summit: alpine grassland (640–1980 m) [6]; Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest, moss (1385 m). **Arlberg area**—Oberlech: dwarf shrubs with grass (1650 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests and meadows, colline and low montane wetlands, subalpine pastures, alpine grassland; xeric to moist (altitude 405–1980 m).

**General distribution:** Austria (K N O S nT V), Switzerland (SO VS), Southern Germany (BW BY), Italian Alps (BZ); Holarctic.

*Liochthonius perelegans* Moritz, 1976

**Vorarlberg:** New record for Vorarlberg. **Walgauf**—Gamperdonatal, south of Vasalpe: pasture (1180 m) [unpubl.].

**Vorarlberg habitats:** single record in montane pasture (altitude 1180 m).

**General distribution:** Austria (N nT), Southern Germany (BW), Italian Alps (BZ); Central, South, Southeast Europe.

*Liochthonius perfusorius* Moritz, 1976

**Vorarlberg:** New record for Vorarlberg and Austria. **Bregenzerwald**—Kanisfluh, above Obern Alm: Rhododendretum, moist litter (1650 m) [unpubl.].

**Vorarlberg habitats:** single record in subalpine dwarf shrubs (altitude 1650 m).

**General distribution:** Switzerland (NE), Southern Germany (BW BY); Europe.

*Liochthonius sellnicki* (Thor, 1930)

**Vorarlberg:** **Bregenzerwald**—Diedamskopf, summit: alpine grassland (2090 m); Subersachtal north of Schoppernau near Halden: hay meadow (1650 m). Hochtannberg—Kalbelesee: wet meadow, moist grass (1655 m) [unpubl.]. **Walgauf**—Jagdberg: hay and xeric meadows (590 m); Hochgerach summit: alpine grassland (1980 m) [6]; Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Oberlech: subalpine pasture (1645 m). **Montafon**—south of Partenen, near tollbooth: herbaceous pasture (1150 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); Ochsental, at Vermunt glacier: subnival region, moss, herb cushion (2620–2630 m). **Brandnertal**—Lünersee, path to Totalphütte: under *Salix* (2050 m); ibid., Rhododendretum (2130 m); ibid., near Totalphütte: subnival region, *Dryas octopetala* cushion (2390 m) [unpubl.].

**Vorarlberg habitats:** single record in colline meadow, frequently found in low montane and montane meadows and forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to moist (altitude 590, 920–2630 m).

**General distribution:** Austria (K N S St nT oT V), Switzerland (GR TI VD VS), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental.

*Liochthonius simplex* (Forsslund, 1942)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest, moss (480 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m). **Leiblachtal**—Eichenberg, cut of small rivulet near Schüssellehen: spruce forest (850 m). **Walgauf**—Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Laguztal, “Fuchswald”:

mixed forest (1160–1280 m). **Montafon**—Silbertal: mixed forest (950 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests; rather moist (altitude 480–1520 m).

**General distribution:** Austria (St nT), Southern Germany (BW BY), Italian Alps (TN); Holarctic, Oriental, South Africa, Australia.

*Liochthonius strenzkei* Forsslund, 1963

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (405 m); Hohenems, „Old Rhine“: riverine forest (405 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows (590–680 m) [6]. **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest, moss (1385 m); ibid., above “Fuchswald”: mixed forest (1280 m). **Klostertal**—west of Langen near Alfenz river: riverine forest (1050 m). **Montafon**—Silbertal, west of Innerberg: mixed forest (1115 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m). **Brandnertal**—Lünersee, above Totalphütte: subnival region, dry herb cushion (2406 m) [unpubl.].

**Vorarlberg habitats:** mainly in colline to montane meadows and forests, also in alpine dwarf shrubs, subnival cushion plants; xeric to moist (altitude 405–1385 m, 2030–2406 m).

**General distribution:** Austria (N O St nT V), Switzerland (BE GR LU TG TI VD VS), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental (China).

*Neoliochthonius piluliferus* Forsslund, 1942

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Vordere Niedere near Bezau: spruce forest (1420 m) [unpubl.].

**Vorarlberg habitats:** single record in montane forest (altitude 1420 m).

**General distribution:** Austria (nT), Southern Germany (BW); Holarctic.

*Poecilochthonius spiciger* (Berlese, 1910)

**Vorarlberg: Bregenzerwald**—above Schnepfegg: mixed forest (880 m). **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows (825 m) [6].

**Vorarlberg habitats:** single records in colline meadow, low montane and montane forests (altitude 825–1280 m).

**General distribution:** Austria (N K nT V W), Switzerland (BL TI VS), Southern Germany (BW BY), Italian Alps (BZ VI); Holarctic, Oriental (China), South America.

*Sellnickochthonius cricoides* (Weis-Fogh, 1948)

**Vorarlberg:** New record for Vorarlberg. **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest, moist moss (780 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane forest (altitude 780 m).

**General distribution:** Austria (N), Switzerland (NE), Southern Germany (BW BY); Palaearctic, western Oriental, Australia.

*Sellnickochthonius hungaricus* (Balogh, 1943)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Schnepfau, near Bregenzer Ach: mixed forest (730 m). **Walgau**—Gamperdonatal, south of Vasalpe: mixed forest; ibid., pasture (930 m). **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m). [unpubl.].

**Vorarlberg habitats:** colline to montane forests, montane pasture; rare (altitude 730–1280 m).

**General distribution:** Austria (B St nT oT), Switzerland (VS), Southern Germany (BW), Italian Alps (BZ); southern Palaearctic, Oriental (China).

*Sellnickochthonius immaculatus* (Forsslund, 1942)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (405 m). **Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); between Hohemems and Lustenau: wet meadow, reed (410 m).

**Bregenzerwald**—Ebniter Tal, near Emser Hütte: pasture (1260 m); Kanisfluh, above Obern Alm: dwarf shrubs (1660 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows (590–825 m) [6]. **Brandnertal**—Lünersee, path to Totalphütte: under *Salix* (2050 m); ibid., Rhododendretum (2130 m), ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests and meadows, subalpine and alpine dwarf shrubs, subnival cushion plants; xeric to moist (altitude 405–2410 m).

**General distribution:** Austria (B N O St nT oT V W), Switzerland (BE BL GR? NE SO TG VS), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Neotropical.

*Sellnickochthonius rostratus* (Jacot, 1936)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Ebniter Tal, near Emser Hütte: pasture (1260 m). **Walgau**—near Göfis: raised bog, moist grass litter and moss (555 m). **Brandnertal**—Lünersee, near Totalphütte: subnival region, dry grass cushion (2390 m) [unpubl.].

**Vorarlberg habitats:** single records in colline raised bog, low montane pasture, subnival cushion plants (altitude 555–2390 m).

**General distribution:** Austria (B nT W), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Mexico.

*Sellnickochthonius zelawaiensis* (Sellnick, 1928)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—above Mellau: mixed forest (960 m); Diedamskopf, west of Halden Alpe: dwarf shrubs (1720 m); Subersachtal: spruce forest (1200 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane and montane forests, subalpine dwarf shrubs (altitude 960–1720 m).

**General distribution:** Austria (N St nT), Switzerland (BL NE LU SO TG TI VD), Southern Germany (BW BY), Italian Alps (BZ); Holarctic.

*Synchthonius crenulatus* (Jacot, 1938)

**Vorarlberg:** **Rheintal**—Röthis, above Viktorsberg: mixed forest (920 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, dry litter (1145 m) [7]; Ebniter Tal, near Emser Hütte: pasture (1260 m); Diedamskopf: dwarf shrubs (1720–1840 m). **Montafon**—Silbertal, near GH Fellimännle: pasture (1100 m) [unpubl.].

**Vorarlberg habitats:** low montane and pasture, montane forests, subalpine dwarf shrubs; xeric to moist; rare (altitude 920–1840 m).

**General distribution:** Austria (K St nT V), Switzerland (LU), Southern Germany (BW), Italian Alps (BZ); Holarctic.

## Fam. Atopochthoniidae Grandjean, 1949

*Atopochthonius artiodactylus* Grandjean, 1948

**Vorarlberg:** **Brandnertal**—Bürser Schlucht / gorge south of Bludenz, mixed forest (~600–700 m) [8].

**Vorarlberg habitats:** single record in colline forest (altitude ~600–700 m).

**General distribution:** Austria (K N St V), Southern Germany (BW); Holarctic, Oriental (China).

## Fam. Pterochthoniidae Grandjean, 1950

*Pterochthonius angelus* (Berlese, 1910)

**Vorarlberg:** **Brandnertal**—Bürser Schlucht / gorge south of Bludenz, mixed forest (~600–700 m) [8].

**Vorarlberg habitats:** single record in colline forest (altitude ~600–700 m).

**General distribution:** Austria (K N St nT V); Holarctic, Oriental, Mexico, Hawaii.

## Fam. Eniochthoniidae Grandjean, 1947

*Eniochthonius minutissimus* (Berlese, 1903)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Reute above Hohenems: mixed forest, moss (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, Örfla gorge above Me-

schach: mixed forest (670 m); Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., mixed forest (540 m). **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation with moss (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); Hittisau, Häusern: beech forest (770 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs, wet *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, above Hackwald: mixed forest (920 m); ibid., road junction to Koblach: mixed forest (740 m); mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal, at tollbooth: mixed forest (730 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); above Schnepfegg: mixed forest (880 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forest; fen; subalpine pastures; dwarf shrubs; Hochgerach summit: alpine grassland (565–1980 m) [6, unpubl.]; near Göfis: raised bog (555 m); Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Saminatal: spruce forest (530 m); Gamperdonatal, south of Vasalpe: pasture (1180 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Laguztal, above “Fuchswald”: mixed forest (1280 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, Silberberg near Schruns: mixed forest (900 m); St. Gallenkirch—Badmunt, mouth of Sugadimbach: riverine forest, leaf litter (800 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests and meadows, colline and low montane wetlands, subalpine dwarf shrubs, alpine grassland; xeric to moist (altitude 420–1980 m).

**General distribution:** Austria (B K N O St nT oT V), Switzerland (AG NE VD), Southern Germany (BW BY), Italian Alps (BG BS BZ TN); semicosmopolitan.

## Fam. Hypochthoniidae Berlese, 1910

*Hypochthonius rufulus* C. L. Koch, 1835

**Vorarlberg: Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (397 m); ibid., riverine and deciduous forest (398–405 m). **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele: mixed forest (490 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Reute above Hohenems: mixed forest (885 m); Hohenems, „Old Rhine“: riverine forest (405 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); ibid., Batschuns: pasture in orchard (590 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); ibid., Unterries near Bangs: moist meadow (435 m); ibid., Gisingen: riverine forest (435 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Gschwendene: mixed forest (790 m); ibid., near Falz: hay meadow (980 m); ibid., wet meadow (805 m); ibid., near Doren: hay meadow (490 m); ibid., steep slope above Doren: mixed forest (530 m); Egg, south of junction Bezau—Lingenau: slope with alder (600 m); Hittisau, Häusern: beech forest (770 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m); ibid., mixed forest beside raised bog (1020 m) [unpubl.]. Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal, Löffelau tollbooth: mixed forest (960 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Hirschau: deciduous forest (730 m); between Hirschau and Schnepfau: deciduous forest (730 m); above Bad Hopfreben: mixed forest (1030 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). **Kleinwalsertal**—Rietzlern, beside mill: pasture (1070 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; fen; colline mixed forest, moss; subalpine pastures (490–1560 m) [6]; above Thüringen, near Quadern: mixed forest (615 m); near Göfis: raised bog, moist moss (555 m); between Schnifis and Schlins, beside rivulet: hay meadow (600 m); west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m);

Amerlügen near Frastanz: pasture (865 m); Saminatal: mixed forest (740 m); Gamperdonatal, south of Vasalpe: pasture (1180 m); west of Nüziders: beech forest (545 m). **Großes Walsertal**—east of Marul: pasture (980 m). **Klostertal**—Innerbraz, east of Masonbach: hay meadow (695 m); west of Dalaas, above road: mixed forest (775 m). **Montafon**—north of Lorüns: mixed forest (585 m); Silbertal, above road: mixed forest (950 m); ibid., near Fellimännle: pasture (1100 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests and meadows, colline to subalpine wetlands, subalpine pastures; xeric to moist (altitude 397–1835 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG AI BE BL GR JU NE VD VS ZH), Southern Germany (BW BY), Italian Alps (BL BZ TN); semicosmopolitan.

## Fam. Parhypochthoniidae Grandjean, 1932

*Parhypochthonius aphidinus* Berlese, 1904

**Vorarlberg:** **Brandnertal**—Bürser Schlucht / gorge south of Bludenz, beech forest, humus at trunk of *Fagus sylvatica* (~600–700 m) [8].

**Vorarlberg habitats:** single record in colline forest (altitude ~600–700 m).

**General distribution:** Austria (nT V), Southern Germany (BW); semicosmopolitan.

## Fam. Eulohmanniidae Grandjean, 1931

*Eulohmannia ribagai* (Berlese, 1910)

**Vorarlberg:** **Rheintal**—Rankweil, Batschuns: pasture in orchard (590 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis*, moss and decayed litter (1660 m); Diedamskopf, west of Halden Alpe: dwarf shrubs (1720 m) [unpubl.]. **Walgau**—Jagdberg: subalpine pasture (1550 m) [6]; Amerlügen near Frastanz: pasture (865 m). **Großes Walsertal**—west of Buchboden at bridge: mixed forest (900 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Oberlech: dwarf shrubs with grass (1650 m); west of Zug: subalpine pasture (1540 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—Silbertal, above road: mixed forest (950 m); ibid., near Fellimännle: pasture, moss (1100 m); Gargellenthal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., alpine grassland, grass and cushion plants (sifted) (2030 m); ibid., “Gamslugen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane pastures, low montane and montane forests, subalpine pastures and dwarf shrubs, alpine dwarf shrubs and grassland, subnival cushion plants (altitude 590–2410 m).

**General distribution:** Austria (K N O S St nT V W), Switzerland (AG BL GR VD), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental.

## Fam. Euphthiracaridae Jacot, 1930

*Acrotritia ardua* (C. L. Koch, 1841)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (397 m); ibid., riverine and spruce forests (398 m). **Rheintal**—south of Lauterach: wet meadow (410 m); above Dornbirn, near Bödele: mixed forest (490 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Hohenems, „Old Rhine“: riverine forest (405 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); ibid., below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., Gisingen: riverine forest (435 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); west of Eichenberg, brookside: riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Fluh: mixed forest (750 m).

Falz: mixed forest, rotten wood from tree stump (990 m); ibid., near Doren: hay meadow (490 m); Hittisau, Häusern: beech forest (770 m) [unpubl.]; Fohramoos: moorland forest, dry litter, moist moss; fen and raised bogs; wet *Sphagnum* (1150 m) [7, unpubl.]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); above Mellau: mixed forest (960 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; fen; colline mixed forest, moss (490–825 m) [6, unpubl.]; above Thüringen, near Quadern: mixed forest (615 m); Amerlügen near Frastanz: pasture (865 m); Saminatal: spruce forest (530 m); west of Nüziders: beech forest (545 m). **Großes Walsertal**—west of Buchboden at bridge: mixed forest (900 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m); east of Marul: pasture (980 m). **Montafon**—Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests, colline and low montane meadows, pastures and wetlands, subalpine wetlands; xeric to moist (altitude 397–1835 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BL BS FR GE GR JU NE SH TG TI VD VS), Southern Germany (BW BY), Italian Alps (BS BZ SO TN TO VI); cosmopolitan.

#### *Euphthiracarus cribrarius* (Berlese, 1904)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); above Bad Hopfren: spruce forest, decayed woody litter from tree stump (1030 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane forests, both samples taken from rotten tree stumps (altitude 1030, 1270 m).

**General distribution:** Austria (B N O S St nT oT), Switzerland (AG GL GR JU LU SH TG TI VS), Southern Germany (BW BY), Italian Alps (BL TN); Holarctic.

**Remark:** This species is morphologically very similar to *E. reticulatus* (Berlese, 1913) and *E. reticulatus alpinus* Märkel, 1964, but differs from those in having distally flagellate rostral and anal setae  $a_1$  and  $a_2$  (vs. straight rostral setae and not flagellate anal setae in *E. reticulatus*), as well as 3 pairs of anal setae (vs. 6–9 pairs in *E. reticulatus alpinus*). Determination according to Niedbała (2011).

### Fam. Phthiracaridae Perty, 1841

#### *Atropacarus striculus* (C. L. Koch, 1835)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m); Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele: mixed forest (490 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); near Dornbirn, beside motorway exit 14: hay meadow (410 m); Schuttenanen above Hohenems: spruce forest (1200 m); Hohenems, „Old Rhine“: riverine forest (405 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., mixed forest (540 m); Feldkirch, Gisingen: riverine forest (435 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: spruce forest (1030 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Gschwendele: mixed forest (790 m); ibid., near Falz: mixed forest (995 m); ibid., wet meadow (805 m); Sulzberg, near Doren: hay meadow (490 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Balderschwangertal, near Gerisgenschwend: spruce forest (1010 m); Hittisau, Häusern: beech forest (770 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m); ibid., mixed forest beside raised bog (1020 m); between Ittensberg and Großdorf: meadow (810 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, above Hackwald: mixed forest (920 m); ibid., near Vorderschauern: spruce forest (970 m); ibid., near Kobealpe: birch stand, wet *Juncus* with moss (1040 m); ibid., road junction to Kobealpe: mixed forest (740 m); Vordere Niedere near Bezau, Sonderdach: mixed forest (980 m); Vordere Niedere near Bezau, near cableway station: wet meadow (770 m); Bizauer Tal, at tollbooth: mixed forest (730 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Au, Argenzipfel, Leuebach: mixed forest

(995 m); above Bad Hopfreben: spruce forest (1030 m); ibid., mixed forest (1030 m); below Kanisfluh: mixed forest (1190 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); Diedamskopf: dwarf shrubs (1840 m); Sibratsgfäll, Völken: spruce forest (1050 m); ibid., beside Subersach, near ski slope: pasture (860 m); Subersachtal: spruce forest (1200 m); Ifenstock area, west of Schönenbach Alm: raised bog, wet *Sphagnum* (1020 m). Kleinwalsertal—Rietzler, beside mill: pasture (1070 m); Baad, near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn: dwarf shrubs (1860 m); above Walmendinger Alpe: dwarf shrubs (1860 m); Hörnlepass: raised bog, moist moss (1160 m) [unpubl.]. **Walzau**—Jagdberg: hay and xeric meadows; colline mixed forests; fen; subalpine pastures (565–1555 m) [6, unpubl.]; near Göfis: raised bog, moist grass litter and moss (555 m); west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Amerlügen near Frastanz: pasture (865 m); Saminatal: spruce forest (530 m); Gamperdonatal: mixed forests (930–1280 m); ibid., south of Vasalpe: pasture (930 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m); ibid., above “Fuchswald”: mixed forest (1280 m); east of Marul: pasture (980 m). **Klostertal**—west of Wald, beside road: mixed forest (915 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); ibid., above Schlegelkopf: subalpine pasture, Curvuletum (1850 m); west of Zug: subalpine pasture (1540 m); Formarintal: dwarf shrubs (1800 m); ibid., near Formarinsee: subalpine pasture (1850 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, Silberberg near Schruns: mixed forest (900–950 m); ibid., near Fellimänne: pasture (1100 m); Gargellen, north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m). **Brandnertal**—Lünersee, path to Totalphütte: under *Salix* (2050 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, meadows, pastures and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to moist (altitude 396–2050 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG BE BL FR GL GR JU LU NE SG SO TG TI UR VD VS), Southern Germany (BW BY), Italian Alps (BL BS BZ TN); semicosmopolitan.

#### *Hoplothiracarus illinoiensis* (Ewing, 1909)

**Vorarlberg: Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinetum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7, unpubl.]. Kleinwalsertal—Hörnlepass: raised bog, moist moss (1160 m) [unpubl.].

**Vorarlberg habitats:** low montane forests and wetlands; rare (altitude 1150–1160 m).

**General distribution:** Austria (nT V), Switzerland (BE NE JU VD), Southern Germany (BW BY); Holarctic, Oriental, Central America.

#### *Phthiracarus bryobius* Jacot, 1930

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Reute above Hohenems: mixed forest, moss (885 m); Feldkirch, St. Cornelius in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m). **Bregenzerwald**—Fohramoos: spruce forest, wet moss (1145 m); Subersachtal: spruce forest, rotten wood from tree stump (1290 m) [unpubl.]. **Walzau**—Jagdberg: montane spruce forest, moss near a small pond (1610 m) [6]; above Thüringen, near Quadern: mixed forest (615 m); Gamperdonatal, tollbooth: spruce forest, rotten wood (750 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetland; xeric to wet (altitude 520–1610 m).

**General distribution:** Austria (O), Switzerland (VS), Southern Germany (BW BY); Holarctic, Neotropical.

#### *Phthiracarus compressus* Jacot, 1930

**Vorarlberg: Rheintal**—Rankweil, Batschuns: pasture in orchard (590 m). **Leiblachatal**—between Weienried and Möggen: wet meadow (860 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, near Gschwendele: mixed forest (790 m) [unpubl.]; Fohramoos: dry Nardetum (1145 m) [7]; Ebniter Tal, near Vorderschauern: spruce forest (970 m); ibid., road junction to Kobelalpe: mixed forest (740 m); Au, Argenzipfel, Leuebach: mixed forest (995 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1860 m). **Walzau**—Saminatal: mixed forest (690 m); Gamperdonatal, at road bridge: mixed forest (930 m). **Arlberg**

**area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m). **Montafon**—north of Lorüns: mixed forest (585 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests and pastures, subalpine dwarf shrubs; moist to wet (altitude 585–1880 m).

**General distribution:** Austria (N O nT V W), Switzerland (AG GL GR JU TI VS), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Phthiracarus crinitus* (C. L. Koch, 1841)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); Buch at Bregenzer Ach: meadow (650 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., mixed forest (510–540 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, near Gschwendele: mixed forest (790 m); near Sulzberg: wet meadow (805 m); Hittisau, Häusersn: beech forest (770 m); Vordere Niedere near Bezau, near cableway station: deciduous forest (770 m); Hirschau: deciduous forest (730 m). **Walgau**—west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Gamperdonatal, at road bridge: mixed forest (930 m). **Großes Walsertal**—west of Buchboden: hay meadow (890 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Montafon**—north of Lorüns: mixed forest (585 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, meadows and wetlands; rather moist to wet (altitude 440–1040 m).

**General distribution:** Austria (B N oT), Switzerland (AG LU SH SO TG), Southern Germany (BW BY), Italian Alps (BS BZ TN); southwestern Palaearctic.

*Phthiracarus ferrugineus* (C. L. Koch, 1841)

**Vorarlberg:** **Rheintal**—Rankweil, Batschuns: pasture in orchard (590 m). **Bregenzerwald**—Sulzberg, near Doren: hay meadow (490 m); near Sulzberg: wet meadow (805 m); Vordere Niedere near Bezau, near cableway station: wet meadow (770 m); Diedamskopf, west of Halden Alpe: dwarf shrub (1720 m). Kleinwalsertal—Rietzlern, beside mill: pasture (1070 m) [unpubl.]. **Walgau**—Jagdberg: fen, moss and reed (565 m) [6]. **Montafon**—Gargellenthal, north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane pastures and wetlands, montane forests, subalpine dwarf shrubs; moist (altitude 490–1720 m).

**General distribution:** Austria (N O S St nT V), Switzerland (AG BE SG SO TI), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

*Phthiracarus globosus* (C. L. Koch, 1841)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (490–960 m); Schuttannen above Hohenems: spruce forest (1200 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Corneli in Tosters: mixed forest (510 m); ibid., Unterries near Bangs: moist meadow (435 m). **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (750–840 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest 650 m); Balder-schwangertal, near Gerisgschwend: spruce forest (1010 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7, unpubl.]. Ebniter Tal, Briedler Alpe: spruce forest (1450 m); ibid., above Hackwald: mixed forest (920 m); ibid., road junction to Kobealpe: mixed forest (740 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Vordere Niedere near Bezau, Sonderdach: mixed forest (980 m); above Bad Hopfreben: spruce forest (1035 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf: dwarf shrubs (1840 m); Subersachtal north of Schoppernau, steep slope: krummholz, woody litter (1600 m). Kleinwalsertal—Baad,

near Camping Vorderboden: mixed forest (1220 m); Hirschgärtchen, Schwarzwässertal: spruce forest (1340 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1730–1770 m). Laternsertal—Furkajoch: dwarf shrubs (1640–1770 m); west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest: hay and xeric meadows; colline mixed forests; fen; montane spruce forest, moss and needle litter; subalpine pastures with rocks; dwarf shrubs (490–1725 m) [6, unpubl.]; above Thüringen, near Quadern: mixed forest (615 m); near Göfis: raised bog, moist moss (555 m); west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Saminatal: spruce forest (530 m); ibid., mixed forest (690 m); Gamperdonatal: mixed forests (930–1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); west of Buchboden: mixed forest (900 m); ibid., hay meadow (890 m); Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m); ibid., above “Fuchswald”: mixed forest (1280 m). **Klostertal**—west of Langen near Alfenz river: riverine forest (1050 m). **Arlberg area**—Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); ibid., above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); ibid., subalpine pasture, Curvuletum (1850 m); Oberlech: spruce forest (1670 m); ibid., dwarf shrubs (1650 m); east of Zug: spruce forest (1475 m); west of Zug: subalpine pasture (1540 m); Spullersee: Rhododendretum (1840 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—south of Schruns, near Ill river: riverine forest (770 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forest (900–950 m); Gargellen, north of Gargellen: spruce forest (1390 m); Unterermunt, near road: slope with *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m); ibid., near Totalphütte: subnival region, *Dryas octopetala* cushion (2390 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline and low montane forests, meadows and wetlands, montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs, subnival cushion plants; xeric to moist (altitude 435–2410 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GE GR TI UR VD VS ZH), Southern Germany (BW BY), Italian Alps (BG BL BZ TN UD); Holarctic, Oriental, Central America.

#### *Phthiracarus laevigatus* (C. L. Koch, 1841)

**Vorarlberg:** Bodensee—mouth of Rhine-Rohrspitz: below *Salix* (397 m); ibid., spruce forest (398 m). **Rheintal**—Dornbirn, railway station Haselstauden: small forest strip (420 m); Rankweil, Batschuns: pasture in orchard (590 m). **Leiblachtal**—west of Eichenberg, brookside: riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder, Fluh: mixed forest (750 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest (650 m); Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., riverbank near Doren: grass litter (450 m); Hittisau, Häusern: beech forest (770 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinetum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); ibid., above Hackwald: mixed forest (920 m); ibid., near Kobealpe: birch stand, wet *Juncus* with moss (1040 m); Vordere Niedere near Bezau: spruce forest (1420 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); above Bad Hopfreben: spruce forest (1030 m); Kanisfluh: mixed forest (1750 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls, near timberline: spruce forest (1755 m); Damüls, Krumbach: spruce forest (1450 m); Subersachtal: spruce forest (1200 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn: dwarf shrubs (1860 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed forests; fen; montane spruce forest, moss and needle litter; subalpine pastures with rocks; dwarf shrubs; Hochgerach summit: alpine grassland (490–1980 m) [6, unpubl.]; Saminatal: spruce forest (530 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—east of Marul: pasture (980 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); west of Zug: subalpine pasture (1540 m). **Montafon**—north of Lorüns: mixed forest (585 m); Silbertal, west of Innerberg: mixed forest (1115 m). **Brandner-**

**tal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, meadows and wetlands, montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to moist (altitude 397–2410 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG? BL GE GR SH SO TI), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic, western Oriental (Pakistan), Ethiopian, South America (Peru).

*Phthiracarus lentulus* (C. L. Koch, 1841)

**Vorarlberg:** New record for Vorarlberg. **Leiblachtal**—Eichenberg near Schüssellehen: spruce forest (850 m). **Bregenzerwald**—Ebniter Tal, near Vorderschauern: spruce forest (970 m); ibid., near Kobelealpe: birch stand, wet *Juncus* with moss (1040 m); above Schnepfegg: mixed forest (880 m). Kleinwalsertal—Baad, near church: pasture (1240 m); ibid., near Camping Vorderboden: mixed forest (1220 m) [unpubl.].

**Vorarlberg habitats:** low montane forests and pastures; moist (altitude 850–1240 m).

**General distribution:** Austria (St nT), Switzerland (TI VS), Southern Germany (BW); Holarctic, Ethiopian, Oriental (China).

*Phthiracarus longulus* (C. L. Koch, 1841)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Götzis, above Meschach: fir forest (1140 m); Röthis, above Viktorsberg: mixed forest (920 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); St. Cornelius in Tosters: mixed forest (510–540 m). Leiblachtal—Ried near Hohenweiler: mixed forest with oaks (470 m).

**Bregenzerwald**—Sulzberg, near Falz: mixed forest (995 m); Fohramoos: spruce forest, wet moss (1145 m); Bizauer Tal, at tollbooth: mixed forest (730 m); below Kanisfluh: mixed forest (1190 m); Diedamskopf, summit: alpine grassland (2090 m). Laternsertal—west of Furkajoch: spruce forest (1370 m). **Walgau**—Bazulwald west of Nenzing: mixed forest (670 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Arlberg area**—east of Zug: spruce forest (1475 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, alpine dwarf shrubs and grassland; xeric to wet (altitude 470–2090 m).

**General distribution:** Austria (B O St nT), Switzerland (FR GR LU SH SO TG TI), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, South America (Uruguay).

*Steganacarus applicatus* (Sellnick, 1920)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest (1200 m); Reute above Hohenems: mixed forest (885 m); Götzis, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Feldkirch, Gisingen: riverine forest (435 m). **Leiblachtal**—Eichenberg near Schüssellehen: spruce forest (850 m). Bregenz—Pfänder: spruce forest (1030 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Falz: mixed forest (995 m); ibid., near Doren: hay meadow (490 m); ibid., steep slope above Doren: mixed forest (530 m); Balderschwangertal, near Gerisgschwend: spruce forest (1010 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinetum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, above Hackwald: mixed forest (920 m); ibid., near Kobelealpe: birch stand, wet *Juncus* with moss (1040 m); ibid., road junction to Kobelealpe: mixed forest (740 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal: mixed forests (730–960 m); Mellau, Roßstellealpe: mixed forest (1050 m); above Mellau: mixed forest (960 m); above Bad Hopfreben: spruce forest (1035 m); Subersachtal: spruce forest (1200 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed forests; fen (490–705 m) [6, unpubl.]; Bazulwald west of Nenzing: mixed forest (670 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—south of Faschinajoch, above road: spruce forest (1220 m); west of Buchboden at bridge: mixed forest (900 m). **Klostertal**—west of

Langen: mixed forest on scree (1040 m). **Arlberg area**—east of Zug: spruce forest (1475 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, Silberberg near Schruns: mixed forest (900–950 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, meadows and wetlands, montane forests; xeric to moist (altitude 435–1475 m).

**General distribution:** Austria (K N O S St nT V), Switzerland (BL GL LU TG), Southern Germany (BW BY), Italian Alps (BZ TN BL); western Palaearctic.

*Steganacarus brevipilus* (Berlese, 1923) (*Tropacarus*)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rheinspitz: riverine forest (398 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest (685 m) [6].

**Vorarlberg habitats:** single records in colline forests (altitude 398, 685 m).

**General distribution:** Austria (V), Southern Germany (BW); southwestern Palaearctic.

*Steganacarus carinatus* (C. L. Koch, 1841) (*Tropacarus*)

**Vorarlberg:** **Leiblachtal**—Gören near Hohenweiler: pasture (560 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; colline mixed forest (490–685 m) [6 part. sub *S. carinatus* forma *pulcherrimus* (Berlese, 1887)].

**Vorarlberg habitats:** single records in colline forests, meadows and wetlands; xeric to rather moist (altitude 490–685 m).

**General distribution:** Austria (B K N O S St nT V), Switzerland (AG GR LU TG TI VD), Southern Germany (BW BY), Italian Alps (BG BL BZ CO TN UD TV); Palaearctic, western Oriental (Kashmir), Mexico.

*Steganacarus herculeanus* Willmann, 1953

**Vorarlberg:** **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); Schuttannen above Hohenems: spruce forest (1200 m); Röthis, above Viktorsberg: mixed forest (920 m); Feldkirch, Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (750–840 m); ibid., spruce forest (1030 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest (650 m); Sulzberg, near Gschwendele: mixed forest (790 m); Hittisau, Häusern: beech forest (770 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moss; fen, wet *Sphagnum* (1145–1150 m) [7]; Ebniter Tal, above Hackwald: mixed forest (920 m); ibid., near Kobealpe: birch stand, wet *Juncus* with moss (1040 m); ibid., road junction to Kobealpe: mixed forest (740 m); Vordere Niedere near Bezau, near cableway station: wet meadow (770 m); Bizauer Tal: mixed forests (730–1000 m); above Schnepfegg: mixed forest (880 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); below Kanisfluh: mixed forest (1190 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; colline mixed forest (490–685 m) [6]; Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Bazulwald west of Nenzing: mixed forest (670 m); Saminatal: mixed forest (740 m); Gamperdonatal, at road bridge: mixed forest (930 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, meadows and wetlands; xeric to moist (altitude 470–1200 m).

**General distribution:** Austria (N O S St V), Switzerland (AG AP BE BL GL JU LU NE SO VD VS), Southern Germany (BW); Central, Southwest Europe.

*Steganacarus magnus* (Nicolet, 1855)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Schetteregg, Amagmach: raised bog, wet moss (1020 m); above Mellau: mixed forest (960 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane forest and wetland; moist (altitude 960, 1020 m).

**General distribution:** Austria (B N O S St nT), Switzerland (AG AI? BL JU SH VD ZH?), Southern Germany (BW BY), Italian Alps (TN BS); Holarctic, Ethiopian.

*Steganacarus vernaculus* Niedbała, 1982

**Vorarlberg:** **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele:

mixed forest (960 m); Schuttannen above Hohenems: spruce forest (1200 m). **Leiblachtal**—Eichenberg near Schüssellehen: spruce forest (850 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m); ibid., spruce forest (1030 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Gschwendele: mixed forest (790 m); ibid., near Doren: hay meadow (490 m); Reifensberg, above Niemans: spruce forest (980 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Balderschwangertal, near Gerisgenschwend: spruce forest (1010 m); Hittisau, Häusern: beech forest (770 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moss; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m); ibid., above Hackwald: mixed forest (920 m); ibid., near Koblalpe: birch stand, wet *Juncus* with moss (1040 m); Vordere Niedere near Bezau, near cableway station: wet meadow (770 m); Bizauer Tal: mixed forests (730–1000 m); above Schnepfegg: mixed forest (880 m); above Bad Hopfreben: spruce forest (1035 m); Sibratsgfäll, Völken: spruce forest (1050 m); Su bersachtal: spruce forest (1200 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m). **Walgau**—Jagdberg: colline mixed forest; subalpine pastures with rocks, in lichens; dwarf shrubs (705–1790 m) [6, unpubl.]; above Thüringen, near Quadern: mixed forest (615 m); Gamperdonatal: mixed forests (930–1280 m); ibid., south of Vasalpe: pasture (930 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m). **Klostertal**—west of Wald, beside road: mixed forest (915 m). **Arlberg area**—Oberlech: dwarf shrubs (1650 m); east of Zug: spruce forest (1475 m); west of Zug: subalpine pasture (1540 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, Silberberg near Schruns: mixed forest (900 m); ibid., near Fellimännle: pasture (1100 m); Gargellen, north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests and meadows, low montane wetlands, subalpine pastures and dwarf shrubs, alpine dwarf shrubs; xeric to moist (altitude 470–2030 m).

**General distribution:** Austria (nT V), Italian Alps (BZ TN); also in remaining Central Europe.

## Fam. Crotoniidae Thorell, 1876

*Camisia biurus* (C. L. Koch, 1839)

**Vorarlberg:** **Rheintal**—Götzis, above Meschach: fir forest (1140 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moss; raised bog (1145–1150 m) [7, unpubl.]; Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m). Kleinwalsertal—Walmendinger Horn: dwarf shrubs (1860 m). **Montafon**—Silbertal, near Fellimännle: pasture (1100 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m) [unpubl.].

**Vorarlberg habitats:** low montane forests, meadows, pastures and wetlands, subalpine dwarf shrubs, alpine dwarf shrubs and grassland; rather moist (altitude 1100–2080 m).

**General distribution:** Austria (K N O S St nT oT V), Switzerland (GR NE VD), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental (China).

*Camisia biverrucata* (C. L. Koch, 1839)

**Vorarlberg:** New record for Vorarlberg. **Arlberg area**—Oberlech: spruce forest (1670 m). **Montafon**—Gargellen-tal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); Ochsental, at Vermunt glacier: subnival region, herb cushion (2630 m) [unpubl.].

**Vorarlberg habitats:** montane forests, alpine dwarf shrubs, subnival cushion plants; rather xeric; rare (altitude 1510–2630 m).

**General distribution:** Austria (B K N O S St nT oT), Switzerland (GR VD VS), Italian Alps (BS BZ TN); Holarctic.

*Camisia horrida* (Hermann, 1804)

**Vorarlberg:** New record for Vorarlberg. **Walgaus**—above Thüringen, near Quadern: mixed forest (615 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m) [unpubl.].

**Vorarlberg habitats:** single records in colline and low montane forests; rather xeric (altitude 615, 765 m).

**General distribution:** Austria (B K O N S St nT oT), Switzerland (BS GR VS), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, western Oriental (Pakistan), Ethiopia, Central America.

*Camisia solhoeyi* Colloff, 1993

**Vorarlberg:** New record for Vorarlberg and Austria. **Montafon**—Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m); ibid., outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** single records in subalpine dwarf shrubs and raised bog (altitude 1795–1860 m).

**General distribution:** Southern Germany (BY), Italian Alps (BZ); Palaearctic; rare. Mainly in alpine habitats.

*Camisia spinifer* (C. L. Koch, 1835)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss; raised bog (1145–1150 m) [7]; Ebniter Tal, near Emser Hütte: pasture (1260 m); Kanisfluh: dwarf shrubs (1650–1660 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1860 m). Laternsertal—below Furkajoch: pasture (1550 m) [unpubl.]. **Walgaus**—Jagdberg: colline mixed forest; Hochgerach summit: alpine grassland (685–1980 m) [6]. **Arlberg area**—Arlbergpass, at Rauzbach: Rhododendretum (1780 m). **Montafon**—Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, low montane wetlands, montane and subalpine pastures, subalpine dwarf shrubs, alpine dwarf shrubs and grassland; moist to wet (altitude 685–2030 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (GR NE VD), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental, Neotropical.

*Heminothrus targionii* (Berlese, 1885)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (398–405 m). **Rheintal**—between Höhems and Lustenau: wet meadow, reed (410 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); Ried near Hohenweiler: mixed forest (470 m). **Bregenzerwald**—Ebniter Tal, below Hohe Kugel: subalpine grassland, Nardetum (1635 m); Vordere Niedere near Bezau: spruce forest (1420 m); Hirschau: deciduous forest, moss on rock (730 m) [unpubl.]. **Walgaus**—Jagdberg: hay meadows (490 m) [6]; Saminatal: spruce forest (530 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m) [unpubl.]. **Klostertal**—west of Dalaas, above road: mixed forest (775 m).

**Vorarlberg habitats:** colline to montane forests, colline meadows and wetlands, subalpine pastures; xeric to moist (altitude 398–1635 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AI BL VD VS), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental, Central America.

*Platynothrus capillatus* (Berlese, 1914)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (490 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m) [unpubl.]; Fohramoos: moorland forest, moss (1145 m) [7]; Vordere Niedere near Bezau: spruce forest (1420 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1860 m). **Walgaus**—Jagdberg: subalpine pasture with rocks (1700 m) [6]. **Arlberg area**—Spullersee: Rhododendretum (1840 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, subalpine pastures and dwarf shrubs; xeric to wet (altitude 490–1860 m).

**General distribution:** Austria (S V), Southern Germany (BW BY), Italian Alps (BG); Holarctic.

*Platynothrus peltifer* (C. L. Koch, 1839)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m); ibid., deciduous forest (405 m); ibid., north of Höchst: wet meadow (398 m). **Rheintal**—above Dornbirn, near Bödele: mixed forest (490–960 m); near Dornbirn, beside motorway exit 14: hay meadow (410 m); Schuttannen above Hohenems: spruce forest (1200 m); between Hohenems and Lustenau: wet meadow, reed (410 m); east of Koblach, foot of Kummenberg: wet meadow, reed (420 m); Götzis, above Meschach: pasture (1150 m); Röthis, above Viktorsberg: mixed forest (920 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest (650 m); Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Falz: mixed forest (995 m); ibid., steep slope above Doren: mixed forest (530 m); Egg, south of junction Bezau—Lingenau: slope with alder (600 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m); between Ittensberg and Großdorf: meadow (810 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist and wet moss; wet Molinetum; fen and raised bogs (1145–1150 m) [7]; Ebniter Tal, near Emser Hütte: pasture (1260 m); ibid., below Hohe Kugel: subalpine grassland, Nardetum (1635 m); ibid., above Hackwald: mixed forest (920 m); ibid., near Vorderschauern: spruce forest (970 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Vordere Niedere near Bezau: near cableway station: wet meadow (770 m); ibid., Sonderdach: wet pasture (1250 m); Bizauer Tal, near river: mixed forest (1000 m); ibid., south of Bizau: hay meadow (680 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); Mellau, Roßstellealpe: mixed forest (1050 m); ibid., Bleichenalm: pasture (1230 m); above Mellau: mixed forest (960 m); between Bad Hopfreben and Schoppernau: pasture (920 m); above Bad Hopfreben: spruce forest (1035 m); Kanisfluh: mixed forest (1750 m); Kanisfluh, below Öberle Alm: pasture (1470 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); ibid., Krumbach: spruce forest (1450 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m); Subersachtal north of Schoppernau, steep slope: krummholz, woody litter (1600 m) [unpubl.]; Ifenstock area: spring below Schneckenloch cave (1240 m) [3, 5]. **Kleinwalsertal**—Walmendinger Horn: dwarf shrubs (1860 m); Hirschgägg, Schwarzwässertal: spruce forest (1340 m). **Hochtannberg**—Warth, near Tyrolean border: spruce forest (1480 m); Kalbelesee: wet meadow (1655 m); southwest of Kalbelesee: Rhododendretum (1730 m). **Laternaltal**—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]; near Göfis: raised bog, moist moss (555 m); Bazulwald west of Nenzing: mixed forest (670 m); Saminatal: mixed forest (740 m); Gamperdonatal: mixed forests (930–1280 m); ibid., pastures (930–1320 m). **Großes Walsertal**—south of Faschinajoch, above road: spruce forest (1220 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal, above Alpe Laguz: swampy meadow (1585 m); ibid., *Pinus sylvestris* forest (1385 m). **Klostertal**—west of Langen near Alfenz river: riverine forest (1050 m). **Arlberg area**—beside road to Stuben: wet moss below *Alnus viridis* (1705 m); Flexenpass: subalpine pasture (1755 m); Oberlech: subalpine pasture (1645 m); east of Zug: spruce forest (1475 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); west of Zug: subalpine pasture (1540 m); Spullerbachtal: raised bog at Spullerbach, moist moss below *Alnus viridis* (1680 m); Formarintal, near Formarinsee: subalpine pasture (1870 m). **Montafon**—Silbertal, above road: mixed forest (950 m); ibid., near Fellimännle: pasture (1100 m); Gargellenatal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Gargellenatal, north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); Untervernunt, near road: slope with *Alnus viridis* (1680 m); Kleinvernunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Ochsental, Vermunt Alpe, below “Hohes Rad” mountain: alpine grassland, moss, *Saxifraga* (2300 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, meadows, pastures and frequently in wetlands, subalpine dwarf shrubs and pastures, alpine grassland and pastures; rather moist to wet (altitude 396–2300 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG BE BL GR JU NE TI VD ZH), Southern Germany (BW BY), Italian Alps (BG BL BS BZ PN SO TN); semicosmopolitan.

