

5 Results

5.1 Subfossils

No archaeological site has ever revealed such a high diversity of bryophyte species. In a detailed investigation of the subfossil samples J.H. Dickson recovered more than 75 different mosses and liverworts from the corpse, clothing, gear and sediment of the Iceman. Strikingly, many different liverworts, which usually quickly decay, were in a good state of preservation. Due to the good preservation of most bryophyte fragments, 68 taxa could be identified to the species level by J.H. Dickson. All of the subfossil bryophytes occur in Europe today, but many are known only from lower elevations than the nival zone (at 3,210 m a.s.l.) where the Iceman was found. We expect that most of these species were not able to grow in high altitudes even when the Iceman lived. Climatic changes around 5,000 years ago were complex and at the precise time of the Iceman the temperatures may have been slightly colder than now. In any case, the conditions before the Iceman died would not have been sufficient to allow the growth of bryophytes from lower altitudes at that elevation (Dickson 2011b).

One of the surprising findings among the subfossils was *Sphagnum imbricatum* / *affine*. Today, this very rare species is only known from localities remote from the discovery place of the Iceman. One of the nearest places where the species is found today is a peat bog, called

the “Schwemm”, near the village Walchsee, North Tyrol, Austria (Oeggel 1988). In Italy, at present, it does not occur at all (Dickson 2003; Dickson et al. 2005). All other subfossil bryophytes identified are still present in Italy and Austria.

Some subfossil bryophytes such as *Neckera complanata* were already involved in the reconstruction of the southern provenance of the Iceman, his last itinerary and his environment (Dickson et al. 1996; 2003a, b; Dickson 2000; Oeggel et al. 2007).

In the following the bryological discoveries with the Iceman are listed alphabetically with some detailed information on the Tertiary, Quaternary and archaeological context. All 200 investigated samples can be ordered by the following categories of finding types which were set up by Bagolini et al. (1995):

1. Equipment: comprising the wooden tools and weapons, such as the bow and the axe, quiver, backpack, birch bark vessels containing charcoal and maple leaves, retouching tool, wood;
2. Clothing: including twisted and sown leather, fur, hat, shoes;
3. Netting: grass cape, twisted grasses, cords, animal hair, grass leaves,
4. Stray finds: summarizing all finds, that could not be assigned to any of the categories mentioned, e.g. bird feathers.
5. Sediment: all remains – mainly minerogenic but also organic – retrieved from the bottom of the gully (see also Dickson et al. 2019).

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***Amblystegium serpens* (HEDW.) SCHIMP. in one sample.** A single, short leafy stem was inside the mass of *Neckera complanata* carried by the Iceman. This is a species with a detailed Tertiary and Quaternary history not just from Holocene or interglacial times but from the Last Glacial period (about 19,000 years ago) at Princeton, Ohio (Miller 1992). Three Last Glacial records from Poland are known (Szafran 1949). Recently, the species was found as part of the caulking of an early Bronze Age logboat (3200 BC – 2300 BC) recovered from Degersee, southern Germany (Dickson et al. 2013; 2015).

***Andreaea* spp. in 102 samples.** Species of *Andreaea* always grow on rock, most of them on rock faces and boulders that frequently dry out. Such a habitat would seem uncondusive to preservation in Quaternary deposits. Hedenäs (1994a) identified about 100 subfossil bryophyte taxa from 17 Last Glacial interstadials from northern Sweden: not one was an *Andreaea* (and only one was a liverwort). Nonetheless, *Andreaea* species were occasionally reported as subfossils. In 1973 four species were listed by J.H. Dickson as subfossils in Europe: *A. blyttii* SCHIMP., *A. obovata* THED., *A. rothii* WEB. & MOHR, and *A. rupestris* HEDW. In 1994 Huntley found *A. rothii* in eight samples of the Late Glacial period from Morrone Birk Woods in Scotland as well as *A. cf. blyttii* in one sample. The fact that there is even a Polish Last Glacial subfossil of *A. blyttii* (Szafran 1949) makes it all the more likely that *A. blyttii* will be found growing somewhere in the mountains of cen-

tral Europe including the Alps. Miller (in Anderson et al. 1985) recognized *A. rothii* from the Late Glacial layers of northern Maine. The sole subfossil discovery of *A. alpina* HEDW. was from lake sediment laid down in the last 200 years in the English Lake District (Tallantire 1997). Dickson (1973) predicted that *A. nivalis* HOOK. would turn up in the subfossil state and it did but not till more than 20 years later when the Iceman melted out of the ice. Hundreds of fragments of both costate and ecostate *Andreaea* species were recovered from ancient sediment accumulated in the hollow of the discovery site.

One may wonder how any *Andreaea* species could be recovered from human innards but that is exactly how an ecostate species (*A. cf. rupestris*) was found in the small bowel of Long Ago Person Found, an ancient frozen body from British Columbia (Dickson & Mudie 2008).

***A. alpestris* (THED.) SCHIMP.** A single subfossil leafy stem was confirmed by Barbara Murray, the world authority of the genus (personal communication). Fredskild et al. (1975) found it from the Holocene at Kløftsø, southern Greenland.

***A. nivalis* HOOK. in 67 samples.** There were many leafy stems of *Andreaea* with leaf nerves in the Iceman samples; likely these were mostly this species, rather than *A. rothii* not usually found in quantity as high as the nival zone.

***A. rupestris* HEDW. in 77 samples.**

Anomodon viticulosus (HEDW.) HOOK. & TAYL. Along with tiny pieces of *Neckera complanata* (HEDW.) HÜB., leaf fragments of this species were found in the colon of the Iceman. There are many reports from archaeological contexts and occasionally other species of the genus too; *A. longifolius* (SCHLEICH ex BRID.) HARTM. was present in a small amount with a mass of *A. viticulosus* used to caulk the sternboard of the Bronze Age dugout canoe found at Degersee, southern Germany (Dickson et al. 2013; 2015). There are also Pliocene records from Germany and the Caucasus according to Miller in Anderson et al. (1985).

Anthelia sp. A little subfossil tuft with largely leafless appearance often seen in the field seems to be more likely *A. julacea* (L.) DUMORT. rather than *A. juratzkana* (LIMPR.) TREVIS.