*Platynothrus thori* (Berlese, 1904)

**Vorarlberg: Bregenzerwald**—Fohramoos: raised bog (1150 m) [7]; Ifenstock area, west of Schönenbach Alm: raised bog (1020 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Gargellenatal, north of Gargellen: spruce forest (1390 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane and montane forests, low montane wetlands (altitude 780–1390 m).

**General distribution:** Austria (B K N S St nT oT V), Switzerland (GR), Southern Germany (BY), Italian Alps (BZ TN); Holarctic, Oriental.

## Fam. Hermanniidae Sellnick, 1928

*Hermannia convexa* (C. L. Koch, 1839)

**Vorarlberg:** **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moist and wet moss; raised bog (1145–1150 m) [7]; Mellau, Roßstellealpe: mixed forest; wet moss (1050 m) [unpubl.]; Ifenstock area: spring below Schneckenloch cave (1240 m) [3, 5].

**Vorarlberg habitats:** single records in low montane wetlands (altitude 860–1240 m).

**General distribution:** Austria (K N O St nT oT V), Switzerland (AI AR BL GR NE VD VS ZH), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental (Himalaya—Sikkim), Seychelles.

*Hermannia gibba* (C. L. Koch, 1839)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); west of Eichenberg, brookside: riparian vegetation (620 m). Bregenz—Pfänder: mixed forest (840 m); ibid., spruce forest (1030 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Falz: mixed forest (995 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Balder-schwangertal, near Gerisgschwend: spruce forest (1010 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet moss (1145–1150 m) [7, unpubl.]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m); Vordere Niedere near Bezau: spruce forest (1420 m); ibid., near cableway station: deciduous forest (770 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); above Mellau: mixed forest (960 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls, near timberline: spruce forest (1755 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf, west of Halden Alpe: dwarf shrub (1720 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1860 m); Hirschgägg, Schwarzwässertal: spruce forest (1340 m); Hörnlepass: raised bog, wet moss (1160 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m). Laternsertal—west of Furkajoch: spruce forests (1185–1370 m) [unpubl.]. **Walgau**—Jagdberg: fen; colline mixed forests; montane spruce forest, moss and needle litter; Hochgerach summit: alpine grassland (565–1980 m) [6, unpubl.]; Amerlügen near Frastanz: pasture (865 m). **Großes Walserthal**—Meiern near Thüringerberg: mixed forest (765 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385–1590 m). **Arlberg area**—Oberlech: spruce forest (1670 m); east of Zug: spruce forest (1475 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m). **Montafon**—Silbertal, Silberberg near Schruns: mixed forest (900 m); ibid., near Fellimännle: pasture (1100 m); Gargellenalp, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m). **Brandnertal**—Lünernersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland; rather moist to wet (altitude 440–2080 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BE GR JU NE VD), Southern Germany (BW BY), Italian Alps (BG BL BZ SO TN); Holarctic, western Oriental (Pakistan).

## Fam. Malaconothridae Berlese, 1916

*Malaconothrus monodactylus* (Michael, 1888)

**Vorarlberg:** **Rheintal**—between Hohemems and Lustenau: wet meadow, reed (410 m); Götzis, above Meschach: fir forest (1140 m). **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m). **Bregenzerwald**—Schetteregg, Amagmach: raised bog, wet moss in water (1020 m); ibid., mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet moss (1145–1150 m) [7, unpubl.]; Ebniter Tal, near Emser Hütte: pasture (1260 m); ibid., below Hohe Kugel: subalpine grassland, Nardetum (1635 m); Vordere Niedere near Bezau, Sonderdach: mixed forest, dry moss on rock (980 m); ibid., near cableway station: wet meadow (770 m); between Bad Hopfreben and Schoppernau: pasture (920 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); Diedamskopf, summit: alpine grassland (2090 m); ibid., west of Halden Alpe: wet pasture (1750 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m). Kleinwalsertal—Hörnlepass: raised bog, wet moss (1160 m). Hochtannenberg—Kalbelesee: wet meadow (1655 m). Laternsertal—below Furkajoch: pasture (1550 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; subalpine pastures (565–1555 m) [6, unpubl.]; near Göfis: raised bog, moist grass litter and moss (555 m). **Arlberg area**—Lech, above Schlegelkopf: subalpine pasture, Curvuletum (1850 m); Formarintal, near Formarinsee: subalpine pasture (1850 m). **Montafon**—Silbertal: pastures (1100–1150 m); Kleinvermunt, Bielerhöhe: dwarf shrubs (2025 m) [unpubl.].

**Vorarlberg habitats:** colline to subalpine meadows, pastures and wetlands, low montane and montane forests, subalpine dwarf shrubs, alpine dwarf shrubs and grassland; rather moist to wet; frequently in wet meadows and moorland (altitude 410–2090 m).

**General distribution:** Austria (B K N S St nT V), Switzerland (BE BL GR JU NE VD), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, western Oriental (Pakistan), Neotropical (Chile).

*Tyrphonothrus foveolatus* (Willmann, 1931)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: moorland forest, moist and wet moss; fen and raised bogs (1145–1150 m) [7].

**Vorarlberg habitats:** reported only from Fohramoos near Bödele; low montane forests and moorland; moist to wet (altitude 1145–1150 m).

**General distribution:** Austria (N S St nT V), Switzerland (BE NE VS), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental.

*Tyrphonothrus maior* (Berlese, 1910)

**Vorarlberg:** **Bregenzerwald**—Schetteregg, Amagmach: raised bog, wet moss in water (1020 m) [unpubl.]; Fohramoos: moorland forest, dry litter and wet moss; raised bog, wet grass (1145–1150 m) [7]. Hochtannenberg—Kalbelesee: wet meadow (1655 m). **Montafon**—Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, wet moss (1825 m) [unpubl.].

**Vorarlberg habitats:** low montane moorland forests and wetlands, subalpine wetlands; dripping wet moss (altitude 1020–1825 m).

**General distribution:** Austria (K N oT V), Switzerland (BE BL JU NE TI VD), Southern Germany (BW BY), Italian Alps (BZ); cosmopolitan.

## Fam. Nanhermanniidae Sellnick, 1928

*Nanhermannia comitalis* Berlese, 1916

**Vorarlberg:** **Bregenzerwald**—between Ittensberg and Großdorf: wet meadow (810 m) [unpubl.]; Fohramoos: moorland forest, moist moss; wet Molinietum; raised bog (1145–1150 m) [7]. **Walgau**—Jagdberg: fen (565–640 m) [6].

**Vorarlberg habitats:** single records in colline and low montane wetlands, low montane forests and meadows; moist to dripping wet (altitude 565–1150 m).

**General distribution:** Austria (B K N S St nT V), Southern Germany (BW), Italian Alps (BZ); Holarctic.

*Nanhermannia elegantula* Berlese, 1913

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Subersachtal: spruce forest, rotten wood from tree stump (1290 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane forest (altitude 1290 m).

**General distribution:** Austria (B K N O S St nT), Switzerland (BL GR), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Nanhermannia nana* (Nicolet, 1855)

**Vorarlberg:** **Bodensee**—mouth of Rhine-Rohrspitz: below *Salix* (396 m). **Rheintal**—south of Lauterach: wet meadow (410 m); above Dornbirn, road to Bödele: hay meadow (895 m); Röthis, above Viktorsberg: mixed forest (920 m); Feldkirch, Unterries near Bangs: moist meadow (435 m). **Bregenzerwald**—Vordere Niedere near Bezau, near cableway station: pasture (770 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m). Kleinwalsertal—Rietzlern, beside mill: pasture (1070 m) [unpubl.]. **Walgaу**—Jagdberg: hay and xeric meadows; subalpine pastures (590–1560 m) [6]; Gamperdonatal, south of Vasalpe: pasture (1180 m). **Großes Walsertal**—Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, meadows and pastures, subalpine pastures; xeric to moist (altitude 396–1180 m, 1590 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AI BL JU NE VD), Southern Germany (BW BY), Italian Alps (BG BL BZ TN); semicosmopolitan.

*Nanhermannia sellnicki* Forsslund, 1958

**Vorarlberg:** **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m). Bregenz—Pfänder: spruce forest (1030 m). **Bregenzerwald**—Sulzberg, around Gullenbach: mixed forest (655 m); ibid., near Gschwendele: mixed forest (790 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry to wet litter and moss litter; wet Molinietum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7]; ibid., spruce forest, raised bogs (1150 m) [unpubl.]; Ebniter Tal, near Emser Hütte: pasture (1260 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Damüls, Krumbach: spruce forest (1450 m); Subersachtal: spruce forest (1200 m); Ifenstock area, west of Schönenbach Alm: raised bog (1020 m). Kleinwalsertal—Hörnlepass: raised bog, moist moss (1160 m) [unpubl.]. **Walgaу**—Jagdberg, hay and xeric meadows; fen (590–640 m) [6]; near Göfis: raised bog, moist moss (555 m). **Arlberg area**—Spullerbachtal: raised bog at Spullerbach, wet moss (1680 m). **Montafon**—Silbertal, near Fellimännle: pasture (1100 m); Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); ibid., north of Gargellen: spruce forest (1390 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, meadows, pastures and wetlands, subalpine dwarf shrubs and raised bogs; xeric to wet (altitude 555–1835 m).

**General distribution:** Austria (V), Switzerland (VD), Italian Alps (BZ); Palaearctic.

## Fam. Nothridae Berlese, 1896

*Nothrus anauniensis* Canestrini & Fanzago, 1876

**Vorarlberg:** **Rheintal**—Feldkirch, St. Corneli in Tosters: mixed forest (540 m) [unpubl.]. **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss (1150 m) [7]; Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Ifenstock area, west of Schönenbach Alm: raised bog (1020 m) [unpubl.]. **Walgaу**—Jagdberg: hay and xeric meadows (590–825 m) [6]; Amerlügen near Frastanz: pasture (865 m); Saminatal: spruce forest (530 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests and wetlands; xeric to wet (altitude 490–1150 m).

**General distribution:** Austria (B K N O St nT oT V W), Switzerland (JU NE VD), Southern Germany (BW BY), Italian Alps (BZ); semicosmopolitan.

*Nothrus borussicus* Sellnick, 1928

**Vorarlberg:** **Walgau**—Jagdberg: hay and xeric meadows, colline mixed forest (490–590 m) [6 part. sub *N. silvestris*].

**Vorarlberg habitats:** single records in colline xeric meadows and forest (altitude 490–590 m).

**General distribution:** Austria (K O N S St nT oT V), Switzerland (GR), Southern Germany (BY), Italian Alps (BZ TN); Holarctic, Neotropical.

*Nothrus palustris* C. L. Koch, 1839

**Vorarlberg:** **Rheintal**—Reute above Hohenems: mixed forest (885 m); Hohenems, „Old Rhine“: riverine forest (405 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m). Bregenz—Pfänder: mixed forest (750–840 m). **Bregenzerwald**—Sulzberg, near Doren: hay meadow (490 m) [unpubl.]; Fohramoos: fen, wet moss (1150 m) [7]; Hirschau: deciduous forest (730 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest; subalpine pasture; Hochgerach summit: alpine grassland (705–1980 m) [6, unpubl.]; Amerlügen near Frastanz: pasture (865 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests and meadows, low montane wetlands, subalpine pasture, alpine grassland; rather moist (altitude 405–1980 m).

**General distribution:** Austria (B K N O S St nT V), Switzerland (AG BL NE VD), Southern Germany (BW BY), Italian Alps (BL BZ TN); Holarctic, western Oriental (Pakistan, Nepal), Ethiopian.

*Nothrus pratensis* Sellnick, 1928

**Vorarlberg:** **Bregenzerwald**—Fohramoos: moorland forest, dry to moist litter and moss; wet Molinietum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7, unpubl.]. Kleinwalsertal—Hörnlepass: raised bog, moist moss (1160 m) [unpubl.]. **Walgau**—Jagdberg: fen (640 m) [6]; near Göfis: raised bog (555 m). **Montafon**—Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** low montane forests, colline to subalpine wetlands; moist to wet (altitude 555–1835 m).

**General distribution:** Austria (K N S St nT V), Switzerland (BE GR JU NE VD), Southern Germany (BW BY), Italian Alps (BZ); Holarctic.

*Nothrus silvestris* Nicolet, 1855

**Vorarlberg:** **Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Götzis, above Melschach: fir forest (1140 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m). Bregenz—Pfänder, Fluh: mixed forest (750 m). **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Hittisau, Häusern: beech forest (770 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, wet moss; wet Molinietum; fen, wet moss; raised bog, wet grass and *Sphagnum* (1145–1150 m) [7]; above Mellau: mixed forest (960 m); Sibratsgfäll, Völken: spruce forest (1050 m). Hochtannberg—Kalbelesee: wet meadow (1655 m). **Walgau**—Gamperdonatal, south of Vasalpe: pasture (1180 m). **Brandnertal**—Lünersee, near Totalphütte: subnival region, dry grass cushion (2390 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane and subalpine wetlands, montane pastures, subnival grass cushion; rather xeric to moist (altitude 570–2390 m).

**General distribution:** Austria (B K N O S St nT V W), Switzerland (AG BL NE), Southern Germany (BW), Italian Alps (BL BZ SO TN); Holarctic, Oriental (Himalaya—Nepal), Mexico, New Zealand.

## Fam. Trhypochthoniidae Willmann, 1931

*Mainothrus badius* (Berlese, 1905)

**Vorarlberg:** New record for Vorarlberg. **Walgau**—near Göfis: raised bog, moist moss (555 m) [unpubl.].

**Vorarlberg habitats:** single record in colline raised bog (altitude 555 m).

**General distribution:** Austria (S St nT oT), Switzerland (GR VD), Italian Alps (BZ); Holarctic, western Oriental (Pakistan).

*Mucronothrus nasalis* (Willmann, 1929)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Hochtannberg, Kalbelesee: wet meadow, dripping wet moss (1655 m) [unpubl.].

**Vorarlberg habitats:** single record in subalpine wet meadow (altitude 1655 m).

**General distribution:** Austria (S nT), Switzerland (GR VD), Southern Germany (BY), Italian Alps (BZ TN VR); semicosmopolitan; frequently in springs.

*Trhypochthoniellus longisetus* (Berlese, 1904) forma *longiseta*

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Fohramoos: raised bog (1150 m). **Walgau**—near Göfis: raised bog (555 m) [unpubl.].

**Vorarlberg habitats:** single records in colline and low montane raised bogs; large individual numbers in dripping wet moss (altitude 555–1150 m).

**General distribution:** Austria (K N S St nT), Switzerland (BL), Southern Germany (BW BY), Italian Alps (BZ); semicosmopolitan; preferably in bogs.

*Trhypochthoniellus longisetus* (Berlese, 1904) forma *setosa* Willmann, 1928

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Schetteregg, Amagmach: raised bog, wet moss in water (1020 m). Kleinwalsertal—Hörnlepass: raised bog (1160 m). **Walgau**—near Göfis: raised bog, wet grass litter and moss (555 m) [unpubl.].

**Vorarlberg habitats:** single records in colline and low montane raised bogs; dripping wet moss (altitude 555–1160 m).

**General distribution:** Austria (N nT), Switzerland (NE), Southern Germany (BW BY); Holarctic; preferably in bogs, „boreo-alpine“.

**Remark:** According to Weigmann (1997) *T. longisetus* and *T. setosa* are highly variable and may occur sympatric, therefore he proposed the rank „formae“ for these taxa. In Vorarlberg both taxa occur together in some of the investigated bogs, partially in high abundances.

*Trhypochthonius nigricans* Willmann, 1928

**Vorarlberg:** **Walgau**—Jagdberg: fen (640 m) [6].

**Vorarlberg habitats:** single record in colline moorland; wet moss (altitude 640 m).

**General distribution:** Austria (V), Italian Alps (BZ); Holarctic.

*Trhypochthonius tectorum* (Berlese, 1896)

**Vorarlberg:** New record for Vorarlberg. **Montafon**—Ochsental, at Vermunt glacier: subnival region, *Silene* cushion (2620 m) [unpubl.].

**Vorarlberg habitats:** single record in subnival dry cushion plants; large individual numbers (altitude 2620 m).

**General distribution:** Austria (B K N O S St nT oT), Switzerland (GR ZH), Southern Germany (BW), Italian Alps (BS BZ TN); semicosmopolitan.

## Fam. Hermanniellidae Grandjean, 1934

*Hermannella septentrionalis* Berlese, 1910

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (405 m); above Dornbirn, near Bödele: mixed forest (490 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Hohenems, „Old Rhine“: riverine forest (405 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Cornelius in Tosters: mixed forest (510–540 m); ibid., Gisingen: riverine forest (435 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (750–840 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest 650 m); Hittisau, Häusern: beech forest (770 m); Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal, at tollbooth: mixed forest (730 m); between Hirschau and Schnepfau: deciduous forest (730 m); Au, Argenzipfel, Leuebach: mixed forest (995 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric

meadows; colline mixed forest, moss (490–685 m) [6 part. sub *H. punctulata*, see remarks]; above Thüringen, near Quadern: mixed forest (615 m); Bazulwald west of Nenzing: mixed forest (670 m); Gamperdonatal, south of Vasalpe: pasture (1180 m); west of Nüziders: beech forest (545 m); west of Dalaas: mixed forest (775–915 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m); Laguztal, above “Fuchswald”: mixed forest (1280 m). **Montafon**—north of Lorüns: mixed forest (585 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline to montane deciduous and mixed forests, colline meadows and wetlands, montane pasture; xeric to wet (altitude 405–1280 m).

**General distribution:** Austria (K N nT oT V), Italian Alps (BL BZ TN); southern Palaearctic, Holarctic.

**Remark:** *Hermannella septentrionalis* was described by Berlese (1910) as var. of *H. punctulata* Berlese, 1908 and elevated to species rank by several authors (e.g. Sitnikova in Ghilyarov & Krivolutsky 1975, Mahunka & Mahunka-Papp 2004, Subías 2004, and others). *Hermannella punctulata* is considered as synonym of *H. picea* (C. L. Koch, 1839) in Subías (2004, electronic update 2020), but according to Hammen (1952) and Weigmann (2006) the identity of *H. picea* is not clear. Morphological differences between *H. punctulata* and *H. septentrionalis* are mainly the shape of the small pits on the center of the notogaster which are larger and without connecting lines in *H. punctulata* vs. much smaller and with thin connecting lines in *H. septentrionalis* (Grandjean 1931, Weigmann 2006). In some *Hermannella* specimens from Vorarlberg the connecting lines are very indistinct and hardly visible. Due to the small size of the pits all specimens are considered as *H. septentrionalis*.

## Fam. Neolioididae Sellnick, 1928

*Platyliodes scalaris* (C. L. Koch, 1839)

**Vorarlberg:** **Walgau**—Jagdberg: subalpine pasture; Hochgerach summit: alpine grassland (1560–1980 m) [6].

**Vorarlberg habitats:** single records in subalpine pasture and alpine grassland (altitude 1560–1980 m).

**General distribution:** Austria (B K N O St nT oT V), Switzerland (BL), Southern Germany (BW BY), Italian Alps (BZ TN); southern Palaearctic, Holarctic.

*Porolioides farinosus* (C. L. Koch, 1840)

**Vorarlberg:** **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forests (565–685 m) [6].

**Vorarlberg habitats:** single records in colline mixed forests (altitude 470–685 m).

**General distribution:** Austria (B K N O St nT oT V), Switzerland (BL), Southern Germany (BW BY), Italian Alps (BZ); southern Palaearctic, Oriental (Himalaya—Nepal).

## Fam. Gymnodamaeidae Grandjean, 1954

*Arthrodamaeus reticulatus* (Berlese, 1910)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: moorland forest, moist moss (1145 m) [7]. **Walgau**—Jagdberg: subalpine pastures with rocks; dwarf shrubs with grass; Hochgerach summit: alpine grassland (1700–1980 m) [6].

**Vorarlberg habitats:** single records in low montane moorland forest, subalpine dwarf shrubs, alpine grassland (altitude 1145–1980 m).

**General distribution:** Austria (K N St nT oT V), Switzerland (GR), Italian Alps (BL BZ TN); southern Palaearctic, western Oriental (Pakistan).

*Gymnodamaeus bicostatus* (C. L. Koch, 1835)

**Vorarlberg:** **Rheintal**—Reute above Hohenems: mixed forest (885 m) [unpubl.]. **Walgau**—Jagdberg: subalpine pasture, lichens on rock (1790 m) [6].

**Vorarlberg habitats:** single records in low montane mixed forest, subalpine pasture; in dry moss and lichens (altitude 885–1790 m).

**General distribution:** Austria (B K N O St nT oT V W), Southern Germany (BW BY), Italian Alps (BZ); southern Palaearctic, Holarctic, Ethiopian.

## Fam. Damaeidae Berlese, 1896

*Belba aegrota* (Kulczynski, 1902)

**Vorarlberg:** New record for Vorarlberg. **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks; wet leaf litter (470 m) [unpubl.].

**Vorarlberg habitats:** single record in colline mixed forest (altitude 470 m).

**General distribution:** Austria (St), Southern Germany (BW); Central, East Europe; rare.

*Belba bartosi* Winkler, 1955

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rheinspitz: riverine forest (398 m). **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m). **Leiblachtal**—near Hohenweiler: mixed forest (570–695 m). **Bregenzerwald**—Sulzberg: mixed forest (790–995 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: moorland forest, moist to wet moss; fen and raised bogs, wet grass and moss (1145–1150 m) [7, unpubl.]; above Schnepfegg: mixed forest (880 m). **Walgau**—Jagdberg: colline mixed forest; montane spruce forest; subalpine pasture with rocks (705–1725 m) [6 sub *Belba corynopus*, unpubl.]. **Montafon**—west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetland, subalpine pasture and dwarf shrubs; xeric to moist (altitude 398–1860 m).

**General distribution:** Austria (K V), Southern Germany (BW BY), Italian Alps (BZ TN); southwestern Palaearctic.

**Remark:** Considered as synonym of *B. patelloides* (Michael, 1890) according to Subías (2004, electronic update 2020).

*Damaeobelba minutissima* (Sellnick, 1920)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Götzis, above Meschach: fir forest (1140 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: moorland forest, moss; raised bog (1145–1150 m) [7, unpubl.]; Subersachtal: spruce forest (1200 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, low montane wetlands; rather moist (altitude 655–1200 m).

**General distribution:** Austria (B N O St nT V), Switzerland (NE VD), Southern Germany (BW BY); Palaearctic.

*Damaeus clavipes* (Hermann, 1804) (*Paradamaeus*)

**Vorarlberg:** **Rheintal**—between Hohemems and Lustenau: wet meadow, reed (410 m); Feldkirch, St. Cornelius in Tosters: mixed forest (540 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m); Eichenberg near Schüssellehen: spruce forest (850 m). Pfänder: mixed forest (840 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moist to wet moss; fen and raised bogs (1145–1150 m) [7]; Kanisfluh: mixed forest (1750 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m) [unpubl.]. Ifenstock area: Schneckenloch cave, entrance region (1270 m) [3, 5]. Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1860 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1730 m). Laternsertal—Furkajoch: dwarf shrubs (1640–1770 m) [unpubl.]. **Walgau**—Jagdberg: fen; colline mixed forest; montane spruce forest; subalpine pastures; dwarf shrubs, *Alnus viridis* slope (640–1725 m) [6]; near Göfis: raised bog, wet grass litter and moss (555 m); Bazulwald west of Nenzing: mixed forest (670 m), Amerlügen near Frastanz: pasture (865 m). **Montafon**—Gargellenthal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, low montane pasture, subalpine dwarf shrubs and pastures; xeric to moist (altitude 410–1860 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AI AR BE BL GR VD ZH), Southern Germany (BW BY), Italian Alps (BL BZ TN); Palaearctic.

*Damaeus crispatus* (Kulczynski, 1902)

**Vorarlberg: Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m) [unpubl.]. **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss (1150 m) [7]; Vordere Niedere near Bezau: spruce forest (1420 m); Sibratsgfäll, Völken: spruce forest (1050 m) [unpubl.]. **Walgau**—Jagdberg: subalpine pasture with rocks (1610–1725 m) [6].

**Vorarlberg habitats:** low montane and montane forests, low montane wetlands, subalpine dwarf shrubs and pastures; xeric to moist; rare (altitude 1050–1725 m).

**General distribution:** Austria (V), Southern Germany (BW BY); western Palaearctic, western Oriental (Pakistan); rare.

*Damaeus gracilipes* (Kulczynski, 1902)

**Vorarlberg: Leiblachtal**—Eichenberg near Schüssellehen: spruce forest (850 m). Bregenz—Pfänder: mixed forest (750–840 m) [unpubl.]. **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss; raised bog (1150 m) [7]. **Walgau**—Jagdberg: colline mixed forests (565–685 m) [6].

**Vorarlberg habitats:** colline and low montane forests, low montane wetlands; moist; rare (altitude 565–1150 m).

**General distribution:** Austria (K N O nT V), Switzerland (BL GR), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic, western Oriental (Pakistan).

*Damaeus onustus* (C. L. Koch, 1844) (*Adamaeus*)

**Vorarlberg: Rheintal**—Dornbirn, railway station Haselstauden: small forest strip (420 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder, Fluh: mixed forest (750 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moss (1145 m) [7].

**Vorarlberg habitats:** single records in colline and low montane forests (altitude 422–1145 m).

**General distribution:** Austria (B K N O St oT V), Switzerland (AI BL GR VD ZH), Southern Germany (BW BY), Italian Alps (BL BZ TN); Palaearctic, Ethiopian.

*Damaeus riparius* Nicolet, 1855

**Vorarlberg: Rheintal**—above Dornbirn, near Bödele: mixed forest (490 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m); Feldkirch, Gisingen: riverine forest (435 m); ibid., Ardetzenberg: mixed forest (595 m). **Bregenz**—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, riverbank near Doren: grass litter (450 m); Hittisau, Häusern: beech forest (770 m); between Hirschau and Schnepfau: deciduous forest (730 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest; subalpine pastures with rocks, slope with *Alnus viridis* (685–1725 m) [6]; Saminatal: mixed forest (530–740 m); west of Nüziders: beech forest (545 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, colline meadows, subalpine dwarf shrubs and pastures (altitude 435–840 m, 1725 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (GR), Southern Germany (BW), Italian Alps (BZ TN); Palaearctic, western Oriental (Pakistan).

*Epidameus bituberculatus* (Kulczynski, 1902)

**Vorarlberg: Bregenzerwald**—Fohramoos: raised bog, *Sphagnum* (1150 m) [7].

**Vorarlberg habitats:** reported only from Fohramoos near Bödele; low montane raised bog (altitude 1150 m).

**General distribution:** Austria (K N St nT oT V), Southern Germany (BW), Italian Alps (BZ); Palaearctic. Prefers wetlands habitats (Weigmann *et al.* 2015).

*Epidameus tetricus* (Kulczynski, 1902)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Fohramoos: near rivulet in moorland forest, moss (1150 m) [7]. **Montafon**—Unterwermunt, near road: slope with *Alnus viridis* (1680 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane moorland forest and subalpine dwarf shrubs; moist to wet (altitude 1150–1680 m).

**General distribution:** Austria (B K N O S St nT), Switzerland (GR), Southern Germany (BY), Italian Alps (BZ); Holarctic, western Oriental (Pakistan); rare, mainly in montane to alpine habitats.

*Kunstidamaeus diversipilis* (Willmann, 1951)

**Vorarlberg:** New record for Vorarlberg. **Montafon**—Ochsental, southern end of Silvretta Reservoir: Rhododendrum (2080 m); ibid., at Vermunt glacier: subnival region, moss, herbs and *Silene* cushions (2620–2630 m).

**Brandnertal**—Lünersee, near Totalphütte: subnival region, dry grass cushion (2390 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** single records in alpine dwarf shrubs and subnival cushion plants; xeric (altitude 2080–2630 m).

**General distribution:** Austria (K O S St nT oT), Switzerland (GR), Southern Germany (BW), Italian Alps (BZ TN); Alps and Southern Schwarzwald (Black forest); mainly in montane to alpine habitats.

*Kunstidamaeus granulatus* (Willmann, 1951)

**Vorarlberg: Bregenzerwald**—Ifenstock area: Schneckenloch cave, entrance region (1270 m) [2 sub *Belba granulata*, 5 sub *Damaeus granulata*].

**Vorarlberg habitats:** single record in montane forest (altitude 1270 m).

**General distribution:** Austria (K nT V), Switzerland (GR?), Italian Alps (BZ); Alps (endemic); in montane to alpine habitats.

*Kunstidamaeus nidicola* (Willmann, 1936)

**Vorarlberg:** New record for Vorarlberg. **Arlberg area**—Oberlech: spruce forest (1670 m) [unpubl.].

**Vorarlberg habitats:** single record in montane forest (altitude 1670 m).

**General distribution:** Austria (K N nT oT), Italian Alps (TN); Central, North Europe; „boreo-alpine“.

*Kunstidamaeus tecticola* (Michael, 1888)

**Vorarlberg: Walgau**—Jagdberg: colline mixed forests (565–685 m) [6].

**Vorarlberg habitats:** single records in colline forests (altitude 565–685 m).

**General distribution:** Austria (B K N S nT V), Switzerland (GR), Italian Alps (BZ TN); Europe; rare.

*Metabelba papillipes* (Nicolet, 1855)

**Vorarlberg: Walgau**—Jagdberg: subalpine pasture with rocks; Hochgerach summit: alpine grassland (1700–1980 m) [6 part. sub *M. sphagni*].

**Vorarlberg habitats:** single records in subalpine dwarf shrubs and alpine grassland (altitude 1700–1980 m).

**General distribution:** Austria (N nT V), Southern Germany (BY), Italian Alps (BS BZ TN); Holarctic, New Zealand.

*Metabelba parapulverosa* Moritz, 1966

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Sulzberg, near Falz: mixed forest (995 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane mixed forests (altitude 765–995 m).

**General distribution:** Austria (O nT), Southern Germany (BW BY), Italian Alps (BZ); Central, South, Southeast Europe.

*Metabelba propexa* (Kulczynski, 1902)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Götzis, Örfla gorge above Meschach: mixed forest (670 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m). **Bregenzerwald**—Schetteregg, Amagmach: mixed forest beside raised bog (1020 m). **Montafon**—Untervermunt, near road: slope with *Alnus viridis* (1680 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, subalpine dwarf shrubs; moist to wet; rare (altitude 540–1680 m).

**General distribution:** Austria (nT), Italian Alps (BZ); Central and Southeast Europe, Georgia (Murvanidze & Mumladze 2016); rare.

*Metabelba pulverosa* Strenzke, 1953

**Vorarlberg: Bregenzerwald**—Sulzberg, near Falz: hay meadow (980 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forests; subalpine pastures (565–1650 m) [6]; Bazulwald west of Nenzing: mixed forest (670 m) [unpubl.]. **Klostertal**—Innerbraz, east of Masonbach: hay meadow (695 m) [unpubl.].

**Vorarlberg habitats:** colline forests and meadows, subalpine pastures; rather xeric; rare (altitude 565–1650 m).

**General distribution:** Austria (B K N O St nT oT V W), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Porobelba spinosa* (Sellnick, 1920)

**Vorarlberg: Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: moorland forest, moss (1145 m) [7]; Ebniter Tal, near Emser Hütte: pasture (1260 m); Sibratsgfäll, Völken: spruce forest (1050 m) [unpubl.]. Laternsertal—Furkajoch: dwarf shrubs (1770 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; montane spruce forest; subalpine pastures (590–1700 m) [6 part. sub *Metabelba sphagni*]. **Montafon**—west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests and meadows, subalpine dwarf shrubs and pastures; rather xeric (altitude 590–1860 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

*Spatiodamaeus verticillipes* (Nicolet, 1855)

**Vorarlberg:** New record for Vorarlberg. **Bregenz**—Pfänder: mixed forest (840 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane mixed forest (altitude 840 m).

**General distribution:** Austria (B K N O S St nT oT), Switzerland (AR BL GR VD VS), Southern Germany (BY), Italian Alps (BZ); Holarctic (western Palaearctic, eastern USA).

*Tokukobelba compta* (Kulczynski, 1902)

**Vorarlberg: Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Götzis, above Meschach: fir forest (1140 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m) [unpubl.]. **Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, dry to wet litter and moss; fen and raised bogs, wet grass and moss (1145–1150 m) [7]; above Mellau (960–1050 m); Kanisfluh: mixed forest (1750 m) [unpubl.]. **Walgau**—Jagdberg: subalpine pasture with *Alnus viridis* and rocks; Hochgerach summit: alpine grassland (1725–1980 m) [6]. **Montafon**—Silbertal, above road: mixed forest (950 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland (altitude 570–2030 m).

**General distribution:** Austria (B K N O S St nT V), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic, western Oriental (Pakistan).

**Remark:** Generic assignment according to Lamos (2016).

## Fam. Cepheusidae Berlese, 1896<sup>1</sup>

*Cepheus cepheiiformis* (Nicolet, 1855)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (405 m). **Leiblachtal**—between Weiernried and Möggen: wet meadow (860 m). Bregenz—Pfänder, Fluh: mixed forest (750 m) [unpubl.]. **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss; moorland forest, moss; transition bog, fen and raised bogs; wet moss (1145–1150 m) [7, unpubl.]. **Walgau**—Jagdberg: fen; montane spruce forest; subalpine pasture with *Alnus viridis* (565–1650 m) [6]; above Thüringen, near Quadern: mixed forest (615 m) [unpubl.].

<sup>1</sup> Cepheidae Berlese, 1896, the frequently used name for this oribatid mite family is a junior homonym of Cepheidae Agassiz, 1862 (Cnidaria). A proposal to establish a replacement name for Cepheidae Berlese to the International Commission on Zoological Nomenclature is submitted (Halliday & Norton 2019).

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine dwarf shrubs and pastures; moist to wet (altitude 405–1650 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AP BL GE GR JU NE TG UR VD VS ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental.

*Cepheus dentatus* (Michael, 1888)

**Vorarlberg:** **Rheintal**—east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m). **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: moorland forest, litter and moss; raised bog (1145 m) [7]; Oberdamüls, near timberline: spruce forest (1755 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m) [unpubl.]. **Walzau**—Jagdberg: fen; colline mixed forest; montane spruce forest (565–1610 m) [6]. **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Oberlech: spruce forest (1670 m). **Montafon**—Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine pasture; xeric to moist (altitude 440–1755 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AP GR SO TI ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic.

*Cepheus grandis* Sitnikova, 1975

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Oberdamüls, near timberline: spruce forest (1755 m) [unpubl.]. **Walzau**—Jagdberg: subalpine pasture with rocks (1725 m) [6].

**Vorarlberg habitats:** single records in montane forest and subalpine dwarf shrubs and pasture (altitude 1725–1755 m).

**General distribution:** Austria (N oT), Switzerland (VS), Southern Germany (BW), Italian Alps (BZ TN); Central, South, Southeast Europe; rare.

**Remark:** Possibly a variety of *Cepheus dentatus* (Michael, 1888) according to Weigmann (2006); considered as synonym of *C. dentatus* according to Subías (2004, electronic update 2020). The recorded specimens are distinguished from *C. dentatus* by the number of 10 pairs of genital setae.

*Cepheus latus* C. L. Koch, 1835

**Vorarlberg:** **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss; raised bog (1150 m) [7]. Kleinwalsertal—Hirschegg, Schwarzwassertal: spruce forest (1340 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane wetlands, montane forest (altitude 1150–1340 m).

**General distribution:** Austria (K N O S St nT oT V), Switzerland (BL GR NE TI UR VD VS ZH), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental.

*Conoppia palmicincta* (Michael, 1880)

**Vorarlberg:** **Leiblachtal**—west of Eichenberg, brookside: riparian vegetation (620 m) [unpubl.]. Bregenz—Pfänder area [1, 5 sub *C. microptera*, 4 sub *Phyllogeus palmicinctus*]. **Bregenzerwald**—Fohramoos: moorland forest, moss; raised bog (1145–1150 m) [7]; Ebner Tal, mouth of Ebner Ach: riverine forest (490 m); Hirschau: deciduous forest, moss on rock (730 m) [unpubl.]. **Walzau**—Jagdberg: hay and xeric meadows; montane spruce forest; subalpine pasture with *Juniperus communis*, moss (590–1610 m) [6]; Saminatal: mixed forest (690 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline meadows, low montane wetlands, subalpine pasture; xeric to wet (altitude 490–1610 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AP GR LU NE TI VD VS), Southern Germany (BW), Italian Alps (BL BZ TN); Holarctic, Oriental, South America (Bolivia).

**Remark:** Synonym: *Conoppia microptera* (Berlese, 1885) according to Grandjean (1936).

*Ommatocepheus ocellatus* (Michael, 1882)

**Vorarlberg:** New record for Vorarlberg and Austria. **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m). **Walzau**—Saminatal: spruce forest (530 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane forests (altitude 530–960 m).

**General distribution:** Switzerland (LU TI), Southern Germany (BW), Italian Alps (BZ TN); southwestern Palaearctic, Oriental (Himalaya—India); rare.

#### *Tritegeus bisulcatus* Grandjean, 1953

**Vorarlberg: Rheintal**—Dornbirn, railway station Hasselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest (1200 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moss; fen and raised bogs (1145–1150 m) [7]; Ebniter Tal, above Hackwald: mixed forest (920 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); ibid., Bleichenalm: pasture (1230 m); Au, Argenzipfel, Leuebach: mixed forest (995 m). Kleinwalsertal—Walmendinger Horn: dwarf shrubs (1860 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m) [unpubl.]. **Walzgau**—Jagdberg: river Ill, riverine forest; colline mixed forests; subalpine pastures; Hochgerach summit: alpine grassland (490–1980 m) [6]. **Arlberg area**—east of Zug: spruce forest (1475 m). **Montafon**—north of Lorüns: mixed forest (585 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, montane pastures, subalpine dwarf shrubs and pastures, alpine grassland, wetlands; xeric to wet (altitude 420–1980 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG AI AP BL GE GL GR JU NE SZ TI UR VD VS ZH), Southern Germany (BW BY), Italian Alps (BZ TN); western Palaearctic.

#### Fam. Microzetidae Grandjean, 1936

##### *Amiracarus* sp. cf. *senensis*

**Vorarlberg:** New record for Vorarlberg and Austria. **Bregenzerwald**—Schnepfau, near Bregenzer Ach: riverine forest with *Fagus silvatica*, moist moss and rotten litter (47°20'35"N, 9°57'32"E, 760 m, 15.iv.1981) [unpubl.].

**Vorarlberg habitats:** single record in colline riverine forest (altitude 760 m).

**Remark:** The two specimens from Vorarlberg are morphologically very similar to the description of *Amiracarus senensis* (Bernini, 1975), described from a cave in the environment of Siena, Italy, also found as probably Pliocene fossil in a cave in the South-West Carpathians (Romania) (Bernini 1975, Miko *et al.* 2013). However, the present specimens show morphological resemblances to other *Miracarus* and *Amiracarus* species. The morphological differences between the known taxa are relatively small and no details are known about variabilities of some characters (Miko *et al.* 2013). Therefore, I hesitate to state a definite species assignment. The geographically closest findings of the genus are *Amiracarus similis* (Subías & Iturronobeitia, 1978) in Valais, Switzerland (Mahunka & Mahunka-Papp 2009b) and *A. discrepans* (Mahunka, 1966) in Vicenza, Italy, Southern Alps (Mahunka 1966), but these species are morphologically slightly different from the specimens from Vorarlberg.

#### Fam. Caleremaeidae Grandjean, 1965

##### *Caleremaeus monilipes* (Michael, 1882)

**Vorarlberg: Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); west of Eichenberg, brookside: riparian vegetation (620 m). **Bregenzerwald**—Sulzberg, near Falz: mixed forest, rotten wood from tree stump (990 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [10]; Fohramoos: rivulet in moorland forest, wet moss; raised bog (1150 m) [7]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); ibid., above Hackwald: mixed forest (920 m); above Bad Hopfreben: spruce forest (1030 m); Oberdamüls, near timberline: spruce forest (1755 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest, rotten wood from tree stump (1290 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1650 m). Laternsertal—Furkajoch: spruce forest, moss on rock (1185 m); west of Innerlaterns: lumberyard, moss on bark (1000 m) [unpubl.]. **Walzgau**—Jagdberg: montane spruce forest, rotten bark and moss (1610 m) [6]; Gamperdonatal, tollbooth: spruce

forest, rotten wood in old tree stump (750 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m); Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m). **Montafon**—Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, subalpine and alpine dwarf shrubs; xeric to moist (altitude 440–2080 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BS GR), Southern Germany (BW BY), Italian Alps (BZ SO TN); western Palaearctic, Mexico?

### Fam. Ctenobelidae Grandjean, 1965

*Ctenobelba pectinigera* (Berlese, 1908)

**Vorarlberg:** **Rheintal**—Rankweil, Batschuns: pasture in orchard (590 m). Rheintal—Feldkirch, St. Corneli in Tosters: mixed forest (540 m). **Bregenzerwald**—Sulzberg, near Falz: hay meadow (980 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; Hochgerach summit: alpine grassland (490–1980 m) [6]; Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, south of Vasalpe: pasture (1180 m). **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m). **Arlberg area**—near Stuben: spruce forest (1705 m); Oberlech: dwarf shrubs (1650 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests and meadows, colline wetlands, subalpine dwarf shrubs, alpine dwarf shrubs and grassland; xeric to moist (altitude 490–2030 m).

**General distribution:** Austria (B K N S St nT V W), Switzerland (BL GR JU), Southern Germany (BW BY), Italian Alps (BG BS BZ TN); southwestern Palaearctic.