Antitrichia curtispindula (HEDW.) BRID. **in 4 samples.** A single leaf (half a leaf is more than enough for identification) was found in the mass of *Neckera complanata*. There were also two leafy stems in other samples. It is often reported from Quaternary deposits including archaeological contexts. Fredskild et al. (1975) reported it from the Holocene at Isoetes Sø, southern Greenland. The species was found as part of the caulking of an early Bronze Age logboat recovered from Degersee, southern Germany (Dickson et al. 2013; 2015).

Apomarsupella revoluta (NEES) R. M. SCHUST. **in 11 samples** (Fig. 5.1). With the unmistakable revolute margins, these leafy

fragments are the first subfossils of this hepatic which occurs in European mountains but is not known from Britain and Iberia. It is not present in the hydrological catchment of the Iceman site now, although it must have found suitable places for growth there in the ancient past.



Fig. 5.1: *Apomarsupella revoluta*. A 4 mm long leafy stem from a sediment sample. The dark colour obscures the markedly revolute margins.

Aulacomnium palustre (HEDW.) SCHWAEGR. **in 2 samples.** This is one of those mosses most commonly recorded from Quaternary deposits. Its history goes back at least to the Pliocene of Meighen Island (Kuc 1973; Fyles 1990).

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***Bartramia ithyphylla* BRID. in 2 samples.** Dickson (1973) found it in Late Glacial deposits at Drumurcher, Ireland. Hedenäs (1994a) listed it from the last glacial interstadial in northern Sweden and Miller (1993) found it from the Late Pleistocene of Connecticut. The genus seems to be seldom found as subfossil; Miller (1980) reported *B. pomiformis* from the Holocene of Marion Lake, British Columbia.

Bryum* spp. in 3 samples. *B. cf. alpinum* HUDS., *B. cf. capillare* HEDW., *B. sp. Very small amounts of scrappy subfossil material of this genus were difficult or impossible to identify. Consequently, these determinations are very tentative. Only those species of this large genus with very distinctive features have been recorded frequently as subfossils from Quaternary deposits. There are many records of *B. pseudotriquetrum* (HEDW.) SCHWAEGR. in the literature (see for instance Dickson 1973 and Miller 1980) and even a Pliocene one from Meighen Island (Kuc 1973; Fyles 1990). From various Quaternary sites in North America (Miller 1980, 1992) *Bryum* species are listed such as *B. cryophyllum*, *B. creberrimum*, *B. stenotrichum*, *B. tortifolium* and *B. neodamense*. Exceptionally, the full glacial deposits at Skaerumhede in Denmark also had four species: *B. cyclophyllum* (SCHWÄGR.) BRUCH & SCHIMP., *B. neodamense* ITZIGS., *B. pallescens* SCHLEICH. ex SCHWÄGE., and tentatively *B. creberrimum* TAYLOR (Odgaard 1981).

***Cephalozia bicuspidata* (L.) DUMORT. in one sample.** There seem to be very few Quaternary records of this genus; Miller (1980) listed “*Cephalozia*” from a Late Glacial site at Munro Lake, Michigan.

***Conostomum tetragonum* (HEDW.) LINDB. in three samples.** There are records from a Swedish Last Glacial interstadial (Hedenäs 1994a), subfossils from three glacial periods in Denmark (Odgaard 1981) and one from the Late Glacial of Scotland (Huntley 1994).

***Dicranum* spp. (*D. cf. scoparium* HEDW., *Dicranum* sp.) in 19 samples.** Only *D. scoparium* has been recorded frequently in the subfossil state but there are sparse records of *D. elongatum* SCHLEICH. ex SCHWÄGR., *D. fuscescens* SM., *D. leioneuron* KINDB., *D. majus* SM. and *D. undulatum* SCHRAD. ex BRID. (Miller 1980) and *D. majus*, *D. angustum* LINDB., *D. laevidens* R.S. WILLIAMS and *D. acutifolium* (LINDB. & ARNELL) C.E.O. JENSEN (Hedenäs 1994a). Odgaard (1981) listed *D. scoparium* and *D. fuscescens* from the Last Interglacial in Denmark. *D. leioneuron* has been reported from the Pliocene of Meighen Island (Kuc 1973; Fyles 1990).

***Diplophyllum taxifolium* (WAHLENB.) DUMORT. in one sample** (Fig. 5.2). This genus has rarely been found as a subfossil and indeed the comment applies to the whole family Scapaniaceae. The single leafy stem found with the Iceman is well enough preserved to render a confident determination of the genus

and the species. It is the only subfossil ever found. For *Diplophyllum albicans* (L.) DUMORT. an English Bronze Age record exists from the same site as the *Scapania* sp. (Dickson 1973).



Fig. 5.2: *Diplophyllum taxifolium*. A 4 mm long leafy fragment from a sediment sample.

***Distichium capillaceum* (HEDW.) BRUCH & SCHIMP. in 13 samples.** The species has a detailed Quaternary history in both Europe and North America with many records from glacial stages and even some from interglacial periods including the Holocene (Dickson 1973).

***Ditrichum flexicaule* (SCHWAEGR.) HAMPE in 4 samples.** This is a species which turns up often in glacial deposits. Dickson

(1973) listed seven localities of Full-glacial and Late-glacial age from the British Isles and one from the early Holocene; Miller (1980) listed 14 discoveries from the North American Quaternary.

***Encalypta* sp. or spp. in 3 samples.** There were three detached, unfringed calyptras from the Iceman site. Certainly, *Encalypta* but nothing further can be said except that they are not from *E. ciliata* HEDW. or any other species with fringed capsules. Dickson (1976) found a detached calyptra from a Late Glacial deposit in west-central Scotland. A sporophyte of the tentatively identified *E. vulgaris* HEDW. was reported from the upper Pleistocene of Siberia by I. I. Abramov (Dickson 1973).

Encalypta alpina SM., *E. streptocarpa* HEDW. and tentatively *E. rhaptocarpa* SCHWÄGR. are recorded from the Last Glacial in Denmark (Odgaard 1981). Miller (1993) found *E. procera* BRUCH as well as *E. alpina* and *E. rhaptocarpa* in Late Glacial sites in Connecticut and Vermont. Janssens (1983) listed subfossils of *E. alpina* from two sites in Canada. Kuc (1971) reported it from the Holocene of Prince Patrick Island, Canada.