### Fam. Damaeolidae Grandjean, 1965

*Fosseremus laciniatus* (Berlese, 1905)

**Vorarlberg:** **Rheintal**—south of Lauterach: wet meadow (410 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); ibid., pasture in orchard (590 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); Feldkirch, Unterries near Bangs: moist meadow (435 m). **Bregenzerwald**—Sulzberg, near Falz: hay meadow (980 m) [unpubl.]; Fohramoos: raised bog, wet moss (1150 m) [7]; Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal, at tollbooth: mixed forest (730–960 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); Mellau: hay meadow (660 m); Hirschau: deciduous forest (730 m); between Hirschau and Schnepfau: deciduous forest (730 m). **Kleinwalsertal**—Rietzlern, beside mill: pasture (1070 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows (490–825 m) [6]; Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, south of Vasalpe: pasture (1180 m); west of Nüziders: beech forest (545 m). **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m). **Montafon**—Silbertal, west of Innerberg: mixed forest (1115 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, meadows and pastures, colline and montane wetlands; xeric to moist (altitude 410–1280 m).

**General distribution:** Austria (B K N O St nT oT V W), Switzerland (BL JU VD), Southern Germany (BW BY), Italian Alps (BG BZ TN); semicosmopolitan.

### Fam. Hungarobelidae Miko & Travé, 1996

*Hungarobelba visnyai* (Balogh, 1938)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—above Schnepfegg: mixed forest (880 m). **Walgau**—Gamperdonatal, at road bridge: mixed forest (930 m); ibid., south of Vasalpe: pasture (1180 m). **Großes Walser-tal**—west of Buchboden at bridge: mixed forest (900 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane mixed forests and pasture (altitude 880–1180 m).

**General distribution:** Austria (B), Southern Germany (BW), Italian Alps (BZ); southern Palaearctic.

## Fam. Eremaeidae Oudemans, 1900

*Eremaeus hepaticus* C. L. Koch, 1835

**Vorarlberg: Bregenzerwald**—Ebniter Tal, road junction to Kobelealpe: mixed forest (740 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest (685 m) [6]; Bazulwald west of Nenzing: mixed forest (670 m) [unpubl.].

**Vorarlberg habitats:** single records in colline and low montane mixed forests (altitude 670–740 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GR VD), Southern Germany (BW BY), Italian Alps (BG BL BS BZ TN); Holarctic, western Oriental (Pakistan).

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

**Vorarlberg: Bregenzerwald**—Oberdamüls, near timberline: spruce forest (1755 m) [unpubl.]; Ifenstock area: Schneckenloch cave, entrance region (1270 m); sinkhole in „Gottesackerplateau“ north of Ifenstock (1780 m) [3, 5 sub *Eremaeus oblongus*]. **Walgau**—Jagdberg: montane spruce forest, moss near a small pond; Hochgerach summit: alpine grassland (1610–1980 m) [6]; above Thüringen, near Quadern: mixed forest (615 m). **Arlberg area**—Oberlech: spruce forest (1670 m) [unpubl.].

**Vorarlberg habitats:** single record in colline forests, more frequent in montane forests, subalpine dwarf shrubs, alpine grassland; xeric to moist (altitude 615 m, 1270–1980 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL BS GR VD ZH), Southern Germany (BW BY), Italian Alps (BL BS BZ SO TN); Holarctic, Oriental.

**Remark:** A morphological differentiation of *E. oblongus* towards *E. valkanovi* (Kunst, 1957) is given by Weigmann (2006), but in the present material the different characters were not always clearly distinguishable. Some specimens show a high variability and a mosaic pattern of characters in-between species. The specimens mentioned above are considered as *E. oblongus*, but intermediate forms in some sites mentioned sub *E. valkanovi* could also belong to *E. oblongus*. A synonymy of *E. valkanovi* is supposed by Subías (2004, electronic update 2020). Further studies to clear this problem are in progress.

*Eueremaeus silvestris* (Forsslund, 1956)

**Vorarlberg:** New record for Vorarlberg. **Arlberg area**—Oberlech: spruce forest (1670 m) [unpubl.].

**Vorarlberg habitats:** single record in montane spruce forest (altitude 1670 m).

**General distribution:** Austria (B K N St nT oT), Italian Alps (BZ); Holarctic.

*Eueremaeus valkanovi* (Kunst, 1957)

**Vorarlberg: Bregenzerwald**—Fohramoos: dry Nardetum (1145 m) [7]; Vordere Niedere near Bezau: mixed forest (980–1420 m); above Bad Hopfreben: spruce forest (1035 m). Laternsertal—Furkajoch: spruce forest, moss on rock (1185 m); west of Innerlaterns: lumberyard, moss on bark (1000 m) [unpubl.]. **Walgau**—Jagdberg: montane spruce forest; subalpine pastures; dwarf shrubs; Hochgerach summit: alpine grassland (1580–1980 m) [6]. **Montafon**—Gargellental: spruce forest (1390 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); ibid., Vermunt Alpe: alpine grassland (2340 m). **Brandnertal**—Lünersee, near Totalphütte: subnival region, dry grass and *Dryas octopetala* cushions (2390 m); “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [ibid., unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grasslands, subnival cushion plants; rather xeric (altitude 980–2410 m).

**General distribution:** Austria (B K N O St nT oT V), Southern Germany (BW BY), Italian Alps (BZ); southern Palaearctic.

**Remark:** see *E. oblongus*.

## Fam. Niphocepheidae Travé, 1959

*Niphocepheus nivalis* (Schweizer, 1922)

**Vorarlberg:** **Montafon:** near Silvretta Alpine Road (L188), lichens on silicate rocks (~2000 m) [8]; Ochsental, at Vermunt glacier: subnival region, *Saxifraga* cushion (2610 m) [unpubl.].

**Vorarlberg habitats:** single records in alpine and subnival cushion plants (altitude ~2000–2610 m).

**General distribution:** Austria (K N S St nT oT V), Switzerland (BE GR TI UR VS), Italian Alps (BZ TN); Palaearctic, Oriental. Mainly in alpine habitats.

## Fam. Zetorchestidae Michael, 1898

*Litholestes altitudinis* Grandjean, 1951

**Vorarlberg:** **Montafon**—Silvretta: Großvermuntalpe, trail to Wiesbadener Hütte at southern end of Silvretta Reservoir, moss on rocks (2070 m) [8].

**Vorarlberg habitats:** single record in alpine region (altitude 2070 m).

**General distribution:** Austria (S St oT V), Switzerland (UR); also in remaining Central Europe, western Oriental (India). Mainly in alpine habitats.

*Zetorchestes flabriarius* Grandjean, 1951

**Vorarlberg:** **Bregenzerwald**—Hirschau: deciduous forest, moss on rock (730 m). **Walgau**—Gamperdonatal, south of Vasalpe: pasture (1180 m) [unpubl.]. **Großes Walsertal**—Sonntag, Buchboden: scree slope, moss on rock (930 m) [8]; Laguztal, above “Fuchswald”: mixed forest (1280 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, montane pasture; rather xeric; rare (altitude 730–1280 m).

**General distribution:** Austria (K N O S St nT V), Switzerland (VS), Southern Germany (BW BY), Italian Alps (BS BZ); southwestern Palaearctic.

## Fam. Astegistidae Balogh, 1961

*Cultroribula bicultrata* (Berlese, 1905)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Götzis, above Meschach: fir forest (1140 m). **Bregenzerwald**—above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); between Hirschau and Schnepfau: deciduous forest (730 m) [unpubl.].

**Vorarlberg habitats:** single records in colline and low montane mixed forests (altitude 730–1140 m).

**General distribution:** Austria (B N St nT oT), Switzerland (BL JU), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental.

*Cultroribula juncta* (Michael, 1885)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: raised bog, *Sphagnum* (1150 m) [7].

**Vorarlberg habitats:** reported only from Fohramoos near Bödele; low montane raised bog (altitude 1150 m).

**General distribution:** Austria (B N nT V), Switzerland (BL), Southern Germany (BW BY), Italian Alps (BZ); Holarctic.

*Cultroribula lata* Aoki, 1961

**Vorarlberg:** **Walgau**—Jagdberg: hay and xeric meadows (570–825 m) [6]; near Göfis: raised bog, moist grass litter and moss (555 m). **Großes Walsertal**—east of Marul: pasture (980 m) [unpubl.]. **Klostertal**—Innerbraz, east of Masonbach: hay meadow (695 m).

**Vorarlberg habitats:** single records in colline forests, meadows and raised bog (altitude 555–980 m).

**General distribution:** Austria (V), Italian Alps (BZ); Palaearctic, Oriental, Australia, New Zealand.

*Furcoribula furcillata* (Nordenskjöld, 1901)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Fohramoos: raised bog, wet moss (1150 m) [unpubl.].

**Vorarlberg habitats:** reported only from Fohramoos near Bödele; low montane raised bog (altitude 1150 m).

**General distribution:** Austria (B K N nT), Switzerland (AG ZH), Southern Germany (BW), Italian Alps (BZ); Holarctic, Ethiopian.

## Fam. Gustaviidae Oudemans, 1900

*Gustavia microcephala* (Nicolet, 1855)

**Vorarlberg: Bodensee area**—mouth of Rhine, north of Höchst: wet meadow (398 m). **Rheintal**—Reute above Hohenems: mixed forest (885 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m); Rankweil, Batschuns: pasture in orchard (590 m); Feldkirch, Unterries near Bangs: moist meadow (435 m); ibid., Gisingen: riverine forest (435 m). **Leiblachtal**—near Eichenberg: mixed forest (620–850 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, near Gschwendele: mixed forest (790 m); near Sulzberg: wet meadow (805 m); ibid., near Doren: hay meadow (490 m); ibid., steep slope above Doren: mixed forest (530 m); Egg, south of junction Bezau—Lingenau: slope with alder (600 m); Hittisau, Häusern: beech forest (770 m); Schetteregg, Amagmach: mixed forest (1020 m) [unpubl.]; Fohramoos: dry Nardetum (1145 m) [7]; Ebniter Tal, road junction to Kobelealpe: mixed forest (740 m); Bizauer Tal, near river: mixed forest (1000 m); Schnepfau: mixed forest (730–880 m); between Hirschau and Schnepfau: deciduous forest (730 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; colline mixed forest; subalpine pastures (565–1700 m) [6, unpubl.]; near Göfis: raised bog, moist grass litter and moss (555 m); between Schnifis and Schlins, beside rivulet: hay meadow (600 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Amerlügen near Frastanz: pasture (865 m); Bazulwald west of Nenzing: mixed forest (670 m); Saminatal: mixed forest (740 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Laguztal, above “Fuchswald”: mixed forest (1280 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forest (900–1115 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows and wetlands, subalpine pastures; xeric to moist (altitude 398–1700 m).

**General distribution:** Austria (B K N O S St nT V W), Switzerland (VD), Southern Germany (BW BY), Italian Alps (BS BZ TN); Palaearctic, Oriental (China), Mexico.

## Fam. Liacaridae Sellnick, 1928

*Adoristes ovatus* (C. L. Koch, 1839)

**Vorarlberg: Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Reute above Hohenems: mixed forest (885 m); Götzis, above Meschach: fir forest (1140 m); Feldkirch, St. Cornelius in Tosters: mixed forest (510 m). **Leiblachtal**—near Hohenweiler: mixed forest (470–695 m). Bregenz—Pfänder: pasture (1000 m); ibid., spruce forest (1030 m). **Bregenzerwald**—near Sulzberg: mixed forest, rotten wood from tree stump (655–990 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Balderschwangertal, near Gerisgschwend: spruce forest (1010 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moss; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m); ibid., near Kobelealpe: mixed forest (740 m); Vordere Niedere near Bezau: wet meadow (770 m); ibid., spruce forest (1420 m); Sibratgsfällt, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). **Kleinwalsertal**—Baad, near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn: dwarf shrubs (1860 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m). **Hochtannberg**—Warth, near Tyrolean border: spruce forest (1480 m) [unpubl.]. **Walgau**—Jagdberg: fen, moss and reed; colline mixed forest; montane spruce forest; subalpine pasture with rocks (640–1700 m) [6]; west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Saminatal: spruce forest (530 m); Gamperdonatal, tollbooth: spruce forest, rotten

wood (750 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m); south of Faschinajoch, above road: spruce forest (1220 m). **Klostertal**—west of Wald, beside road: mixed forest (915 m). **Arlberg area**—Oberlech: spruce forest (1670 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine pastures; xeric to moist (altitude 422–1860 m).

**General distribution:** Austria (B K N O St nT oT V), Switzerland (AG BE BL GR JU NE VD), Southern Germany (BW BY), Italian Alps (BG BZ TN); Holarctic.

*Liacarus coracinus* (C. L. Koch, 1841)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m). **Rheintal**—east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., mixed forest (510 m). **Leiblachtal**—near Hohenweiler: mixed forest (470–695 m); Sulzberg, west of Gullenbach: mixed forest (655 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m) [unpubl.]; Fohramoos: moorland forest, moss; raised bog, wet grass and *Sphagnum* (1145–1150 m) [7]; Bregenzer Ach near Bezau: riverine forest (620 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls, near timberline: spruce forest (1755 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m). Laternsertal—east of Furkajoch: dwarf shrubs (1640–1770 m) [unpubl.]. **Walgau**—Jagdberg: fen, moss and reed; subalpine pasture with *Juniperus communis* (640–1560 m) [6]. **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m). **Montafon**—Silbertal, near Fellimännle: pasture (1100 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine pastures, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to moist (altitude 396–2080 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG BL GR NE VD ZH), Southern Germany (BW BY), Italian Alps (BL BZ TN); Palaearctic, western Oriental (Pakistan), Ethiopian.

*Liacarus nitens* (Gervais, 1844)

**Vorarlberg:** New record for Vorarlberg. **Bregenz**—Pfänder: mixed forest (840 m). **Bregenzerwald**—Vordere Niedere near Bezau, Sonderdach: mixed forest (980 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane mixed forests (altitude 840, 980 m).

**General distribution:** Austria (B K N O nT), Switzerland (AG VD VS ZH), Southern Germany (BW BY), Italian Alps (BZ GO TN); Holarctic.

*Liacarus subterraneus* (C. L. Koch, 1844)

**Vorarlberg: Rheintal**—Dornbirn, railway station Haselstauden: small forest strip (420 m); Hohenems, „Old Rhine“: riverine forest (405 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moss; raised bog, wet grass and *Sphagnum* (1145–1150 m) [7]. **Walgau**—west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Saminatal: spruce forest (530 m) [unpubl.].

**Vorarlberg habitats:** colline forests, low montane moorland forest and raised bog; moist; rare (altitude 405–1150 m).

**General distribution:** Austria (K N O St V), Switzerland (BL JU NE TI ZH), Southern Germany (BW BY), Italian Alps (UD); Holarctic.

*Liacarus xylariae* (Schrank, 1803)

**Vorarlberg: Bregenzerwald**—Fohramoos: moorland forest, moss (1145 m) [7]. **Walgau**—Jagdberg: colline mixed forest (685–705 m) [6, unpubl.].

**Vorarlberg habitats:** single records in colline and low montane forest, low montane wetland (altitude 685–1145 m).

**General distribution:** Austria (B K N O St nT V), Switzerland (AG JU), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic, Oriental (Himalaya—Nepal).

*Xenillus discrepans* Grandjean, 1936

**Vorarlberg:** **Walgau**—Jagdberg: colline mixed forest (685 m) [6]; Saminatal: pasture (510 m) [unpubl.].

**Vorarlberg habitats:** single records in colline mixed forest and pasture (altitude 510–685 m).

**General distribution:** Austria (B V), Southern Germany (BW BY), Italian Alps (BZ TN); southern Palaearctic.

*Xenillus tegeocranus* (Hermann, 1804)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m); ibid., deciduous forest (405 m).

**Rheintal**—Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., mixed forest (510 m). **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m). Bregenz—Pfänder, Fluh: mixed forest (750 m). **Bregenzerwald**—Sulzberg, near Falz: hay meadow (980 m); Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; colline mixed forest; subalpine pastures (490–1560 m) [6]; above Thüringen, near Quadern: mixed forest (615 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, meadows and wetlands, also single records in subalpine pastures; xeric to wet (altitude 396–980 m, 1560 m).

**General distribution:** Austria (B K N O St nT oT V W), Switzerland (BL VD ZH), Southern Germany (BW BY), Italian Alps (BL BS BZ TN VI); Palaearctic, Oriental.

**Fam. Peloppiidae Balogh, 1943**

*Ceratoppia bipilis* (Hermann, 1804)

**Vorarlberg:** **Leiblachtal**—Eichenberg near Schüssellehen: spruce forest (850 m) [unpubl.]. **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss; raised bog, wet grass and moss (1145–1150 m) [7, unpubl.]; Au, Argenzipfel, Leuebach: mixed forest (995 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m) [unpubl.]; Ifenstock area: Schneckenloch cave, entrance region (1270 m); sinkhole in „Gottesackerplateau“ north of Ifenstock (1780 m) [3, 5]. Kleinwalsertal—Walmendinger Horn: dwarf shrubs (1860 m) [unpubl.].

**Walgau**—Jagdberg: montane spruce forest; subalpine pastures with *Juniperus communis*, *Alnus viridis* and rocks; Hochgerach summit: alpine grassland (1560–1980 m) [6]. **Großes Walsertal**—west of Buchboden: mixed forest (900 m). **Klostertal**—west of Langen: mixed forest on scree (1040 m). **Arlberg area**—Oberlech: spruce forest (1670 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, above road: mixed forest (950 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland; rather xeric to moist (altitude 780–2030 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AR BL GR VD VS ZH), Southern Germany (BW BY), Italian Alps (BL BG BZ TN); Holarctic, western Oriental (Pakistan), Mexico.

*Ceratoppia quadridentata* (Haller, 1882)

**Vorarlberg:** **Rheintal**—Feldkirch, Gisingen: riverine forest (435 m) [unpubl.]. **Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, litter and moss; fen, wet moss; raised bog, wet grass and *Sphagnum* (1145–1150 m) [7, unpubl.]; Mellau, Roßstellealpe: mixed forest (1050 m); Damüls, Krumbach: spruce forest (1450 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m) [unpubl.]. **Walgau**—Jagdberg: fen; subalpine pasture with *Alnus viridis* (640–1650 m) [6].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine dwarf shrubs and pastures; rather moist to wet (altitude 435–1770 m).

**General distribution:** Austria (B K N O S St nT V), Switzerland (GR JU), Southern Germany (BW), Italian Alps (BZ TN); Holarctic, Oriental.

## Fam. Carabodidae C. L. Koch, 1843

*Carabodes areolatus* Berlese, 1916

**Vorarlberg: Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moist to wet moss; raised bog (1145–1150 m) [7]; above Mellau: mixed forest (960 m); above Bad Hopfreben: spruce forest (1030 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest, rotten wood from tree stump (1290 m). Kleinwalsertal—Hörnlepass: raised bog, wet moss (1160 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest (685 m) [6].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands; xeric to wet (altitude 685–1290 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (GR NE VD), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Carabodes coriaceus* C. L. Koch, 1835

**Vorarlberg: Rheintal**—Feldkirch, Gisingen: riverine forest (435 m). **Bregenz**—Pfänder: mixed forest (840 m).

**Bregenzerwald**—Vordere Niedere near Bezau: spruce forest (1420 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; colline mixed forest, moss (685 m) [6]; Bazulwald west of Nenzing: mixed forest (670 m).

**Montafon**—Gargellenthal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests; rather xeric (altitude 435–1510 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (BL GR LU SO TG TI VD? ZH?), Southern Germany (BW BY), Italian Alps (BL BZ CO TN); Holarctic.

*Carabodes intermedius* Willmann, 1951

**Vorarlberg: Walgau**—Jagdberg—Hochgerach summit: alpine grassland (1980 m) [6].

**Vorarlberg habitats:** single record in alpine grassland (altitude 1980 m).

**General distribution:** Austria (K nT oT V), Switzerland (GR VS), Italian Alps (SO TN); Alps, Caucasus. Mainly in alpine habitats.

*Carabodes labyrinthicus* (Michael, 1879)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (405 m). **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest (1220 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: pasture (1150 m); Röthis, above Viktorsberg: mixed forest (920 m). **Leiblachtal**—near Hohenweiler: mixed forest (570–695 m); Eichenberg: spruce forest (620–850 m); Ried near Hohenweiler: mixed forest (470 m). Bregenz—Pfänder: mixed forest (750–1030 m). **Bregenzerwald**—Sulzberg: mixed forest (655–995 m); ibid., wet meadow (805 m); Reifensberg, above Niemans: spruce forest (980 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Balderschwangertal, near Gerisgschwend: spruce forest (1010 m); Schetteregg, Amagmach: mixed forest (1020 m); above Schwarzenberg: hay meadow (830 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist and wet moss; wet Molinietum; fen and raised bogs; wet grass and moss (1145–1150 m) [7, unpubl.]; Ebniter Tal: spruce forest (1270–1450 m); mouth of Ebniter Ach: riverine forest (490 m); Bregenzer Ach near Bezau: riverine forest (620 m); Vordere Niedere near Bezau: mixed forest (980–1420 m); Bizauer Tal, near river: mixed forest (1000 m); Mellau, Roßstellealpe: mixed forest (1050 m); above Bad Hopfreben: spruce forest (1035 m); Damüls, Krumbach: spruce forest (1450 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200–1600 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m); Hirschgägg, Schwarzwassertal: spruce forest (1340 m). Hochtannenberg—Warth, near Tyrolean border: spruce forest (1480 m). Furkajoch: dwarf shrubs (1770 m); ibid., spruce forest (1185–1370 m); west of Innerlaterns: lumberyard, moss on bark (1000 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest; montane spruce forest, moss; subalpine pasture with rocks, lichens (705–1790 m) [6, unpubl.]; near Göfis: raised bog, moist grass litter and moss (555 m); Saminatal: spruce forest (530 m); Gamperdonatal: mixed forest (750–1280 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m); Laguztal: *Pinus sylvestris* forest (1385–1590 m). **Arlberg area**—Oberlech: spruce forest (1670 m); ibid., subalpine pasture (1645 m); east of Zug: spruce

forest (1475 m); Formarintal, near Formarinsee: subalpine pasture (1850 m). **Montafon**—Silbertal, Silberberg near Schruns: mixed forest (900 m); ibid., pasture (1100 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests, colline and low montane wetlands, low montane meadows and pastures, subalpine dwarf shrubs and pastures; xeric to wet (altitude 405–1850 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG AP BS FR GR JU LU NE SO TG TI UR VD VS), Southern Germany (BW BY), Italian Alps (BG BZ SO TN); Holarctic.

*Carabodes marginatus* (Michael, 1884)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: moorland forest, moss (1145 m) [7]. **Walgau**—Jagdberg: subalpine pasture with *Juniperus communis* (1560 m) [6]; Diedamskopf: dwarf shrubs (1840 m). **Montafon**—Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane wetland forest, subalpine dwarf shrubs and pasture, alpine dwarf shrubs; rather moist (altitude 1145–2080 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AR? BL GR LU NE TG TI VD VS), Southern Germany (BW BY), Italian Alps (BL BZ SO TN); Palaearctic.

*Carabodes ornatus* Štorkán, 1925

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Götzis, above Meschach: fir forest (1140 m). **Bregenz**—Pfänder: mixed forest (840–1030 m). **Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs (1145–1150 m) [7, unpubl.]; Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Sibratsgfäll, Völken: spruce forest (1050 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forests (570–685 m) [6, unpubl.]; Bazulwald west of Nenzing: mixed forest (670 m). **Montafon**—Silbertal, Silberberg near Schruns: mixed forest (900 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, low montane meadow and wetlands; xeric to moist (altitude 570–1150 m).

**General distribution:** Austria (K N O St nT oT V W), Switzerland (GR NE TG TI VS), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

*Carabodes reticulatus* Berlese, 1913

**Vorarlberg:** **Bregenz**—Pfänder: mixed forest (840 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest; montane spruce forest (565–1610 m) [6].

**Vorarlberg habitats:** single records in colline to montane forests (altitude 565–1610 m).

**General distribution:** Austria (K V), Switzerland (TI UR VS), Southern Germany (BW BY), Italian Alps (BZ TN); western Palaearctic.

*Carabodes rugosior* Berlese, 1916

**Vorarlberg:** **Bregenzerwald**—Fohramoos: moorland forest, moist to wet moss; raised bog (1145–1150 m) [7, unpubl.]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); Mellau, Roßstellealpe: mixed forest (1050 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Sibratsgfäll, Völken: spruce forest (1050 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1650 m) [unpubl.]. **Walgau**—Jagdberg: mixed forest; montane spruce forest (705–1610 m) [6, unpubl.]. **Montafon**—Silbertal, near Fellimännle: pasture (1100 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane pasture and wetlands, subalpine dwarf shrubs; moist to wet (altitude 705–1660 m).

**General distribution:** Austria (K St nT oT V), Switzerland (BE FR JU LU NE TG TI VS), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Carabodes schatzi* Bernini, 1976

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Diedamskopf: dwarf shrubs (1840 m). **Montafon**—Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m) [unpubl.].

**Vorarlberg habitats:** single records in subalpine and alpine dwarf shrubs (altitude 1840–2080 m).

**General distribution:** Austria (nT), Switzerland (GR TI), Italian Alps (BZ SO); Alps, West Europe (Ireland), Caucasus. Mainly in alpine habitats.

*Carabodes tenuis* Forsslund, 1953

**Vorarlberg: Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m). **Bregenzerwald**—above Schneppfegg: mixed forest, rotten wood on tree stump (880 m); above Bad Hopfreben: spruce forest (1030 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane wetlands; in rotten wood; rare (altitude 880–1220 m).

**General distribution:** Austria (K St nT oT V), Switzerland (GL TI), Southern Germany (BW), Italian Alps (BZ); Palaearctic, western Oriental (Pakistan).

*Odontocepheus elongatus* (Michael, 1879)

**Vorarlberg: Rheintal**—Götzis, above Meschach: fir forest (1140 m); Röthis, above Viktorsberg: mixed forest (920 m) [unpubl.]. **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss; raised bog (1145–1150 m) [7]; Vordere Niedere near Bezau: spruce forest (1420 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, moss; montane spruce forest, moss near a small pond (565–1610 m) [6].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands; xeric to moist; rare (altitude 565–1610 m).

**General distribution:** Austria (B K N St nT V), Switzerland (BL GR LU TG TI VD? VS), Southern Germany (BW BY), Italian Alps (BZ); Holarctic.

## Fam. Autognetidae Grandjean, 1960

*Autogneta longilamellata* (Michael, 1885)

**Vorarlberg: Rheintal**—Feldkirch, St. Corneli in Tosters: mixed forest (510 m); ibid., Ardetzenberg: mixed forest (595 m). **Bregenzerwald**—Sulzberg, near Falz: mixed forest, rotten wood from tree stump (990 m) [unpubl.]; Fohramoos: raised bog (1150 m) [7]. **Walgau**—Gamperdonatal: spruce forest, rotten wood in old tree stump (750 m). **Montafon**—St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, low montane wetland, also in rotten wood; xeric to moist (altitude 510–1150 m).

**General distribution:** Austria (B K N O St nT oT V), Switzerland (BL), Southern Germany (BW BY), Italian Alps (BZ); Holarctic.

*Conchogneta dalecarlica* (Forsslund, 1947)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Au, Argenzipfel, Leuebach: mixed forest (995 m). **Walgau**—above Thüringen, near Quadern: mixed forest (615 m); Bazulwald west of Nenzing: mixed forest (670 m). **Montafon**—north of Lorüns: mixed forest (585 m); Silbertal, Silberberg near Schruns: mixed forest (900 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests; rare (altitude 585–995 m)

**General distribution:** Austria (N St nT, B? K? S? sub *C. willmanni*), Southern Germany (BW BY), Italian Alps (BZ, TN? sub *C. willmanni*); Palaearctic.

**Remark:** A synonymy of *C. dalecarlica* with the older name *C. willmanni* is assumed by Weigmann (2006) and considered by Subías (in electronic updates 2007, 2020), but according to Weigmann (*op. cit.*) the single specimen of *C. willmanni* (Dyrdowska, 1929) in the collection Willmann in Munich is largely damaged. Woas (1986) presented a supplementary description of *C. dalecarlica* without any comment to *C. willmanni*. Until final clarification of the possible synonymy I retain the name *C. dalecarlica*.

*Conchogneta traegardhi* (Forsslund, 1947)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: wet Molinietum; raised bog (1145–1150 m) [7]. **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m). **Montafon**—Silbertal, Silberberg near Schruns: mixed forest (900–1115 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane wetlands; rare (altitude 900–1385 m).

**General distribution:** Austria (nT V), Southern Germany (BW); Holarctic.

### Fam. Machuellidae Balogh, 1983

*Machuella bilineata* Weigmann, 1976

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Feldkirch, St. Corneli in Tosters: mixed forest (540 m) [unpubl.].

**Vorarlberg habitats:** single record in colline forest (altitude 540 m).

**General distribution:** Austria (K N St nT), Southern Germany (BW); also in remaining Central Europe, British Islands, Azores.

### Fam. Oppiidae Sellnick, 1937

*Berniniella bicarinata* (Paoli, 1908)

**Vorarlberg:** **Rheintal**—Dornbirn, railway station Haselstauden: small forest strip (420 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: mixed forest (670–1140 m); Röthis, above Viktorsberg: mixed forest (920 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (530–990 m) [unpubl.]; Fohramoos: raised bog (1150 m) [7]; Ebniter Tal, above Hackwald: mixed forest (740–920 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); Mellau: mixed forest (1050 m); between Hirschau and Schnepfau: deciduous forest (730 m); above Bad Hopfreben: spruce forest (1030 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); Subersachtal: spruce forest (1200 m). **Kleinwalsertal**—Baad, near Camping Vorderboden: mixed forest (1220 m). **Laternsertal**—Furkajoch: dwarf shrubs (1770 m); west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forest (570–705 m) [6, unpubl.]; near Göfis: raised bog, wet grass litter and moss (555 m); Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal: mixed forest (930–1280 m). **Großes Walsertal**—west of Buchboden: mixed forest (900 m); Laguztal: *Pinus sylvestris* forest (1160–1590 m); ibid., above “Fuchswald”: mixed forest (1280 m). **Klostertal**—west of Wald: mixed forest (915 m); west of Langen: mixed forest on scree (1040 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Lech, above Schlegelkopf: dry moss below *Alnus viridis* (1880 m); ibid., subalpine pasture, Curvuletum (1850 m); Oberlech: spruce forest (1670 m); ibid., dwarf shrubs (1650 m); Spullersee: Rhododendretum (1840 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—Silbertal, Silberberg near Schruns: mixed forest (900–950 m); ibid., near Fellimännle: pasture (1100 m); Gargellen, north of Gargellen: spruce forest (1390 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m). **Brandnertal**—Lünernersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to wet (altitude 420–2030 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GR), Southern Germany (BW BY), Italian Alps (BG BL BZ TN); Palaearctic, Oriental, Madagascar.

*Berniniella conjuncta* (Strenzke, 1951)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—south of Lauterach: wet meadow (410 m); above Dornbirn, near Bödele: mixed forest (960 m). **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach (705 m). **Großes Walsertal**—Laguztal, mixed forest (1280–1385 m) [unpubl.].

**Vorarlberg habitats:** single records in colline to montane forests, colline wet meadow, rather moist habitats (altitude 410–1385 m).

**General distribution:** Austria (N O St nT), Switzerland (NW), Southern Germany (BW), Italian Alps (BZ); Europe, Caucasus.

*Berniniella sigma* (Strenzke, 1951)

**Vorarlberg:** New record for Vorarlberg. **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m). **Bregenzerwald**—Sulzberg: mixed forest (790–990 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Subersachal: spruce forest, rotten wood from tree stump (1290 m). **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Oberlech: spruce forest (1670 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forest (950–1135 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, subalpine dwarf shrubs; rather xeric (altitude 570–1880 m).

**General distribution:** Austria (nT), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

**Remark:** The species *Berniniella sigma* and *B. conjuncta* (the latter originally described as subspecies of *sigma*, Strenzke 1951) are morphologically very similar. Main differences are: interlamellar ridges not connected with the anterior notogastral margin, sensillus smooth, posterior to bothridium a small isolated chitinous bulge in *B. sigma* vs. interlamellar ridges connected with anterior notogastral margin, sensillus smooth or with small ciliae, posterior to bothridium without isolated bulge in *B. conjuncta*. I found some intermediate forms with species specific characters of *B. sigma* but with small ciliae on the sensillus which were also mentioned by Woas (1986). In Vorarlberg both species differ in ecological demands, *B. sigma* prefers rather xeric habitats (also found by Strenzke 1951), while *B. conjuncta* lives in moister soils.

*Dissorrhina ornata* (Oudemans, 1900)

**Vorarlberg:** **Rheintal**—south of Lauterach: wet meadow (410 m); above Dornbirn, near Bödele: mixed forest (490–960 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest 650 m) [unpubl.]; Fohrmoos: moorland forest, moist to wet moss; fen and raised bogs, wet *Sphagnum* (1145–1150 m) [7]; Hirschau: deciduous forest, moss on rock (730 m); Damüls, Krumbach: spruce forest (1450 m); Subersachal: spruce forest (1200 m); Walmendinger Horn: dwarf shrubs (1860 m); Hirschgägg, Schwarzwässertal: spruce forest (1340 m); southwest of Kalbelesee: Rhododendretum (1770 m). **Laternaltal**—west of Innerlaterns: lumberyard, moss on bark (1000 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forests; montane spruce forest; subalpine pasture with *Alnus viridis*; Hochgerach summit: alpine grassland (1980 m) [6]; Bazulwald west of Nenzing: mixed forest (670 m); Gamperdonatal, at road bridge: mixed forest (930–1280 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); Spullersee: Rhododendretum (1840 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, west of Innerberg: mixed forest (1115 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m). **Brandnertal**—Lünertal, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m); ibid., subnival region, dry grass cushion (2390 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to moist (altitude 410–2390 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BL GR NE), Southern Germany (BW BY), Italian Alps (BG BL BZ TN); Holarctic, Ethiopian.

*Dissorrhina signata* (Schwalbe, 1989)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood

(1220 m); Götzis, above Meschach: fir forest (1140 m). **Bregenzerwald**—Oberdamüls, near timberline: spruce forest (1755 m); Sibratsgfäll, Völken: spruce forest (1050 m). Kleinwalsertal—Hirschgägg, Schwarzwassertal: spruce forest (1340 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, subalpine dwarf shrubs; rare (altitude 1050–1770 m).

**General distribution:** Austria (B nT), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ); Central, Southeast Europe, Caucasus.

*Graptoppia foveolata* (Paoli, 1908)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**, Laternsertal—west of Innerlaterns: lumberyard, moss on bark (1000 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane forest, in corticolous moss (altitude 1000 m).

**General distribution:** Austria (nT), Southern Germany (BW), Italian Alps (BG); Palaearctic; rare.

*Micropia minus* (Paoli, 1908)

**Vorarlberg:** **Walgau**—Jagdberg: dwarf shrubs with grass, herbs and lichens (1835 m) [6]. **Großes Walsertal**—Laguztal, Fuchswald": mixed forest (1160–1280 m) [unpubl.].

**Vorarlberg habitats:** single records in montane forests and subalpine dwarf shrubs (altitude 1160–1280 m, 1835 m).

**General distribution:** Austria (B K N S St nT oT V W), Switzerland (AG BL JU), Southern Germany (BW BY), Italian Alps (BZ); semicosmopolitan.

*Multioppia glabra* (Mihelčić, 1955)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: raised bog (1150 m) [7]; Schnepfau, near Bregenzer Ach: mixed forest (720–730 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest (685 m) [6]; near Göfis: raised bog, wet grass litter and moss (555 m). **Klostertal**—west of Langen: mixed forest on scree (1040 m). **Montafon**—north of Lorüns: mixed forest (585 m); Silbertal, near Fellimännle: pasture (1100 m); ibid., west of Innerberg: mixed forest (1115 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests and wetlands, low montane pasture; xeric to moist (altitude 555–1150 m).

**General distribution:** Austria (K N nT oT V), Southern Germany (BW), Italian Alps (BZ); Palaearctic.

*Neotrichoppia confinis* (Paoli, 1908) (*Confinoppia*)

**Vorarlberg:** **Rheintal**—Götzis, above Meschach: fir forest (1140 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m); west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, brookside with moss (570 m) [6].

**Vorarlberg habitats:** single records in colline to montane forests, subalpine dwarf shrubs (altitude 570–1770 m).

**General distribution:** Austria (N V), Switzerland (BL), Southern Germany (BW), Italian Alps (BG BZ TN); southwestern Palaearctic.

*Oppiella escotata* (Subías & Rodriguez, 1986) (*Moritzoppia*)

**Vorarlberg:** New record for Vorarlberg and Austria. **Bregenzerwald**—Diedamskopf, summit: alpine grassland (2090 m); ibid., dwarf shrubs (1720–1840 m). **Walgau**—Jagdberg: subalpine pasture with rocks (1725 m) [6 part. sub *Moritzoppia unicarinata*]. **Montafon**—Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Ochsental, at Vermunt glacier: subnival region, moss (2620 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** subalpine dwarf shrubs, pastures and raised bogs, alpine dwarf shrubs and grassland, subnival moss cushion; rather xeric; rare (altitude 1720–2620 m).

**General distribution:** Central, North, Southwest Europe (Spain); rare.

*Oppiella falcata* (Paoli, 1908) (*Oppiella*)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Reute above Hohenems: mixed forest (885 m); Götzis, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Röthis, above Viktorsberg: mixed forest (920 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); ibid., Unterries near Bangs: moist meadow (435 m). **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation (620 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (530–995 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist and wet moss; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, Briedler Alpe: mixed forest (740–1450 m); Vordere Niedere near Bezau: spruce forest (1420 m); Bizauer Tal, near river: mixed forest (1000 m); Schnepfau, near Bregenzer Ach: riverine forest (760 m); above Schnepfegg: mixed forest (880 m); Mellau: hay meadow (660 m); above Mellau: mixed forest (960 m); between Hirschau and Schnepfau: deciduous forest (730 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfreben: spruce forest (1035 m); Kanisfluh: mixed forest (1750 m); ibid., dwarf shrubs, Rhododendretum, *Juniperus communis* (1650 m); Oberdamüls, near timberline: spruce forest (1755 m); Damüls, Schwende: open spruce forest, *Cal-luna tussock* (1255 m); Diedamskopf: dwarf shrubs (1720–1840 m); ibid., alpine grassland (2090 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal north of Schoppernau, steep slope: krummholz, woody litter (1600 m); ibid., spruce forest (1200 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn: dwarf shrubs (1860 m); ibid., subalpine pasture (1970 m); Hirschegg, Schwarzwässertal: spruce forest (1340 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m); southwest of Kalbelesee: Rhododendretum (1770 m). Laternsertal—west of Furkajoch: spruce forest (1185–1370 m); Furkajoch: dwarf shrubs (1640–1770 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; colline mixed forest; montane spruce forest; subalpine pastures with *Alnus viridis* and rocks (490–1700 m) [6]; above Thüringen, near Quadern: mixed forest (615 m); near Göfis: raised bog, wet grass litter and moss (555 m); Gamperdonatal, at road bridge: mixed forest (930–1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); south of Faschinajoch: spruce forest (1220 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1160–1590 m). **Klostertal**—west of Dalaas: mixed forest (775–915 m); west of Langen: mixed forest on scree (1040 m). **Arlberg area**—near Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Oberlech: spruce forest (1670 m); east of Zug: spruce forest (1475 m); Spullersee: Rhododendretum (1840 m). **Montafon**—Silbertal, near Fellimännle: pasture (1100 m); Silbertal: mixed forest (900–1115 m); Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m). **Brandnertal**—Lünernersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, colline and low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland; xeric to wet (altitude 435–2130 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GR VD), Southern Germany (BW BY), Italian Alps (BG BL BZ TN); Palaearctic.

*Oppiella fallax* (Paoli, 1908) (*Rhinoppia*)

**Vorarlberg:** **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m) [unpubl.]. **Bregenzerwald**—Fohramoos: fen, wet moss (1150 m) [7]; below Kanisfluh: mixed forest (1190 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forest, brookside; subalpine pastures with *Alnus viridis* (570–1560 m) [6]; Gamperdonatal, at road bridge: mixed forest (930 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline meadows, colline and low montane wetlands, subalpine pastures; rather moist (altitude 570–1560 m).

**General distribution:** Austria (B K N St nT oT V), Switzerland (AG BL VS), Southern Germany (BW), Italian Alps (BL BZ TN); semicosmopolitan.

*Oppiella incisa* Mahunka & Mahunka-Papp, 2000 (*Moritzoppia*)

**Vorarlberg:** New record for Vorarlberg and Austria. **Rheintal**—Schuttannen above Hohenems: spruce forest (1220 m). **Bregenzerwald**—Ebniter Tal, near Emser Hütte: pasture (1260 m); ibid., Briedler Alpe: spruce forest (1450 m); Mellau, Roßstellealpe: mixed forest (1050 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfrehen: spruce forest (1035 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Diedamskopf, west of Halden Alpe: dwarf shrub (1720 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: montane spruce forest, moss near a small pond; subalpine pasture with rocks (1610–1650 m) [6]; Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m). **Klostertal**—west of Langen: mixed forest on scree (1040 m). **Montafon**—Gargellental: spruce forest (1390–1510 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m); ibid., below *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, montane meadows, subalpine dwarf shrubs and pastures; rather moist to wet (altitude 920–1860 m).

**General distribution:** Switzerland (NW), Southern Germany (BW BY); Alps, also in remaining Central Europe. Mainly in alpine habitats.

*Oppiella keilbachi* (Moritz, 1969) (*Moritzoppia*)

**Vorarlberg: Bregenzerwald**—Fohramoos: moorland forest, moist to wet moss; raised bog, (1145–1150 m) [7]; Ebniter Tal, near Emser Hütte: pasture (1260 m); Kanisfluh: dwarf shrubs, Rhododendretum, *Juniperus communis* (1650–1660 m); Damüls, Krumbach: spruce forest (1450 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1650 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m). Laternsertal—east of Furkajoch: dwarf shrubs (1640 m) [unpubl.]. **Walgau**—Jagdberg: subalpine pasture with rocks (1650 m) [6 part. sub *Moritzoppia unicarinata*]; Gamperdonatal: spruce forest near tollbooth, rotten wood in old tree stump (750 m). **Großes Walsertal**—Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m). **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Oberlech: spruce forest (1670 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m). **Brandnertal**—Lünernersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane wetlands, montane pasture, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to moist (altitude 750–780 m, 1145–2080 m).

**General distribution:** Austria (B K N nT V), Switzerland (SZ), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic, Ethiopian, Neotropical (Cuba, Chile).