***Grimmia* spp. in 61 samples.** Just like the rupestral genus *Andreaea* the ecologically similar *Grimmia* has a poor Quaternary record with only four subfossil discoveries from four sites in Britain listed in Dickson (1973). Fredskild et al. (1975) identified *Grimmia torquata* DRUMM. tentatively from the Holocene Kloftso, southern Greenland and Övstedal & Aarseth (1975) reported it from

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the Late Glacial at Vinnes, Norway. *Grimmia montana* BRUCH & SCHIMP. was found in Last Interglacial deposits at Zeifen, southern Bavaria (Jung et al. 1972) and *Grimmia ovalis* (HEDW.) LIMPR. from the Late Glacial in the Vosges (Firbas et al. 1948).

That there are no less than seven species recovered from the Iceman site is unprecedented. In *Fossilium Catalogus*, mistakenly Dixon (1927) listed seven species of *Grimmia* sensu lato and *Coscinodon humilis* MILDE as “glacial” which unfortunately had not been found as a subfossil. However, four of these *Grimmia* species have now been recovered at the Iceman site.

These seven were all confirmed or first recognised by the *Grimmia* authority Henk Greven (personal communication): *Grimmia alpestris* (F. WEBER & D. MOHR) SCHLEICH. **in two samples**, *Grimmia anodon* BRUCH & SCHIMP. **in two samples**, *Grimmia elongata* KAULF. **in four samples**, *Grimmia funalis* (SCHWÄGR.) BRUCH & SCHIMP. **in one sample**, *Grimmia incurva* SCHWÄGR. **in 12 samples** and *Grimmia triformis* CARESTIA & DE NOT. **in one sample**.

Grimmia mollis BRUCH & SCHIMP. **in 53 samples** (Fig. 5.3). As exception to the rule for the genus, this species grows on rock constantly wetted by snow and ice melt water. It was found in 26 % of the Iceman samples. It doesn't grow within the hydrological catchment now.

Gymnomitrium corallioides NEES **in 10 samples**.

Heterocladium dimorphum (BRID.)

SCHIMP. **in one sample**. A single, short leafy fragment was recovered from the Iceman site. It is indeed not the first moss that a bryologist would expect with frozen corpses because it grows on the ground in grass and shrub vegetation. It is noteworthy that in the little beaver skin bag belonging to Long Ago Person Found, an ancient frozen body from British Columbia, there was a leafy stem of this species (Dickson 2011b).

Hylocomium splendens (HEDW.) SCHIMP. **in 12 samples**. With the detailed Quaternary and Tertiary history of this species, it was no surprise to find it with the Iceman. It is an abundant species in Europe, being blanket-forming and large. It has been collected for small scale domestic purposes for thousands of years. There are various other large species that can form extensive blankets such as *Rhytidiadelphus* and *Pleurozium schreberi* (WILLD.) MITT., all of them Pliocene subfossils from Poland, Bashkir, the central Volga region and Meighen Island (Kuc 1973).



Fig. 5.3: *Grimmia mollis*. A 3 mm long part of a leafy fragment from a sediment sample.

Hymenostylium recurvirostrum (HEDW.) DIX. **in one sample.** There are very few if any discoveries of subfossils of this species often encrusted with a precipitate of calcium carbonate. In contrast to other species like *Hylocomium splendens* and *Neckera* spp. it was a surprise, the more so as it was extracted from the Iceman's rectum. How did the subfossil fragments come to be there? That this moss was used as a kind of a toilet papers is highly unlikely due to its delicate structure. Clearly the plant got ingested, but accidentally or deliberately? If intentionally used, what was the purpose?

Hypnum callichroum BRID. **in one sample.** There is only one stem from the Iceman site. It was recorded from the Full-glacial of southern England by H.N. Dixon (Dickson 1973). Pliocene deposits at Banks Island contained this species.

Hypnum cupressiforme HEDW. **in one sample.** As one of the very commonest mosses in Europe, a solitary little leafy stem was washed from the Iceman's brown bear fur cap. There are many subfossils from the European Quaternary and archaeological contexts. Their history extends back at least to the Pliocene (central Volga region, Abramova & Abramov 1959, 1962). Recently *Hypnum cupressiforme* s. l. was found as part of the caulking of an early Bronze Age logboat recovered from Degersee, southern Germany (Dickson et al. 2013; 2015).

Hypnum revolutum (MITT.) LINDB. **in two samples.** It is known from glacial layers in Sweden, Denmark, Ireland, United States and Canada (Dickson 1973; Miller 1980; Janssens 1983).

Hypnum vaucheri LESQ. **in one sample.** A subfossil of this moss was recovered from late Pliocene layers at Banks Island (Kuc 1973). There are reports from glacial layers in Sweden (Hedenäs 1994a), southern England (Dickson 1973), United States and Canada (Miller 1980; Janssens 1983).

Isopterygiopsis pulchella (HEDW.) IWATS. **in one sample.** There was a single, short leafy stem recovered from the Iceman site. Subfossils are known from northern Sweden (Hedenäs 1994a), United States and Canada (Miller 1980; Janssens 1983) and the Volga region (middle Pleistocene, Abramova & Abramov 1959, 1962).

Leucodon sciuroides (HEDW.) SCHWAEGR. **in one sample** (Fig. 5.4). There was a mere one leafy stem with the Iceman. It occurs occasionally in Quaternary and archaeological layers in Europe.

Lophozia sudetica (NEES ex HÜB.) GROLLE **in six samples.** Species of *Lophozia* have seldom been found as subfossils; Miller (1980) listed one species from Greenland and one from Canada and Janssens (1983) two from the Yukon. Huntley (1994) recognised *Barbilophozia barbata* from the Late Glacial in Aberdeenshire, Scotland.

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Fig. 5.4: *Leucodon sciuroides*. A 4 mm long leafy stem from a sample from the Iceman's clothing.

***Marsupella brevissima* (DUMORT.)**

GROLLE in one sample. A tentative identification.

***Marsupella sphacelata* (GIESEKE ex LINDENB.) DUMORT. in five samples.**

***Mnium thomsonii* SCHIMP. in one sample.**

One badly preserved leafy subfossil was confirmed by Timmo Koponen (personal communication). Miller (1980) listed one subfossil record from the Late Glacial of Vermont, Mogensen (1984) reported it from the "Pliocene or early Pleistocene" of Kap København, northern Greenland. There are Pliocene records from Germany and Italy (Szafran 1949).

***Neckera complanata* (HEDW.) HÜB. in 10 samples.** This species and *Sphagnum cf. affine* are the two most significant mosses found with the Iceman (Dickson 2003; Dickson et al. 2003a, b; 2005). A mass of stems, up to 6 cm long, was found with the Iceman. It seems that he had carried this moss gathered from the south of where his mummy was found. This moss is the eponym to the plant community Neckerion complanatae, which is found in humid, shady places on rock or bark usually in woodland on base-rich substrata. The community includes several other species, all found with the Iceman: *Amblystegium serpens*, *Anomodon viticulosus*, *Antitrichia curtipendula*, *Leucodon sciuroides* and *Neckera crispa* HEDW. (for further information see also Dickson 2003 and Dickson et al. 2003a). It has a detailed late Tertiary (Miocene and Pliocene) and Quaternary history in Europe (Dickson 1973; Miller 1980). Recently, the species was found as part of the caulking of an early Bronze Age logboat recovered from Degersee, southern Germany (Dickson et al. 2013; 2015).

***Neckera crispa* HEDW. in 6 samples.** Like the previous moss, this is no surprise, being one of the most commonly found mosses in archaeological contexts and, for instance, was often chosen to caulk wooden boats from prehistory to medieval times. This long tradition persisted in the Saône/Rhone valleys till the mid-20th century AD. Many European Neolithic sites had abundant remains of this species, especially in Switzerland. A shoe insole made of a pure mass of this species was

found at the Neolithic site at Zug, Switzerland (Hochuli 2002). *Neckera* spp. occurred repeatedly in European archaeological sites. The 13/14th century medieval layers in the town of Most, Czech Republic, revealed four species of *Neckera*: the two already discussed as well as *N. pennata* HEDW. and *N. pumila* HEDW. (Culiková 1995). There are Pliocene records from Germany and the Caucasus (Szafran 1949).

Oligotrichum bercynicum (HEDW.) LAM. & DC. **in one sample.** It is a species seldom found as a subfossil (Hedenäs 1994a).

Paraleucobryum nerve (THED.) LOESKE **in 74 samples.**

Plagiomnium affine (BLAND.) T. KOP. **in two samples** (Fig. 5.5). One badly preserved subfossil of this species was confirmed by Timmo Koponen (personal communication). There are few reliably identified Quaternary subfossils which account for the taxonomic revisions by Koponen (1968, 1971, 1980, 1981 and 1988).



Fig. 5.5: *Plagiomnium affine*. A 6 mm long stem with two leaves from a sample of a stray find together with hair.

Pogonatum urnigerum (HEDW.) P. BEAUV. **in 14 samples.** Dickson (1973) listed seven Last Glacial and Holocene records in Britain and Ireland. There are Last Glacial records from Denmark and Sweden and a Holocene record from southern Greenland (Fredskild et al. 1975; Odgaard 1981; Hedenäs 1994a).

Poblia spp. **in 138 samples.** Often subfossil material was identified only to the genus and not the species level (Dickson 1973; Miller 1980). Odgaard (1981) listed *P. drummondii* (MÜLL. HAL.) A.L. ANDREWS, *P. nutans* (HEDW.) LINDB. and *P. obtusifolium* (VILL. ex BRID.) L.F. KOCH from the Danish Quaternary and Hedenäs (1994a) mentioned *P. crudoides* (SULL. & LESQ.) BROTH. from the Swedish Last Glacial. Miller (1980) listed *P. cruda* (HEDW.) LINDB. and *P. nutans* from the Pliocene of Meighen Island.

Poblia cf. *elongata* HEDW. **in two samples.**

Poblia ludwigii (SPRENG. ex SCHWÄGR.) BROTH. **in one sample.**

Poblia wahlenbergii (F. WEBER & D. MOHR) A.L. ANDREWS var. *glacialis* (BRID.) E.F. WARB. **in one sample.** Dickson (1973) reported subfossils of the species from seven Quaternary sites in the British Isles. *P. wahlenbergii* was also reported from the Pliocene of Meighen Island (Kuc 1973; Fyles 1990).

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Polytrichastrum alpinum (HEDW.) SM. **in 8 samples.** The Late Glacial period of the British Isles was called “the *Polytrichum alpinum* period” (Dickson 1973). There are many records of subfossils from the rest of Europe and there is even a Pliocene record from deposits on Meighen Island (Dickson 1973).

Polytrichastrum sexangulare (BRID.) SM. **in 137 samples.** This was the third most common species retrieved from the Iceman site. There are subfossils from various parts of Europe, all from Last Glacial layers (Dickson 1973).

Polytrichum piliferum HEDW. **in 182 samples.** Poorly preserved subfossil material can lead to difficult determinations as encountered by Miller in Anderson et al. (1985): “*Polytrichum juniperinum-piliferum* type”. Found in almost all the samples that yielded mosses, *P. piliferum* was by far the most abundant moss preserved at the Iceman site with thousands of leafy stems and detached leaves. According to J.H. Dickson, none of them seemed to be *P. juniperinum* HEDW. which in any case occurs seldom if ever in the nival zone. Miller (1980) reported one Late Glacial occurrence from Cambridge, Massachusetts.

Pterigynandrum filiforme HEDW. **in one sample.**

Ptilidium ciliare (L.) HAMPE **in two samples.** One stem in each of two samples. It is rare as a subfossil. Fredskild et al. (1975) recovered it from Holocene muds under two of

the six lakes in the Cape Farewell area, southernmost Greenland. Miller (1980) listed it from an “interglacial” layer about 43,000 years old from Banks Island, the westernmost island of the Canadian Arctic Archipelago.