*Oppiella maritima* (Willmann, 1929) (*Oppiella*)

**Vorarlberg: Rheintal**—east of Koblenz, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Röthis, above Viktorsberg: mixed forest (920 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moss; raised bog (1145–1150 m) [7]; Vordere Niedere near Bezau, Sonderdach: mixed forest (980 m) [unpubl.]. **Walgau**—Jagdberg: montane spruce forest (1610 m) [6]; near Göfis: raised bog, wet grass litter and moss (555 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine dwarf shrubs; xeric to wet (altitude 440–1860 m).

**General distribution:** Austria (K nT oT V), Switzerland (SO TI), Southern Germany (BW), Italian Alps (BZ); Holarctic.

*Oppiella nova* (Oudemans, 1902) (*Oppiella*)

**Vorarlberg: Rheintal**—south of Lauterach: wet meadow (410 m); Feldkirch, Unterries near Bangs: moist meadow (435 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (470–570 m); between Weienried and Möggen:

wet meadow (860 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist and wet moss; fen and raised bogs (1145–1150 m) [7, unpubl.]; Ebniter Tal, near Vorderschauern: spruce forest (970 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); above Mellau: mixed forest (960 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). Kleinwalsertal—Rietztern, beside mill: pasture (1070 m); Hörnlepass: raised bog, moist moss (1160 m). Hochtannenberg—southwest of Kalbelesee: Rhododendretum (1770 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forests; fen; montane spruce forest; subalpine pastures; Hochgerach summit: alpine grassland (570–1980 m) [6]; above Thüringen, near Quadern: mixed forest (615 m); near Göfis: raised bog (555 m); Bazulwald west of Nenzing: mixed forest (670 m); Gamperdonatal, at road bridge: mixed forest (930 m). **Großes Walsertal**—near Blons: pasture (920 m); south of Faschinajoch, above road: spruce forest (1220 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal: mixed forest (1160–1385 m). **Klostertal**—west of Wald, beside road: mixed forest (915 m). **Arlberg area**—Oberlech: subalpine pasture (1645 m); east of Zug: spruce forest (1475 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); south of Partenen, near tollbooth: herbaceous pasture (1150 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland; xeric to wet (altitude 410–2080 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG? BE BL GR JU NE VD ZH), Southern Germany (BW BY), Italian Alps (BG BL BS BZ TN); cosmopolitan.

*Oppiella obscura* (Mahunka & Mahunka-Papp, 2000) (*Oppiella*)

**Vorarlberg:** New record for Vorarlberg and Austria. **Montafon**—Ochsental, at Vermunt glacier: subnival region, moss (2620 m) [unpubl.].

**Vorarlberg habitats:** single record in subnival moss cushion (altitude 2620 m).

**General distribution:** Switzerland (GR VS); Alps (endemic); in alpine habitats.

**Remark:** A synonymy with *Lauroppia doris* (E. Pérez-Iñigo, 1978, known from Spain, Hungary and Iran) is supposed by Weigmann (2006) and considered by Subías (electronic update 2007, 2020). But Mahunka & Mahunka-Papp (2004) found *L. doris* also in Hungary and they were able to compare both species. There are differences in the structures of the prodorsal sclerites and in the shape of the sensillus. I retain the name *Oppiella obscura*.

*Oppiella obsoleta* (Paoli, 1908) (*Rhinoppia*)

**Vorarlberg:** **Walgau**—Jagdberg: hay and xeric meadow, grass litter (590 m) [6].

**Vorarlberg habitats:** single record in colline meadow (altitude 590 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BL GR NE VD VS), Southern Germany (BW BY), Italian Alps (BL BZ TN); Holarctic, New Zealand, Hawaii.

*Oppiella propinqua* Mahunka & Mahunka-Papp, 2000 (*Oppiella*)

**Vorarlberg:** **Rheintal**—south of Lauterach: wet meadow (410 m). **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, dry litter, moist moss; fen and raised bogs (1145–1150 m) [7, unpubl.]. **Montafon**—north of Lorüns: mixed forest (585 m); Gargellen, north of Gargellen: spruce forest (1390 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows and wetlands, alpine dwarf shrub; rather moist to wet (altitude 410–2080 m). In Germany this species was also frequently found in a raised bog (Weigmann *et al.* 2015).

**General distribution:** Austria (K N O V), Switzerland (LU), Italian Alps (BZ); Alps, Central, West Europe; frequently recorded in moist habitats.

*Oppiella subpectinata* (Oudemans, 1900) (*Rhinoppia*)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: riverine forest (398 m). **Rheintal**—above Dornbirn, near Bödele: mixed forest (490–960 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest (1200–1220 m); Reute above Hohenems: mixed forest (885 m); Götzis, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Röthis, above Viktorsberg: mixed forest (920 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); ibid., pasture in orchard (590 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation (620 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg: mixed forest (530–995 m); Balderschwangertal, near Gerisgschwend: spruce forest (1010 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m); ibid., mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs (1145–1150 m) [7, unpubl.]; Ebniter Tal, mixed and spruce forest (740–1270 m); Vordere Niedere near Bezau: spruce forest (1420 m); Bizauer Tal, near river: mixed forest (1000 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (960–1050 m); between Hirschau and Schnepfau: deciduous forest (730 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfreben: spruce forest (1035 m); below Kanisfluh: mixed forest (1190 m); Damüls, Krumbach: spruce forest (1450 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200–1600 m). Kleinwalsertal—Baad, near church: pasture (1240 m); ibid., near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn: dwarf shrubs (1860 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m). Laternsertal—below Furkajoch: pasture (1550 m); west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed and forests; fen; montane spruce forest; subalpine pastures; dwarf shrubs; Hochgerach summit: alpine grassland (490–1980 m) [6, unpubl.]; above Thüringen, near Quadern: mixed forest (615 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, at road bridge: mixed forest (930–1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal: *Pinus sylvestris* forest (1385–1590 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m); west of Langen: mixed forest on scree (1040 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); Oberlech: dwarf shrubs (1650 m); ibid., spruce forest (1670 m); west of Zug: subalpine pasture (1540 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forest (900–1115 m); ibid., near Fellimännle: pasture (1100 m); Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., subnival region, dry *Carex firma*, *Anthyllis vulneraria* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, meadows and pastures, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to moist (altitude 398–2410 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BE GR JU NE VD), Southern Germany (BW BY), Italian Alps (BS BZ); Holarctic, West Africa.

*Oppiella uliginosa* (Willmann, 1919) (*Oppiella*)

**Vorarlberg: Bodensee area**—mouth of Rhine, north of Höchst: wet meadow (398 m). **Rheintal**—south of Lauterach: wet meadow (410 m); above Dornbirn, near Bödele: mixed forest (960 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest (1200–1220 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); between Weienried and

Möggen: wet meadow (860 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg: mixed forest (530–990 m); ibid., wet meadow (805 m); ibid., near Falz: hay meadow (980 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Hittisau, Häusern: beech forest (770 m); Schetteregg, Amagmach: raised bog (1020 m); ibid., mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, near Emser Hütte: pasture (1260 m); ibid., near Koblalp: birch stand, wet *Juncus* with moss (1040 m); Bizauer Tal, near river: mixed forest (1000 m); above Schnepfegg: mixed forest; Mellau, Roßstellealpe: mixed forest (1050 m); above Mellau: mixed forest (960 m); above Bad Hopfreben: spruce forest (1030 m); Dämüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); ibid., Krumbach: spruce forest (1450 m); Diedamskopf, west of Halden Alpe: dwarf shrub (1720 m); Subersachtal: spruce forest (1200 m); Ifenstock area, west of Schönenbach Alm: raised bog (1020 m). Kleinwalsertal—Walmendinger Horn: dwarf shrubs (1860 m); Hirschegg, Schwarzwärtal: spruce forest (1340 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1730–1770 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; montane spruce forest (565–1580 m) [6, unpubl.]; near Göfis: raised bog (555 m); Amerlügen near Frastanz: pasture (865 m); Saminatal: pasture (510 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—Laguztal, Alpe Laguz: *Pinus sylvestris* forest (1395–1590 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); west of Zug: subalpine pasture (1540 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, Silberberg near Schruns: mixed forest (900–950 m); Gargellenthal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests, colline and low montane meadows and wetlands, montane pastures, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to wet (altitude 398–2080 m).

**General distribution:** Austria (N nT V), Southern Germany (BW), Italian Alps (BZ); Central, West Europe.

**Remark:** A synonymy of *Oppiella uliginosa* with *O. nova* (Oudemans, 1902) was supposed by different authors, but a thorough study of *O. uliginosa* by Woas (1986) demonstrated the morphological differences of both species. The validity of *O. uliginosa* is accepted since then, although sometimes classified as subspecies of *O. nova* (e.g. Subías electronic update 2008, 2020). Moreover, Woas (*op. cit.*) indicated different habitat preferences from the literature and own observations, whereupon *O. uliginosa* was mainly found in moss. Likewise in Vorarlberg 76% of samples with *O. uliginosa* are from moss and mossy habitats, as opposed to only 25% of samples with *O. nova*.

#### *Oppiella unicarinata* (Paoli, 1908) (*Moritzoppia*)

**Vorarlberg:** **Bregenzerwald**—near Sulzberg: wet meadow (805 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m); Ebniter Tal, near Koblalp: birch stand, wet *Juncus* with moss (1040 m); Dämüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); Subersachtal north of Schoppernau, steep slope: krummholz, woody litter (1600 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg—Hochgerach summit: alpine grassland (1980 m) [6 part. sub *Moritzoppia unicarinata*]. **Brandnertal**—Lünernersee, path to Totalphütte: Rhododendretum (2130 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane meadows, pastures and wetlands, subalpine dwarf shrubs, alpine dwarf shrubs and grassland; rather moist to wet (altitude 805–2130 m).

**General distribution:** Austria (B K N S St nT oT V), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BG BZ); Holarctic, northern Neotropical.

#### *Ramusella clavipectinata* (Michael, 1885) (*Ramusella*)

**Vorarlberg:** New record for Vorarlberg. **Walgau**—Gamperdonatal, tollbooth: spruce forest, rotten wood in old tree stump (750 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane forest, in rotten wood (altitude 750 m).

**General distribution:** Austria (B N nT), Southern Germany (BW BY), Italian Alps (BG BZ TN TV); semicosmopolitan.

*Ramusella furcata* (Willmann, 1928) (*Insculptoppia*)

**Vorarlberg:** New record for Vorarlberg. **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m). **Rheintal**—Götzis, Örfla gorge above Meschach: mixed forest (670 m); Feldkirch, Unterries near Bangs: moist meadow (435 m). **Bregenzerwald**—Sulzberg, near Doren: hay meadow (490 m); between Ittensberg and Großdorf: wet meadow (810 m); Argenau, Wieden: hay meadow (690 m). **Walgau**—near Göfis: raised bog, moist grass litter and moss (555 m) [unpubl.].

**Vorarlberg habitats:** colline forest, meadows and raised bog; rather moist; rare (altitude 396–810 m).

**General distribution:** Austria (B K N O St oT), Southern Germany (BW), Italian Alps (BZ); Europe, Caucasus, Palaearctic?

*Ramusella insculpta* (Paoli, 1908) (*Insculptoppia*)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: wet Molinetum; raised bog (1145–1150 m) [7]. **Walgau**—Jagdberg: colline mixed forest, brookside with moss; fen, in reed (565–640 m) [6].

**Vorarlberg habitats:** single records in colline forest, colline and low montane wetlands (altitude 565–1150 m).

**General distribution:** Austria (B K N O nT V W), Switzerland (BL VD), Southern Germany (BW), Italian Alps (BL BZ TN); southern Palaearctic, Oriental.

*Subiasella quadrimaculata* (Evans, 1952) (*Lalmoppia*)

**Vorarlberg:** **Walgau**—Jagdberg: fen, moss in reed (565 m) [6].

**Vorarlberg habitats:** single record in colline wetland (altitude 565 m).

**General distribution:** Austria (nT oT V), Switzerland (GR), Southern Germany (BW), Italian Alps (BZ); Palaearctic.

## Fam. Quadroppiidae Balogh, 1983

*Coronoquadroppia monstruosa* (Hammer, 1979)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (405 m). **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele: mixed forest (490 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest (1200 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Cornelius in Tosters: mixed forest (510–540 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation (620 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Balderschwangertal, near Gerisgschwend: spruce forest (1010 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist moss (1145 m) [7]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); Bizauer Tal, Löffelau tollbooth: mixed forest (960 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Hirschau: deciduous forest, moss on rock (730 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfreben: spruce forest (1035 m); Subersachtal: spruce forest (1200 m). **Kleinwalsertal**—Baad, near Camping Vorderboden: mixed forest (1220 m); Hirschegg, Schwarzwässertal: spruce forest (1340 m). **Hochtannberg**—southwest of Kalbelesee: Rhododendretum (1770 m). **Laternal**—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; colline mixed forest; brookside; subalpine pasture with rocks; Hochgerach summit: alpine grassland (490–1980 m) [6 also part. sub *C. gumista*, *C. galaica*, unpubl.]; near Göfis: raised bog, wet grass litter and moss (555 m); Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, at road bridge: mixed forest (930 m); ibid., south of Vasalpe: pasture (930 m); ibid., near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Meier near Thüringerberg: mixed forest (765 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385–1590 m); ibid., above

“Fuchswald”: mixed forest (1280 m). **Klostertal**—west of Wald, beside road: mixed forest (915 m); west of Langen: mixed forest on scree (1040 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Oberlech: dwarf shrubs (1650 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forests (900–1115 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests, colline and low montane wetlands, low montane and montane meadows and pastures, subalpine dwarf shrubs, alpine dwarf shrubs and grassland; xeric to rather moist (altitude 405–2130 m).

**General distribution:** Austria (B K N O nT V), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ); Central, South, West Europe, Oriental (Java), North America.

**Remark:** Synonym: *Coronoquadroppia gumista* (Gordeeva & Tarba, 1990) according to Weigmann & Schatz (2015). Schatz & Fischer (2013 [6]) reported *Coronoquadroppia galaica* (Minguez, Ruiz & Subías, 1985) from Jagdberg together with *C. monstruosa* (sub „*C. gumista*“) in the same sample. The morphological variabilities of the „*C. galaica*“ specimens are in the range of *C. monstruosa*, so all these findings are considered as *C. monstruosa*.

*Quadroppia hammerae* Minguez, Ruiz & Subías, 1985

**Vorarlberg:** **Kleinwalsertal**—Rietzlern, beside mill: pasture (1070 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows (680–825 m) [6]. **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m). **Arlberg area**—Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); west of Zug: subalpine pasture (1540 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., Rhododendretum (2130 m); ibid., subnival region, *Ranunculus alpestris* cushion, herbs with soil (2320 m) [unpubl.].

**Vorarlberg habitats:** colline meadows and wetlands, low montane pasture, montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs, subnival cushion plants; moist (altitude 680–2320 m).

**General distribution:** Austria (nT V), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic, Central America (Costa Rica), New Zealand, Hawaii.

*Quadroppia longisetosa* Minguez, Ruiz & Subías, 1985

**Vorarlberg:** New record for Vorarlberg and Austria. **Montafon**—west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m). **Brandnertal**—Lünersee, path to Totalphütte: Rhododendretum (2130 m); ibid., subnival region, dry grass cushion (2390 m) [unpubl.].

**Vorarlberg habitats:** subalpine and alpine dwarf shrubs, subnival cushion plants; rare (altitude 1860–2390 m).

**General distribution:** Switzerland (NW), Italian Alps (BZ); Central, Southwest Europe, Makaronesia.

*Quadroppia quadricarinata* (Michael, 1885)

**Vorarlberg:** **Rheintal**—south of Lauterach: wet meadow (410 m); above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest (1200–1220 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Röthis, above Viktorsberg: mixed forest (920 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Cornelius in Tosters: mixed forest (540 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation (620 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Gschwendele: mixed forest (790 m); ibid., near Falz: mixed forest (995 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m) [unpubl.]; Fohramoos: moorland forest, moist to wet moss; fen, wet *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, near Emser Hütte: pasture (1260 m); ibid., Briedler Alpe: spruce forest (1450 m); ibid., below Hohe Kugel: subalpine grassland, Nardetum (1635 m); ibid., Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); ibid., near Vorderschauern: spruce forest (970 m); ibid., road junction to Kobealpe: mixed forest (740 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Vordere Niedere near

Bezau: spruce forest (1420 m); Bizauer Tal: mixed forests (730–960 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); Mellau, Roßstellealpe: mixed forest (1050 m); Hirschau: deciduous forest (730 m); between Hirschau and Schnepfau: deciduous forest (730 m); above Bad Hopfreben: spruce forest (1035 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Diedamskopf, summit: alpine grassland (2090 m); ibid., west of Halden Alpe: dwarf shrub (1720 m); Subersachtal: spruce forest (1200 m). Kleinwalsertal—Rietzlern, beside mill: pasture (1070 m); above Walmendinger Alpe: dwarf shrubs (1860 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m); southwest of Kalbelesee: Rhododendretum (1770 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m); west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest; subalpine pasture with *Juniperus communis* rocks and lichens; dwarf shrubs with grass and herbs; Hochgerach summit: alpine grassland (705–1980 m) [6, unpubl.]; near Göfis: raised bog, moist grass litter and moss (555 m); Gamperdonatal, at road bridge: mixed forest (930 m); ibid., near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1160–1385 m); ibid., above “Fuchswald”: mixed forest (1280 m). **Klostertal**—west of Wald, beside road: mixed forest (915 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); east of Zug: spruce forest (1475 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); Spullerbachtal: raised bog at Spullerbach, moist moss below *Alnus viridis* (1680 m); Spullersee: Rhododendretum (1840 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, above road: mixed forest (950 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m); Ochsental, at Vermunt glacier: subnival region, *Saxifraga* and *Silene* cushions, moss (2610–2620 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m); ibid., near Totalphütte: subnival region, dry *Carex firma*, *Anthyllis vulneraria*, *Dryas octopetala* cushions (2390–2410 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests and wetlands, low montane and montane pastures, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to wet (altitude 410–2620 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG BL GR NE VD ZH), Southern Germany (BW BY), Italian Alps (BG BZ TN); Holarctic, Oriental, Ethiopian.

## Fam. Thysanidae Grandjean, 1953

*Banksinoma lanceolata* (Michael, 1885)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Buch at Bregenzer Ach: meadow (650 m). **Leiblachatal**—Gören near Hohenweiler: pasture (560 m). Bregenz—Pfänder: spruce forest (1030 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Montafon**—St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline meadows and pastures, low montane forests; rare (altitude 560–1030 m).

**General distribution:** Austria (B N St nT oT), Switzerland (BL VD), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Hawaii.

*Pantelozetes alpestris* (Willmann, 1929)

**Vorarlberg:** New record for Vorarlberg. **Montafon**—Ochsental, Vermunt Alpe: alpine grassland (2240 m). **Brandnertal**—Lünersee, near Totalphütte: subnival region, dry *Carex firma*, *Anthyllis vulneraria*, *Dryas octopetala* cushions (2390–2410 m) [unpubl.].

**Vorarlberg habitats:** single records in alpine grassland and subnival cushion plants (altitude 2240–2410 m).

**General distribution:** Austria (K N St nT), Switzerland (GR UR), Italian Alps (BZ TN); Holarctic, western Oriental (Pakistan). Mainly in alpine habitats.

*Pantelozetes paolii* (Oudemans, 1913)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: spruce forest (398 m). **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest (1200 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m); Feldkirch, St. Corneli in Tosters: mixed forest (510–540 m); ibid., Unterries near Bangs: moist meadow (435 m); ibid., Gisingen: riverine forest (435 m). **Bregenzerwald**—Sulzberg, near Gschwendele: mixed forest (790 m); ibid., near Falz: mixed forest (995 m); ibid., hay meadow (980 m); near Sulzberg: wet meadow (805 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m); ibid., mixed forest beside raised bog (1020 m); Ebniter Tal, Briedler Alpe: spruce forest (1450 m); Bizauer Tal, near river: mixed forest (1000 m); Schnepfau, near Bregenzer Ach: riverine forest (720–730 m); Mellau, Roßstellealpe: mixed forest (1050 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); between Bad Hopfreben and Schoppernau: pasture (920 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist moss; fen and raised bogs (1145–1150 m) [7]; above Bad Hopfreben: spruce forest (1035 m); Oberdamüls: pasture (1690 m); Diedamskopf: alpine grassland (1550–2090 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m); Subersachtal north of Schoppernau, steep slope: krummholz, woody litter (1600 m) [unpubl.]. Ifenstock area: sinkhole in „Gottesackerplateau“ north of Ifenstock (1780 m) [3, 5 sub *Oribella paolii*]. Hochtannberg—southwest of Kalbelesee: Rhododendretum (1730 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: montane spruce forest, moss and needle litter; subalpine pasture with *Juniperus communis* and rocks; dwarf shrubs with grass, herbs and lichens; Hochgerach summit: alpine grassland (1555–1980 m) [6]; Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, at road bridge: mixed forest (930 m); west of Nüziders: beech forest (545 m). **Großes Walsertal**—west of Buchboden at bridge: mixed forest (900 m); Laguztal, near Alpe Laguz and „Fuchswald“: *Pinus sylvestris* forest (1160–1590 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, Silberberg near Schruns: mixed forest (900–950 m); Gargellenthal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests, colline and low montane meadows, pastures and wetlands, subalpine dwarf shrubs and pastures and alpine grasslands; rather xeric to moist (altitude 398–2090 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (GR VS), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental (Java).

## Fam. Suctobelbidae Jacot, 1938

*Allosuctobelba grandis* (Paoli, 1908)

**Vorarlberg: Rheintal**—Röthis, above Viktorsberg: mixed forest (920 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, moss (685 m) [6].

**Vorarlberg habitats:** single records in colline and low montane forests; rare (altitude 685–920 m).

**General distribution:** Austria (B N St nT V), Switzerland (GL GR TG TI), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental (China).

*Helvetobelba dichotoma* Mahunka & Mahunka-Papp, 1999

**Vorarlberg:** New record for Vorarlberg and Austria. **Klostertal**—Innerbraz west of Dalaas, above road near GH „Engel“: mixed forest on foot of cliff, leaf litter between rocks (47°07'46" N 9°57'55" E, 780 m, 21.vi.1984) [unpubl.].

**Vorarlberg habitats:** single record in low montane forest (altitude 780 m).

**General distribution:** Switzerland (SG TI); Alps (endemic).

**Remark:** In the meantime, this site has been destroyed in the course of the new highway construction.

*Rhynchobelba ornithorhyncha* (Willmann, 1953)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Fohramoos: spruce forest, wet moss (1145 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); Damüls, Krumbach: spruce forest (1450 m) [unpubl.].

**Vorarlberg habitats:** single records in colline to montane forests (altitude 705–1450 m).

**General distribution:** Austria (S St nT), Switzerland (GL), Italian Alps (BZ); Alps, Northwestern Romania.

**Remark:** Generic assignment according to Mahunka & Mahunka-Papp (2001).

*Suctobelba altvateri* Moritz, 1970

**Vorarlberg:** **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele: mixed forest (490–960 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Corneli in Tosters: mixed forest (510 m); ibid., Unterries near Bangs: moist meadow (435 m); ibid., Gisingen: riverine forest (435 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Gschwendele: mixed forest (790 m); ibid., near Falz: mixed forest (995 m); ibid., steep slope above Doren: mixed forest (530 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist to wet moss; raised bog (1145–1150 m) [7]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m); ibid., above Hackwald: mixed forest (920 m); ibid., near Vorderschauern: spruce forest (970 m); ibid., road junction to Kobelalpe: mixed forest (740 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Vordere Niedere near Bezau: spruce forest (1420 m); ibid., Sonderdach: mixed forest (980 m); Bizauer Tal, Löffelau tollbooth: mixed forest (960 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); Hirschau: deciduous forest, moss on rock (730 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls: pasture (1690 m); Sibratsgfäll, Völken: spruce forest (1050 m); ibid., beside Subersach, near ski slope: pasture (860 m). Kleinwalsertal—Hirschgägg, Schwarzwassertal: spruce forest (1340 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m); southwest of Kalbelesee: Rhododendretum (1730–1770 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, brookside; hay and xeric meadows; subalpine pasture with *Juniperus communis* and rocks, lichens, (570–1725 m) [6]; near Göfis: raised bog, moist grass litter and moss (555 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Bazulwald west of Nenzing: mixed forest (670 m); Saminatal: mixed forest (740 m); Gamperdonatal: mixed forests (930–1280 m). **Großes Walser-tal**—west of Buchboden at bridge: mixed forest (900 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385–1590 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); ibid., above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); ibid., above Schlegelkopf: subalpine pasture, Curvuletum (1850 m); west of Zug: subalpine pasture (1540 m); Spullersee: Rhododendretum (1840 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forests (900–1115 m); ibid., near Fellimännle: pasture (1100 m); Gargellenal: spruce forests, moss on rocks (1390–1510 m). **Brandnertal**—Lünersee, path to Totalphütte: Rhododendretum (2130 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests, colline and low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to moist (altitude 435–2130 m).

**General distribution:** Austria (B N nT oT V), Switzerland (NE VS), Southern Germany (BW BY), Italian Alps (BZ); southwestern Palaearctic.

*Suctobelba atomaria* Moritz, 1970

**Vorarlberg:** **Rheintal**—Götzis, Örfla gorge above Meschach: mixed forest (670 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m). **Bregenzerwald**—Bizauer Tal, Löffelau tollbooth: mixed forest (960 m); Au, Argenzipfel, Leuebach: mixed forest (995 m) [unpubl.]. **Walgau**—Jagdberg: Hochgerach summit: alpine grassland (1980 m) [6]; near Göfis: raised bog, moist grass litter and moss (555 m); west of Satteins, near rivulet

Kirchenbach: riverine forest (505 m); Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Saminatal: spruce forest (530 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline wetlands, low montane pasture, alpine grassland; rather xeric to moist (altitude 505–995 m, 1705–1980 m).

**General distribution:** Austria (V), Switzerland (BL GR VS), Southern Germany (BW BY); also in remaining Central Europe, Caucasus.

*Suctobelba granulata* Hammen, 1952

**Vorarlberg:** New record for Vorarlberg. **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m). **Arlberg area**—Spullerbachtal: raised bog at Spullerbach, moist moss below *Alnus viridis* (1790 m) [unpubl.].

**Vorarlberg habitats:** single records in montane forest, subalpine dwarf shrubs (altitude 1385, 1790 m).

**General distribution:** Austria (K nT), Switzerland (TI), Southern Germany (BW); Palaearctic.

*Suctobelba regia* Moritz, 1970

**Vorarlberg:** **Rheintal**—east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m). **Bregenzerwald**—Vordere Niedere near Bezau, Sonderdach: mixed forest, dry moss on rock (980 m); Hirschau: deciduous forest, moss on rock (730 m). Kleinwalsertal—Hirschgägg, Schwarzwässertal: spruce forest (1340 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; subalpine pasture with rocks and lichens; Hochgerach summit: alpine grassland (590–1980 m) [6]; Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline meadows, subalpine dwarf shrubs and pasture, alpine grassland; rather moist (altitude 440–1980 m).

**General distribution:** Austria (O nT V), Switzerland (GR SG TI), Southern Germany (BW), Italian Alps (BZ); Palaearctic.

*Suctobelba reticulata* Moritz, 1970

**Vorarlberg:** Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadow; subalpine pasture with rocks (680–1700 m) [6]; Gamperdonatal, at road bridge: mixed forest (930 m). **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m). **Arlberg area**—Spullersee: Rhododendretum (1840 m) [unpubl.].

**Vorarlberg habitats:** low montane to montane forests, colline wetlands, subalpine dwarf shrubs; rather moist; rare (altitude 680–1840 m).

**General distribution:** Austria (nT V), Switzerland (GR), Southern Germany (BY); Central, Southeast Europe.

*Suctobelba secta* Moritz, 1970

**Vorarlberg:** **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m). **Bregenzerwald**—Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadow; Hochgerach summit: alpine grassland (680–1980 m) [6].

**Vorarlberg habitats:** colline and montane forests, colline wetlands, alpine grassland; rather moist; rare (altitude 490–1185 m, 1980 m).

**General distribution:** Austria (nT V), Southern Germany (BW), Italian Alps (BZ); Central, Southeast Europe.

*Suctobelba trigona* (Michael, 1888)

**Vorarlberg:** **Rheintal**—south of Lauterach: wet meadow (410 m); above Dornbirn, near Bödele: mixed forest (960 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m); ibid., Unterries near Bangs: moist meadow

(435 m). **Leiblachtal**—west of Eichenberg, brookside: riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Balderschwangertal, near Gerisgschwend: spruce forest (1010 m) [unpubl.]; Fohramoos: moorland forest, moist to wet moss; raised bog (1145–1150 m) [7, unpubl.]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m); ibid., near Vorderschauern: spruce forest (970 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf, summit: alpine grassland (2090 m); ibid., dwarf shrubs (1720–1840 m); Sibratsgfäll, Völken: spruce forest (1050 m); ibid., beside Subersach, near ski slope: pasture (860 m). **Kleinwalsertal**—above Walmendinger Alpe: dwarf shrubs (1860 m); Hirschgägg, Schwarzwassertal: spruce forest (1340 m). **Hochtannberg**—southwest of Kalbelesee: Rhododendretum (1770 m). **Laternsertal**—west of Furkajoch: spruce forest, moss on rock (1185 m); Furkajoch: dwarf shrubs (1640–1770 m). **Walgau**—Jagdberg: colline mixed forest; montane spruce forest, moss; subalpine pasture with *Juniperus communis* and rocks; Hochgerach summit: alpine grassland (705–1980 m) [6, unpubl.]; Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1160–1385 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Oberlech: dwarf shrubs (1650 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, near Fellimännle: pasture (1100 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); ibid., at Vermunt glacier: subnival region, moss (2620 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m) [unpubl.].

**Vorarlberg habitats:** numerous records throughout the country: colline to montane forests, colline and low montane meadows, pastures and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to wet (altitude 410–2620 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG AP BL GL GR SO TG TI VD VS), Southern Germany (BW BY), Italian Alps (BG BZ TN); Palaearctic, Greenland.

#### *Suctobelbata prelli* (Markel & Meyer, 1958)

**Vorarlberg: Rheintal**—east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m) [unpubl.]. **Bregenzerwald**—Fohramoos: raised bog (1150 m) [7]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); ibid., near Kobelealpe: birch stand, wet *Juncus* with moss (1040 m). **Laternsertal**—west of Furkajoch: spruce forest (1370 m). **Walgau**—Gamperdonatal, tollbooth: spruce forest, rotten wood in old tree stump (750 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands; rather moist to wet; rare (altitude 440–1370 m).

**General distribution:** Austria (V), Southern Germany (BW), Italian Alps (BZ); Central, South, Southeast Europe.

#### *Suctobelbella acutidens* (Forsslund, 1941)

**Vorarlberg: Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Hohenems, „Old Rhine“: riverine forest (405 m). **Leiblachtal**—west of Eichenberg, brookside: riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, raised bog, moist to wet moss (1145–1150 m) [7, unpubl.]; Ebniter Tal, near Vorderschauern: spruce forest (970 m); Bizauer Tal, at tollbooth: mixed forest (730 m); Hirschau: deciduous forest (730 m); between Hirschau and Schnepfau: deciduous forest (730 m); Argenau, Wieden: hay meadow (690 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfreben: spruce forest (1035 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); below Kanisfluh: mixed forest (1190 m); Diedamskopf, west of Halden Alpe: dwarf shrub (1720 m); Sibratsgfäll, Völken: spruce forest (1050 m). **Hochtannberg**—southwest of Kalbelesee: Rhododendretum (1770 m). **Laternsertal**—Furkajoch: dwarf shrubs (1770 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest; montane spruce forest, moss; subalpine pasture with *Juniperus communis* and rocks; Hochgerach summit: alpine grassland (705–1980 m) [6, unpubl.]; Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m).

**gau**—Jagdberg: hay and xeric meadows; fen; Hochgerach summit: alpine grassland (565–1980 m) [6]; Latz west of Nenzing, at Galina bridge: deciduous forest (690 m). **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385–1590 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); ibid.: subalpine pasture, Curvuletum (1850 m). **Montafon**—Gargellen, north of Gargellen: spruce forest (1390 m); south of Partenen, near tollbooth: herbaceous pasture (1150 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m). **Brandnertal**—Lünersee, path to Totalphütte: Rhododendretum (2130 m); ibid., subnival region, dry herb and grass cushions (2390–2406 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to wet (altitude 405–2406 m).

**General distribution:** Austria (B O St nT V), Switzerland (GR NE SG VD VS), Southern Germany (BW BY), Italian Alps (BS BZ); Holarctic, South America (Argentina).

*Suctobelbella acutidens* (Forsslund, 1941) spp. *lobata* (Strenzke, 1950)

**Vorarlberg:** New record for Vorarlberg. **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m) [unpubl.].

**Vorarlberg habitats:** single record in a low montane meadow (altitude 860 m).

**General distribution:** Austria (nT oT), Southern Germany (BW), Italian Alps (BZ); Europe, Caucasus.

*Suctobelbella arcana* Moritz, 1970

**Vorarlberg: Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Ebniter Tal, above Hackwald: mixed forest (920 m); above Bad Hopfreben: spruce forest (1030 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1650 m) [unpubl.]. **Walgaus**—Jagdberg: hay and xeric meadows; montane spruce forest, moss (565–1580 m) [6]. **Brandnertal**—Lünersee, above Totalphütte: subnival region, dry herb cushion (2406 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline meadows, subalpine dwarf shrubs, subnival cushion plants; xeric to moist; rare (altitude 470–2406 m).

**General distribution:** Austria (N O nT V), Switzerland (AP GR NE SG TI), Southern Germany (BW BY), Italian Alps (BZ); Holarctic.

*Suctobelbella falcata* (Forsslund, 1941)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Götzis, above Meschach: fir forest (1140 m). **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); above Mellau: mixed forest (960 m). **Walgaus**—Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests; frequently in rotten wood; moist (altitude 705–1280 m).

**General distribution:** Austria (St nT), Switzerland (LU TG TI), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic; New Zealand.

**Remark:** Considered as synonym of *S. longicuspis* Jacot, 1937 according to Subías (2004, electronic update 2020), considered as possible synonym of *S. longicuspis* according to Woas (1986).

*Suctobelbella forsslundi* (Strenzke, 1950)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (405 m). **Rheintal**—south of Lauterach: wet meadow (410 m); Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele: mixed forest (490 m); Hohenems, „Old Rhine“: riverine forest (405 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Cornelius in Tosters: mixed forest (510–540 m); ibid., Gisingen: riverine forest (435 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder, Fluh: mixed forest (750 m). **Bregenzerwald**—Sulzberg, near Gschwendle: mixed forest (790 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m); between Ittensberg and

Großdorf: meadow (810 m) [unpubl.]; Fohramoos: dry Nardetum; raised bog (1145 m) [7]; Ebniter Tal: mixed forests (740–920 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal, near river: mixed forests (730–1000 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); above Mellau: mixed forest (960 m); Hirschau: deciduous forest (730 m); between Hirschau and Schnepfau: deciduous forest (730 m); Au, Argenzipfel, Leuebach: mixed forest (995 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m); southwest of Kalbelesee: Rhododendretum (1770 m). **Walgau**—near Göfis: raised bog, moist grass litter and moss (555 m); west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Gamperdonatal: mixed forest (930–1280 m); ibid., south of Vasalpe: pasture (930 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m); west of Langen near Alfenz river: riverine forest (1050 m). **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); west of Zug: subalpine pasture (1540 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, above road: mixed forest (950 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., Rhododendretum (2130 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane and montane meadows, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to wet (altitude 405–2130 m).

**General distribution:** Austria (N O nT V), Switzerland (GR NE SG TI VD VS), Southern Germany (BW), Italian Alps (BZ); Palaearctic.

*Suctobelbella hamata* Moritz, 1970

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—above Schnepfegg: mixed forest, rotten wood on tree stump (880 m). **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane and montane forests (altitude 880–1280 m).

**General distribution:** Austria (nT), Southern Germany (BW BY); Central, South Europe, Makaronesia, southern North America (Louisiana).

*Suctobelbella latirostris* (Strenzke, 1950)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: rivulet in moorland forest, moist to wet moss; raised bog, wet moss (1145–1150 m) [7, unpubl.].

**Vorarlberg habitats:** reported only from Fohramoos near Bödele; low montane forest and raised bog (altitude 1145–1150 m).

**General distribution:** Austria (nT V), Southern Germany (BW BY), Italian Alps (TN); Palaearctic; Oriental (Vietnam).

*Suctobelbella longirostris* (Forsslund, 1941)

**Vorarlberg:** **Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, dry litter and wet moss; raised bog, moist leaf litter, wet grass and moss (1145–1150 m) [7]; above Schnepfegg: mixed forest, rotten wood on tree stump (880 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane and montane forests, low montane wetlands; moist to wet (altitude 880–1220 m).

**General distribution:** Austria (St V), Switzerland (NE TG), Southern Germany (BY), Italian Alps (BZ); Holarctic.

*Suctobelbella moritzi* Mahunka, 1987

**Vorarlberg:** **Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, moss; fen, wet *Sphagnum* (1145–1150 m) [7].

**Vorarlberg habitats:** reported only from Fohramoos near Bödele; low montane forests, meadows and moorlands, dry grass tussock and wet mosses (altitude 1145–1150 m).

**General distribution:** Austria (B V); also in remaining Central Europe, Caucasus (Dagestan).

*Suctobelbella nasalis* (Forsslund, 1941)

**Vorarlberg:** **Rheintal**—Götzis, Örfla gorge above Meschach: mixed forest (670 m); Feldkirch, St. Corneli in

Tosters: mixed forest (540 m). **Bregenzerwald**—Sulzberg, near Doren: hay meadow (490 m); Sulzberg, steep slope above Doren: mixed forest (530 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m); Fohramoos: spruce forest; raised bog, moist to wet moss (1145 m); Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); Bregenzer Ach near Bezau: riverine forest (620 m); Bizauer Tal, near river: mixed forest (1000 m); above Schnepfegg: mixed forest (880 m); above Mellau: mixed forest (960 m); below Kanisfluh: mixed forest (1190 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m) [unpubl.]. **Walzau**—Jagdberg: fen; hay and xeric meadows; montane spruce forest with *Juniperus communis* and rocks; subalpine pasture, moss (565–1650 m) [6]; Saminatal: mixed forest (740 m); Gamperdonatal: mixed forests (930–1280 m). **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1160–1385 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m); west of Wald, beside road: mixed forest (915 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); east of Zug: spruce forest (1475 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forests (900–1115 m); ibid., near Fellimännle: pasture (1100 m); Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m). **Brandnertal**—Lünersee, path to Totalphütte: Rhododendretum (2130 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows, pastures and wetlands, subalpine dwarf shrubs, pastures and wetlands, alpine dwarf shrubs; xeric to wet (altitude 490–2130 m).

**General distribution:** Austria (N nT V), Switzerland (BE VD), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic, western Oriental (Pakistan), New Zealand.

#### *Suctobelbella palustris* (Forsslund, 1953)

**Vorarlberg:** **Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m). **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, dry to wet litter and moss; wet Moliniatum, fen, wet moss; raised bogs, leaf litter (1145–1150 m) [7, unpubl.]; Ebniter Tal: spruce forests (970–1270 m); Mellau, Roßstellealpe: mixed forest (1050 m); Diedamskopf: dwarf shrubs (1840 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m); Ifenstock area, west of Schönenbach Alm: raised bog, wet *Sphagnum* (1020 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m) [unpubl.]. **Walzau**—Jagdberg: fen, moss in reed (565 m) [6]; near Göfis: raised bog, moist grass litter and moss (555 m). **Großes Walsertal**—Laguztal, “Fuchswald”: *Pinus sylvestris* forest (1160 m). **Arlberg area**—Oberlech: dwarf shrubs (1650 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Gargellental, north of Gargellen: spruce forest (1390 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane pastures, colline and low montane wetlands, subalpine dwarf shrubs; rather moist to wet (altitude 555–1840 m).

**General distribution:** Austria (O St nT V), Switzerland (GR JU NE), Southern Germany (BW), Italian Alps (BZ); Holarctic, western Oriental (Pakistan).

#### *Suctobelbella perforata* (Strenzke, 1950)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Schnepfau, near Bregenzer Ach: mixed forest (730 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Damüls, Krumbach: spruce forest (1450 m). **Walzau**—Gamperdonatal, at road bridge: mixed forest (930 m). **Großes Walsertal**—Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests; rare (altitude 730–1590 m).

**General distribution:** Austria (O St nT), Switzerland (GR NE VD VS), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

#### *Suctobelbella sarekensis* (Forsslund, 1941)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (397 m). **Rheintal**—south of Lauterach: wet meadow (410 m); Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele: mixed

forest (490–960 m); Schuttannen above Hohenems: spruce forest (1200–1220 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); ibid., Batschuns: pasture in orchard (590 m); Feldkirch, St. Corneli in Tosters: mixed forest (510–540 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); between Weinried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest (650 m); Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Gschwendle: mixed forest (790 m); ibid., near Doren: hay meadow (490 m); ibid., steep slope above Doren: mixed forest (530 m); Balderschwangertal, near Gerisgswend: spruce forest (1010 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, wet moss; wet Molinietum; fen and raised bogs; wet *Sphagnum* (1145–1150 m) [7]; Ebniter Tal: spruce forests (1270–1450 m); ibid., mixed forests (740–970 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal: mixed forests (730–1000 m); ibid., south of Bizau: hay meadow (680 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); above Mellau: mixed forest (960 m); Hirschau: deciduous forest, moss on rock (730 m); between Hirschau and Schnepfau: deciduous forest (730 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfreben: mixed forest (1030 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); below Kanisfluh: mixed forest (1190 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); ibid., Krumbach: spruce forest (1450 m); Diedamskopf, west of Halden Alpe: dwarf shrub (1720 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). **Kleinwalsertal**—Baad: pasture (1240 m); Walmendinger Horn, near summit: subalpine pasture (1970 m); ibid., dwarf shrubs (1860 m); Hirschgägg, Schwarzwässertal: spruce forest (1340 m); Hörnlepass: raised bog, wet moss (1160 m); Warth, near Tyrolean border: spruce forest (1480 m); southwest of Kalbelesee: Rhododendretum (1770 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m); west of Furkajoch: spruce forest (1185–1370 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forests, brookside; fen; subalpine pasture with rocks (565–1700 m) [6]; above Thüringen, near Quadern: mixed forest (615 m); near Göfis: raised bog, moist grass litter and moss (555 m); west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Saminatal: mixed forest (530–740 m); Gamperdonatal, at road bridge: mixed forests (930–1280 m); ibid., south of Vasalpe: pasture (1180 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1160–1590 m); ibid., above “Fuchswald”: mixed forest (1280 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Oberlech: dwarf shrubs (1650 m); east of Zug: spruce forest (1475 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); west of Zug: subalpine pasture (1540 m); Spullerbachtal: raised bog at Spullerbach, moist moss below *Alnus viridis* (1680 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, Silberberg near Schruns: mixed forest (900–1115 m); ibid., near Fellimännle: pasture (1100 m); Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); ibid., north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); Unterermunt, near road: slope with *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m); ibid., subnival region, dry *Carex firma*, *Anthyllis vulneraria* and herb cushions (2390–2410 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, meadows and pastures, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs, subnival cushion plants; xeric to moist (altitude 397–2410 m).