Racomitrium canescens (HEDW.) BRID. **in 20 samples.** Compared to *Racomitrium lanuginosum* (HEDW.) BRID., *R. canescens* sensu lato has a sparse Quaternary history. In 1973 Dickson wrote “There are few records from the Pleistocene anywhere” (Dickson 1973). Now we know that there are subfossils from the Holocene of southern Greenland, the Last Glacial of northern Sweden, the early Last Glacial of Denmark and the Late Glacial of Maine and the Yukon, and the Holocene of Alaska and Ontario (Miller 1980; Janssens 1983).

Racomitrium lanuginosum (HEDW.) BRID. **in 148 samples.** This is the second commonest moss found with the Iceman. There are 20 subfossil localities given in Dickson (1973) from Late Glacial and Holocene sites in Britain and Ireland. In contrast, Miller (1980) listed only two subfossil sites from North America and four from southern Greenland.

Rhytidium rugosum (HEDW.) KINDB. **in 7 samples.** Subfossils of this species are frequently reported from glacial layers (Kuc & Hills 1971; Dickson 1973; Odgaard 1981; Hedenäs 1994a; Bos et al. 2004) and occasionally from Holocene sediments (Rybniček et al. 1998). There is a Pliocene subfossil from the central Volga region (Miller 1984).

***Sanionia uncinata* (HEDW.) LOESKE in one sample.** Miller (1980) listed 8 sites of subfossils from North America and Greenland. Hedenäs (1994a) found it as a subfossil in northern Sweden.

***Scapania* sp. or spp. in 4 samples.** There were four very badly preserved scraps recovered from the Iceman site. Subfossils of the family Scapaniaceae are very rarely found.

***Sciuro-hypnum starkei* (BRID.) IGNATOV & HUTTUNEN in one sample.** There was only one leafy stem. There appear to be few if any other subfossils of this species.

***Sphagnum* spp. in three samples** (Fig. 5.6). Two or perhaps three species were found with the Iceman (Dickson et al. 2005, 2009; Dickson 2013). One was outside the body (*S. cf. teres* (SCHIMP.) ÅNGSTR.), one inside (colon, *S. cf. affine* [REN. & CARDOT.] FLATBERG) and another inside (stomach) but not in good state to be determined to species level. Various species of *Sphagnum* are major components of Holocene peats and interglacial peats, too. They are much more sparsely present in deposits from the glacial periods. Evidence exists from the European Holocene of *S. teres* which has also been recovered from Danish Last Interglacial and Last Glacial times (Odgaard 1981) and from the middle Pleistocene of the Volga region (Abramova & Abramov 1959, 1962). The oldest subfossils come from the Pliocene of Banks Island (Miller 1980). There are many records of subfossil "*S. imbricatum*

HORN SCH." sensu lato (containing *S. affine*) from Europe. It is impossible to say how many of these records could be from *S. affine*. *Sphagnum* cf. *teres* (Fig. 28) was confirmed by Mark Hill (personal communication). Also with the first ever ancient glacier body from the Americas (Long Ago Person Found, an ancient frozen body from British Columbia) *Sphagnum* sp. was recovered together with other bryophytes (Dickson et al. 2004).



Fig. 5.6: *Sphagnum* cf. *teres*. A 1.5 mm long bud from a sample connected to the Iceman's equipment (netting).

***Timmia* sp. in one sample.** There was only a single subfossil leaf lacking the sheathing base extracted from the Iceman site. The genus was occasionally recorded from Quaternary sites: *T. norvegica* J.E. ZETTERST. from Banks Island and *T. austriaca* HEDW. from Columbia Bridge, Vermont (Miller 1980), *T. austriaca* and *T. norvegica* from Meighen Island (Kuc 1973) and *T. bavarica* HESSL. and *T. norvegica* from Denmark (Odgaard 1981).

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Tortella tortuosa (HEDW.) LIMPR. **in one sample** and *T. fragilis* (HOOK. & WILS.) LIMPR. **in one sample**. Both are tentative at the species level. Szafran (1952) reported two Last Glacial occurrences of *T. tortuosa* from Poland and one of *T. fragilis*. Odgaard (1981) listed both these species from the Last Glacial of Denmark. Late Glacial layers at Roxburghshire, Scotland yielded *T. fragilis* (Webb & Moore 1983). In Janssens (1983) and Miller (1980, 1993) seven occurrences of subfossils of *T. tortuosa*, five of *T. fragilis* and three of *T. inclinata* (R. HEDW.) LIMPR. are listed from North America.

Tortula leucostoma (R. BR.) HOOK. & GREV. There was a single fragment **in one sample**. There appear to be few if any other subfossils.

Warnstorfia exannulata (SCHIMP.) LOESKE **in one sample** and *Warnstorfia fluitans* (HEDW.) LOESKE **in one sample**. Being aquatic/subaquatic mosses, species of the former *Drepanocladus* sensu lato are well known from Quaternary layers in both Eurasia and North America (Dickson 1973). A Pliocene subfossil of *W. exannulata* is known from Meighen Island (Kuc 1973).

5.2 Present bryoflora

Altogether 500 species of bryophytes have been documented and their altitudinal distribution is indicated. 315 species were recorded

for both the TS/IT and the TN/AT parts of the investigated area, 146 only for TS/IT and 39 only for TN/AT. The species are divided into 77.6 % (387 species) mosses and 22.4 % (112 species) liverworts.