**General distribution:** Austria (B K N O nT V W), Switzerland (BL GR JU NE ZH), Southern Germany (BW BY), Italian Alps (BZ); Holarctic.

*Suctobelbella similis* (Forsslund, 1941)

**Vorarlberg: Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); Schuttannen above Hohenems: spruce forest (1200–1220 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—near Sulzberg: wet meadow (805 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: moorland forest, wet moss; fen and raised bogs; wet leaf litter and *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal: spruce forest (970–1270 m); ibid., above Hackwald: mixed forest (920 m); Hirschau: deciduous forest (730 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf: dwarf shrubs (1840 m); Sibratsgfäll, Völken: spruce forest (1050 m). Kleinwalsertal—Hirscheegg, Schwarzwassertal: spruce forest (1340 m). **Walgau**—Jagdberg: montane spruce forest, moss and needle litter (1610 m) [6]. **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, subalpine dwarf shrubs and pasture; xeric to moist (altitude 480–1880 m).

**General distribution:** Austria (N St nT V), Switzerland (AP GR NE NW TI UR VS), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

*Suctobelbella singularis* (Strenzke, 1950)

**Vorarlberg: Bregenzerwald**—Au, Argenzipfel, Leuebach: mixed forest (995 m); Diedamskopf, west of Halden Alpe: dwarf shrub (1720 m) [unpubl.]. **Walga**—Jagdberg: fen with reed (640 m) [6]; near Göfis: raised bog, moist grass litter and moss (555 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m). **Montafon**—Gargellenthal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, colline wetlands, subalpine dwarf shrubs; xeric to moist (altitude 555–1720 m).

**General distribution:** Austria (V), Southern Germany (BW); Palaearctic, Oriental.

*Suctobelbella subcornigera* (Forsslund, 1941)

**Vorarlberg: Rheintal**—south of Lauterach: wet meadow (410 m); above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); Röthis, above Viktorsberg: mixed forest (920 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—around Sulzberg: mixed forests (655–995 m); ibid., near Falz: hay meadow (980 m); ibid., steep slope above Doren: mixed forest (530 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Schetteregg, Amagmach: mixed forest, raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, wet moss; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal: spruce forests (970–1270 m); ibid.: mixed forest (740–920 m); ibid., near Kobelealpe: birch stand, wet *Juncus* with moss (1040 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Bregenzer Ach near Bezau: riverine forest (620 m); Vordere Niedere near Bezau, Sonderdach: mixed forest (980 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); above Mellau: mixed forest (960 m); between Hirschau and Schnepfau: deciduous forest (730 m); above Bad Hopfreben: spruce forest (1035 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls, near timberline: spruce forest (1755 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf, west of Halden Alpe: dwarf shrub (1720 m); Sibratsgfäll, Völken: spruce forest (1050 m); ibid., beside Subersach, near ski slope: pasture (860 m). Kleinwalsertal—Baad, near church: pasture (1240 m); Walmendinger Horn: dwarf shrubs (1860 m); above Walmendinger Alpe: dwarf shrubs (1650 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m); southwest of Kalbelesee:

Rhododendretum (1770 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forests, brookside; hay and xeric meadows; fen with reed; subalpine pasture with *Alnus viridis* and rocks (570–1725 m) [6, unpubl.]; near Göfis: raised bog, wet grass litter and moss (555 m); Bazulwald west of Nenzing: mixed forest (670 m); Saminatal: pasture (510 m); ibid.: mixed forest (690 m); Gamperdonatal, south of Vasalpe: pasture (1180 m); ibid., near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m); ibid., above “Fuchswald”: mixed forest (1280 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Oberlech: dwarf shrubs (1650 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forest (900–950 m); ibid., above road: mixed forest (950 m); Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); ibid., north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); south of Partenon, near tollbooth: herbaceous pasture (1150 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m); ibid., “Gamsluggen” at crest of Totalköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, colline and low montane meadows, pastures and wetlands, subalpine dwarf shrubs, pastures and wetlands, alpine dwarf shrubs, subnival cushion plants; xeric to wet (altitude 410–2410 m).

**General distribution:** Austria (B K N S St nT V W), Switzerland (BE GE GL GR JU LU SO TG TI VD VS), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental, New Zealand.

*Suctobelbella subtrigona* (Oudemans, 1900)

**Vorarlberg: Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Reute above Hohenems: mixed forest (885 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); west of Eichenberg, brookside: riparian vegetation (620 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Schetteregg, Amagmach: mixed forest, raised bog, wet moss (1020 m) [unpubl.]; Fohramoos: rivulet in moorland forest, wet moss; spruce forest; fen and raised bogs; wet leaf litter and *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, above Hackwald: mixed forest (920 m); Subersachtal: spruce forest (1200 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, brookside; fen; subalpine pasture with rocks and *Alnus viridis*; Hochgerach summit: alpine grassland (565–1980 m) [6]; Latz west of Nenzing, at Galina bridge: deciduous forest (690 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m); west of Langen near Alfenz river: riverine forest (1050 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m). **Montafon**—Silbertal, west of Innerberg: mixed forest (1115 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine grassland; rather moist to wet (altitude 565–1980 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG AP BL GR NE SO TG VS), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental, Neotropical.

*Suctobelbila dentata* (Hammer, 1961) ssp. *europaea* Moritz, 1974

**Vorarlberg: Walgau**—Jagdberg: hay and xeric meadows, fen (680–825 m) [6].

**Vorarlberg habitats:** single records in colline meadows and fen (altitude 680–825 m).

**General distribution:** Austria (V), Southern Germany (BW BY); also in remaining Central Europe, Caucasus (Dagestan).

## Fam. Tectocepheidae Grandjean, 1954

*Tectocepheus knuellei* Vanek, 1960

**Vorarlberg: Bregenzerwald**—Fohramoos: moorland forest, moist to wet litter and moss; raised bogs, wet leaf litter and *Sphagnum* (1145–1150 m) [7]; above Bad Hopfreben: spruce forest (1030 m) [unpubl.]. **Walgau**—Jagdberg: fen with reed (640 m) [6].

**Vorarlberg habitats:** single records in low montane moorland forests, colline, montane, and low montane wetlands (altitude 640–1150 m).

**General distribution:** Austria (N V), Italian Alps (BZ); Palaearctic.

*Tectocepheus minor* Berlese, 1903

**Vorarlberg: Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (397 m). **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele: mixed forest (490–960 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest (1200 m); ibid., pasture (1125 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzing, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Corneli in Tosters: mixed forest (510–540 m); ibid., Unterries near Bangs: moist meadow (435 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, near Falz: mixed forest, rotten wood from tree stump (990 m); Reifensberg, above Niemans: spruce forest (980 m); Balderschwangertal, near Gerisgenschwend: spruce forest (1010 m); Fohramoos: spruce forest (1145 m); Ebniter Tal, near Emser Hütte: pasture (1260 m); ibid., Briedler Alpe: spruce forest (1450 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Bregenzer Ach near Bezau: riverine forest (620 m); Bizauer Tal, at tollbooth: mixed forest (730 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Hirschau: deciduous forest (730 m); Oberdamüls, near timberline: spruce forest (1755 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadow; colline mixed forest; subalpine pasture with rocks and *Alnus viridis* (680–1650 m) [6, unpubl.]; above Thüringen, near Quadern: mixed forest (615 m); between Schnifis and Schlinz, beside rivulet: hay meadow (600 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Saminatal: spruce forest (530 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Laguztal, above “Fuchswald”: mixed forest (1280 m). **Arlberg area**—Lech, above Schlegelkopf: subalpine pasture, Curvuletum (1850 m). **Montafon**—north of Lorüns: mixed forest (585 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows and pastures, colline wetlands, subalpine dwarf shrubs and pastures; xeric to wet (altitude 397–1850 m).

**General distribution:** Austria (B K N O S St nT V W), Southern Germany (BW BY), Italian Alps (BZ TN); semi-cosmopolitan.

*Tectocepheus sarekensis* (Trägårdh, 1910)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rohrspitz: in reed: wet reed litter (396 m); ibid., below *Salix* (396 m); mouth of Rhine-Rheinspitz: deciduous forest (405 m); ibid., spruce forest (398 m). **Rheintal**—south of Lauterach: wet meadow (410 m); Buch at Bregenzer Ach: meadow (650 m); above Dornbirn, near Bödele: mixed forest (490–960 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest (1200 m); Hohenems, „Old Rhine“: riverine forest (405 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); ibid., pasture in orchard (590 m); Feldkirch, St. Corneli in Tosters: mixed forest (510 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Ried near Hohenweiler: mixed forest with oaks (470 m); Hörbranz, Erlach: pasture (480 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, riverbank of Weidach: riverine forest, moss on rocks (595 m); ibid., west of Gullenbach: mixed forest (655 m); ibid., near Falz: mixed forest (995 m); ibid., hay meadow (980 m); ibid., riverbank near Doren: grass litter (450 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m); ibid., mixed forest beside raised bog (1020 m); between Ittensberg and Großdorf: meadow (810 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; raised bogs (1145–1150 m) [7, unpubl.]; Ebniter Tal, near Emser Hütte: pasture (1260

m); ibid., Schneewald Alm: spruce forest (1270 m); ibid., near Vorderschauern: spruce forest (970 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Andelsbuch: hay meadow (635 m); Bregenzer Ach near Bezau: riverine forest (620 m); Vordere Niedere near Bezau, near cableway station: deciduous forest (770 m); ibid.: wet meadow (770 m); Bizauer Tal: mixed forests (730–1000 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: pasture (1230 m); above Mellau: mixed forest (960 m); Mellau: hay meadow (660 m); Hirschau: deciduous forest (730 m); Argenau, Wieden: hay meadow (690 m); between Bad Hopfreben and Schoppernau: pasture (920 m); above Bad Hopfreben: mixed forest (1030 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls: pasture (1690 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf: alpine grassland (1550–2090 m); ibid.: dwarf shrubs (1720–1840 m); Sibratsgfäll, Völken: spruce forest (1050 m); ibid., north of Schoppernau near Halden: hay meadow (1650 m); Subersachtal: spruce forest (1200 m); Ifenstock area, west of Schönenbach Alm: raised bog, wet *Sphagnum* (1020 m). Kleinwalsertal—Baad, near church: pasture (1240 m); Walmendinger Horn, near summit: subalpine pasture (1970 m); ibid., dwarf shrubs (1860 m); above Walmendinger Alpe: dwarf shrubs (1860 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m); southwest of Kalbelesee: Rhododendretum (1730–1770 m). Laternsertal—Furkajoch: dwarf shrubs (1640–1770 m); below Furkajoch: pasture (1550 m); west of Furkajoch: spruce forest (1185–1370 m) [unpubl.]. **Walgaу**—Jagdberg: hay and xeric meadows; colline mixed forests; fen; montane spruce forest; subalpine pastures with *Alnus viridis* and rocks; dwarf shrubs (490–1835 m) [6]; above Thüringen, near Quadern: mixed forest (615 m); near Göfis: raised bog, wet grass litter and moss (555 m); between Schnifis and Schlins, beside rivulet: hay meadow (600 m); Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Saminatal: spruce forest (530 m); ibid., mixed forest (690 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m); ibid., near Alpe Gamperdone: pasture (1320 m); west of Nüziders: beech forest (545 m); west of Bludenz: pasture on woodland edge (530 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); near Blons, beside road: pasture (920 m); south of Faschinajoch, above road: spruce forest (1220 m); west of Buchboden: hay meadow (890 m); Laguztal, above Alpe Laguz: swampy meadow (1585 m); ibid., near Alpe Laguz: *Pinus sylvestris* forest (1160–1385 m); ibid., above “Fuchswald”: mixed forest (1280 m); east of Marul: pasture (980 m). **Klostertal**—Innerbraz, east of Masonbach: hay meadow (695 m); west of Dalaas, above road: mixed forest (775 m); west of Langen near Alfenz river: riverine forest (1050 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); Oberlech: dwarf shrubs (1650 m); ibid., subalpine pasture (1645 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); west of Zug: subalpine pasture (1540 m); Spullerbachtal: subalpine pasture in spruce forest (1620 m); ibid.: raised bog at Spullerbach, moist moss below *Alnus viridis* (1680 m); Spullersee: Rhododendretum (1840 m); Formarintal: dwarf shrubs (1800 m); ibid., near Formarinsee: subalpine pasture (1870 m). **Montafon**—north of Lorüns: mixed forest (585 m); south of Schruns, near river Ill: riverine forest (770 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forests (900–1115 m); Silbertal, near Fellimännele: pasture (1100 m); Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); ibid., north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); south of Partenen, near tollbooth: herbaceous pasture (1150 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m); ibid., near road: slope with *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); ibid., Vermunt Alpe: alpine grassland (2240–2340 m); ibid., at Wiesbadener Hütte: alpine grassland (2465 m); ibid., at Vermunt glacier: subnival region, moss, herb cushions (2620–2630 m). **Brandnertal**—Lünersee, path to Totalphütte: under *Salix* (2050 m); ibid.: subnival region, *Ranunculus alpestris*, *Carex firma*, *Anthyllis vulneraria*, *Silene acaulis*, *Dryas octopetala* cushions (2320–2410 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, meadows, pastures and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival moss and cushion plants; xeric to wet (altitude 396–2630 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (BE BL JU NE VD ZH), Southern Germany (BW BY), Italian Alps (BZ TN); semicosmopolitan.

*Tectocepheus velatus* (Michael, 1880)

**Vorarlberg:** **Bodensee area**—mouth of Rhine, north of Höchst: wet meadow (398 m). **Rheintal**—Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); Feldkirch, St. Cornelius in Tosters: mixed forest (540 m); ibid., Gisingen: riverine forest (435 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m). Bregenz—Pfänder: mixed forest (840 m); Bregenz—ibid., spruce forest (1030 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest 650 m; Sulzberg, near Falz: mixed forest, rotten wood from tree stump (990 m); near Sulzberg: wet meadow (805 m); Reifensberg, above Niemans: spruce forest (980 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Balderschwangertal, near Gerisgswend: spruce forest (1010 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs (1145–1150 m) [7, unpubl.]; Ebniter Tal, below Hohe Kugel: subalpine grassland, Nardetum (1635 m); above Bad Hopfreben: spruce forest (1030 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls, near timberline: spruce forest (1755 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); ibid., Krumbach: spruce forest (1450 m); Diedamskopf, summit: alpine grassland (2000–2090 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m); Subersachtal: spruce forest, rotten wood from tree stump (1290 m). Kleinwalsertal—Walmendinger Horn: dwarf shrubs (1860 m); Hirschgägg, Schwarzwässertal: spruce forest (1340 m) [unpubl.]. **Walga**—Jagdberg: fen; colline mixed forest, montane spruce forest, moss; subalpine pasture with *Juniperus communis* (640–1610 m) [6, unpubl.]; near Göfis: raised bog, moist grass litter and moss (555 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m); west of Buchboden at bridge: mixed forest (900 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m). **Montafon**—Silbertal, Silberberg near Schruns: mixed forest (900 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); ibid., at Wiesbadener Hütte: alpine grassland (2465 m). **Brandnertal**—Lünernersee, near Totalphütte: subnival region, herb and grass cushion (2370–2406 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, low montane forests and pastures, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to wet (altitude 398–2465 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BE BL GR JU NE VD ZH), Southern Germany (BW BY), Italian Alps (BZ SO TN); cosmopolitan.

#### Fam. Hydrozetidae Grandjean, 1954

*Hydrozetes confervae* (Schrank, 1781)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—east of Koblach, foot of Kummenberg: wet meadow, wet reed (420 m). **Bregenzerwald**—Vordere Niedere near Bezau, near cableway station: wet meadow (770 m). Hochtannberg—Kalbelesee: wet meadow (1655 m) [unpubl.].

**Vorarlberg habitats:** single records in colline, montane and subalpine wet meadows; moist to dripping wet (altitude 420–1655 m).

**General distribution:** Austria (K N St nT), Switzerland (BL TI VD), Southern Germany (BY), Italian Alps (BZ TN); Holarctic.

*Hydrozetes lacustris* (Michael, 1882)

**Vorarlberg:** **Rheintal**—Röthis, above Viktorsberg: mixed forest, moist leaf litter (920 m). **Bregenzerwald**—Schetteregg, Amagmach: raised bog, wet moss in water (1020 m) [unpubl.]; Fohramoos: moorland forest, leaf litter and moss; raised bog, wet moss and grass (1145–1150 m) [7, unpubl.]. Kleinwalsertal—Hörnlepass: raised bog, wet moss (1160 m). **Walga**—near Göfis: raised bog, moist moss (555 m). **Montafon**—Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, wet moss (1825 m) [unpubl.].

**Vorarlberg habitats:** low montane forests, colline to subalpine wetlands; moist litter to dripping wet moss (altitude 555–1825 m).

**General distribution:** Austria (K N S St nT V), Switzerland (JU NE VD), Southern Germany (BW), Italian Alps (BZ TN); Holarctic.

*Hydrozetes lacustris* forma *parisiensis* Grandjean, 1948

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Hohenems: Alter Rhein, Wasserprobe (410 m) [leg. Gerecke, 24.iv.2013, unpubl.]

**Vorarlberg habitats:** single record in a colline limnic sample, dripping wet (altitude 410 m).

**General distribution:** Austria (B K N St), Italian Alps (BZ TN); Palaearctic.

**Remark:** Taxonomical status in dispute, subspecific rank according to Subías (electronic update 2007, 2020). Morphological and biometric studies (Deichsel 2005, Weigmann 2006) demonstrate transitions between *lacustris* and *parisiensis*. Weigmann (2006) indicated different habitat preferences and suggested a differentiation of both taxa as „*formae*“.

*Hydrozetes lemnae* (Coggi, 1899)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**—Hochtannberg, Kalbelesee: wet meadow, dripping wet moss (1655 m) [unpubl.].

**Vorarlberg habitats:** single record in subalpine meadow, dripping wet moss near a lake (altitude 1655 m).

**General distribution:** Austria (B K N St), Switzerland (BW), Southern Germany (BW); semicosmopolitan.

## Fam. Limnozetidae Thor, 1937

*Limnozetes ciliatus* (Schrank, 1803)

**Vorarlberg:** **Bregenzerwald**—Schetteregg, Amagmach: raised bog, wet moss in water (1020 m) [unpubl.]; Fohramoos: moorland forest, leaf litter and wet moss; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, near Vorderschauern: spruce forest (970 m); Ifenstock area, west of Schönenbach Alm: raised bog, wet *Sphagnum* (1020 m). Kleinwalsertal—Hörnlepass: raised bog, wet moss (1160 m). Hochtannberg—Kalbelesee: wet meadow (1655 m) [unpubl.]. **Walgau**—Jagdberg: fen (640 m) [6]; near Göfis: raised bog, wet grass litter and moss (555 m) [unpubl.].

**Vorarlberg habitats:** low montane moorland forest, colline to subalpine wetlands; moist litter to dripping wet moss (altitude 555–1655 m).

**General distribution:** Austria (B K N S St nT V), Switzerland (BS GR JU NE VD TI), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Limnozetes rugosus* (Sellnick, 1923)

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**, Kleinwalsertal—Hörnlepass: raised bog, wet moss (1160 m). **Montafon**—Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, wet moss (1825 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane and subalpine raised bogs; dripping wet moss (altitude 1160, 1825 m).

**General distribution:** Austria (St nT oT), Switzerland (NE), Southern Germany (BY), Italian Alps (BZ); Palaearctic.

## Fam. Cymbaeremaeidae Sellnick, 1928

*Cymbaeremaeus cymba* (Nicolet, 1855)

**Vorarlberg:** **Rheintal**—Reute above Hohenems: mixed forest (885 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m) [unpubl.]. **Bregenzerwald**—Fohramoos: dry Nardetum; spruce forest, rivulet in moorland forest, wet moss; raised bog (1145–1150 m) [7, unpubl.]; Vordere Niedere near Bezau: spruce forest (1420 m); Oberdamüls, near timberline: spruce forest (1755 m); Ifenstock area: spring below Schneckenloch cave (1240 m) [3, 5]. **Walgau**—Jagdberg: colline mixed forest, moss (685 m) [6]; Saminatal: spruce forest (530 m). **Großes Walsertal**—south of Faschinajoch, above road: spruce forest (1220 m). **Arlberg area**—Oberlech: spruce forest (1670 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane meadow and wetlands; rather xeric (altitude 530–1755 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BE BL BS GR JU NE VD ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic, Oriental (Himalaya—Sikkim), Mexico.

**Remark:** Schäffer *et al.* (2019) distinguished and described several cryptic species of *Cymbaeremaeus* from Austria and Southern Germany. They are not considered in this context.

#### Fam. Licneremaeidae Grandjean, 1954

*Licneremaeus licnophorus* (Michael, 1882)

**Vorarlberg:** New record for Vorarlberg. **Arlberg area**—Oberlech: spruce forest, dry needle litter (1670 m) [unpubl.].

**Vorarlberg habitats:** single record in montane forest (altitude 1670 m).

**General distribution:** Austria (B K N S St nT oT), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental, Neotropical.

#### Fam. Micreremidae Grandjean, 1954

*Micreremus brevipes* (Michael, 1888)

**Vorarlberg:** New record for Vorarlberg. **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m). **Bregenzerwald**—Sulzberg, riverbank of Weidach: riverine forest, moss on rocks (595 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m) [unpubl.].

**Vorarlberg habitats:** single records in colline riverine forests and low mountain forest (altitude 396–920 m).

**General distribution:** Austria (B K N O St nT oT), Switzerland (BL BS NE ZH), Southern Germany (BW BY), Italian Alps (BS BZ TV); Palaearctic.

#### Fam. Passalozetidae Grandjean, 1954

*Passalozetes africanus* Grandjean, 1932

**Vorarlberg:** **Walgau**—Jagdberg: hay and xeric meadow (590 m) [6]. **Arlberg area**—Lech, above Schlegelkopf: subalpine Curvuletum (1850 m) [unpubl.].

**Vorarlberg habitats:** single records in colline meadow and subalpine pasture (altitude 590, 1850 m).

**General distribution:** Austria (K N St nT oT V), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ); southern Palaearctic, western Ethiopian.

*Passalozetes intermedius* Mihelčič, 1954

**Vorarlberg:** **Bregenzerwald**—Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m) [unpubl.]. **Walgau**—Jagdberg: fen; hay and xeric meadow (640–815 m) [6].

**Vorarlberg habitats:** single records in colline xeric meadow and wetland, montane forest (altitude 640–1255 m).

**General distribution:** Austria (B K St nT oT V), Italian Alps (BZ); southern Palaearctic.

*Passalozetes perforatus* (Berlese, 1910)

**Vorarlberg:** New record for Vorarlberg. **Montafon**—Ochsental, at Vermunt glacier: subnival region, *Silene* cushion (2620 m). **Brandnertal**—Lünernersee, near Totalphütte: subnival region, dry grass cushion (2390 m) [unpubl.].

**Vorarlberg habitats:** single records in subnival cushion plants (altitude 2390–2620 m).

**General distribution:** Austria (K N St nT), Switzerland (GR), Italian Alps (BZ); Palaearctic.

## Fam. Scutoverticidae Grandjean, 1954

*Provertex kuehnelti* Mihelčič, 1959

**Vorarlberg:** Montafon—Silvretta: Ochsental, moss from rocks (2340 m) [8].

**Vorarlberg habitats:** single record in the alpine region (altitude 2340 m).

**General distribution:** Austria (K N O St oT V), Italian Alps (BZ TS); Europe, „boreo-alpine“.

*Scutovertex ianus* Pfingstl et al., 2010

**Vorarlberg:** Walgau—Jagdberg: Hochgerach summit: alpine grassland (1980 m) [6].

**Vorarlberg habitats:** single record in alpine grassland (altitude 1980 m).

**General distribution:** Austria (O St V), Southern Germany (BW); Alps.

## Fam. Phenopelopidae Petrunkevich, 1955

*Eupelops acromios* (Hermann, 1804)

**Vorarlberg:** Rheintal—Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moist and wet moss; fen and raised bog; wet *Sphagnum* (1145–1150 m) [7]; Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn: dwarf shrubs (1860 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, subalpine dwarf shrubs; moist (altitude 520–1860 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AI BL BS GR NE VD ZH), Southern Germany (BW BY), Italian Alps (BL BZ); Palaearctic, Oriental, Neotropical.

*Eupelops curtipilus* (Berlese, 1916)

**Vorarlberg:** New record for Vorarlberg. **Montafon**—west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m). **Brandnertal**—Lünersee, above Totalphütte: subnival region, dry *Carex firma*, *Anthyllis vulneraria* cushions (2410 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** single records in subalpine dwarf shrubs, subnival cushion plants (altitude 1860–2410 m).

**General distribution:** Austria (N S nT), Switzerland (BL GR JU), Southern Germany (BY), Italian Alps (BL BZ); Palaearctic, western Oriental, Greenland.

*Eupelops hirtus* (Berlese, 1916)

**Vorarlberg:** Walgau—Jagdberg: colline mixed forests (565–685 m) [6, unpubl.].

**Vorarlberg habitats:** single records in colline forests (altitude 565–705 m).

**General distribution:** Austria (B K N O S St nT V), Switzerland (NE VD), Southern Germany (BW BY), Italian Alps (BL BZ TN); Holarctic, western Oriental (Pakistan).

**Remark:** A synonymy with *Eupelops major* (Hull, 1914) is supposed by Halliday et al. (2018). Subías (2004, electronic update 2018) stated *E. major* as valid name with *E. hirtus* as synonym, but in recent updated versions (Subías electronic update 2019, 2020) *E. hirtus* is listed as valid name with *E. major sp. inqu.* as possible synonym without any commentary. I follow Weigmann (2006) and Behan-Pelletier & Lindo (2019) who listed *E. hirtus* as valid name.

*Eupelops occultus* (C. L. Koch, 1835)

**Vorarlberg:** Bodensee area—mouth of Rhine, north of Höchst: wet meadow (398 m). **Bregenzerwald**—Ebniter Tal, near Emser Hütte: pasture (1260 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forest, moss; subalpine pastures; dwarf shrubs; Hochgerach summit: alpine grassland (490–1980 m) [6]; between Schnifis and Schlins, beside rivulet: hay meadow (600 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, south of Vasalpe: pasture (1180 m). **Großes Walsertal**—near Blons, beside road: pasture (920 m) [unpubl.]. **Klostertal**—Innerbraz, east of Masonbach: hay meadow (695 m).

**Vorarlberg habitats:** colline forests, meadows and wetlands, low montane and montane pastures, subalpine dwarf shrubs and pastures, alpine grassland; rather xeric (altitude 398–1980 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (NE VD VS), Southern Germany (BW BY), Italian Alps (BS BZ TN); Palaearctic, western Oriental (Pakistan).

*Eupelops plicatus* (C. L. Koch, 1835)

**Vorarlberg:** **Rheintal**—south of Lauterach: wet meadow (410 m); Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); near Dornbirn, beside motorway exit 14: hay meadow (410 m); Schuttannen above Hohenems: pasture (1125 m); between Hohemems and Lustenau: wet meadow, reed (410 m); Götzis, above Meschach: pasture (1150 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, Gisingen: riverine forest (435 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Hörbranz, Erlach: pasture (480 m). **Bregenzerwald**—Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist and wet moss; wet Molinietum; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [7, unpubl.]; Bregenzer Ach near Bezau: riverine forest (620 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf, summit: alpine grassland (2090 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1860 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1730 m). Laternsertal—below Furkajoch: pasture (1550 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; colline mixed forest; subalpine pastures; dwarf shrubs; Hochgerach summit: alpine grassland (565–1980 m) [6]; Saminatal: mixed forest (690 m); Gamperdonatal, south of Vasalpe: pasture (1180 m); ibid., near Alpe Gamperdona: pasture (1320 m). **Großes Walsertal**—west of Buchboden at bridge: mixed forest (900 m); ibid.: hay meadow (890 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m); ibid., above “Fuchswald”: mixed forest (1280 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); Oberlech: dwarf shrubs (1650 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); west of Zug: subalpine pasture (1540 m). **Montafon**—Silbertal, near Fellimännle: pasture (1100 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m). **Brandnertal**—Lünersee, path to Totalphütte: under *Salix* (2050 m); ibid., subnival region, *Ranunculus alpestris* cushion, moist herbs with soil (2320 m); ibid., subnival region, *Dryas octopetala* cushion (2390 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, meadows and pastures, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to wet (altitude 408–2390 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BL GR JU NE VD ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Eupelops strenzkei* (Knülle, 1954)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: raised bog, moist moss (1150 m); Ebniter Tal, above Hackwald: mixed forest (920 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; Hochgerach summit: alpine grassland (590–1980 m) [6]. **Arlberg area**—Oberlech: spruce forest (1670 m) [unpubl.].

**Vorarlberg habitats:** colline meadow, low montane forests, colline and low montane wetlands, subalpine dwarf shrubs, alpine grassland; rather moist to wet; rare (altitude 590 -1980 m).

**General distribution:** Austria (nT V), Southern Germany (BW), Italian Alps (BZ); also in remaining Central Europe.

*Eupelops subuliger* (Berlese, 1916)

**Vorarlberg:** **Bregenzerwald**—Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: moorland forest, moist and wet moss; raised bogs, wet *Sphagnum* (1145–1150 m) [7]; above Mellau: mixed forest (960 m); Kanisfluh: mixed forest (1750 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m); above Walmendinger Alpe: dwarf shrubs (1860 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m) [unpubl.]. **Walga**—Jagdberg: hay and xeric meadows; subalpine pastures with *Alnus viridis* and rocks (590 -1725 m) [6]. **Großes Walsertal**—south of Faschinajoch, above road: spruce forest

(1220 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Spullerbachtal: raised bog at Spullerbach, moist moss below *Alnus viridis* (1680 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Bielerhöhe: dwarf shrubs (2025 m) [unpubl.].

**Vorarlberg habitats:** colline meadow, low montane and montane forests, low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; rather moist to wet (altitude 590–2030 m).

**General distribution:** Austria (B K N S St nT oT V), Switzerland (GR VS), Southern Germany (BY), Italian Alps (BZ SO TN); southern Palaearctic; rare.

*Eupelops tardus* (C. L. Koch, 1835)

**Vorarlberg:** **Rheintal**—Rankweil, Batschuns: pasture in orchard (590 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadow (590 m) [6]. **Großes Walsertal**—Laguztal, “Fuchswald”: *Pinus sylvestris* forest (1160 m). **Montafon**—Gargellental, north of Gargellen: spruce forest (1390 m) [unpubl.].

**Vorarlberg habitats:** colline meadows and pastures, montane forests; rather xeric; rare (altitude 590–1390 m).

**General distribution:** Austria (B K N O S St nT V W), Southern Germany (BY), Italian Alps (BZ); Palaearctic.

*Eupelops torulosus* (C. L. Koch, 1839)

**Vorarlberg:** **Rheintal**—Schuttannen above Hohenems: spruce forest (1200 m); Götzis, Örfla gorge above Meischach: mixed forest (670 m); Feldkirch, Unterries near Bangs: moist meadow (435 m). **Bregenz**—Pfänder: mixed forest (840 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moist and wet moss; fen, wet moss; raised bog (1145–1150 m) [7]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m). Laternsertal—east of Furkajoch: dwarf shrubs (1640 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; fen; colline mixed forests; subalpine pasture (565–1555 m) [6, unpubl.]. **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, above road: mixed forest (950 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline meadow, colline and low montane wetlands, subalpine dwarf shrubs and pasture; xeric to moist (altitude 435–1640 m).

**General distribution:** Austria (B K N O St nT oT V), Switzerland (GR JU NE VD), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic, Ethiopian.

*Eupelops* sp. nr. *variatus*

**Vorarlberg:** New record for Vorarlberg and Austria. **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m). **Arlberg area**—Formarintal: dwarf shrubs (1800 m) [unpubl.].

**Vorarlberg habitats:** single records in montane forest and subalpine dwarf shrubs (altitude 1280, 1800 m). In South Tyrol found in subalpine and alpine regions (Schatz 2018a).

**General distribution:** Italian Alps (BZ).

**Remark:** All specimens recorded from the Alps (Italian Alps, BZ—Schatz 2018a, sub *E. variatus*) and Vorarlberg belong to the same species and differ from the original description of *Eupelops variatus* (Mihelčič 1957, Pérez-Íñigo 1972, 1993) in some morphological characters. A detailed description is in preparation. *Eupelops variatus* (Mihelčič, 1957) is recorded from Spain and Caucasus (Shtanchaeva & Subías 2010).

*Peloptulus phaeonotus* (C. L. Koch, 1844)

**Vorarlberg:** **Bregenzerwald**—Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, wet moss; raised bog, wet grass and *Sphagnum* (1145–1150 m) [7 sub *P. phaeonotus*]; Ebniter Tal, below Hohe Kugel: subalpine grassland, Nardetum (1635 m); Andelsbuch: hay meadow (635 m); Vordere Niedere near Bezau, near cableway station: wet meadow (770 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); Ifenstock area, west of Schönenbach Alm: raised bog, wet *Sphagnum* (1020 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; subalpine pasture; dwarf shrubs; Hochgerach summit: alpine grassland (590–1980 m) [6 sub *P. phaeonotus*]. **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, colline and low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine grassland; rather moist to wet (altitude 590–1980 m).

**General distribution:** Austria (B K N O S St nT oT V [8 sub *P. phaenotus*]), Switzerland (BL GR JU NE ZH),

Southern Germany (BW BY), Italian Alps (BS BZ TN); Palaearctic, western Oriental (Pakistan).

**Remark:** The original species name “*phaeonotus*” of C. L. Koch was used in older literature until Sellnick (1928).

Willmann (1931) erroneously used “*phaenotus*” which is used in most publications since then.

## Fam. Unduloribatidae Kunst, 1971

*Unduloribates undulatus* (Berlese, 1914)

**Vorarlberg:** New record for Vorarlberg. **Montafon**—Ochsental, at Vermunt glacier: subnival region, *Saxifraga* cushion (2610 m). **Brandnertal**—Lünersee, above Totalphütte: subnival region, dry herb cushion (2406 m) [unpubl.].

**Vorarlberg habitats:** single records in subnival cushion plants (altitude 2406–2610 m).

**General distribution:** Austria (K S St nT oT), Switzerland (GR), Italian Alps (BZ SO); Palaearctic, western Oriental (Pakistan); mainly in alpine habitats.

## Fam. Achipteriidae Thor, 1929

*Achipteria coleoptrata* (Linnaeus, 1758)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m); ibid., north of Höchst: wet meadow (398 m); ibid., deciduous forest (405 m); ibid., spruce forest (398 m). **Rheintal**—south of Lauterach: wet meadow (410 m); Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); Buch at Bregenzer Ach: meadow (650 m); above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest (1200 m); ibid., pasture (1125 m); Reute above Hohenems: mixed forest (885 m); Hohenems, „Old Rhine“: riverine forest (405 m); between Hohemems and Lustenau: wet meadow, reed (410 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Röthis, above Viktorsberg: mixed forest (920 m); Rankweil, Batschuns: pasture in orchard (590 m); Feldkirch, Unterries near Bangs: moist meadow (435 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Gören near Hohenweiler: pasture (560 m); ibid., mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); west of Eichenberg, brookside: riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Gschwendele: mixed forest (790 m); ibid., near Falz: mixed forest (995 m); near Sulzberg: wet meadow (805 m); Sulzberg, near Doren: hay meadow (490 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Balderschwangertal, near Gerisgschwend: spruce forest (1010 m); Hittisau, Häusern: beech forest (770 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinetum; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [?]; Ebniter Tal, below Hohe Kugel: subalpine grassland, Nardetum (1635 m); ibid., near Emser Hütte: pasture (1260 m); ibid., spruce forests (740–1450 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Andelsbuch: hay meadow (635 m); Bregenzer Ach near Bezau: riverine forest (620 m); Vordere Niedere near Bezau: pasture (1690 m); ibid., spruce forest (1420 m); ibid., near cableway station: pasture (770 m); Bizauer Tal: mixed forest (960–1000 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); ibid., Bleichenalm: pasture (1230 m); above Mellau: mixed forest (960 m); Mellau: hay meadow (660 m); Hirschau: deciduous forest (730 m); Argenau, Wieden: hay meadow (690 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); between Bad Hopfreben and Schoppernau: pasture (920 m); above Bad Hopfreben: mixed forest (1030 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); below Kanisfluh: mixed forest (1190 m); Oberdamüls: pasture (1690 m); Damüls, Schwende: open spruce forest, *Calluna* tussock (1255 m); ibid., Krumbach: spruce forest (1450 m); Diedamskopf, summit: alpine grassland (2090 m); ibid., dwarf shrubs (1840 m); ibid., west of Halden Alpe: dwarf shrub (1720 m); Sibratsgfäll, Völken: spruce forest (1050 m); ibid., beside Subersach, near ski slope: pasture (860 m); Subersachtal north of Schoppernau, steep slope: krummholz, woody litter (1600 m). **Kleinwalsertal**—Rietzlern, beside mill: pasture (1070 m); Baad, near church: pasture

(1240 m); ibid., near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn: dwarf shrubs (1860 m); above Walmendinger Alpe: dwarf shrubs (1860 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m); Kalbelesee: wet meadow (1655 m); southwest of Kalbelesee: Rhododendretum (1730 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m); west of Furkajoch: spruce forests (1185–1370 m); west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walga**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed forests; fen; montane spruce forest; subalpine pastures; dwarf shrubs; Hochgerach summit: alpine grassland (490–1980 m) [6, unpubl.]; between Schnifis and Schlinz, beside rivulet: hay meadow (600 m); Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal: pastures (930–1320 m); ibid., mixed forests (930–1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); near Blons, beside road: pasture (920 m); south of Faschinajoch, above road: spruce forest (1220 m); west of Buchboden at bridge: mixed forest (900 m); west of Buchboden: hay meadow (890 m); Laguztal, above Alpe Laguz: swampy meadow (1585 m); ibid., *Pinus sylvestris* forest (1160–1590 m); east of Marul: pasture (980 m). **Klostertal**—Innerbraz, east of Masonbach: hay meadow (695 m); west of Wald, beside road: mixed forest (915 m); west of Langen near Alfenz river: riverine forest (1050 m); ibid., mixed forest on scree (1040 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); ibid., subalpine pasture, Curvuletum (1850 m); Oberlech: spruce forest (1670 m); ibid., dwarf shrubs (1650 m); ibid., subalpine pasture (1645 m); east of Zug: spruce forest (1475 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); west of Zug: subalpine pasture (1540 m); Spullersee: Rhododendretum (1840 m); Formarintal: pasture on rivulet (1650 m); ibid., dwarf shrubs (1800 m); ibid., near Formarinsee: subalpine pasture (1850 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forest (900–1115 m); ibid., pastures (1100–1150 m); Silbertal, Innerberg: pasture (1150 m); Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); ibid., north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m); ibid., Rhododendretum (2130 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, meadows, pastures, colline and wetlands, subalpine dwarf shrubs, pastures and wetlands, alpine dwarf shrubs and grassland; xeric to wet (altitude 396–2130 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GR NE VS VD ZH), Southern Germany (BW BY), Italian Alps (BG BL BS BZ TN); Holarctic, western Oriental (Pakistan, Sikkim).

#### *Achipteria nitens* (Nicolet, 1855)

**Vorarlberg: Rheintal**—Rankweil, Batschuns: pasture in orchard (590 m) [unpubl.]. **Walga**—Jagdberg: hay and xeric meadow; mixed forest, brookside; subalpine pasture with rocks and rotten wood (490–1560 m) [6]. **Montafon**—north of Lorüns: mixed forest (585 m) [unpubl.].

**Vorarlberg habitats:** colline forests and meadows, subalpine pasture; xeric to moist; rare (altitude 490–1560 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BL BS BZ TN); Holarctic.

#### *Achipteria sellnicki* Hammen, 1952

**Vorarlberg: Bregenzerwald**—Schnepfau, near Bregenzer Ach: riverine forest (720 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m) [unpubl.]. **Walga**—Jagdberg: subalpine pasture with *Juniperus communis* (1560 m) [6]. **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); east of Zug: spruce forest (1475 m). **Montafon**—Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m) [unpubl.].

**Vorarlberg habitats:** colline and montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; rather xeric (altitude 720–2080 m).

**General distribution:** Austria (B K O St nT V), Switzerland (VD), Southern Germany (BW), Italian Alps (BZ TN); Palaearctic.

*Anachipteria deficiens* Grandjean, 1932

**Vorarlberg:** **Bregenzerwald**—Fohramoos: rivulet in moorland forest, moss (1150 m) [7]; Subersachtal: spruce forest, rotten wood from tree stump (1290 m) [unpubl.]. **Walgau**—Jagdberg: montane spruce forest, needle litter and moss (1610 m) [6].

**Vorarlberg habitats:** single records in low montane and montane forest; moist to wet (altitude 1150–1610 m).

**General distribution:** Austria (nT oT V), Italian Alps (BZ); Palaearctic.

*Anachipteria shtanchaevae* Subías, 2009

**Vorarlberg:** **Walgau**—Jagdberg: subalpine pasture, lichens; dwarf shrubs with grass, herbs and lichens; Hochgerach summit: alpine grassland (1790–1980 m) [6 sub *A. alpina*]; Bazulwald west of Nenzing: mixed forest (670 m). **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m). **Arlberg area**—Formarintal: pasture on rivulet (1650 m); ibid., dwarf shrubs (1800 m); ibid., near Formarinsee: subalpine pasture (1850–1870 m). **Montafon**—Ochsental, at Wiesbadener Hütte: alpine grassland (2465 m). **Brandnertal**—Lünersee, near Totalphütte: subnival region, *Ranunculus alpestris*, *Dryas octopetala*, *Carex firma*, *Anthyllis vulneraria* cushions, herbs with soil (2320–2410 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** colline and montane forests, subalpine dwarf shrubs and pastures, alpine grassland, subnival cushion plants; xeric to moist (altitude 670–2465 m).

**General distribution:** Austria (K O S St nT V), Switzerland (GR VS), Italian Alps (BZ); Central, South, Southeast Europe; mainly in montane to alpine habitats.