Immediately around the Iceman site only 21 species of mosses and liverworts were to be found after much searching by the authors and their colleagues (see also Dickson et al. 2019). New absolute altitudinal records were established for *Andreaea alpestris* (ca. 3,019 m a.s.l., AT/IT), *Andreaea nivalis* (3,200 m a.s.l., AT), *Andreaea rothii* ssp. *rothii* (ca. 3,200 m a.s.l., AT/IT), *Atrichum undulatum* (2,500 – 2,540 m a.s.l., AT), *Barbula sinuosa* (1,370 – 1,434 m a.s.l., IT), *Blasia pusilla* (2,320 – 2,490 m a.s.l., AT), *Bryum alpinum* (3,242 m, AT/IT), *Bryum moravicum* (2,660 m a.s.l., AT), *Calypogeia suecica* (2,540 – 2,630 m a.s.l., AT), *Campylopus fragilis* (2,550 m a.s.l., IT), *Cephalozia bicuspidata* (ca. 3,200 m a.s.l., AT/IT), *Chiloscyphus pallescens* (ca. 2,540 – 2,630 m a.s.l., AT), *Climacium dendroides* (ca. 2,560 – 2,630 m a.s.l., AT), *Conostomum tetragonum* (ca. 3,050 m a.s.l., AT/IT), *Cynodontium strumiferum* (2,800 m a.s.l., AT), *Dicranum polysetum* (ca. 2,350 – 2,610 m a.s.l., IT), *Diphyscium foliosum* (2,660 – 2,844 m a.s.l., AT), *Encalypta ciliata* (ca. 3,150 m a.s.l., AT, IT), *Eurhynchium crassinervium* (2,600 – 2,875 m a.s.l., IT), *Eurhynchium striatum* (2,030 – 2,100 m a.s.l., AT), *Fabronia ciliaris* (1,462 m a.s.l. to above 1,500 m a.s.l., IT), *Fissidens viridulus* (ca. 2,320 – 2,490 m a.s.l., AT), *Frullania fragilifolia* (1,700 – 1,780 m a.s.l., IT; ca. 2,130 – 2,250 m a.s.l., AT), *Grimmia laevigata* (2,890 m a.s.l.,

AT/IT), *Grimmia montana* (3,019 m a.s.l., AT/IT), *Grimmia orbicularis* (1,980–2,050 m a.s.l., IT), *Grimmia pulvinata* (2,788 m a.s.l., AT), *Grimmia trififormis* (ca. 3,200 m a.s.l., AT/IT), *Hygrobrella laxifolia* (ca. 2,540 – 2,630 m a.s.l., AT), *Isopterygiopsis muelleriana* (3,019 m a.s.l., AT/IT), *Jamesoniella autumnalis* (ca. 2,600 – 2,875 m a.s.l., IT), *Jungermannia hyalina* (ca. 2,620 – 2,880 m a.s.l., AT), *Marsupella alpina* (3,019 m a.s.l., AT/IT), *Marsupella commutata* (ca. 3,200 m a.s.l., AT/IT), *Odontoschisma elongatum* (2,700 – 2,880 m a.s.l., TS/IT and ca. 2,620 – 2,880 m a.s.l., TN/AT), *Oligotrichum hercynicum* (ca. 3,200 m a.s.l., AT/IT), *Orthotrichum diaphanum* (1,810 – 1,820 m a.s.l., IT), *Paraleucobryum enerve* (3,225 m a.s.l., AT/IT), *Philonotis seriata* (up to 2,880 m a.s.l., IT), *Plagiomnium undulatum* (2,148 m a.s.l., IT; AT), *Pleurocladula albescens* (3,019 m a.s.l., 3,036 m a.s.l., AT/IT), *Pogonatum urnigerum* (ca. 3,200 m a.s.l., AT/IT), *Porella platyphylla* (ca. 2,580 m a.s.l., IT), *Racomitrium elongatum* (3,242 m a.s.l., AT/IT), *Riccardia palmata* (2,030–2,560 m a.s.l., AT), *Scapania subalpina* (2,620 – 2,880 m a.s.l., AT), *Schistidium elegantulum* (2,030 – 2,100 m a.s.l., AT), *Sphagnum girgensohnii* (ca. 2,500 – 2,560 m a.s.l., AT), *Sphagnum flexuosum* (1,970 – 2,030 m a.s.l., AT), *Sphagnum warnstorffii* (2,520 – 2,630 m a.s.l., AT), and *Tortula canescens* (ca. 1,360–1,420 m a.s.l., IT).

Apart from this listing, the new elevation records will be highlighted in the description of the species.

Abietinella abietina (HEDW.) FLEISCH.

Syn: *Thuidium abietinum* (HEDW.)

SCHIMP. (Thuidiaceae) Echtes Tannenmoos, Prickly Tamarisk-moss

Some authors distinguish two varieties, *Abietinella abietina* var. *abietina* and *A. a.* var. *hystricosa*. According to Düll-Hermanns (1985) and Cortini Pedrotti (2006) var. *hystricosa* is very rare in the investigation area and accordingly only var. *abietina* was found in this research.

A. a. a. is very abundant: 115 squares: 4-7, 9-20, 23-28, 32-36, 38-44, 48, 50, 52, 54-60, 70, 84, 85, 87, 88, 93-97, 99-106, 108-120, 128-136, 138, 140, 142-155, 158-160, 172-174, 178, 181, 184, 185, 190, 193-198, both TN/AT and TS/IT, lacking only in a few squares. From lowest ca. 525 m a.s.l. (TS/IT) and 1,450 – 1,650 m a.s.l. (TN/AT) to ca. 2,550 m a.s.l. (TS/IT) and 2,500 – 2,540 m a.s.l. (TN/AT). Mostly on open, bright, dry places, also on rocks, rare in shady sites and only once found in a damaged peat bog (drained, grazed and fertilised).

AT: the highest occurrence at 3020 m a.s.l., south of Festkogel (TN). In TE it is documented up to 2,660 m a.s.l., Melitz and Nussinggrat, in IT reaching 2,600 m a.s.l., Lago Miserin, Aosta. Further altitudinal limits are: CH: from 200 – 2,825 m a.s.l.; FR: 2,560 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Aloina ambigua (BRUCH & SCHIMP.)

LIMPR. (Pottiaceae), Zweifelhafes Aloe-moos, Tall Aloe-moss

Two records (c.fr.) squares: 7, 9 (TS/IT), from south facing slopes in Tschars (below cable car

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station Unterstell) and Naturns (Juval, Schlossalm), at elevations of 980 m a.s.l. and 1,300 m a.s.l., on bare soil and dry stonewalls.

Very rare in AT, apart from the Pannonian region, with few records for TN, without altitudinal measurements. Also for IT no altitudinal records available. In TS rare with records only before 1950. In CH from 310 – **2,175 m a.s.l.** In FR documented from 600 m a.s.l., Apremont, Savoy.