**Remark:** New name for *Oribata tecta alpina* Schweizer, 1922 nec Halbert.

*Parachipteria fanzagoi* Jacot, 1929

**Vorarlberg:** **Rheintal**—Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); Feldkirch, Gisingen: riverine forest (435 m). **Bregenzerwald**—between Ittensberg and Großdorf: meadow (810 m); Fohramoos: raised bog, moist moss (1150 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m). Kleinwalsertal—Hörnlepass: raised bog, moist moss (1160 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m) [unpubl.]. **Walgau**—Jagdberg: fen; in reed (565–640 m) [6]; near Göfis: raised bog, moist grass litter and moss (555 m); Amerlügen near Frastanz: pasture (865 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests and wetlands, low montane meadow and pastures, subalpine dwarf shrubs; moist to wet (altitude 435–1770 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BE GR JU NE VD), , Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Central America (Costa Rica).

*Parachipteria punctata* (Nicolet, 1855)

**Vorarlberg:** **Rheintal**—Reute above Hohenems: mixed forest (885 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moist to wet moss; raised bog (1145–1150 m) [7]; Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); Vordere Niedere near Bezau, Sonderdach: mixed forest, dry moss on rock (980 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Hirschau: deciduous forest, moss on rock (730 m). Laternsertal—west of Innerlaterns: lumberyard, moss on bark (1000 m) [unpubl.]. **Walgau**—Jagdberg: Hochgerach summit: alpine grassland (1980 m) [6]; west of Satteins, near rivulet Kirchenbach: riverine forest (505 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m); south of Faschinajoch, above road: spruce forest (1220 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m). **Arlberg area**—Oberlech: spruce forest (1670 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, alpine grassland; rather xeric to moist (altitude 490–1980 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL? GR? NE? VD?), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Pseudachipteria magna* (Sellnick, 1928)

**Vorarlberg:** **Bregenzerwald**—Oberdamüls, near timberline: spruce forest (1755 m); Subersachtal: spruce forest,

rotten wood from tree stump (1290 m) [unpubl.]. **Walgau**—Jagdberg: montane spruce forest, moss and needle litter; subalpine pastures with *Juniperus communis*, lichens (1550–1790 m) [6]. **Großes Walsertal**—Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m). **Montafon**—Gargellen, north of Gargellen: spruce forest (1390 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m) [unpubl.].

**Vorarlberg habitats:** montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; moist (altitude 1290–2030 m).

**General distribution:** Austria (B K N O St nT oT V), Southern Germany (BW), Italian Alps (TN); Palaearctic.

## Fam. Oribatellidae Jacot, 1925

### *Ophidiotrichus tectus* (Michael, 1884)

**Vorarlberg:** **Rheintal**—Götzis, Örfla gorge above Meschach: mixed forest (670 m); Röthis, above Viktorsberg: mixed forest (920 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: moorland forest, dry litter, moist moss; fen, wet moss (1145–1150 m) [7 part. sub *Oribatella sexdentata* Berlese, 1916]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); above Mellau: mixed forest (960 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest; brookside with moss (570–705 m) [6, unpubl.]; Bazulwald west of Nenzing: mixed forest (670 m). **Montafon**—Silbertal, Silberberg near Schruns: mixed forest (900 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands; xeric to wet (altitude 570–1270 m).

**General distribution:** Austria (B K N O St nT V W), Switzerland (AG GR), Southern Germany (BW BY), Italian Alps (BG BZ TN); Palaearctic.

### *Oribatella calcarata* (C. L. Koch, 1835)

**Vorarlberg:** **Rheintal**—Feldkirch, St. Cornelius in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest (650 m) [unpubl.]; Fohramoos: moorland forest, wet *Sphagnum*; raised bogs, wet leaf litter and *Sphagnum* (1145–1150 m) [7]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m); Vordere Niedere near Bezau: spruce forest (1420 m); between Hirschau and Schnepfau: deciduous forest (730 m); Oberdamüls, near timberline: spruce forest (1755 m) [unpubl.]; Ifenstock area: spring below Schneckenloch cave (1240 m) [3, 5]. Kleinwalsertal—Walmendinger Horn, near summit: subalpine pasture (1970 m); ibid., dwarf shrubs (1860 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forests; montane spruce forest (570–1725 m) [6, unpubl.]; Gamperdonatal, at road bridge: mixed forest (930 m). **Großes Walsertal**—Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Oberlech: spruce forest (1670 m). **Montafon**—Silbertal, above road: mixed forest (950 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, subalpine pasture and dwarf shrubs; xeric to moist (altitude 470–1970 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BL GR VD), Southern Germany (BW BY), Italian Alps (BL BZ TN TO); Holarctic.

### *Oribatella euthricha* Berlese, 1908

**Vorarlberg:** New record for Vorarlberg and Austria. **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest, wet leaf litter (650 m) [unpubl.].

**Vorarlberg habitats:** single record in colline forest (altitude 650 m).

**General distribution:** Record from Southern Germany (BW); Central, South, Southeast Europe, Caucasus.

*Oribatella longispina* Berlese, 1915

**Vorarlberg:** **Leiblachtal**—west of Eichenberg, brookside: riparian vegetation (620 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest 650 m); Vordere Niedere near Bezau: spruce forest (1420 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Sibratsgfäll, Völken: spruce forest (1050 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1650 m); Hirschegg, Schwarzwassertal: spruce forest (1340 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest; subalpine pastures with *Juniperus communis* and rocks; Hochgerach summit: alpine grassland (685–1980 m) [6]. **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Oberlech: spruce forest (1670 m); ibid., dwarf shrubs (1650 m). **Montafon**—Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); Ochsental, at Vermunt glacier: subnival region, *Saxifraga* cushion (2610 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to moist (altitude 620–2610 m).

**General distribution:** Austria (K NT oT V), Italian Alps (BZ SO TN); Alps, Southeast Europe. Mainly in montane to alpine habitats.

*Oribatella parvula* Bernini, 1974

**Vorarlberg:** New record for Vorarlberg and Austria. **Rheintal**—Röthis, above Viktorsberg: oak, beech, spruce mixed forest, oak leaf litter (920 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane forest (altitude 920 m).

**General distribution:** Italian Alps (BG CO TO). Alps (endemic).

*Oribatella quadricornuta* (Michael, 1880)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m); ibid., spruce forest (398 m). **Rheintal**—Dornbirn, railway station Haselstauden: small forest strip (420 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moist to wet moss; raised bog (1145–1150 m) [7]; Diedamskopf, summit: alpine grassland (2090 m) [unpubl.]. **Walgau**—Jagdberg: fen, wet moss (640 m) [6].

**Vorarlberg habitats:** colline and low montane forests and wetlands, also single record in alpine grassland; xeric to moist (altitude 396–1150 m, 2090 m).

**General distribution:** Austria (B K N O St nT V), Switzerland (BL BS VD VS ZH), Southern Germany (BW BY), Italian Alps (BZ TN TO); Holarctic.

*Oribatella similesuperbula* Weigmann, 2001

**Vorarlberg:** New record for Vorarlberg and Austria. **Rheintal**—Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m) [unpubl.].

**Vorarlberg habitats:** single record in colline forest, rotten wood (altitude 520 m).

**General distribution:** Central Europe (Germany).

**Remark:** In Subías (2004—electronic update 2012) treated as synonym of *O. willmanni* Subías & Gil-Martín, 1995, later (Subías electronic update 2013, 2020) as valid species.

**Fam. Haplozetidae Grandjean, 1936**

*Lagenobates lagenulus* (Berlese, 1904)

**Vorarlberg:** **Bregenzerwald**—Sulzberg, near Falz: mixed forest, rotten wood from tree stump (990 m) [unpubl.]; Fohramoos: spruce forest, rivulet in moorland forest, raised bog, wet moss (1145–1150 m) [7, unpubl.]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, above road: mixed forest (950 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane wetlands; rather moist (altitude 780–1270 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BE NE VD), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

*Protoribates capucinus* Berlese, 1908

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: deciduous forest (405 m). **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m). **Bregenzerwald**—between Ittensberg and Großdorf: meadow (810 m). Kleinwalsertal—Rietztern, beside mill: pasture (1070 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed forest, moss; fen (490–825 m) [6]; near Göfis: raised bog, moist grass litter and moss (555 m); between Schnifis and Schlins, beside rivulet: hay meadow (600 m); Saminatal: spruce forest (530 m); west of Nüziders: beech forest (545 m). **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m); east of Marul: pasture (980 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline meadows and pastures, low montane wetlands; xeric to wet (altitude 405–1280 m).

**General distribution:** Austria (B K N O St nT oT V W), Switzerland (BL JU ZH), Southern Germany (BW BY), Italian Alps (BS BZ TN); semicosmopolitan.

*Protoribates lophothrichus* (Berlese, 1904)

**Vorarlberg: Walgau**—Jagdberg: colline mixed forest, brookside with moss (570 m) [6].

**Vorarlberg habitats:** single record in colline forest (altitude 570 m).

**General distribution:** Austria (B N O St nT V), Switzerland (NE), Southern Germany (BY), Italian Alps (BZ); semicosmopolitan.

**Fam. Oribatulidae Thor, 1929**

*Lucoppia burrowsii* (Michael, 1890)

**Vorarlberg:** New record for Vorarlberg. **Großes Walsertal**—Meiern near Thüringerberg: mixed forest, dry needle litter (765 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane forest (altitude 765 m).

**General distribution:** Austria (N), Southern Germany (BY); Holarctic, Oriental, Hawaii.

*Oribatula amblyptera* Berlese, 1916

**Vorarlberg: Rheintal**—south of Lauterach: wet meadow (410 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttannen above Hohenems: spruce forest (1200 m); Reute above Hohenems: mixed forest (885 m); between Hohemems and Lustenau: wet meadow, reed (410 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, St. Cornelius in Tosters: mixed forest (540 m); ibid., Gisingen: riverine forest (435 m); ibid., Ardetzenberg: mixed forest (595 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); between Weienried and Möggen: wet meadow (860 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, near Falz: hay meadow (980 m); near Sulzberg: wet meadow (805 m); ibid., steep slope above Doren: mixed forest (530 m); Balderschwangertal, near Gerisgenschwend: spruce forest (1010 m); Hittisau, Häusern: beech forest (770 m); Schetteregg, Amagmach: mixed forest, raised bog, wet moss (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, spruce forests (970–1450 m); ibid., near Emser Hütte: pasture (1260 m); ibid., below Hohe Kugel: subalpine grassland, Nardetum (1635 m); Vordere Niedere near Bezau: pasture (1690 m); ibid., Sonderdach: wet pasture (1250 m); ibid., mixed forest, dry moss on rock (980 m); Hirschau: deciduous forest, moss on rock (730 m); Argenau, Wieden: hay meadow (690 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfreben: mixed forest (1030 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); ibid., below Oberle Alm: pasture (1470 m); Oberdamüls, near timberline: spruce forest (1755 m); Damüls, Schwende: open spruce

forest, *Calluna* tussock (1255 m); Diedamskopf, summit: alpine grassland (2000–2090 m); ibid., dwarf shrubs (1720–1840 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m); Subersachtal: spruce forest (1200 m). Kleinwalsertal—Rietzler, beside mill: pasture (1070 m); Baad, near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn, near summit: subalpine pasture (1970 m); ibid., dwarf shrubs (1860 m); above Walmendinger Alpe: dwarf shrubs (1860 m); Hirscheegg, Schwarzwässertal: spruce forest (1340 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1730–1770 m). Laternsertal—Furkajoch: dwarf shrubs (1640–1770 m); below Furkajoch: pasture (1550 m); west of Furkajoch: spruce forest (1185–1370 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forest; fen; montane spruce forest; subalpine pastures with rocks; dwarf shrubs; Hochgerach summit: alpine grassland (590–1980 m) [6, unpubl.]; between Schnifis and Schlins, beside rivulet: hay meadow (600 m); Saminatal: spruce forest (530 m); ibid., pasture (510 m); Gamperdonatal, at road bridge: mixed forest (930 m); ibid., south of Vasalpe: pasture (930 m); west of Nüziders: beech forest (545 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); south of Faschinajoch, above road: spruce forest (1220 m); Laguztal, near and above Alpe Laguz: swampy meadow (1585 m); ibid., *Pinus sylvestris* forest (1160–1590 m); east of Marul: pasture (980 m). **Klostertal**—Innerbraz, east of Masonbach: hay meadow (695 m); west of Dalaas, near Alfenz river: riverine forest (830 m); west of Wald, beside road: mixed forest (915 m); west of Langen: mixed forest on scree (1040 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); ibid., above Schlegelkopf: subalpine pasture, Curvuletum (1850 m); Oberlech: dwarf shrubs (1650 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); west of Zug: subalpine pasture (1540 m); Spullerbachtal: raised bog at Spullerbach, moist moss below *Alnus viridis* (1680 m); Spullersee: Rhododendretum (1840 m); Formarintal: dwarf shrubs (1800 m); near Formarinsee: subalpine pasture (1850 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forest (900–1115 m); ibid., near Fellimännle: pastures (1100–1150 m); Gargellental, near Hotel “Ver galda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); south of Partenen, near tollbooth: herbaceous pasture (1150 m); Unterermunt, near road: slope with *Alnus viridis* (1680 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); ibid., Vermunt Alpe: alpine grassland (2240 m). **Brandnertal**—Lünersee, path to Totalphütte: under *Salix* (2050 m); ibid., Rhododendretum (2130 m); ibid., subnival region, dry *Carex firma*, *Anthyllis vulneraria*, *Dryas octopetala* and herb cushions (2390–2410 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, meadows, pastures and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival cushion plants; xeric to wet (altitude 410–2410 m).

**General distribution:** Austria (B K N O St nT V), Switzerland (GR), Italian Alps (BG TZ TN); Southwestern Palaearctic, Nearctic.

**Remark:** This species was listed as synonym of *Oribatula tibialis tibialis* (Nicolet, 1855) in Subías (2004—electronic update 2013) and later as valid subspecies of *O. tibialis* (Subías (electronic updates 2014, 2020). Weigmann (2006) considered *O. amblyptera* as species.

#### *Oribatula caliptera* Berlese, 1902

**Vorarlberg:** New record for Vorarlberg and Austria. **Rheintal**—east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Feldkirch, St. Cornelius in Tosters: mixed forest (510 m). **Bregenz**—Pfänder: mixed forest (840 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests; rare (altitude 440–840 m).

**General distribution:** Italian Alps (BS BZ); Southwestern Palaearctic, Nearctic.

**Remark:** A morphological differentiation of *O. caliptera* towards *O. amblyptera* is given by Mahunka (1994), but in the present material the different characters are not always clearly distinguishable. Some specimens show a high variability and a mosaic pattern of characters in-between species. The specimens mentioned above are considered as *O. caliptera*, but intermediate forms in some sites mentioned *sub O. amblyptera* could possibly also belong to *O. caliptera*. Weigmann (2006) treated *O. caliptera* as valid species. This species was listed as synonym of *Oribatula tibialis allifera* Subías 2000 in Subías (2004—electronic update 2013), later as potential

synonym of *O. tibialis allifera* and *sp. inqu.* (Subías (electronic update 2014–2016) and as valid subspecies of *O. tibialis* (Subías electronic update 2017–2020). I follow Mahunka (1994) and Weigmann (2006) to treat *O. caliptera* as separate species.

*Oribatula interrupta* (Willmann, 1939)

**Vorarlberg: Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m) [unpubl.]. **Bregenzerwald**—Fohramoos: raised bog (1150 m) [7]; Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Bad Hopfreben: mixed forest (1030 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls, near timberline: spruce forest (1755 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, brookside with moss; dwarf shrubs with grass, herbs and lichens (565–1835 m) [6, unpubl.]. **Montafon**—Unterermunt, near bridge across river Ill: spruce forest (1520 m); Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); ibid., at Vermunt glacier: subnival region, *Saxifraga*, *Silene*, herb cushions, moss (2610–2630 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, subalpine and alpine dwarf shrubs, subnival cushion plants; xeric to moist (altitude 440–2630 m).

**General distribution:** Austria (B K N St nT oT V), Switzerland (BS), Southern Germany (BW), Italian Alps (BZ); Holarctic, Ethiopian. Frequently in montane to alpine habitats.

*Oribatula longelamellata* Schweizer, 1956

**Vorarlberg: Walgau**—Jagdberg: dwarf shrubs with grass, herbs and lichens; Hochgerach summit: alpine grassland (1835–1980 m) [6]. **Montafon**—Ochsental, Vermunt Alpe, crossing rivulet: alpine grassland (2340 m) [unpubl.].

**Vorarlberg habitats:** single records in subalpine dwarf shrubs and alpine grasslands (altitude 1835–2340 m).

**General distribution:** Austria (St nT V), Switzerland (GR), Southern Germany (BY), Italian Alps (BZ); Alps, Central, Southeast Europe. Mainly in montane to alpine habitats.

*Oribatula tibialis* (Nicolet, 1855)

**Vorarlberg: Rheintal**—Buch at Bregenzer Ach: meadow (650 m); Dornbirn, railway station Haselstauden: small forest strip (422 m); Götzis, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Feldkirch, St. Cornelius in Tosters: mixed forest (510–540 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m); ibid., spruce forest (1030 m). **Bregenzerwald**—Langen, near bridge above Leckenbach: mixed forest (650 m); Sulzberg, steep slope above Doren: mixed forest (530 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Ebniter Tal, near Emser Hütte: pasture (1260 m); ibid., below Hohe Kugel: subalpine grassland, Nardetum (1635 m); Vordere Niedere near Bezau, near cableway station: deciduous forest (770 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m). Kleinwalsertal—Rietzlern, beside mill: pasture (1070 m); Walmendinger Horn, near summit: subalpine pasture (1970 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forests, moss; subalpine pastures with *Juniperus communis* and rocks; Hochgerach summit: alpine grassland (565–1980 m) [6, unpubl.]; near Göfis: raised bog, wet grass litter and moss (555 m); west of Nüziders: beech forest (545 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests, colline to montane meadows and pastures, colline wetlands, subalpine dwarf shrubs and pastures, alpine grassland; xeric to moist (altitude 422–1980 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG AI BL GR NE VD VS ZH), Southern Germany (BW BY), Italian Alps (BZ SO TN); Holarctic, Oriental (Himalaya—Sikkim), Neotropical.

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

**Vorarlberg: Rheintal**—Feldkirch, St. Cornelius in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m). Reifensberg, above Niemans: spruce forest (980 m) [unpubl.]; Fohramoos: spruce forest, Nardetum (1145 m) [7, unpubl.]; Vordere Niedere near Bezau, Sonderdach: mixed forest, dry moss on rock (980 m); between Hirschau and Schnepfau: deciduous forest (730 m); Oberdamüls, near timberline: spruce forest (1755 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forests; fen; subalpine pasture with rocks (565–1725 m) [6]. **Großes Walsertal**—Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m). **Arlberg area**—Oberlech: spruce forest (1670 m). **Montafon**—Gargellen, north of Gargellen: spruce forest (1390 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine and pastures; xeric to moist (altitude 520–1755 m).

**General distribution:** Austria (B K N O St nT oT V), Switzerland (BS BL GR NE VD VS ZH), Southern Germany (BW BY), Italian Alps (BS BZ TN VI); Holarctic, Oriental (Himalaya—Nepal).

*Phauloppia nemoralis* (Berlese, 1916)

**Vorarlberg:** New record for Vorarlberg. **Montafon**—Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** single record in subalpine raised bog (altitude 1835 m).

**General distribution:** Austria (N nT), Switzerland GR(), Southern Germany (BY), Italian Alps (BZ); Central, South, Southeast Europe.

**Remark:** Determination according to Weigmann (2014).

*Phauloppia rauschenensis* (Sellnick, 1908)

**Vorarlberg:** New record for Vorarlberg. **Bodensee area**—mouth of Rhine-Rheinspitz: spruce forest (398 m). **Walgau**—Bazulwald west of Nenzing: mixed forest (670 m). **Montafon**—Silbertal: mixed forests (950–1115 m) [unpubl.].

**Vorarlberg habitats:** single records in colline and low montane forests (altitude 398–1115 m).

**General distribution:** Austria (K N nT oT), Switzerland (BS), Southern Germany (BW), Italian Alps (BZ); Palearctic, Mexico.

*Zygoribatula exilis* (Nicolet, 1855)

**Vorarlberg:** **Rheintal**—east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m).

**Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m); west of Furkajoch: spruce forest (1185–1370 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest, leaf litter with rotten bark (490 m) [6]. **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Arlberg area**—Oberlech: subalpine pasture (1645 m). **Montafon**—Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Bielerhöhe: dwarf shrubs (2025 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; moist (altitude 440–2030 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BL GR VD ZH), Southern Germany (BW BY), Italian Alps (BG BZ TN); Holarctic.

## Fam. Parakalummidae Grandjean, 1936

*Neoribates aurantiacus* (Oudemans, 1914)

**Vorarlberg:** **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m) [unpubl.]. **Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, moist moss; raised bog (1145–1150 m) [7]; Ebniter Tal, above Hackwald: mixed forest (920 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal: mixed forests (960–1000 m); Schnepfau, near Bregenzer Ach: mixed forest (730 m); Mellau, Roßstellealpe: mixed forest (1050 m). **Kleinwalsertal**—Baad, near Camping Vorderboden: mixed forest (1220 m) [unpubl.]. **Walgau**—Jagdberg: subalpine pasture with *Alnus viridis* and rocks (1610–1725 m) [6]; west of Satteins, near rivulet Kirchenbach: riverine forest (505 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m); west of Langen: mixed forest on scree (1040 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m). **Montafon**—Silbertal, above road: mixed forest (950 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane meadows and wetlands, subalpine dwarf shrubs and pastures; rather moist (altitude 470–1755 m)

**General distribution:** Austria (B O St nT oT V), Switzerland (BL GR), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental (Himalaya—Nepal), Pakistan.

### Fam. Scheloribatidae Grandjean, 1933

*Dometorina plantivaga* (Berlese, 1895)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m) [unpubl.].

**Vorarlberg habitats:** single record in colline forest (altitude 520 m).

**General distribution:** Austria (K N O St), Switzerland (AI BL BS GR VD VS ZH), Southern Germany (BW BY), Italian Alps (BL BZ); semicosmopolitan.

*Hemileius initialis* (Berlese, 1908)

**Vorarlberg: Bodensee area**—mouth of Rhine-Rheinspitz: spruce forest (398 m). **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest (1200 m); Reute above Hohenems: mixed forest (885 m); Götzis, above Meschach: fir forest (1140 m); Röthis, above Viktorsberg: mixed forest (920 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); Ried near Hohenweiler: mixed forest with oaks (470 m); Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); Balderschwangertal, near Gerisgenschwend: spruce forest (1010 m); near Hittisau: pasture (950 m); Schetteregg, Amagmach: raised bog, wet moss in water (1020 m); ibid., mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [7, unpubl.]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m); ibid., below Hohe Kugel: subalpine grassland, Nardetum (1635 m); ibid., above Hackwald: mixed forest (920 m); Bregenzer Ach near Bezau: riverine forest (620 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); above Mellau: mixed forest (960 m); Hirschau: deciduous forest (730 m); Argenau, Wieden: hay meadow (690 m); above Bad Hopfreben: mixed forest (1030 m); Kanisfluh, above Obere Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); ibid., below Öberle Alm: pasture (1470 m); Damüls, Krumbach: spruce forest (1450 m); Subersachtal north of Schoppernau, steep slope: krummholz, woody litter (1600 m); ibid., spruce forest (1200 m). Kleinwalsertal—Rietzlern, beside mill: pasture (1070 m); Baad, near church: pasture (1240 m); ibid., near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn, near summit: subalpine pasture (1970 m); ibid., dwarf shrubs (1860 m); above Walmendinger Alpe: dwarf shrubs (1860 m); Hirschgägg, Schwarzwassertal: spruce forest (1340 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m); west of Furkajoch: spruce forest (1370 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; colline mixed forests, moss; montane spruce forest; fen; subalpine pastures; Hochgerach summit: alpine grassland (490–1980 m) [6, unpubl.]; Bazulwald west of Nenzing: mixed forest (670 m); Saminatal: spruce forest (530 m); Gamperdonatal, south of Vasalpe: pasture (1180 m); ibid., near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—south of Faschinajoch, above road: spruce forest (1220 m); west of Buchboden at bridge: mixed forest (900 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1160–1590 m). **Klostertal**—west of Wald, beside road: mixed forest (915 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m); Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); ibid., above Schlegelkopf: subalpine pasture, Curvuletum (1850 m); Oberlech: dwarf shrubs (1650 m); east of Zug: spruce forest (1475 m); west of Zug: subalpine pasture (1540 m); Formarinthal, near Formarinsee: subalpine pasture (1850 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forests (900–1115 m); ibid., pastures (1100–1150 m); Gargellenal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); south of Partenen, near tollbooth: herbaceous pasture (1150 m); Untervermunt, near road: slope with *Alnus viridis* (1680 m); Bielerhöhe: dwarf shrubs (2025 m). **Brandnertal**—Lünernersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, colline and low montane meadows, pastures and wetlands, montane pastures, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland; xeric to wet (altitude 398–2030 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BE BL GR NE VD), Southern Germany (BW BY), Italian Alps (BL BZ TN); Palaearctic, New Mexico, Oriental, Galápagos Islands.

*Liebstadia humerata* Sellnick, 1928

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Feldkirch, St. Corneli in Tosters: mixed forest (540 m). **Wal-**  
**gau**—Saminatal: mixed forest (740 m) [unpubl.].

**Vorarlberg habitats:** single records in colline and low montane forests (altitude 540, 740 m).

**General distribution:** Austria (B N nT oT), Switzerland (BL NE), Southern Germany (BW BY), Italian Alps (BL BZ TV); Holarctic, Oriental.

*Liebstadia longior* (Berlese, 1908)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Reute above Hohenems: mixed forest (885 m). **Leiblachtal**—west of Eichenberg, brookside: riparian vegetation (620 m). Bregenz—Pfänder, Fluh: mixed forest (750 m).

**Bregenzerwald**—Schetteregg, Amagmach: mixed forest beside raised bog (1020 m); Oberdamüls, near timberline: spruce forest (1755 m) [unpubl.]. **Walga**—Jagdberg: montane spruce forest, moss and needle litter (1610 m) [6]. **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests; xeric to moist (altitude 620–1755 m).

**General distribution:** Austria (B K N O S St nT), Switzerland (BS GR), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

*Liebstadia pannonica* (Willmann, 1951)

**Vorarlberg:** **Rheintal**—near Dornbirn, beside motorway exit 14: hay meadow (410 m); between Hohemems and Lustenau: wet meadow, reed (410 m); Rankweil, Batschuns: pasture in orchard (590 m) [unpubl.]. **Bregen-**  
**zerwald**—Fohramoos: rivulet in moorland forest, wet moss; raised bog (1145–1150 m) [7]; Andelsbuch: hay meadow (635 m). **Walga**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; fen; Hochgerach summit: alpine grassland (490–1980 m) [6]; Amerlügen near Frastanz: pasture (865 m) [unpubl.].

**Vorarlberg habitats:** colline forests, colline to low montane meadows, pastures and wetlands, also in alpine grassland; xeric to moist (altitude 410–1150 m, 1980 m).

**General distribution:** Austria (B K N O St nT oT V), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Oriental.

*Liebstadia similis* (Michael, 1888)

**Vorarlberg:** **Rheintal**—Hohenems, „Old Rhine“: riverine forest (405 m). **Bregenzerwald**—Sulzberg, near Doren: hay meadow (490 m); between Ittensberg and Großdorf: meadow (810 m) [unpubl.]; Fohramoos: dry Nardetum; spruce forest; raised bog, wet moss (1145–1150 m) [7, unpubl.]; Ebniter Tal, near Kobelealpe: birch stand, wet *Juncus* with moss (1040 m); Bizauer Tal, Löffelau tollbooth: mixed forest (960 m); ibid., south of Bizau: hay meadow (680 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); Oberdamüls: pasture (1690 m); Diedamskopf: alpine grassland (1550–2090 m). Laternsertal—east of Furkajoch: dwarf shrubs (1640 m) [unpubl.]. **Walga**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed forest, moss; montane spruce forest, moss and needle litter (490–1610 m) [6]; Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m). **Großes Walsertal**—Laguztal, above Alpe Laguz: swampy meadow (1585 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Oberlech: subalpine pasture (1645 m); west of Zug, at tollboth: hay meadow (1500 m). **Montafon**—Ochsental, Vermunt Alpe: alpine grassland (2240 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests and meadows, low montane and montane wetlands, subalpine dwarf shrubs and pastures, alpine grassland; rather moist (altitude 405–2240 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GR NE TI ZH), Southern Germany (BW BY), Italian Alps (BL BZ TN TV); Holarctic, Oriental (Himalaya—Sikkim), New Zealand.

*Liebstadia willmanni* Miko & Weigmann, 1996

**Vorarlberg:** **Rheintal**—east of Koblach, foot of Kummenberg: wet meadow, wet reed (420 m); Götzis, above Meischach: fir forest (1140 m). **Bregenz**—Pfänder: mixed forest (750–840 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moss; raised bog (1145–1150 m) [7]; Ebniter Tal, near Vorderschauern: spruce forest (970 m); ibid., mouth of Ebniter Ach: riverine forest (490 m). Kleinwalsertal—Walmendinger Horn: dwarf shrubs (1860 m); Hörnlepass: raised bog, wet moss (1160 m) [unpubl.]. **Walgaу**—Jagdberg: hay and xeric meadow; montane spruce forest, moss and needle litter; Hochgerach summit: alpine grassland (590–1980 m) [6]; above Thüringen, near Quadern: mixed forest (615 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, south of Vasalpe: pasture (1180 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Laguztal, above “Fuchswald”: mixed forest (1280 m). **Klostertal**—Innerbraz, east of Masonbach: hay meadow (695 m). **Brandnertal**—Lünersee, path to Totalphütte: Rhododendretum (2130 m); ibid., near Totalphütte: subnival region, *Ranunculus alpestris*, *Carex firma* cushions, herbs with soil (2320–2406 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and montane meadows and pastures, colline and low montane wetlands, subalpine dwarf shrubs, alpine dwarf shrubs and grassland, subnival cushion plants; rather xeric to moist (altitude 420–2410 m).

**General distribution:** Austria (K O nT V), Southern Germany (BW), Italian Alps (BZ); Central, Southeast Europe.

**Remark:** This species was listed as valid in Subías (2004, electronic update 2006), later considered as synonym of *Liebstadia divergens* (Mihelčič, 1955) (Subías electronic update 2007), and as synonym of *L. pannonica* (Willmann, 1951) (Subías electronic update 2008–2020) without any commentary. I follow Miko & Weigmann (1996) who separated *L. willmanni* from *L. pannonica* based on consistent morphological differences.

*Paraleius leontonycha* (Berlese, 1910)

**Vorarlberg:** New record for Vorarlberg. **Walgaу**—Jagdberg: montane spruce forest, moss and needle litter (1610 m) [6, unpubl.].

**Vorarlberg habitats:** single records in montane forest (altitude 1610 m).

**General distribution:** Austria (N St), Southern Germany (BW BY); Holarctic.

*Scheloribates ascendens* Weigmann & Wunderle, 1990 (*Scheloribates*)

**Vorarlberg:** **Walgaу**—Jagdberg: colline mixed forests, moss (570–685 m) [6].

**Vorarlberg habitats:** single records in colline forests (altitude 570–685 m). Preferably corticolous (Weigmann 2006, Weigmann et al. 2015).

**General distribution:** Austria (O nT V), Switzerland (BS), Southern Germany (BW BY), Italian Alps (BZ); also in remaining Central Europe.

*Scheloribates circumcarinatus* Weigmann & Miko, 1998 (*Topobates*)

**Vorarlberg:** **Bregenzerwald**—near Sulzberg: wet meadow (805 m) [unpubl.]; Fohramoos: moorland forest; wet Molinietum; fen and raised bog; wet moss (1150 m) [7, unpubl.]; Sibratsgfäll, beside Subersach, near ski slope: pasture, moist grass (860 m); Ifenstock area, west of Schönenbach Alm: raised bog, wet *Sphagnum* (1020 m). Kleinwalsertal—Hörnlepass: raised bog, moist moss (1160 m) [unpubl.]. **Walgaу**—Jagdberg: fen, in reed (565–640 m) [6].

**Vorarlberg habitats:** colline and low montane wetlands, low montane pasture; moist to wet (altitude 565–1160 m).

**General distribution:** Austria (V), Italian Alps (BZ TN), Southern Germany (BW BY); also in remaining Central Europe.

*Scheloribates laevigatus* (C. L. Koch, 1835) (*Scheloribates*)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (397 m); mouth of Rhine, north of Höchst: wet meadow (398 m). **Rheintal**—Buch at Bregenzer Ach: meadow (650 m); near Dornbirn, beside motorway exit 14: hay meadow (410 m); Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); Hohenems, „Old Rhine“: riverine forest (405 m); between Hohemems and Lustenau: wet meadow, reed (410 m). **Lei-**

**blachtal**—Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m); Eichenberg near Schüssellehen: spruce forest (850 m); Hörbranz, Erlach: pasture (480 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—near Sulzberg: wet meadow (805 m); Sulzberg, near Doren: hay meadow (490 m); Egg, south of junction Bezau—Lingenau: slope with alder (600 m); Schetteregg, Amagmach: raised bog, wet moss (1020 m); between Ittensberg and Großdorf: meadow (810 m) [unpubl.]; Fohramoos: moorland forest, wet moss; wet Molinetum; raised bog, wet moss (1145–1150 m) [7, unpubl.]; Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); Vordere Niedere near Bezau, near cableway station: pasture (770 m); Argenau, Wieden: hay meadow (690 m); Sibratsgfäll, beside Subersach, near ski slope: pasture (860 m). Kleinwalsertal—Rietzern, beside mill: pasture (1070 m). **Walgau**—Jagdberg: fen, wet grass and reed (640 m) [6, unpubl.]; near Göfis: raised bog, moist grass litter and moss (555 m); between Schnifis and Schlins, beside rivulet: hay meadow (600 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, south of Vasalpe: pasture (1180 m); ibid., near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—near Blons, beside road: pasture (920 m); west of Buchboden: hay meadow (890 m); east of Marul: pasture (980 m). **Montafon**—Silbertal, Innerberg: pasture (1150 m); Gargellental, north of Gargellen: spruce forest (1390 m); south of Partenen, near tollbooth: herbaceous pasture (1150 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, meadows and pastures, colline and low montane wetlands; xeric to wet (altitude 397–1390 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (AG BE BL GR JU NE VD VS ZH), Southern Germany (BW BY), Italian Alps (BS BZ TN); semicosmopolitan.

*Scheloribates latipes* (C. L. Koch, 1844) (*Scheloribates*)

**Vorarlberg: Bodensee area**—mouth of Rhine, north of Höchst: wet meadow (398 m). **Rheintal**—south of Lauterach: wet meadow (410 m); Rankweil, Batschuns: pasture in orchard (590 m); ibid., mixed forest on rock slope (880 m); Feldkirch, St. Cornelius in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., Unterries near Bangs: moist meadow (435 m); ibid., Gisingen: riverine forest (435 m). **Leiblachthal**—between Weienried and Möggen: wet meadow (860 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, near Doren: hay meadow (490 m) [unpubl.]; Fohramoos: moorland forest, dry litter; raised bog, wet moss (1150 m) [7, unpubl.]; Andelsbuch: hay meadow (635 m); Mellau: hay meadow (660 m). Kleinwalsertal—Hörnlepass: raised bog, moist moss (1160 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed forest, moss (490–685 m) [6]; near Göfis: raised bog, moist moss (555 m); between Schnifis and Schlins, beside rivulet: hay meadow (600 m). **Großes Walsertal**—near Blons, beside road: pasture (920 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests and wetlands, low montane pasture; xeric to wet (altitude 398–1160 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (BE BL GR JU NE VD ZH), Southern Germany (BW BY), Italian Alps (BL BS BZ TN TO); Holarctic, Oriental, Ethiopian.

*Scheloribates pallidulus* (C. L. Koch, 1841) (*Scheloribates*)

**Vorarlberg: Bregenzerwald**—Sulzberg, near Doren: hay meadow (490 m) [unpubl.]; Fohramoos: moorland forest, dry litter, moist and wet moss; moors and raised bogs (1145–1150 m) [7]; Ebniter Tal, near Emser Hütte: pasture (1260 m); Bregenzer Ach near Bezau: riverine forest (620 m). Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1650 m); Hörnlepass: raised bog, wet moss (1160 m) [unpubl.]. **Walgau**—Jagdberg: fen; montane spruce forest, moss near a small pond (565–1610 m) [6]; near Göfis: raised bog, moist moss (555 m). **Montafon**—north of Lorüns: mixed forest (585 m); Unterermunt, near bridge across river Ill: spruce forest (1520 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and montane meadows and pasture, colline and low montane wetlands, subalpine dwarf shrubs; xeric to moist (altitude 490–1650 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GR), Southern Germany (BW BY), Italian Alps (BZ); semicosmopolitan.

## Fam. Ceratozetidae Jacot, 1925

*Ceratozetes gracilis* (Michael, 1884)

**Vorarlberg:** **Rheintal**—Schuttannen above Hohenems: spruce forest (1200 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m). **Leiblachtal**—Hub near Hohenweiler: mixed forest (695 m); between Weienried and Möggen: wet meadow (860 m). **Bregenzerwald**—Sulzberg, steep slope above Doren: mixed forest (530 m) [unpubl.]; Fohramoos: dry Nardetum; raised bog, wet moss (1145–1150 m) [7]; Vordere Niedere near Bezau, Sonderdach: mixed forest (980 m); between Hirschau and Schnepfau: deciduous forest (730 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; fen; subalpine pastures; dwarf shrubs; Hochgerach summit: alpine grassland (490–1980 m) [6]; Bazulwald west of Nenzing: mixed forest (670 m); Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—west of Buchboden: hay meadow (890 m); Laguztal, above Alpe Laguz: *Pinus sylvestris* forest (1590 m). **Montafon**—north of Lorüns: mixed forest (585 m). Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, west of Innerberg: mixed forest (1115 m); Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); ibid., north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m). **Brandnertal**—Lünersee, path to Totalphütte: under *Salix* (2050 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland; xeric to rather moist (altitude 490–2050 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG BL GR JU VD), Southern Germany (BW BY), Italian Alps (BL BZ TN); cosmopolitan.

*Ceratozetes mediocris* Berlese, 1908

**Vorarlberg:** **Rheintal**—near Dornbirn, beside motorway exit 14: hay meadow (410 m) [unpubl.]. **Walgau**—Jagdberg: hay and xeric meadow (590 m) [6]; between Schnifis and Schlins, beside rivulet: hay meadow (600 m) [unpubl.].

**Vorarlberg habitats:** single records in colline meadows; xeric (altitude 410–600 m).

**General distribution:** Austria (B K N O S St nT V), Southern Germany (BW BY), Italian Alps (BS BZ TN); semi-cosmopolitan.

*Ceratozetes minutissimus* Willmann, 1951

**Vorarlberg:** **Bregenzerwald**—Fohramoos: dry Nardetum (1145 m) [7]. **Walgau**—Jagdberg: hay and xeric meadows; colline mixed forest, moss (590–825 m) [6]; Amerlügen near Frastanz: pasture (865 m) [unpubl.].

**Vorarlberg habitats:** single records in colline forest, colline to low montane meadows and pastures (altitude 590–865 m).

**General distribution:** Austria (B K N St nT V W), Switzerland (BL JU ZH), Italian Alps (BZ); southern Palaearctic.

*Ceratozetes parvulus* Sellnick, 1922

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**, Kleinwalsertal—Hörnlepass: raised bog, moist moss (1160 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane raised bog (altitude 1160 m). In Germany in acidic raised bogs (Weigmann *et al.* 2015).

**General distribution:** Austria (N St), Switzerland (BE NE VD), Southern Germany (BY); Holarctic.

*Ceratozetes sellnicki* Rajski, 1958

**Vorarlberg:** New record for Vorarlberg. **Bregenzerwald**, Kleinwalsertal—Hirschgägg, Schwarzwassertal: spruce forest (1340 m) [unpubl.].

**Vorarlberg habitats:** single record in low montane forest (altitude 1340 m).

**General distribution:** Austria (K N nT oT), Southern Germany (BY), Italian Alps (BZ); Palaearctic.

*Ceratozetes thienemanni* Willmann, 1943

**Vorarlberg:** **Rheintal**—Götzis, above Meschach: fir forest (1140 m) [unpubl.]. **Bregenzerwald**—Fohramoos:

raised bog (1150 m) [7]; Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m); west of Furkajoch: spruce forest (1370 m) [unpubl.]. **Walzau**—Jagdberg: mixed forest, moss (685 m) [6]. **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385–1590 m). **Montafon**—Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m) [unpubl.].

**Vorarlberg habitats:** low montane to montane forests, low montane wetlands, subalpine dwarf shrubs; xeric to moist (altitude 685–1795 m).

**General distribution:** Austria (K N nT V), Switzerland (NE VD), Southern Germany (BW BY), Italian Alps (BZ); Holarctic, Neotropical.

*Diapterobates humeralis* (Hermann, 1804)

**Vorarlberg:** **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m) [unpubl.]. **Bregenzerwald**—Fohramoos: moorland forest, moist and wet moss; fen and raised bogs (1145–1150 m) [7]; Diedamskopf: dwarf shrubs (1840 m). **Walzau**—between Schnifis and Schlins, beside rivulet: hay meadow (600 m). **Montafon**—west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m) [unpubl.].

**Vorarlberg habitats:** low montane forests and wetlands, colline meadows, subalpine dwarf shrubs; moist to wet (altitude 600–1860 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (GR JU VD), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Edwardzetes edwardsi* (Nicolet, 1855)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Hohenems, „Old Rhine“: riverine forest (405 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m). **Leiblachtal**—west of Eichenberg, brookside: riparian vegetation (620 m). **Bregenzerwald**—Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, moist moss; fen, wet *Sphagnum*; raised bog, moist moss (1150 m) [7, unpubl.]; Ebniter Tal, near Vorderschauern: spruce forest (970 m); Schnepfau, Bregenzer Ach: riverine forest (720 m); Hirschau: deciduous forest, moss on rock (730 m); above Bad Hopfreben: mixed forest (1030 m); Kanisfluh, above Obern Alm: Rhododendretum (1650 m); Oberdamüls: pasture (1690 m); Damüls, Krumbach: spruce forest (1450 m); Baad, near church: pasture (1240 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1730–1770 m) [unpubl.]. **Walzau**—Jagdberg: montane spruce forest, moss and needle litter; subalpine pasture with *Juniperus communis* and rocks; Hochgerach summit: alpine grassland (1610–1980 m) [6, unpubl.]; Amerlügen near Frastanz: pasture (865 m); Gamperdonatal, near Virgloriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m); east of Marul: pasture (980 m). **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Spullerbachtal: subalpine pasture in spruce forest (1620 m); ibid., raised bog at Spullerbach, moist moss below *Alnus viridis* (1680 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m). **Brandnertal**—Lünernersee, path to Totalphütte: under *Salix* (2050 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane and montane meadows and pastures, low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland; xeric to moist (altitude 405–2050 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GR JU NE SO VD VS), Southern Germany (BW BY), Italian Alps (BL BZ TN); Europe, Caucasus, Greenland, “arcto-alpine”. Frequently in montane to alpine habitats.