Red list status: 2 – severely endangered (AT), NE – not assessed (CH), V – decreasing (DE).

Aloina rigida (HEDW.) LIMPR.

(Pottiaceae), Steifes Aloemoos,
Rigid Aloe-moss

Three squares: 5, 6 (TS/IT), 159 (TN/AT), in south exposed dry slopes at Naturns on open soil and in Rofental; lowest elevation 550 m a.s.l. (TS/IT); and highest altitudinal ranges of 2,100 – 2,200 m a.s.l. (TN/AT).

In AT in warm alpine valleys ascending up to 1,200 m a.s.l., Finstermüntz, TN and 2,600 m a.s.l. in TE (no precise location given). In IT up to **2,780 m a.s.l.**, Crammont. Recently confirmed for TS, 1,280 – 1,330 m a.s.l., Taufers. In CH from 322 – 2,552 m a.s.l. In FR documented from 850 m a.s.l., Saint-Martin-de-la-Porte.

Red list status: 3 – endangered (AT), VU – vulnerable (CH), V – decreasing (DE).

Amblyodon dealbatus (HEDW.) P. BEAUV.

(Meesiaceae), Bleichgrünes Stumpfbahnmoos,
Short-tooth Hump-moss

In eight squares: 58, 82, 84, 85, 127, 130, 132, 162, both in the Austrian and the Italian

study area, altitudinal ranges from 1,895 – 2,412 m a.s.l. (TN/AT) and from 1,630 – 2,400 m a.s.l. (TS/IT) in wet habitats.

This lime-loving moss is recorded in TN/AT up to 2,700 m a.s.l., Granatenwand near Obergurgl. In IT, the maximum elevation reached is 2,700 m a.s.l., Colle del Nivolet, Gran Paradiso National Park. In TS, it is documented to an elevation of 1,810 – 1,900 m a.s.l., Suldental. Only recorded in Trentino-Alto Adige before 1950. Further altitudinal ranges are: in CH from 400 – **2,900 m a.s.l.** and in FR 2,650 – 2,700 m a.s.l., Bonneval-sur-Arc.

Red list status: VU – vulnerable (CH), 2 – severely endangered (DE).

Amblystegium confervoides (BRID.)

SCHIMP.; Syn.: *Platydictya confervoides* (BRID.) CRUM (Amblystegiaceae), Algenähnlicher Stumpfdedeckel, Tiny Feather-moss

In eight squares: 6, 17, 25, 109, 173, 174, 176, 184 on ground and rock, altitudinal ranges 1,450 – 1,650 m a.s.l. (TN/AT), and 790 – 1,620 m a.s.l. (TS/IT).

In AT: altitudinal range 800 – 2,340 m a.s.l., upper limit in TE; 800 – 1,100 m a.s.l. in TN, but it was missing since 1900 in Austrian Tyrol. Up to 2,200 m a.s.l. in IT, Wolfendorn, TS. Other altitudinal ranges/limits are: CH: 353 – 2,070 m a.s.l.; **FR: 2,491 m a.s.l.**, Tignes.

Red list status: V – decreasing (DE).

Amblystegium serpens (HEDW.) SCHIMP.;

Syn.: *A. juratzkanum* SCHIMP.

(Amblystegiaceae), Kriechendes Stumpfdedeckelmoos, Creeping Feather-moss

In 61 squares: 2-11, 13-20, 24, 25, 33-36, 40, 44, 55, 96, 97, 109-114, 130, 135-138, 140-145, 147-149, 172-178, 181, 184, 186, 187, 192, recorded from 525 m a.s.l. to 1,980 m a.s.l. in TS/IT, in the TN/AT part of the investigated area from 1,450 – 1,670 m a.s.l.; typically on ground in more or less shady, moist and nutrient rich situations.

AT: maximum elevations of up to 2,050 m a.s.l. in TN, Steisbachtal above St. Anton; 1,950 m a.s.l., Pyramidenspitze, TN, and 2,000 m a.s.l., upper Iseltal, TE. In IT elevations of 1,830 – 2,100 m a.s.l., near Tribola Glacier, Aosta, and 1,610 m a.s.l., Castello near Andraz in Buchenstein, Trentino. Other altitudinal ranges/limits: CH: 194 – **2,900 m a.s.l.**; FR: 1,000 m a.s.l., Planay.

Amblystegium subtile (HEDW.) SCHIMP.; Syn.: *Platydictya subtilis* (HEDW.) CRUM (Amblystegiaceae), Feiner Stumpfdedeckel, Feather-moss

17 squares: 1, 7, 13-15, 18, 19, 24, 25, 43, 55, 84, 111, 142, 143, 145, 186; in TS/IT a range of 700 m a.s.l. to 1,930 m a.s.l., in TN/AT recorded range from 1,895 to 2,130 m a.s.l. AT: the former elevation limit was 1,900 m a.s.l. (Tyrol without further indication). TN up to 1,580 m a.s.l., Vintalpl, and in TE 975 m a.s.l., between Huben and Peischlach. In IT it occurs from 1,230 – 1,500 m a.s.l., between Campo and Mortisa, Trentino. In CH 270 – **2,360 m a.s.l.**

Red list status: 3 – endangered (DE).

Amphidium lapponicum (HEDW.)

SCHIMP. (Rhabdoweisiaceae),

Lappländisches Bandmoos, Lapp Yoke-moss

Recently the genus *Amphidium* was revised and the family Amphidiaceae within the subclass Dicranidae was proposed by Sim-Sim et al. (2017); in this work also *A. lapponicum* was re-evaluated.

Only in square 127 in Pfelderertal (TS/IT), below Labkofel, in an altitudinal range of 2,080 – 2,400 m a.s.l., on rock, c.fr.

AT: altitudinal ranges of ca. 1,700 – 2,660 m a.s.l. are given with further elevation measurements of 2,600 m a.s.l., Hanneburger at Volders, TN and 2,660 m a.s.l., Malfroßnitz and Musing, TE. In IT the moss is recorded up to **2,900 m a.s.l.** in Trentino, and at an altitude of 2,650 m a.s.l., Stilsfser Joch, TS. In CH it is recorded from 750 m a.s.l. to 2,760 – 2,850 m a.s.l.; in FR up to an elevation of 2,850 m a.s.l., Pralognan-la-Vanoise.