*Fuscozelotes fuscipes* (C. L. Koch, 1844)

**Vorarlberg:** New record for Vorarlberg. **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m). Bregenzer Wald—Ifenstock area, west of Schönenbach Alm: raised bog, wet *Sphagnum* (1020 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane wetlands (altitude 860–1020 m).

**General distribution:** Austria (K N O St nT oT), Switzerland (AI AR BE BL GR NE VD VS ZH), Southern Germany (BW BY), Italian Alps (BL BZ TN); Holarctic, Oriental (Vietnam).

*Fuscozetes intermedius* Caroli & Maffia, 1934

**Vorarlberg: Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [7]; Vordere Niedere near Bezau: pasture (1690 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); Diedamskopf: alpine grassland (1550 m). **Walgau**—Jagdberg: colline mixed forest; subalpine pasture with rocks and *Juniperus communis*; montane spruce forest; dwarf shrubs; Hochgerach summit: alpine grassland (565–1980 m); Gamperdonatal, near Alpe Gamperdona: pasture (1320 m). **Arlberg area**—Lech, beside ski slope at Schlegelkopf: Rhododendretum (1825 m); Formarintal: pasture on rivulet (1650 m); ibid., dwarf shrubs (1800 m); ibid., near Formarinsee: subalpine pasture (1850–1870 m). **Montafon**—Ochsental, Vermunt Alpe: alpine grassland (2240 m). **Brandnertal**—Lünersee, near Totalphütte: subnival region, *Dryas octopetala*, *Carex firma*, *Anthyllis vulneraria*, herb and grass cushions (2370–2410 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane and montane meadows and pastures, low montane wetlands, more frequent in subalpine dwarf shrubs and pastures, alpine grassland, subnival cushion plants; rather xeric to moist (altitude 565–2410 m).

**General distribution:** Austria (K O S nT V), Italian Alps (BZ TN); Palaearctic. Mainly in montane to high alpine habitats.

**Remark:** Possible synonym: *Fuscozetes tetricus* Seniczak, 1993.

*Fuscozetes setosus* (C. L. Koch, 1839)

**Vorarlberg: Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Schuttannen above Hohenems: spruce forest (1200 m); Reute above Hohenems: mixed forest (885 m); Götzis, above Meschach: fir forest (1140 m).

**Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); between Weienried and Möggen: wet meadow (860 m). Bregenz—Pfänder: mixed forest (840 m); ibid., spruce forest (1030 m). **Bregenzerwald**—Sulzberg, near Falz: mixed forest (995 m); Reifensberg, above Niemans: spruce forest (980 m); north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m); Fohramoos: spruce forest, wet moss (1145 m); ibid., raised bog, wet moss (1150 m); Mellau, Roßstellealpe: mixed forest (1050 m); ibid., Bleichenalm: pasture (1230 m); above Mellau: mixed forest (960 m); above Bad Hopfreben: spruce forest (1030–1035 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Oberdamüls, near timberline: spruce forest (1755 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf: dwarf shrubs (1720–1840 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). **Kleinwalsertal**—Hirscheegg, Schwarzwassertal: spruce forest (1340 m); Hörnlepass: raised bog, moist moss (1160 m). **Laternsertal**—Furkajoch: dwarf shrubs (1770 m). **Laternsertal**—west of Furkajoch: spruce forests (1185–1370 m) [unpubl.].

**Walga**—Jagdberg: fen; subalpine pasture with *Juniperus communis*; montane spruce forest, moss near a small pond; Hochgerach summit: alpine grassland (640–1980 m) [6, unpubl.]; near Göfis: raised bog, moist moss (555 m). **Großes Walsertal**—south of Faschinajoch, above road: spruce forest (1220 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m); ibid., above “Fuchswald”: mixed forest (1280 m). **Arlberg area**—Flexenpass: subalpine pasture (1755 m). **Montafon**—Silbertal, Silberberg near Schruns: mixed forest (900 m); ibid., near Fellimännle: pasture (1100 m); Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane and montane pastures, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine grassland; xeric to rather moist (altitude 555–1980 m).

**General distribution:** Austria (K N O S St nT V), Switzerland (AG AI BE BS GR JU NE VD VS ZH), Southern Germany (BW BY), Italian Alps (BZ); Holarctic. Frequently in montane to high alpine habitats.

*Jugatala angulata* (C. L. Koch, 1839)

**Vorarlberg:** New record for Vorarlberg. **Walga**—Jagdberg: subalpine pasture with *Alnus viridis* and rocks; Hochgerach summit: alpine grassland (1650–1980 m) [6, unpubl.].

**Vorarlberg habitats:** single records in subalpine dwarf shrubs and pastures, also in alpine grassland (altitude 1650–1980 m).

**General distribution:** Austria (K S nT oT), Switzerland (BS VS), Southern Germany (BW BY), Italian Alps (BZ TN); Alps, Central, Southeast Europe. Frequently in montane to alpine habitats.

*Lepidozetes singularis* Berlese, 1910

**Vorarlberg: Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m). **Bregenzerwald**—Balderschwanger-tal, near Gerisgschwend: spruce forest (1010 m) [unpubl.]; Fohramoos: raised bogs, wet *Sphagnum* (1150 m) [7]; Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m). Kleinwalsertal—Wal-mendinger Horn: dwarf shrubs (1860 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgauf**—Jagdberg: montane spruce forest, moss and needle litter; subalpine pasture with *Alnus viridis*, *Juniperus communis* and rocks (1560–1725 m) [6, unpubl.]. **Arlberg area**—Arlbergpass, at Rauzbach: Rhododendretum (1780 m). **Montafon**—Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, near Fellimännle: pasture (1100 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** low montane and montane forests, low montane pastures and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to moist (altitude 780–2030 m).

**General distribution:** Austria (K N S St nT oT V), Switzerland (BS GR VD VS), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, South Africa. Mainly in alpine to high alpine habitats.

*Melanozetes meridianus* Sellnick, 1928

**Vorarlberg: Bregenzerwald**—Fohramoos: spruce forest, wet moss; raised bog, moist moss (1145–1150 m) [7, unpubl.]; Kanisfluh, above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Damüls, Krumbach: spruce forest (1450 m); Diedamskopf, summit: alpine grassland (2000 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m) [unpubl.]. **Walgauf**—Jagdberg: subalpine pasture with *Alnus viridis* and rocks; Hochgerach summit: alpine grassland (1650–1980 m) [6, unpubl.]. **Arlberg area**—Oberlech: dwarf shrubs (1650 m). **Montafon**—Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m). **Brandnertal**—Lünersee, path to Totalphütte: under *Salix* (2050 m) [unpubl.].

**Vorarlberg habitats:** montane forests, low montane wetlands, subalpine dwarf shrubs, pastures and raised bog, alpine dwarf shrubs and grassland; xeric to rather moist (altitude 1145–2050 m).

**General distribution:** Austria (K O S St nT oT V), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic. Frequently in montane to alpine habitats.

*Melanozetes mollicomus* (C. L. Koch, 1839)

**Vorarlberg: Rheintal**—Schuttannen above Hohenems: spruce forest, rotten wood (1220 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m). **Bregenzerwald**—north of Alberschwende: mixed forest at Fischbach, moss and rotten wood (705 m) [unpubl.]; Fohramoos: moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs, wet moss (1145–1150 m) [7, unpubl.]; above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); above Bad Hopfreben: spruce forest (1030 m). Kleinwalsertal—Hörnlepass: raised bog, moist moss (1160 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m). **Walgauf**—Jagdberg: colline mixed forest; montane spruce forest, moss and needle litter; subalpine pasture with *Juniperus communis* (706–1610 m) [6, unpubl.]; Gamperdonatal, near Virglriatobel: scree with mixed forest (1280 m). **Großes Walsertal**—Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m). **Arlberg area**—Lech, above Schlegelkopf—Pe-ttersboden: dry moss below *Alnus viridis* (1880 m). **Montafon**—Silbertal, near Fellimännle: pasture (1100 m). **Brandnertal**—Lünersee, near Totalphütte: subnival region, herb and grass cushion (2370 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane pasture and wetlands, subalpine dwarf shrubs and pastures, subnival cushion plants; xeric to rather moist (altitude 440–2370 m).

**General distribution:** Austria (K N O S St nT oT V), Switzerland (GR NE VD), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, „arcto-alpine“. Frequently in montane to alpine habitats.

*Oromurcia sudetica* Willmann, 1939

**Vorarlberg: Bregenzerwald**—Fohramoos: moorland forest, moist moss; rivulet in moorland forest, wet moss;

wet Molinietum; raised bog, wet grass (1145–1150 m) [7]. **Walgau**—Jagdberg: subalpine pasture with *Alnus viridis* and rocks; Hochgerach summit: alpine grassland (1725–1980 m) [6, unpubl.]. **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); Spullerbachtal: subalpine pasture in spruce forest (1620 m); ibid., raised bog at Spullerbach, moist moss below *Alnus viridis* (1680 m) [unpubl.].

**Vorarlberg habitats:** low montane forests and wetlands, subalpine dwarf shrubs, pastures and raised bog, alpine grassland; rather moist to wet (altitude 1145–1980 m).

**General distribution:** Austria (K N S St nT oT V), Southern Germany (BY), Italian Alps (BZ TN); Central, South, Southeast Europe, Caucasus. Frequently in montane to alpine habitats.

*Sphaerozetes piriformis* (Nicolet, 1855)

**Vorarlberg:** **Rheintal**—above Dornbirn, near Bödele: mixed forest (490 m); Reute above Hohenems: mixed forest (885 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: moorland forest, moist to wet moss; raised bog (1145–1150 m) [7]; Bregenzer Ach near Bezau: riverine forest (620 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m) [unpubl.]; Ifenstock area: Schneckenloch cave, entrance region (1270 m); sinkhole in „Gottesackerplateau“ north of Ifenstock (1780 m) [3 sub *Sphaerobates piriformis*, 5]. **Walgau**—Jagdberg: Hochgerach summit: alpine grassland, moss and leaf litter under *Salix herbacea* (1980 m) [6]. **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m). **Montafon**—Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, subalpine dwarf shrubs, alpine grassland; xeric to wet (altitude 490–1980 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (GR VD), Southern Germany (BW), Italian Alps (BZ TN); Palaearctic.

*Sphaerozetes tricuspidatus* Willmann, 1923

**Vorarlberg:** New record for Vorarlberg. **Walgau**—west of Satteins, rivulet Kirchenbach: riverine forest (505 m); Saminatal: spruce forest (530 m) [unpubl.].

**Vorarlberg habitats:** single records in colline and low montane forests (altitude 505, 530 m).

**General distribution:** Austria (O W), Switzerland (VD), Southern Germany (BW); Palaearctic.

*Trichoribates berlesei* Jacot, 1929 (*Trichoribates*)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m). **Bregenzerwald**—Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); Bizauer Tal, Löffelau tollbooth: mixed forest (960 m); Mellau, Roßstellealpe, Bleichenalm: pasture (1230 m); Kanisfluh: mixed forest (1750 m); Diedamskopf, west of Halden Alpe: wet pasture (1750 m). Hochtannberg—Kalbelesee: wet meadow (1655 m); southwest of Kalbelesee: Rhododendretum (1730 m). Laternsertal—east of Furkajoch: dwarf shrubs (1640 m) [unpubl.]. **Walgau**—Jagdberg: fen, in reed; montane spruce forest, moss and needle litter; subalpine pasture with *Alnus viridis* and rocks (640–1725 m) [6 sub *T. trimaculatus*, unpubl.]; Gamperdonatal, near Alpe Gamperdona: pasture (1320 m). **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m). **Montafon**—Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Kleinvermunt, east of Silvretta Reservoir: Rhododendretum (2030 m); Ochsental, Vermunt Alpe, below “Hohes Rad” mountain: alpine grassland, moss, *Saxifraga* (2300 m); ibid., at Wiesbadener Hütte: alpine grassland (2465 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, montane pastures, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine grassland; xeric to wet (altitude 396–2465 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (BE BL GR ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Oriental.

**Remark:** Synonym: *Trichoribates trimaculatus* (C. L. Koch, 1835), according to Weigmann & Norton (2009).

*Trichoribates incisellus* (Kramer, 1897) (*Latilamellobates*)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: fen and raised bogs; wet leaf litter and *Sphagnum* (1150 m) [7, unpubl.]; Diedamskopf, summit: alpine grassland (2090 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, moss and leaf litter; Hochgerach summit: alpine grassland (685–1980 m) [6].

**Vorarlberg habitats:** colline forests, low montane wetlands, subalpine dwarf shrubs, alpine grassland; rare; moist to wet (altitude 685–2090 m).

**General distribution:** Austria (B K N O S St nT oT V), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Trichoribates novus* (Sellnick, 1928) (*Trichoribates*)

**Vorarlberg:** **Walzau**—Jagdberg: Hochgerach summit: alpine grassland (1980 m) [6].

**Vorarlberg habitats:** single record in alpine grassland (altitude 1980 m).

**General distribution:** Austria (K N O St nT V), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Trichoribates scilierensis* Bayartogtokh & Schatz, 2008 (*Trichoribates*)

**Vorarlberg:** **Bregenzerwald**—Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Damüls, Krumbach: spruce forest (1450 m). Kleinwalsertal—Walmendinger Horn, near summit: subalpine pasture (1970 m) [unpubl.]. **Walzau**—Jagdberg: Hochgerach summit: alpine grassland, moss and leaf litter under *Salix herbacea* (1980 m) [6]. **Arlberg area**—Oberlech: dwarf shrubs (1650 m). Arlbergpass, at Rauzbach: Rhododendretum (1780 m). **Montafon**—Gargellental, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); Ochsental, at Vermunt glacier: subnival region, moss (2620 m). **Brandnertal**—Lünersee, path to Totalphütte: Rhododendretum (2130 m); ibid., subnival region, *Ranunculus alpestris*, *Dryas octopetala*, *Silene acaulis*, *Carex firma*, *Anthyllis vulneraria* cushions, herbs with soil (2370–2410 m); ibid., “Gamsluggen” at crest of Totalpköpfe: subnival region, *Dryas octopetala* cushion (2410 m) [unpubl.].

**Vorarlberg habitats:** montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland, subnival moss and cushion plants (altitude 1450–2620 m).

**General distribution:** Austria (nT oT V), Italian Alps (BZ TN); Alps (endemic). In alpine and high alpine habitats.

## Fam. Chamobatidae Thor, 1937

*Chamobates birulai* (Kulczynski, 1902)

**Vorarlberg:** **Rheintal**—Feldkirch, St. Cornelius in Tosters: mixed forest (540 m) [unpubl.]. **Bregenzerwald**—Fohramoos: dry Nardetum (1145 m) [7]. **Walzau**—Jagdberg: montane spruce forest, moss and needle litter; subalpine pasture with *Alnus viridis* and rocks; Hochgerach summit: alpine grassland (1580–1980 m) [6]. **Arlberg area**—Oberlech: spruce forest (1670 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m) [unpubl.].

**Vorarlberg habitats:** single record in colline forest, also in low montane meadow and montane forests, subalpine dwarf shrubs and pasture, alpine dwarf shrubs and grassland; rather xeric; rare (altitude 540–2030 m).

**General distribution:** Austria (K N nT V), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic, Greenland.

*Chamobates cuspidatus* (Michael, 1884)

**Vorarlberg:** **Walzau**—Jagdberg: hay and xeric meadows; fen; colline mixed forest, brookside with moss; Hochgerach summit: alpine grassland (565–1980 m) [6].

**Vorarlberg habitats:** single records in colline forests, meadows and wetlands, also in alpine grassland (altitude 565–680, 1980 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AI BL VS VD ZH), Southern Germany (BW BY), Italian Alps (BS BZ TN); Holarctic, western Oriental (Pakistan), Seychelles.

**Remark:** All findings of „*Chamobates cuspidatus*“ in Fohramoos near Bödele (Schatz 2015 [7]) and most findings under this name in Jagdberg (Schatz & Fischer 2013 [6]) are *Ch. pusillus* resp. *Ch. voigtsi* (see there).

*Chamobates pusillus* (Berlese, 1895)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rheinspitz: riverine forest (398 m). **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m); Reute above Hohenems: mixed forest (885 m); Hohenems, „Old Rhine“:

riverine forest (405 m); Feldkirch, St. Corneli in Tosters: mixed forest (540 m). **Leiblachtal**—Eichenberg near Schüssellehen: spruce forest (850 m). Bregenz—Pfänder, Fluh: mixed forest (750–840 m). **Bregenzerwald**—Sulzberg, riverbank of Weidach: riverine forest, moss on rocks (595 m); ibid., near Falz: mixed forest (995 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; wet Molinietum; fen and raised bogs; wet leaf litter, grass and *Sphagnum* (1145–1150 m) [7 part. sub *Ch.borealis*, *Ch. cuspidatus*, unpubl.]; Ebmiter Tal, near Vorderschauern: spruce forest (970 m); Bizauer Tal, at tollbooth: mixed forest (730 m); Hirschau: deciduous forest, moss on rock (730 m); Kanisfluh: mixed forest (1750 m); ibid., above Obern Alm: Rhododendretum (1650 m); ibid., above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); Subersachtal north of Schoppernau near Halden: hay meadow (1650 m). Kleinwalsertal—Hirschgägg, Schwarzwässertal: spruce forest (1340 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, brookside with moss; subalpine pastures with *Alnus viridis*, *Juniperus communis* and rocks; Hochgerach summit: alpine grassland (490–1980 m) [6 sub *Ch.borealis*, part. sub *Ch. cuspidatus*, unpubl.]; Saminatal: spruce forest (530 m); Gamperdonatal: mixed forests (930–1280 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); south of Faschinajoch, above road: spruce forest (1220 m); west of Buchboden at bridge: mixed forest (900 m). **Klostertal**—west of Langen: mixed forest on scree (1040 m). **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m); east of Zug: spruce forest (1475 m). **Montafon**—north of Lorüns: mixed forest (585 m); south of Schruns, Ill river: riverine forest (770 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal, Innerberg: pasture (1150 m); Gargellenatal, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, low montane wetlands, subalpine dwarf shrubs and pastures, alpine grassland; xeric to moist (altitude 398–1980 m).

**General distribution:** Austria (B K N O St nT V), Switzerland (GR ZH), Southern Germany (BW BY), Italian Alps (BG BS BZ TN); Holarctic.

**Remark:** Possible synonym: *Chamobates borealis* (Trägårdh, 1902), according to Mahunka & Mahunka-Papp 1995.

#### *Chamobates rastratus* (Hull, 1914)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—Reute above Hohenems: mixed forest (885 m). **Bregenzerwald**—Kleinwalsertal—above Walmendinger Alpe: dwarf shrubs (1650 m) [unpubl.].

**Vorarlberg habitats:** single records in low montane forest, subalpine dwarf shrubs (altitude 885, 1650 m).

**General distribution:** Austria (B K N S nT oT), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic. Frequently in montane to alpine habitats.

**Remark:** Synonym: *Chamobates spinosus* Sellnick, 1928 according to Mahunka & Mahunka-Papp (2004).

#### *Chamobates subglobulus* (Oudemans, 1900)

**Vorarlberg: Bregenzerwald**—Ifenstock area: sinkhole in „Gottesackerplateau“ north of Ifenstock (1780 m) [3, 5 sub *Ch. lapidarius*]. **Walgau**—Jagdberg: fen, in reed (565 m) [6].

**Vorarlberg habitats:** single records in colline moorland and in a subalpine sinkhole in limestone (altitude 565, 1780 m)

**General distribution:** Austria (B N O St nT oT V), Switzerland (BL ZH VD), Southern Germany (BW BY); Palaearctic.

**Remark:** Synonym: „*Chamobates lapidarius*“ sensu Sellnick (1928), Willmann (1931) nec Lucas.

#### *Chamobates voigtsi* (Oudemans, 1902)

**Vorarlberg: Rheintal**—above Dornbirn, near Bödele: mixed forest (960 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); Schuttenanen above Hohenems: spruce forest (1200 m); Reute above Hohenems: mixed forest (885 m); east of Koblach, southern slope of Kummenberg: deciduous forest, moss on tree stump (440 m); Götzis, above Meschach: fir forest (1140 m); ibid., Örfla gorge: mixed forest (670 m); Röthis, above Viktorsberg: mixed forest (920 m); Rankweil, near Batschuns: mixed forest on rock slope (880 m); Feldkirch, Ardetzenberg: mixed forest (595 m); ibid., St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., mixed forest (540 m). **Leiblachtal**—Gören near Hohenweiler: mixed forest (570 m); Hub near Hohenweiler: mixed forest (695 m); Eichenberg near Schüssellehen: spruce forest (850 m); west of Eichenberg, brookside:

riparian vegetation (620 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: spruce forest (1030 m); ibid., Fluh: mixed forest (750 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Gschwendele: mixed forest (790 m); ibid., near Falz: mixed forest (995 m); ibid., steep slope above Doren: mixed forest (530 m); Reifensberg, above Niemans: spruce forest (980 m); Balderschwangertal, near Gerisgenschwend: spruce forest (1010 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]; Fohramoos: moorland forest, moist and wet moss (1145–1150 m) [7 part. sub *Ch. cuspidatus*, unpubl.]; Ebniter Tal, Briedler Alpe: spruce forest (1450 m); ibid., above Hackwald: mixed forest (920 m); ibid., near Vorderschauern: spruce forest (970 m); ibid., road junction to Kobelealpe: mixed forest (740 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Vordere Niedere near Bezau: spruce forest (1420 m); ibid., Sonderdach: mixed forest (980 m); Bizauer Tal, river: mixed forest (1000 m); above Schnepfegg: mixed forest, rotten wood on tree stump (880 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); ibid., Bleichenalm: pasture (1230 m); above Mellau: mixed forest (960 m); Hirschau: deciduous forest (730 m); between Hirschau and Schnepfau: deciduous forest (730 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfreben: spruce forest (1030 m); below Kanisfluh: mixed forest (1190 m); Oberdamüls, near timberline: spruce forest (1755 m); Diedamskopf: dwarf shrubs (1840 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). Kleinwalsertal—Baad, near Camping Vorderboden: mixed forest (1220 m); Walmendinger Horn: dwarf shrubs (1860 m); above Walmendinger Alpe: dwarf shrubs (1860 m); Hirschgägg, Schwarzwassertal: spruce forest (1340 m); Hörnlepass: raised bog, wet moss (1160 m). Hochtannberg—Warth, near Tyrolean border: spruce forest (1480 m); southwest of Kalbelesee: Rhododendretum (1770 m). Laternsertal—east of Furkajoch: dwarf shrubs (1640 m); ibid., Furkajoch: dwarf shrubs (1770 m); ibid., west of Furkajoch: spruce forest (1185–1370 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed forests; fen; montane spruce forest, moss and needle litter; subalpine pastures with rocks; dwarf shrubs (490–1725 m) [6 part. sub *Ch. cuspidatus*, unpubl.]; above Thüringen, near Quadern: mixed forest (615 m); Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Bazulwald west of Nenzing: mixed forest (670 m); Saminatal: spruce forest (530 m); ibid., mixed forest (740 m); Gamperdonatal: mixed forests (930–1280 m); west of Nüziders: beech forest (545 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Meieren near Thüringerberg: mixed forest (765 m); south of Faschinajoch, above road: spruce forest (1220 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1160–1590 m); east of Marul: pasture (980 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m); west of Wald, beside road: mixed forest (915 m); west of Langen: mixed forest on scree (1040 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m); Flexenpass: subalpine pasture (1755 m); Oberlech: spruce forest (1670 m); Arlbergpass, at Rauzbach: Rhododendretum (1780 m); Formarintal: dwarf shrubs (1800 m). **Montafon**—north of Lorüns: mixed forest (585 m); Vandans, Zwischenbach at mouth of Rellstal: spruce forest (780 m); Silbertal: mixed forest (900–1115 m); Gargellen, near Hotel “Vergalda” at Valzifenzbach: spruce forest, moss on rocks (1510 m); ibid., north of Gargellen: spruce forest (1390 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m); west of Zeinisjoch, near Kops Reservoir: dwarf shrubs with *Pinus mugo* and *Vaccinium uliginosum* (1860 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); ibid., under *Salix* (2050 m) [unpubl.].

**Vorarlberg habitats:** among the most frequently discovered species, numerous records throughout the country: colline to montane forests, meadows and pastures, colline and low montane wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs; xeric to wet (altitude 422–2050 m).

**General distribution:** Austria (B K N O S St nT oT V W), Switzerland (NE GR), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic.

*Globozetes longipilus* Sellnick, 1928

**Vorarlberg:** New record for Vorarlberg. **Walgau**—near Göfis: raised bog, moist moss (555 m) [unpubl.].

**Vorarlberg habitats:** single record in colline raised bog (altitude 555 m).

**General distribution:** Austria (B K N O St nT), Southern Germany (BW), Italian Alps (BZ TN); Palaearctic, rare.

## Fam. Euzetidae Grandjean, 1954

*Euzetes globulus* (Nicolet, 1855)

**Vorarlberg:** **Rheintal**—between Hohemems and Lustenau: wet meadow, reed (410 m). **Rheintal**—Feldkirch, Gisingen: riverine forest (435 m); ibid., St. Corneli in Tosters: mixed forest (510–540 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m). **Bregenzerwald**—Sulzberg, near Doren: hay meadow (490 m); Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m); Bregenzer Ach near Bezau: riverine forest (620 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest, leaf litter with rotten bark; fen; subalpine pasture with *Alnus viridis* and rocks (490–1650 m) [6]; Amerlügen near Frastanz: pasture (865 m); Saminatal: spruce forest (530 m). **Großes Walsertal**—east of Marul: pasture (980 m). **Montafon**—south of Schruns, near Ill river: riverine forest (770 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** most findings in colline and low montane forests, meadows and pastures, colline wetlands, also single records in subalpine pasture; xeric to wet (altitude 410–980 m, 1650 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG BE BL VD ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic, South America (Argentina).

## Fam. Puncitorbatidae Thor, 1937

*Feiderzetes latus* (Schweizer, 1956)

**Vorarlberg:** New record for Vorarlberg and Austria. **Arlberg area**—Oberlech: spruce forest (1670 m) [unpubl.].

**Vorarlberg habitats:** single record in montane forest (altitude 1670 m).

**General distribution:** Switzerland (GR TI), Italian Alps (BZ); Central, South, Southwest, Southeast Europe, Caucasus.

**Remark:** Redescription by Bernini & Baratti (1990), additional description by Mahunka (2001).

*Minunthozetes pseudofusiger* (Schweizer, 1922)

**Vorarlberg:** **Rheintal**—Wolfurt, valley of Bregenzer Ach: mixed forest (480 m). Balderschwangertal, near Gerisgschwend: spruce forest (1010 m) [unpubl.]; Fohramoos: moorland forest, moss; wet Molinetum (1145 m) [7]; Vordere Niedere near Bezau, Sonderdach: mixed forest, dry moss on rock (980 m); Schnepfau, near Bregenzer Ach: riverine forest (720 m); above Schnepfegg: mixed forest (880 m); Mellau, Roßstellealpe: mixed forest (1050 m); Hirschau: deciduous forest, moss on rock (730 m). Laternsertal—west of Furkajoch: spruce forest, moss on rock (1185 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; hay and xeric meadows; colline mixed forest, moss; montane spruce forest, moss and needle litter; dwarf shrubs (490–1835 m) [6]. **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m); Laguztal, near Alpe Laguz: *Pinus sylvestris* forest (1385 m); ibid., above “Fuchswald”: mixed forest (1280 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline meadows, low montane wetlands, subalpine dwarf shrubs; xeric to moist (altitude 480–1835 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL VD ZH), Southern Germany (BW BY), Italian Alps (BZ); Palaearctic.

*Minunthozetes semirufus* (C. L. Koch, 1841)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (396 m); ibid., north of Höchst: wet meadow (398 m); mouth of Rhine-Rheinspitz: riverine forest (398 m); ibid., deciduous forest (405 m); ibid., spruce forest (398 m). **Rheintal**—south of Lauterach: wet meadow (410 m); Buch at Bregenzer Ach: meadow (650 m); above Dornbirn, near Bödele: mixed forest (490 m); Dornbirn, railway station Haselstauden: small forest strip (420 m); near Dornbirn, beside motorway exit 14: hay meadow (410 m); between Hohemems and Lustenau: wet meadow, reed (410 m); Götzis, Örfla gorge above Meschach: mixed forest (670 m); Rankweil, Batschuns: pasture in orchard (590 m); Feldkirch, Unterries near Bangs: moist meadow (435 m); ibid., Gisingen: riverine forest (435 m). **Leiblachtal**—Gören near Hohenweiler: pasture (560 m); Ried near Hohenweiler: mixed forest with oaks (470 m); Hörbranz, Erlach: pasture (480 m). Bregenz—mouth of Bregenzer Ach: riverine forest

(400 m). **Bregenzerwald**—Sulzberg, near Falz: mixed forest, rotten wood from tree stump (990 m); ibid., hay meadow (980 m); near Doren: hay meadow (490 m); ibid., riverbank: grass litter (450 m); Reifensberg, above Niemans: spruce forest (980 m); Egg, south of junction Bezau—Lingenau: slope with alder (600 m); between Ittensberg and Großdorf: meadow (810 m); above Schwarzenberg: hay meadow (830 m) [unpubl.]; Fohramoos: moorland forest, moss; raised bog, wet grass (1150 m) [7]; Ebniter Tal, below Hohe Kugel: subalpine grassland, Nardetum (1635 m); ibid., spruce forest, rotten wood from tree stump (1270 m); ibid., near Kobelealpe: birch stand, wet *Juncus* with moss (1040 m); ibid., mouth of Ebniter Ach: riverine forest (490 m); Andelsbuch: hay meadow (635 m); Bregenzer Ach near Bezau: riverine forest (620 m); Vordere Niedere near Bezau, cableway station: wet meadow (770 m); ibid., Sonderdach: mixed forest, dry moss on rock (980 m); above Schnepfegg: mixed forest (880 m); Mellau: hay meadow (660 m). **Walgau**—between Schnifis and Schlins, beside rivulet: hay meadow (600 m) [unpubl.]; Jagdberg: hay and xeric meadows; fen; subalpine pasture, lichens (490–1790 m) [6]; Latz west of Nenzing, at Galina bridge: deciduous forest (690 m); Saminatal: pasture (510 m); Gamperdonatal, at road bridge: mixed forest (930 m). **Großes Walsertal**—Meiern near Thüringerberg: mixed forest (765 m); Laguztal, above “Fuchswald”: mixed forest (1280 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows, pastures and wetlands, subalpine dwarf shrubs; xeric to wet (altitude 396–1790 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (AG BE BL GR JU NE VD ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic.

*Mycobates alpinus* (Willmann, 1951)

**Vorarlberg:** **Walgau**—Jagdberg: montane spruce forest; Hochgerach summit: alpine grassland (1610–1980 m) [6, unpubl.]. **Arlberg area**—Lech, above Schlegelkopf—Petersboden: dry moss below *Alnus viridis* (1880 m) [unpubl.].

**Vorarlberg habitats:** single records in montane forests, subalpine dwarf shrubs, alpine grassland (altitude 1610–1980 m).

**General distribution:** Austria (K N O S St nT V), Italian Alps (BZ); Alps (endemic). Mainly in montane to alpine habitats.

**Remark:** The finding of „*Mycobates alpinus*“ in Jagdberg, colline fen (Schatz & Fischer 2013) is *M. parmeliae*.

*Mycobates carli* (Schweizer, 1922)

**Vorarlberg:** **Bregenzerwald**—Fohramoos: rivulet in moorland forest, wet moss; raised bogs, wet *Sphagnum* (1150 m) [7]; Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m). Hochtannberg—southwest of Kalbelesee: Rhododendretum (1770 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m). **Walgau**—Jagdberg: subalpine pasture, lichens; dwarf shrubs; Hochgerach summit: alpine grassland, moss and leaf litter under *Salix herbacea* (1790–1980 m) [6 part. sub *Mycobates* sp.]. **Montafon**—Ochsental, southern end of Silvretta Reservoir: Rhododendretum (2080 m); ibid., at Wiesbadener Hütte: alpine grassland (2465 m). **Brandnertal**—Lünernersee, near Totalphütte: subnival region, herb and grass cushion (2370 m) [unpubl.].

**Vorarlberg habitats:** low montane moorland forests and wetlands, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grasslands, subnival cushion plants; rather moist to wet (altitude 1150–2465 m).

**General distribution:** Austria (K N S St nT V), Switzerland (GR), Southern Germany (BW BY), Italian Alps (BZ TN); Alps, Central, South, Southeast Europe, Caucasus. Mainly in alpine habitats.

**Remark:** The findings of „*Mycobates carli*“ and „*Mycobates* sp.“ in Jagdberg, colline fen (Schatz & Fischer 2013) are *M. parmeliae*.

*Mycobates parmeliae* (Michael, 1884)

**Vorarlberg:** **Rheintal**—Feldkirch, St. Cornelius in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m) [unpubl.]. **Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, moss; raised bog, wet moss (1150 m) [7, unpubl.]; above Bad Hopfreben: spruce forest (1035 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, moss; fen; subalpine pasture with rocks (565–1700 m) [6 part. sub *M. alpinus*, *M. carli*, *Mycobates* sp., unpubl.]; Saminatal: spruce forest (530 m). **Großes Walsertal**—west of Ragall: mixed forest (920 m); Meiern near Thüringerberg: mixed forest (765 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane forests and wetlands, subalpine pasture; rather xeric to moist (altitude 520–1700 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL BS GR VD ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, Mexico. Frequently in montane to alpine habitats.

*Mycobates sarekensis* (Trägårdh, 1910)

**Vorarlberg: Bregenzerwald**—Ifenstock area: Schneckenloch cave, entrance region (1270 m); sinkhole in „Göttesackerplateau“ north of Ifenstock (1780 m) [3, 4, 5 sub *M. consimilis*]. **Walgau**—Jagdberg: Hochgerach summit: alpine grassland (1980 m) [6 sub *M. bicornis*, unpubl.].

**Vorarlberg habitats:** single records in subalpine sinkhole in limestone, alpine grassland (altitude 1270–1980 m).

**General distribution:** Austria (nT V); Holarctic, „arcto-alpine“.

**Remark:** Synonym: *Mycobates consimilis* Hammer, 1952, according to Behan-Pelletier (1994). A redescription is given by I. Solhøy (1997). The finding of „*Mycobates bicornis* (Strenzke, 1954)“ in Jagdberg (Schatz & Fischer 2013) is *M. sarekensis*.

*Puncitoribates punctum* (C. L. Koch, 1839)

**Vorarlberg:** New record for Vorarlberg. **Bodensee area**—mouth of Rhine, north of Höchst: wet meadow (398 m).

**Rheintal**—south of Lauterach: wet meadow (410 m); near Dornbirn, beside motorway exit 14: hay meadow (410 m); Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m) [unpubl.].

**Vorarlberg habitats:** single records in colline meadows and rotten wood; xeric to moist (altitude 398–520 m).

**General distribution:** Austria (B K N O St nT oT W), Switzerland (GR TI ZH), Southern Germany (BW BY), Italian Alps (BZ TN); Holarctic, western Oriental (Pakistan); New Zealand.

*Puncitoribates sellnicki* Willmann, 1928

**Vorarlberg: Walgau**—Jagdberg: fen, moss and reed (altitude 565–640 m) [6].

**Vorarlberg habitats:** single records in colline wetlands; moist to wet (altitude 565–640 m).

**General distribution:** Austria (B K N nT V), Switzerland (NE VD), Southern Germany (BW), Italian Alps (BZ); Palaearctic.

## Fam. Zetomimidae Shaldybina, 1966

*Zetomimus furcatus* (Warburton & Pearce, 1905)

**Vorarlberg:** New record for Vorarlberg. **Walgau**—near Göfis: raised bog, wet grass litter and moss (555 m) [unpubl.].

**Vorarlberg habitats:** single record in colline wetland (altitude 555 m).

**General distribution:** Austria (B K nT), Switzerland (GR), Southern Germany (BW), Italian Alps (BZ); Palaearctic, South America.

## Fam. Galumnidae Jacot, 1925

*Acrogalumna longipluma* (Berlese, 1904)

**Vorarlberg: Rheintal**—Feldkirch, St. Corneli in Tosters: below “1000-year yew” (*Taxus baccata*), rotten wood (520 m); ibid., mixed forest (510 m); ibid., Ardetzenberg: mixed forest (595 m). **Bregenzerwald**—Sulzberg, west of Gullenbach: mixed forest (655 m); ibid., near Falz: mixed forest (995 m); Ebniter Tal, Schneewald Alm: spruce forest, rotten wood from tree stump (1270 m); ibid., near Kobealpe: birch stand, wet *Juncus* with moss (1040 m); above Schnepfegg: mixed forest (880 m); Au, Argenzipfel, Leuebach: mixed forest (995 m); above Bad Hopfreben: mixed forest (1030 m); Kanisfluh, above Wurzach Alm: dwarf shrubs, *Juniperus communis* (1660 m); below Kanisfluh: mixed forest (1190 m); Sibratsgfäll, Völken: spruce forest (1050 m); Subersachtal: spruce forest (1200 m). Laternsertal—Furkajoch: dwarf shrubs (1770 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, brookside with moss; subalpine pasture; Hochgerach summit: alpine grassland (570–1980 m) [6].

**Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m). **Montafon**—Silbertal: mixed forest

(950–1115 m); Gargellental, north of Gargellen: spruce forest (1390 m); Untervermunt, near bridge across river Ill: spruce forest (1520 m); Großvermunt, near Vermunt Reservoir: Rhododendretum (1795 m). **Brandnertal**—Lünersee, path to Totalphütte: dwarf shrubs with *Pinus mugo* (2030 m); *ibid.*, under *Salix* (2050 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, subalpine dwarf shrubs and pastures, alpine dwarf shrubs and grassland; rather xeric to moist (altitude 510–2050 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BE? GR BL VS ZH), Southern Germany (BW BY), Italian Alps (BG BL BS BZ); semicosmopolitan.

*Galumna alata* (Hermann, 1804)

**Vorarlberg:** New record for Vorarlberg. **Rheintal**—south of Lauterach: wet meadow (410 m). **Bregenzerwald**—between Ittensberg and Großdorf: meadow (810 m); Ebniter Tal, mouth of Ebniter Ach: riverine forest (490 m). **Montafon**—St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m) [unpubl.].

**Vorarlberg habitats:** colline and low montane riverine forests and meadows; moist to wet (altitude 410–810 m).

**General distribution:** Austria (B N O nT oT), Switzerland (JU ZH), Southern Germany (BW BY), Italian Alps (BZ TN); semicosmopolitan.

*Galumna lanceata* (Oudemans, 1900)

**Vorarlberg:** **Bodensee area**—mouth of Rhine-Rohrspitz: below *Salix* (397 m). **Rheintal**—south of Lauterach: wet meadow (410 m); between Hohemems and Lustenau: wet meadow, reed (410 m). **Leiblachtal**—Ried near Hohenweiler: mixed forest with oaks (470 m). **Bregenzerwald**—Hittisau, Häusern: beech forest (770 m) [unpubl.]. **Walgau**—Jagdberg: colline mixed forest, moss (685 m) [6]; Latz west of Nenzing, at Galina bridge: deciduous forest (690 m). **Großes Walsertal**—west of Buchboden at bridge: mixed forest (900 m). **Klostertal**—west of Dalaas, above road: mixed forest (775 m). **Montafon**—north of Lorüns: mixed forest (585 m); St. Gallenkirch—Badmunt, mouth of Suggadinbach: riverine forest (800 m); Zeinisjoch, outflow of Zeinisbach from Kops Reservoir: raised bog, dry moss (1835 m) [unpubl.].

**Vorarlberg habitats:** mainly in colline and low montane forests, colline meadow, also in subalpine raised bog; xeric to moist (altitude 397–900 m, 1835 m).

**General distribution:** Austria (B K O N S St nT oT V W), Switzerland (VS), Southern Germany (BW BY), Italian Alps (BZ TN); Palaearctic, Oriental (Vietnam).

*Galumna obvia* (Berlese, 1914)

**Vorarlberg:** **Leiblachtal**—between Weienried and Möggen: wet meadow (860 m); Ried near Hohenweiler: mixed forest with oaks (470 m). Bregenz—Pfänder: mixed forest (840 m) [unpubl.]. **Walgau**—Jagdberg: river Ill, riverine forest; colline hay and xeric meadows; colline mixed forest, moss (490–685 m) [6, unpubl.].

**Vorarlberg habitats:** colline and low montane forests, meadows and wetlands; moist to wet; rare (altitude 470–860 m).

**General distribution:** Austria (O nT V), Switzerland (NE VD ZH), Southern Germany (BW BY), Italian Alps (BZ); semicosmopolitan.

*Pergalumna altera* (Oudemans, 1915)

**Vorarlberg:** **Rheintal**—Reute above Hohenems: mixed forest (885 m) [unpubl.]. Bregenzer Wald—Fohramoos: rivulet in moorland forest, wet moss; transition bog, wet moss and grass litter (1150 m) [7]. **Walgau**—Jagdberg: fen with reed; subalpine pasture with *Juniperus communis* and rocks (640–1560 m) [6]; Gamperdonatal, south of Vasalpe: pasture (1180 m) [unpubl.].

**Vorarlberg habitats:** low montane forests, montane pasture, colline and low montane wetlands, subalpine pasture; moist; rare (altitude 640–1560 m).

**General distribution:** Austria (B K N nT oT V), Italian Alps (BZ); semicosmopolitan.

*Pergalumna nervosa* (Berlese, 1914)

**Vorarlberg:** **Rheintal**—Reute above Hohenems: mixed forest (885 m); Feldkirch, Gisingen: riverine forest (435 m) [unpubl.]. **Bregenzerwald**—Fohramoos: dry Nardetum; moorland forest, moss; wet Molinietum; fen and raised bogs (1145–1150 m) [7]. **Walgau**—Jagdberg: colline mixed forest, moss; montane spruce forest, needle

litter with moss; subalpine pasture with rocks and rotten wood (685–1610 m) [6]; near Göfis: raised bog, moist moss (555 m). **Großes Walsertal**—Laguztal, above “Fuchswald”: mixed forest (1280 m). **Montafon**—north of Lorüns: mixed forest (585 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane wetlands, subalpine pasture; xeric to wet (altitude 435–1610 m).

**General distribution:** Austria (B K N O S St nT oT V), Southern Germany (BW BY), Italian Alps (BS BZ TN); Holarctic, western Oriental, Ethiopian.

#### *Pilogalumna crassiclava* (Berlese, 1914)

**Vorarlberg:** **Bregenzerwald**—Sulzberg, steep slope above Doren: mixed forest (530 m); Schetteregg, Amagmach: mixed forest beside raised bog (1020 m) [unpubl.]. **Walgaus**—Jagdberg: colline mixed forest, moss; subalpine pasture with rocks (685–1700 m) [6].

**Vorarlberg habitats:** colline and low montane forests, subalpine pasture; rare (altitude 530–1700 m).

**General distribution:** Austria (B K N nT oT V W), Southern Germany (BY), Italian Alps (BZ); southern Palaearctic.

#### *Pilogalumna tenuiclava* (Berlese, 1908)

**Vorarlberg:** **Bregenzerwald**—Schetteregg, Amagmach: raised bog, wet moss (1020 m) [unpubl.]; Fohramoos: dry Nardetum; moorland forest, dry litter, moist and wet moss; fen and raised bogs (1145–1150 m) [7]; Ebniter Tal, above Hackwald: mixed forest (920 m); ibid., near Kobealpe: birch stand, wet *Juncus* with moss (1040 m); Bizauer Tal, near river: mixed forest (1000 m) [unpubl.]. **Walgaus**—Jagdberg: hay and xeric meadows; fen; colline mixed forest; subalpine pasture with *Alnus viridis* and rocks (565–1700 m) [6, unpubl.]; Gamperdonatal: mixed forests (930–1280 m). **Arlberg area**—beside road to Stuben: spruce forest (1705 m) [unpubl.].

**Vorarlberg habitats:** colline to montane forests, colline and low montane meadows and wetlands, subalpine dwarf shrubs and pastures (altitude 565–1705 m).

**General distribution:** Austria (B K N O S St nT oT V), Switzerland (BL GR NE VS), Southern Germany (BW BY), Italian Alps (BG BL BZ TN); Holarctic, western Oriental (Pakistan).

## Corrigenda

A large number of material from previous publications was controlled and redetermined for this compilation. Some erroneously determined species were detected and certain names used have to be corrected (Table 2).

**TABLE 2.** Oribatid mites in Vorarlberg: Corrections of species names in previous publications.

Name in previous publications	sensu	considered as
<i>Anachipteria alpina</i> (Schweizer, 1922)	Schatz & Fischer (2013)	<i>Anachipteria shtanchaevae</i> Subías, 2009
<i>Belba corynopus</i> (Hermann, 1804)	Schatz & Fischer (2013)	<i>Belba bartosi</i> Winkler, 1955
<i>Belba granulata</i> Willm. 1951	Janetschek (1956)	<i>Kunstidamaeus granulatus</i> (Willmann, 1951)
<i>Damaeus granulata</i> (Willmann, 1951)	Schatz (1983)	
<i>Brachychthonius brevis</i> Mich.	Mihelčíč (1957)	<i>Liochthonius brevis</i> (Michael, 1888)
<i>Ceratozetes cisalpinus</i> Berlese, 1908	Franz (1954)	erroneous report, not recorded from Vorarlberg
	Schatz (1983 sub <i>Ceratozetoides</i> )	
<i>Chamobates borealis</i> (Trägårdh, 1902)	Schatz & Fischer (2013)	<i>Chamobates pusillus</i> (Berlese, 1895)
<i>Chamobates cuspidatus</i> (Michael, 1884)	Schatz (2015)	<i>Chamobates pusillus</i> (Berlese, 1895) [partially]
<i>Chamobates lapidarius</i> Lucas	Mihelčíč (1957)	<i>Chamobates subglobulus</i> (Oudemans, 1900)
	Schatz (1983)	

...Continued on the next page

**TABLE 2.** (Continued)

Name in previous publications	sensu	considered as
<i>Conoppia microptera</i> Berlese, 1885	Schweizer (1956) Schatz (1983)	<i>Conoppia palmicincta</i> (Michael, 1880)
<i>Coronoquadroppia galaica</i> (Minguez, Ruiz & Subías, 1985)	Schatz & Fischer (2013)	<i>Coronoquadroppia monstruosa</i> (Hammer, 1979)
<i>Coronoquadroppia gumista</i> (Gordeva & Tarba, 1990)	Schatz & Fischer (2013)	<i>Coronoquadroppia monstruosa</i> (Hammer, 1979)
<i>Eremaeus oblongus</i> C. L. Koch	Mihelčič (1957) Schatz (1983)	<i>Eueremaeus oblongus</i> (C. L. Koch, 1835)
<i>Eupelops variatus</i> (Mihelčič, 1957)	Schatz (2018a)	<i>Eupelops</i> sp. nr. <i>variatus</i>
<i>Hermannella punctulata</i> Berlese, 1908	Schatz & Fischer (2013)	<i>Hermannella septentrionalis</i> Berlese, 1910
<i>Metabelba sphagni</i> (Strenzke, 1950)	Schatz & Fischer (2013)	<i>Porobelba spinosa</i> (Sellnick, 1920), <i>Metabelba papillipes</i> (Nicolet, 1855)
<i>Moritzoppia unicarinata</i> (Paoli, 1908)	Schatz & Fischer (2013)	<i>Oppiella escotata</i> (Subias & Rodriguez, 1986) [partially] <i>Oppiella keilbachi</i> (Moritz, 1969) [partially]
<i>Mycobates alpinus</i> (Willmann, 1951)	Schatz & Fischer (2013)	<i>Mycobates parmeliae</i> (Michael, 1884) [partially]
<i>Mycobates bicornis</i> (Strenzke, 1954)	Schatz & Fischer (2013)	<i>Mycobates sarekensis</i> (Trägårdh, 1910)
<i>Mycobates consimilis</i> Ham.	Mihelčič (1957) Schatz (1983)	<i>Mycobates sarekensis</i> (Trägårdh, 1910)
<i>Mycobates debilis</i> Mihelčič, 1957	Mihelčič (1957)	<i>Mycobates debilis</i> Mihelčič, 1957 sp. inqu.
<i>Mycobates</i> sp.	Schatz & Fischer (2013)	<i>Mycobates carli</i> (Schweizer, 1922) [partially], <i>Mycobates parmeliae</i> (Michael, 1884) [partially]
<i>Nothrus borussicus</i> Sellnick, 1928	Schatz & Fischer (2013)	<i>Nothrus silvestris</i> Nicolet, 1855 [partially]
<i>Oribatella sexdentata</i> Berlese, 1916	Schatz (2015)	<i>Ophidiotrichus tectus</i> (Michael, 1884)
<i>Oribella paolii</i> Oudm.	Mihelčič (1957) Schatz (1983)	<i>Pantelozetes paolii</i> (Oudemans, 1913)
<i>Peloptulus phaenotus</i> (C. L. Koch, 1844)	Schatz & Fischer (2013) Schatz (2015)	<i>Peloptulus phaeonotus</i> (C. L. Koch, 1844)
<i>Rhysotritia ardua</i> (C. L. Koch, 1841)	Schatz & Fischer (2013) Schatz (2015)	<i>Acrotritia ardua</i> (C. L. Koch, 1841)
<i>Sphaerobates piriformis</i> Nic.	Mihelčič (1957)	<i>Sphaerozetes piriformis</i> (Nicolet, 1855)
<i>Steganacarus carinatus</i> forma <i>pulcherrimus</i> (Berlese, 1887)	Schatz & Fischer (2013)	<i>Steganacarus carinatus</i> forma <i>carinatus</i> (C. L. Koch, 1841)
<i>Trichoribates trimaculatus</i> (C. L. Koch, 1835)	Schatz & Fischer (2013)	<i>Trichoribates berlesei</i> Jacot, 1929

### Nomen inquirendum

#### *Mycobates debilis* Mihelčič, 1957

Mihelčič (1957) described under this name numerous specimens from North Tyrol—Zillertal Alps: Hornkees glacier forefield, in pioneer vegetation (2300 m a.s.l.) and from Vorarlberg: Bregenzerwald—Ifenstock area: spring of Kalblegründlebach below entrance of Schneckenloch cave (1240 m); Schneckenloch cave, entrance region (1270 m) [3, 5]. Based on the short description this species cannot be compared with any other known *Mycobates* species. Probably it belongs to another species of Ceratozetoidea. Mihelčič (*op. cit.*) indicated the storage of the type mate-

rial—holotypus in his collection, paratypes in the Institute of Zoology, University of Innsbruck. But neither in the collection of this institute nor in the Tiroler Landesmuseum Ferdinandeum, Innsbruck (see Totschnig 2001) could I find any trace of this species. Subías (2004—electronic update 2019) listed this species as valid. In his recent electronic update (Subías 2020) the status was changed to „sp. inqu.“. Based on the lack of comparable type material I agree and follow Subías to modify the status as „species inquirenda“.

## Erroneous report

### *Ceratozetes cisalpinus* Berlese, 1908

Franz (1954: 420) mentioned this species from Vorarlberg (“described from Bregenz”). This reference was the source of the report from Vorarlberg in the “Catalogus Faunae Austriae” (Schatz 1983 sub *Ceratozetoides cisalpinus*) but no other reference of this species in Vorarlberg has been found in the literature. Berlese (1908) described *C. cisalpinus* from Bergamo, Southern Alps. Weigmann (2006) indicated the species as a possible synonym of *Ceratozetoides maximus* (Berlese, 1908).

## General remarks

### Species number

A total of 327 described species from 61 families are listed in this catalogue, complemented by three subspecific taxa (*Trhypochthoniellus longisetus* forma *setosa*, *Hydrozetes lacustris* forma *parisiensis*, *Suctobelbella acutidens* ssp. *lobata*), two undetermined or undescribed species (*Amiracarus* sp., *Eupelops* sp.), altogether 333 taxa. One species name is doubtful (*Mycobates debilis* Mihelčíč, 1957 sp. inqu.). The families richest in species are Suctobelbidae (29 spp.), Oppiidae (26 spp.), Brachychthoniidae (23 spp.), Ceratozetidae (22 spp.), Damaeidae (21 spp.). On the other side of the scale five families are represented with 3 spp., seven families with 2 spp., and 23 families with 1 sp. each. It is remarkable that members of Oppioidea (families Autognetidae, Machuellidae, Oppiidae, Quadroppiidae, Thrysomidae) and Trizetoidea (family Suctobelbidae) contribute about 20.000 adult specimens (or almost 30% of the entire hitherto unpublished material), belonging to 66 spp.

## Biogeographic overview

Most species and subspecific taxa listed in this catalogue show a wide general distribution (>84%): 7% (22 spp. plus 1 ssp.) are known from Europe, 28% (91 spp. plus 1 „forma“) from the Palaearctic, 31% (103 spp.) from the Holarctic region, 18% (60 spp. plus 1 “forma”) have a wider distribution and are considered as cosmopolitan or semicosmopolitan species. In contrast almost 14% (44 spp.) have a more restricted distribution and are known from Central resp. Central and South Europe. Only 6 species (2%) are restricted to the Alps (Central and Western Alps: *Kunstidamaeus diversipilis* (also in Southern Schwarzwald), *K. granulatus*, *Oppiella obscura*, *Rhynchobelba ornithorhyncha* (recently also found in the Romanian Western Carpathians), *Trichoribates scilierensis*, Southern Alps: *Oribatella parvula*).

In Austria 623 oribatid species and subspecific taxa (incl. „formae“) from 79 families are reported (Krisper *et al.* 2017, including 247 prior records from Vorarlberg), in Switzerland 430 species from 62 families (unpublished compilation), in Germany (entire) 570 species from 81 families (Weigmann *et al.* 2015), in Bavaria 310 species from 61 families (Weigmann *et al.* 2015), and in Baden-Württemberg 413 species from 74 families (Beck *et al.* 2018) (subspecific taxa included in species numbers), in South Tyrol 417 species and subspecies from 72 families (Schatz 2018a, b). The hitherto unpublished species presented in this catalogue enlarge the number of known oribatid species in Vorarlberg considerably. A total of 96 species (including 3 subspecific taxa) are newly reported from Vorarlberg, among them 16 species (including two undetermined or undescribed species) are new records for Austria.

The oribatid mite fauna of Vorarlberg shows close similarities with adjacent and comparable regions in the Alps (Table 3), mainly based on common species which are frequent in mountainous regions. The highest overlap in common species exists with South Tyrol, North Tyrol and Baden-Württemberg and can be mainly explained by a comparable level of knowledge of oribatid species in these countries, in case of North Tyrol and Baden-Württemberg also by similar climatological conditions.

Schweizer (1922, 1956), Mahunka (1993, 2001 and Mahunka & Mahunka-Papp (1999–2003, 2006–2009a, b) described several oribatid species in Switzerland, some of those are still rarely reported. Among these seven species

were also found in montane or alpine habitats in Vorarlberg (*Anachipteria shtanchaevae* (sub *A. alpina*), *Feiderzetes latus*, *Mycobates carli*, *Niphocephheus nivalis*, *Oppiella incisa*, *O. obscura*, *Oribatula longelamellata*), two additional species at lower elevations (*Helvetobelba dichotoma*, *Oppiella propinqua*).

In South Tyrol a substantial proportion of the oribatid species can be considered as „Southern“ or „Mediterranean“ with distributional center in South to Southeast Europe or in the southern Palaearctic region (>25%, Schatz 2018a). Contrary to South Tyrol or to the western part of North Tyrol (Schatz 2018b, Schatz & Fischer 2015) with corridors of warm climate and dry grassland sites, the high mountain range of the Silvretta crystalline and Rätikon in the southern part of Vorarlberg largely inhibit the incursion of species from the south. Mediterranean species can be found also in Vorarlberg in lower intensity (45 species, ~14%), mainly occurring in the Rhine Valley or in south exposed slopes, but also in xeric alpine habitats. On the other hand five species in Vorarlberg are known to be „arcto-alpine“ or „boreo-alpine“ (*Edwardzetes edwardsi*, *Kunstidamaeus nidicola*, *Melanozetes mollicomus*, *Mycobates sarekensis*, *Provertex kuehnelti*).

### Habitat relationships

**Forests**—Large areas of Vorarlberg are still woodland (37%, Landesportal Vorarlberg 2020). Forests have a deep litter layer with organic matter in different stages of decay and differing quality as needle or deciduous litter, mixed with mosses or decaying wood and infiltrated with fungi. Tree stumps and bark are frequently covered with moss or lichens. These microhabitats are ideal for all stages of oribatid mites, and accordingly almost 85% (281 spp.) of all oribatid mite species in Vorarlberg were found in forested areas from colline to montane vegetation belts. Special habitats are riverine forests along or near rivers at lower altitudes with regular or irregular inundation and rather shallow soils (125 spp.). Higher up the mountain forests merge into subalpine dwarf-shrub heaths. These vegetation belts are frequently interlocked as are the animal communities. From the 150 species in dwarf shrubs 118 spp. are in common with montane forests. On the other hand, only 61 species of subalpine dwarf shrubs are in common with alpine grasslands.

**Open habitats**—In Vorarlberg this vegetation type is represented by man-made orchards, meadows, pastures, as well as natural grassland above the timberline and harbour 190 species (57% of the total species number). It is remarkable that dry grasslands are very sparsely represented in Vorarlberg (Holzner 1986). Consequently, relatively few xerotolerant species were detected (they are frequently identical with „Southern species“, see above), some in sunny slopes of the Rhine Valley and in the Jagdberg area in Walgau (Schatz & Fischer 2013), and also in rather xeric montane forests as well as in subalpine and alpine grassland. A remarkable example is *Oribatella parvula*, hitherto only known from xeric forest soils in the Southern Alps, now also recorded from oak litter on the slopes of the Rhine Valley.

**Wetlands**—The climate-depending distribution of precipitation has formed numerous moorlands in several parts of Vorarlberg. A total of 224 oribatid species was found in these habitats, inclusive eurytopic species which are chance stragglers from the surrounding areas but also several species which are closely tied to humid areas. Special habitats are limnic systems. In spite of their low species richness aquatic oribatids can be very abundant in different freshwater habitats, lentic or flowing waters, where they live on submerged water plants, mainly members of the families Malaconothriidae, some Trhypochthoniidae, Hydrozetidae, Limnozetidae (Behan-Pelletier & Eamer 2007, Schatz & Behan-Pelletier 2008).

**Alpine habitats**—About 25% of the area of Vorarlberg are alpine landscapes above the timberline (~>2000 m a.s.l.), mainly in the southern part of the country in Montafon (Silvretta, Rätikon) but also some summits in the Bregenzerwald area, Lechquellengebirge and in the Allgäu Alps. In alpine habitats 110 oribatid mite species were found, in the scatteringly distributed subnival cushion plant formations 42 species, in both together 120 species. Some species were found nowhere else in Vorarlberg (*Carabodes intermedius*, *Kunstidamaeus diversipilis*, *Litholestes altitudinis*, *Niphocephheus nivalis*, *Pantelozetes alpestris*, *Provertex kuehnelti*, *Scutovertex ianus*, *Trichoribates novus*, only in the subnival cushion plants *Liochthonius alpestris*, *Trhypochthonius tectorum*, *Oppiella obscura*, *Passalozetes perforatus*, *Unduloribates undulatus*).

**TABLE 3.** Oribatid mites (Acari, Oribatida) in Vorarlberg: species similarity with adjacent regions.

<sup>1</sup> Data sources: Vorarlberg (this study), Austria and Austrian countries (Krisper *et al.* 2017), Switzerland, Grison (Schatz unpubl.), Baden-Württemberg (Beck *et al.* 2018), Bavaria (Weigmann *et al.* 2015), South Tyrol (Schatz 2018a, b).

Region	Known species <sup>1</sup>	Species common with Vorarlberg	Size km <sup>2</sup>
Vorarlberg	332	100%	2.601
Österreich / Austria	623		
Nordtirol / North Tyrol	426	278	84%
Niederösterreich / Lower Austria	367	226	68%
Steiermark / Styria	347	213	64%
Kärnten / Carinthia	354	207	62%
Burgenland	278	172	52%
Oberösterreich / Upper Austria	244	172	52%
Osttirol / East Tyrol	249	163	49%
Salzburg	191	138	42%
Wien	93	51	15%
Switzerland, Graubünden / Grison	226	148	45%
Germany, Baden-Württemberg	413	264	80%
Germany, Bayern / Bavaria	310	223	67%
Italy, Prov. Bolzano / South Tyrol	398	280	84%
			7.400

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## References

- Auer, I. & Werner, R. (Eds.) (2001/2002) *Klima von Vorarlberg: eine anwendungsorientierte Klimatographie*. Vol. 1–3. Amt der Vorarlberger Landesregierung, Bregenz, 200 pp.
- Baur, B., Joshi, J., Schmid, B., Hänggi, A., Borcard, D., Stary, J., Pedroli-Christen, A., Thommen, H., Luka, H., Rusterholz, H.P., Oggler, P., Ledergerber, S. & Erhard, A. (1996) Variation in species richness of plants and diverse groups of invertebrates in three calcareous grasslands of the Swiss Jura mountains. *Revue suisse de Zoologie*, 103 (4), 801–833.  
<https://doi.org/10.5962/bhl.part.79977>
- Beck, L., Horak, F. & Woas, S. (2014) Zur Taxonomie der Gattung *Phthiracarus* Perty, 1841 (Acari, Oribatida) in Südwestdeutschland. *Carolinea, Karlsruhe*, 72, 109–132.
- Beck, L., Horak, F. & Woas, S. (2018) Südwestdeutsche Oribatiden (Acari: Oribatida)—Arten, Taxonomie, Vorkommen. *Andrias, Karlsruhe*, 21, 1–196.
- Behan-Pelletier, V.M. (1994) *Mycobates* (Acari, Oribatida, Mycobatidae) of North America North of Mexico. *The Canadian Entomologist*, 126 (6), 1301–1361.  
<https://doi.org/10.4039/Ent1261301-6>
- Behan-Pelletier, V. & Eamer, B. (2007) Aquatic Oribatida: adaptations, constraints, distribution and ecology. In: Morales-Malacara, J.B., Behan-Pelletier, V., Ueckermann, E., Pérez, T.M., Estrada-Venegas, E.G. & Badil, M. (Eds.), *Acarology XI: Proceedings of the International Congress*. Instituto de Biología and Facultad de Ciencias, Universidad Nacional Autónoma de México; Sociedad Latinoamericana de Acarología, México, pp. 71–82.

- Behan-Pelletier, V.M. & Lindo, Z. (2019) Checklist of oribatid mites (Acari: Oribatida) of Canada and Alaska. *Zootaxa Monograph*, 4666 (1), 1–180.  
<https://doi.org/10.11646/zootaxa.4666.1.1>
- Berlese, A. (1908) Elenco di generi e specie nuovi di Acari. *Redia*, 5, 1–15.
- Berlese, A. (1910) Acari nuovi. Manipulus V–VI. *Redia*, 6 (2), 199–234.
- Bernini, F. (1975) Notulae Oribatologicae XI. *Miracarus senensis*, una nuova specie dei dintorni di Siena (Acarida, Oribatei). *Redia*, 56, 19–28.
- Bernini, F. & Baratti, M. (1990) Redescription of *Feiderzetes latus* (Schweizer, 1956) with redefinition of *Feiderzetes* (Acarida, Oribatida, Mycobatidae). *International Journal of Acarology*, 16 (3), 119–127.  
<https://doi.org/10.1080/01647959008683523>
- Borcard, D. (1990) Les Oribates des tourbières du Jura suisse (Acari, Oribatei). Faunistique II. Holonota. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 64 (3–4), 251–263.
- Borcard, D. (1991) Les Oribates des tourbières du Jura suisse (Acari, Oribatei). Faunistique I. Introduction, Bifemorata, Ptyctima, Arthonota. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 64, 173–188.
- Borcard, D. (1992a) Les Oribates des tourbières du Jura suisse (Acari, Oribatei). Faunistique III. Nanhermannoidea, Hermannoidea, Belboidea, Cepheoidea, Liacaroidea. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 65 (3–4), 241–250.
- Borcard, D. (1992b) Les Oribates des tourbières du Jura suisse (Acari, Oribatei). Faunistique IV. Carabodoidea, Tectocephoidea, Oppioidea. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 65 (3–4), 241–250.
- Borcard, D. (1994a) Les Oribates des tourbières du Jura suisse (Acari, Oribatei). Faunistique V. Oppioidea: Suctobelbidae. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 67, 7–16.
- Borcard, D. (1994b) Les Oribates des tourbières du Jura suisse (Acari, Oribatei). Faunistique VI. Oppioidea (Thyrisomidae), Hydrozetoidea, Cymberemaoidea, Oribatuloidea (part.). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 67, 363–372.
- Borcard, D. (1995) Les Oribates des tourbières du Jura Suisse (Acari, Oribatei). Faunistique VII. Oribatuloidea (Haplozetidae). Ceratozetoidea. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 68 (3–4), 363–372.
- Borcard, D. (1996) Les Oribates des tourbières du Jura Suisse (Acari, Oribatei). Faunistique VIII. Pelopoidea, Oribatelloidea, Galumnoidea. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 69 (2), 203–214.
- Borcard, D. & Vaucher-von Ballmoos, C. (1997) Oribatid mites (Acari, Oribatida) of a primary peat bog-pasture transition in the Swiss Jura mountain. *Ecoscience*, 4 (4), 470–479.  
<https://doi.org/10.1080/11956860.1997.11682426>
- Bühlmann, A. (1978) Die Bedrohung der humusbildenden Bodenfauna durch Fluor-Immissionen. Mit besonderer Berücksichtigung der Milben (Acari) und Springschwänze (Collembola). *Mitteilungen der Entomologischen Gesellschaft Basel*, Neue Folge, 28 (4), 77–98.
- Colloff, M.J. & Halliday, R.B. (1998) Oribatid Mites: a Catalogue of the Australian Genera and Species. *Monographs on Invertebrate Taxonomy. Vol. 6*. CSIRO Publishing, Melbourne, 224 pp.  
<https://doi.org/10.1071/9780643105201>
- Deichsel, R. (2005) A morphometric analysis of the parthenogenetic oribatid mites *Hydrozetes lacustris* and *Hydrozetes parisiensis*—sister species or morphotypes? In: Weigmann, G., Alberti, G., Wohltmann, A. & Ragusa, S. (Eds.), Acarine Biodiversity in the Natural and Human Sphere. Proceedings of the V Symposium of the European Association of Acarologists (Berlin 2004). *Phytophaga, Palermo*, 14, pp. 377–382. [2004]
- Ermilov, S.G. & Martens, J. (2014) New species, new records and a checklist of oribatid mites (Acari: Oribatida) from Nepal. *Biologia*, 69 (12) 1716–1729.  
<https://doi.org/10.2478/s11756-014-0485-2>
- Franz, H. (1954) *Die Nordostalpen im Spiegel ihrer Landtierwelt*. Universitätsverlag Wagner, Innsbruck, 664 pp.
- Friebe, J.G. (2004) Zur Geologie Vorarlbergs—eine Einführung unter besonderer Berücksichtigung verkarstungsfähiger Gesteine. *Vorarlberger Naturstudien*—*inatura, Dornbirn*, 15, 19–40.
- Ghilyarov, M.S. & Krivolutsky, D.A. (1975) *Identification keys of soil inhabiting mites, Sarcoptiformes*. Nauka, Moscow, 491 pp. [in Russian]
- Grandjean, F. (1931) Observations sur les Oribates (2e Série). *Bulletin du Muséum national d'histoire naturelle*, 2<sup>e</sup> Série, 3, 651–665.
- Grandjean, F. (1936) Observations sur les Oribates (10e Série). *Bulletin du Muséum national d'histoire naturelle*, 2<sup>e</sup> Série, 8, 246–253.
- Halliday, B., Kamran, M. & Hamid Bashir, M. (2018) Checklist of the mites of Pakistan. *Zootaxa*, 4464 (1), 1–178.  
<https://doi.org/10.11646/zootaxa.4464.1.1>
- Halliday, R.B. & Norton, R.A. (2019) Case 3785—Proposal to remove the homonymy of Cepheidae Berlese, 1896 (Acari-formes) with Cepheidae Agassiz, 1862 (Cnidaria), by emending the former to Cepheusidae. *Bulletin of Zoological Nomenclature*, 76, 34–42.  
<https://doi.org/10.21805/bzn.v76.a010>
- Hammen, L. van der (1952) The Oribatei (Acari) of the Netherlands. *Zoologische Verhandelingen, Leiden*, 17, 1–139.
- Holzner, W. (Ed.) (1986) Österreichischer Trockenrasenkatalog. *Grüne Reihe des Bundesministeriums für Gesundheit und Um-*

- weltschutz, Wien, Band 6. 1–380.
- Janetschek, H. (1956) Das Problem der inneralpinen Eiszeitüberdauerung durch Tiere (Ein Beitrag zur Geschichte der Nivalfauna). *Österreichische Zoologische Zeitschrift*, 6, 421–506.
- Janetschek, H. (1961) Die Tierwelt (Vorarlbergs). In: Ilg, K. (Ed.), *Landes- und Volkskunde—Geschichte, Wirtschaft und Kunst Vorarlbergs*. Universitäts-Verlag Wagner Innsbruck, pp. 173–240.
- Krisper, G., Schatz, H. & Schuster, R. (2017) Oribatida (Arachnida: Acari). In: *Checklisten der Fauna Österreichs, Nr. 9, Biosystematics and Ecology Series. Band 33*. Verlag der Österreichischen Akademie der Wissenschaften, Wien, pp. 25–90. <https://doi.org/10.2307/j.ctvdjrr69.5>
- Krisper, G. & Schuster, R. (2016) Erstnachweise bodenbewohnender und arboricoler Milbenarten in österreichischen Bundesländern (Acari: Oribatida s. str.). *Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark*, 145, 69–74.
- Lamos, R.A. (2016) *Tokukobelba* gen. nov. (Acari: Oribatida: Damaeidae). *Carolinea, Karlsruhe*, 74, 53–102.
- Landesportal Vorarlberg (2020) Der Wald in Vorarlberg. Available from: <https://vorarlberg.at/web/land-vorarlberg> (accessed 22 March 2020)
- Mahunka, S. (1966) A study of oribatids collected by Prof. Dr. DiCastri on the Mt. Spitz (Recoaro, Italy). *Atti dell' Istituto Veneto di Scienze, Lettere ed Arti, classe di scienze matematiche e naturali*, 124 (1965–66), 369–386.
- Mahunka, S. (1993) Beitrag zur Kenntnis der Höhlen-Oribatiden der Schweiz (Acari: Oribatida). *Revue suisse de Zoologie*, 100 (2), 225–233. <https://doi.org/10.5962/bhl.part.79859>
- Mahunka, S. (1994) Further notes, additions and redescriptions of the oribatid species preserved in the Berlese Collection (Acari, Oribatida) I. *Acta Zoologica Academiae Scientiarum Hungaricae, Budapest*, 40 (1), 29–49.
- Mahunka, S. (2001) Oribatids from Switzerland IX (Acari: Oribatida: Mycobatidae 2) (Acarologica Genavensis CI). *Archives des sciences, Genève*, 54 (3), 129–138. <https://doi.org/10.5962/bhl.part.79635>
- Mahunka, S. & Mahunka-Papp, L. (1995) *The oribatid species described by Berlese (Acari)*. Hungarian Natural History Museum, Budapest, 325 pp.
- Mahunka, S. & Mahunka-Papp, L. (1999) Oribatid mites from Switzerland, IV. (Acari: Oribatida: Suctobelidae). *Acta Zoologica Academiae Scientiarum Hungaricae, Budapest*, 45 (4), 375–381.
- Mahunka, S. & Mahunka-Papp, L. (2000) Oribatids from Switzerland III (Acari: Oribatida: Oppiidae 1 and Quadroppiidae). (Acarologica Genavensis XCIII). *Revue suisse de Zoologie*, 107 (1), 49–79. <https://doi.org/10.5962/bhl.part.80118>
- Mahunka, S. & Mahunka-Papp, L. (2001) Oribatids from Switzerland V (Acari: Oribatida: Suctobelidae 2) (Acarologica Genavensis XCVII). *Revue suisse de Zoologie*, 108, 355–385. <https://doi.org/10.5962/bhl.part.79635>
- Mahunka, S. & Mahunka-Papp, L. (2002) Oribatids from Switzerland XI (Acari: Oribatida: Cepheidae and Niphocepheidae) (Acarologica Genavensis CIII). *Archives des sciences, Genève*, 55 (2), 97–105. <https://doi.org/10.5962/bhl.part.79635>
- Mahunka, S. & Mahunka-Papp, L. (2003) Oribatids from Switzerland VIII (Acari, Oribatida, Ptyctima) (Acarologica Genavensis CII). *Revue suisse de Zoologie*, 110 (3), 453–481. <https://doi.org/10.5962/bhl.part.80193>
- Mahunka, S. & Mahunka-Papp, L. (2004) A catalogue of the Hungarian oribatid mites (Acari: Oribatida). *Pedozoologica Hungarica. No 2*. Hungarian Natural History Museum, Budapest, 363 pp.
- Mahunka, S. & Mahunka-Papp, L. (2006) Oribatids from Switzerland XIII (Acari: Oribatida: Brachychthoniidae). (Acarologica Genavensis CVII). *Revue suisse de Zoologie*, 113 (4), 841–856. <https://doi.org/10.5962/bhl.part.80380>
- Mahunka, S. & Mahunka-Papp, L. (2009a) Oribatids from Switzerland X (Acari: Oribatida: Carabodidae) (Acarologica Genavensis C). *Contributions to Natural History (Scientific Papers from the Natural History Museum Bern)*, 12 (2), 931–949.
- Mahunka, S. & Mahunka-Papp, L. (2009b) *Topobates helveticus* sp.n. and some other remarkable moss mites from Switzerland (Acari: Oribatida). *Revue suisse de Zoologie*, 116 (3–4), 325–336. <https://doi.org/10.5962/bhl.part.81322>
- Mihelčič, F. (1957) Milben (Acarina) aus Tirol und Vorarlberg. *Veröffentlichungen des Museum Ferdinandeum, Innsbruck*, 37, 99–120.
- Miko, L., Mourek, J., Meleg, I.N. & Moldovan, O.T. (2013) Oribatid mite fossils from pre-Quaternary sediments in Slovenian caves II. *Amiracarus pliocennatus* n.gen., n.sp. (Microzetidae) from Pliocene, with comments on the other species of the genus. *Zootaxa*, 3670 (4), 557–578. <https://doi.org/10.11646/zootaxa.3670.4.8>
- Miko, L. & Weigmann, G. (1996) Notes on the genus *Liebstadia* Oudemans, 1906 (Acarina, Oribatida) in Central Europe. *Acta Musei Nationalis Pragae, Series B, Historia Naturalis*, 52 (1–4), 73–100.
- Murvanidze, M. & Mumladze, L. (2016) Annotated checklist of Georgian oribatid mites. *Zootaxa*, 4089 (1), 1–81. <https://doi.org/10.11646/zootaxa.4089.1.1>
- Niedbała, W. (2008) Ptyctimous mites (Acari: Oribatida) of Poland. *Fauna Poloniae—Fauna Polski. Vol. 3*. Museum and Insti-

- tute of Zoology, Polish Academy of Sciences, Warszawa, pp. 1–242.
- Niedbała, W. (2011) Ptyctimous mites (Acari, Oribatida) of the Palaearctic region. Systematic part. *Fauna Mundi*, Warszawa, 4, pp. 1–472.
- Norton, R.A. (1998) Morphological evidence for the evolutionary origin of Astigmata (Acari: Acariformes). *Experimental Applied Acarology*, 22, 559–594. <https://doi.org/10.1023/A:1006135509248>
- Norton, R.A. & Behan-Pelletier, V. (2009) Chapter 15. Oribatida. In: Krantz, G.W. & Walter, D.E. (Eds.), *A Manual of Acarology 3rd Edition*. Texas Tech. University Press, Lubbock, pp. 421–564.
- Pérez-Íñigo, C. (1972) Acaros oribátidos de suelos de España peninsular e islas Baleares (Acari, Oribatei). Parte IV. *Eos, Revista Española de Entomología*, 47, 247–333.
- Pérez-Íñigo, C. (1993) Acari, Oribatei, Poronota. In: Ramos, A. (Ed.), *Fauna Iberica. Vol. 3*. Museo de Ciencias Naturales, Madrid, pp. 1–320.
- Schäffer, S., Kerschbaumer, M. & Koblmüller, S. (2019) Multiple new species: Cryptic diversity in the widespread mite species *Cymbaeremaeus cymba* (Oribatida, Cymbaeremaeidae). *Molecular Phylogenetics and Evolution*, 135, 185–192. <https://doi.org/10.1016/j.ympev.2019.03.008>
- Schatz, H. (1983) U.-Ordn.: Oribatei, Hornmilben. *Catalogus Faunae Austriae, Wien*, Teil IXI, pp. 1–118.
- Schatz, H. (2002) Die Oribatidenliteratur und die beschriebenen Oribatidenarten (1758–2001)—Eine Analyse. *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 74 (1), 37–45.
- Schatz, H. (2015) Hornmilben (Acari, Oribatida) vom Fohramoos (Vorarlberg, Österreich). *inatura—Forschung online, Dornbirn*, 18, 1–17.
- Schatz, H. (2018a) Catalogue of oribatid mites (Acari: Oribatida) from South Tyrol (Prov. Bolzano, Italy). *Zootaxa*, 4435 (1), 1–89. <https://doi.org/10.11646/zootaxa.4435.1.1>
- Schatz, H. (2018b) Faunistics of oribatid mites (Acari, Oribatida) in dry grassland sites in the Eisack Valley (South Tyrol, Prov. Bolzano, Italy). *Soil Organisms*, 90 (2), 57–70.
- Schatz, H. & Behan-Pelletier, V.M. (2008) Global diversity of oribatids (Oribatida; Acari—Arachnida). In: Balian, E.V., Lévéque, C., Segers, H. & Martens, K. (Eds.), Freshwater Animal Diversity Assessment. *Hydrobiologia*, 595, pp. 323–328. [https://doi.org/10.1007/978-1-4020-8259-7\\_35](https://doi.org/10.1007/978-1-4020-8259-7_35)
- Schatz, H., Behan-Pelletier, V.M., O'Connor, B. M. & Norton, R.A. (2011) Suborder Oribatida van der Hammen, 1968. In: Zhang, Z.-Q. (Ed.), *Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness*. *Zootaxa*, 3148, pp. 141–148. <https://doi.org/10.11646/zootaxa.3148.1.26>
- Schatz, H. & Fischer, B.M. (2013) Die Hornmilben (Acari: Oribatida) der Walgau—Jagdberggemeinden. In: *Naturmonografie Walgau—Jagdberggemeinden. Dornbirn. Vol. 18*. inatura Erlebnis Naturschau, Dornbirn, pp. 569–580.
- Schatz, H. & Fischer, B.M. (2015) Neumeldungen von Hornmilben (Acari: Oribatida) für Nordtirol (Österreich) aus Trockenrasen. *Gredleriana*, 15, 65–76.
- Schatz, H. & Schuster, R. (2009) Acari—Oribatida, Hornmilben. In: Rabitsch, W. & Essl, F. (Eds), *Endemiten in Österreich. Kostbarkeiten in Österreichs Tier- und Pflanzenwelt*. Naturwissenschaftlicher Verein für Kärnten, Klagenfurt und Umweltbundesamt GmbH, Klagenfurt/Wien, pp. 464–475.
- Schenker, R. (1983) Effects of temperature acclimatisation on cold-hardiness of alpine micro-arthropods. *Revue d'Écologie et de Biologie du Sol*, 20 (1), 37–47.
- Schenker, R. (1984) Spatial and seasonal distribution patterns of oribatid mites (Acari: Oribatei) in a forest soil ecosystem. *Pedobiologia*, 27, 133–149.
- Schenker, R. & Streit, B. (1980) Saisonale Verteilungsmuster von Mikroarthropoden. *Revue suisse de Zoologie*, 87 (4), 1017–1028. <https://doi.org/10.5962/bhl.part.85569>
- Schweizer, J. (1922) Beiträge zur Kenntnis der terrestrischen Milbenfauna der Schweiz. *Verhandlungen der Naturforschenden Gesellschaft in Basel*, 23, 23–112. <https://doi.org/10.5962/bhl.part.3644>
- Schweizer, J. (1948) Landmilben aus der Umgebung des Schweizerischen Nationalparks.—*Ergebnisse der wissenschaftlichen Untersuchungen des schweizerischen Nationalparks, Liestal*, Neue Folge, 2 (20), 1–28.
- Schweizer, J. (1956) Die Landmilben des Schweizerischen Nationalparkes. 3. Teil, Sarcoptiformes Reuter 1909. *Ergebnisse der wissenschaftlichen Untersuchungen des schweizerischen Nationalparks, Liestal*, Neue Folge, 5 (34), 213–377.
- Sellnick, M. (1928) Formenkreis: Hornmilben, Oribatei. In: Brohmer, P., Ehrmann, P. & Ulmer, G. (Eds.), *Die Tierwelt Mitteleuropas. (3). 9. Quelle und Meyer*, Leipzig, pp. 1–42.
- Shtanchaeva, U. Ya. & Subías, L.S. (2010) *Catalogue of oribatid mites of the Caucasus*. Dagestan Scientific Center, Russian Academy of Sciences, Makhachkala, 276 pp. [in Russian]
- Solhøy I.W., (1997) A redescription of *Mycobates sarekensis* (Trägardh) (Acari: Oribatei). *Acarologia*, 38 (1), 69–77.
- Steiner, W.A. (1994) The influence of air pollution on moss-dwelling animals: 1. Methodology and composition of flora and fauna. *Revue Suisse de Zoologie*, 101 (2), 533–556. <https://doi.org/10.5962/bhl.part.79917>
- Strenzke, K. (1951) Some new Central European moss-mites (Acarina: Oribatei). *Annals and magazine of natural history*, Se-

- ries 12, 4 (43), 719–726.  
<https://doi.org/10.1080/00222935108654198>
- Subías, L.S. (2004–2020) Listado sistemático, sinonímico y biogeográfico de los ácaros oribátidos (Acariformes, Oribatida) del mundo (excepto fósiles). *Graellsia*, 60 (Número Extraordinario), 3–305 (2004). [actualized pdf in 2006–2020 online capture, available from: [http://bba.bioucm.es/cont/docs/RO\\_1.pdf](http://bba.bioucm.es/cont/docs/RO_1.pdf) (accessed 27 January 2020)  
<https://doi.org/10.3989/graeellsia.2004.v60.iExtra.218>
- Totschnig, U. (2001) Die Hornmilbensammlung (Acari, Oribatida) Franz Mihelcic im Tiroler Landesmuseum Ferdinandeum, Innsbruck. *Veröffentlichungen des Tiroler Landesmuseums Ferdinandeum, Innsbruck*, 81, 205–240.
- Walter, D.E. & Proctor, H.C. (2013) Mites: ecology, evolution and behaviour. Life at a microscale. 2<sup>nd</sup> Edition. Springer, Dordrecht, 494 pp.  
<https://doi.org/10.1007/978-94-007-7164-2>
- Weigmann, G. (1997) Systematics of Central European families and genera of Malacothroidea (Acari, Oribatida). *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 69 (6), 3–10.
- Weigmann, G. (2006) Hornmilben (Oribatida). *Die Tierwelt Deutschlands, Teil 76*. Goecke & Evers, Keltern, 520 pp.
- Weigmann, G. (2014) New species of oribatid mites from Southern Germany (Acari, Oribatida). *Spixiana*, 37 (1), 81–88.
- Weigmann, G., Horak, F., Franke, K. & Christian, A. (2015) Verbreitung und Ökologie der Hornmilben (Oribatida) in Deutschland. In: *Peckiana 10*. Senckenberg Museum für Naturkunde Görlitz, Görlitz, pp. 1–171.
- Weigmann, G. & Norton, R.A. (2009) Validity and interpretation of *Murcia* Koch, *Trichoribates* Berlese and their types (Acari: Oribatida: Ceratozetidae). *Zootaxa*, 2107 (1), 65–68.  
<https://doi.org/10.11646/zootaxa.2107.1.4>
- Weigmann, G. & Schatz, H. (2015) Redescription of *Coronoquadroppia monstruosa* (Hammer, 1979) (Acari, Oribatida, Quadroppiidae) from Java and variability of the species in Europe. *Zootaxa*, 3926 (3), 329–350.  
<https://doi.org/10.11646/zootaxa.3926.3.2>
- Werner, R. & Auer, I. (2002) *Klima von Vorarlberg. Eine anwendungsorientierte Klimatographie, VoGIS-Datengrundlage des Landes Vorarlberg*. Amt der Vorarlberger Landesregierung, Bregenz. [unknown pagination]
- Willmann, C. (1931) Moosmilben oder Oribatiden (Cryptostigmata). In: Dahl, F. (Ed.), *Die Tierwelt Deutschlands. Bd. 22. Vol. 5*. Gustav Fischer, Jena, pp. 79–200.
- Woas, S. (1986) Beitrag zur Revision der Oppioidea sensu Balogh, 1972 (Acari, Oribatei). *Andrias, Karlsruhe*, 5, 21–224.