Red list status: 1 – threatened with extinction (DE).

Amphidium mougeotii (SCHIMP.)

SCHIMP. (Rhabdoweisiaceae), Großes

Bandmoos, Mougeot's Yoke-moss

30 squares: 24, 26, 33, 38, 57, 64, 76, 82, 84, 87, 89, 97, 101, 105, 112, 115, 127, 129, 132, 134, 135, 138-140, 158-161, 172, 181, always on rock, once in a waterfall, from ca. 660 m a.s.l. to 2,590 m a.s.l. (TS/IT), in TH/AT found in altitudes between 1,470 m a.s.l. and 2,290 m a.s.l.

AT: a maximum elevation of 2,920 m a.s.l., TE, and 2,840 m a.s.l., TN can be stated.

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In IT up to 2,900 m a.s.l., Becca di Nonna, Aosta, and 2,500 m a.s.l., Schöntaufspitze, Suldén, TS. In CH 200 – **3,200 m a.s.l.**, upper limit at Bernina.

Red list status: r: 3 – regionally endangered (AT), V – decreasing (DE).

Anastrophyllum assimile (MITT.) STEPH.;

Syn.: *A. reichardtii* (GOTTSCHE.) STEPH.

(Lophoziaceae), Schwarzes Kahnblattmoos,

Similar Notchwort

Recorded in TN/AT only, two squares: 71 (above Martin-Busch-Hütte, 2,540 – 2,630 m a.s.l.) and 199 (Rotmoos, 2,260 – 2,300 m a.s.l.), on rock and in a peat bog, respectively.

AT: an altitudinal range of 1,600 – **2,800 m a.s.l.** can be mentioned. In TN up to 2,600 m a.s.l. and in TE up to 2,800 m a.s.l., near Linz. In CH from 1,080 – 2,600 m a.s.l., few recent records.

Red list status: EN – endangered (IT, CH), AR – at risk (FR).

Anastrophyllum minutum (SCHREB.)

SCHUST.; Syn.: *Sphenolobus minutus*

(SCHREB.) BERGGGR. (Lophoziaceae), Schlankes Kahnblattmoos, Comb Notchwort

In 30 squares: 15, 17, 23, 25, 26, 37, 43, 45, 50, 54, 63, 70, 81, 83, 86, 94, 98, 99, 103, 107, 114, 127, 130, 131, 136, 137, 157, 159, 167, 185, mostly on rock but also on ground and a track bank, lowest records 980 – 1,245 m a.s.l. (TS/IT), 1,525 – 1,530 m a.s.l. (TN/AT), highest record in square 63 which covers both TN/AT and TS/IT, 3,019 m a.s.l. AT: the maximum elevation is ca. 3,030 m a.s.l. In TN reaching 3,030 m a.s.l. in Ötztal,

southern slopes of Festkogel and in TE, 3,000 m a.s.l., Schleinitz. In IT up to 3,100 m a.s.l., Monte Rosa, Aosta. In CH 200 – **3,207 m a.s.l.** and in FR 2,378 m a.s.l., Notre-Dame-de-Briançon.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Andreaea alpestris (THED.) SCHIMP.;

Syn.: *A. rupestris* HEDW. var. *alpestris*

(THED.) SHARP (Andreaeaceae)

Alpen-Klaffmoos, Slender Rockmoss

Sometimes not separated from *A. rupestris*. According to Murray (1988) a clearly defined species.

Five occurrences in squares 61 (TS/IT), Tisenal, track to Similaunhütte, 2,600 – 2,680 m a.s.l.; 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, ca. **3,019 m a.s.l.**; 71 (TN/AT), above Martin-Busch-Hütte, ca. 2,540 – 2,630 m a.s.l.; 82 (TN/AT), Vent towards Hörndle, 2,260 – 2,400 m a.s.l., and 83 (TN/AT), trail to Mutsbichl, ca. 2,130 – 2,250 m a.s.l.; always on rock.

AT: an altitudinal range of ca. 2,000 – 2,700 m a.s.l. In TN reaching >2,500 m a.s.l., Gaisbergtal at Obergurgl, and in TE 2,500 – 2,680 m a.s.l., Zunig. Altitudinal ranges for IT are 1,300 – 2,700 m a.s.l. in Trentino, and in TS up to 2,600 m a.s.l., Wormser Joch. In CH 360 – 3,000 m a.s.l. Not known from the DE territory. In FR up to 2,800 m a.s.l. in Bonneval-sur-Arc.

Red list status: 2 – severely endangered (DE), AR – at risk (FR).

Andreaea frigida HUEBENER

(Andreaeaceae) Eis-Klaffmoos, Ice-Rockmoss
Only once in TS/IT in square 38, Mastauntal,
1,900 – 1,950 m a.s.l. on rock.

AT: an altitudinal range of 1,300 – **2,820 m a.s.l.** In TN up to 2,530 m a.s.l., Hintere Putzsch, Ramolweg, near Obergurgl, and in TE, Ködnitztal up to ca. 2,820 m a.s.l. For IT the altitudinal limits are of 2,544 – 2,568 m a.s.l., near Costa della Civetta, Gran Paradiso National Park. Further altitudinal ranges/limits are: CH: 1,100 – 2,800 m a.s.l.; FR: 2,760 m a.s.l., Bonneval-sur-Arc.

Red list status: VU – vulnerable (CH).

Andreaea heinemannii HAMPE & MÜLL.

HAL. (Andreaeaceae) Heinemanns-Klaffmoos, Heinemann-Rockmoss

Two separate collections of this species were made, one on exposed rock, 2,650 m a.s.l. and 2,900 m a.s.l., Tisental, TS/IT but not assigned to a particular square (Porley, 1999).

AT: recorded from 1,100 m a.s.l. up to 2,900 m a.s.l. in TN, Ötztal, between Rettenbachferner and Einzeiger. CH: 1,450 – **3,290 m**. Only recently found in DE, bayerische Rhön, ca. 800 m a.s.l.

Red list status: 4 – potentially endangered (AT).

Andreaea nivalis HOOK. (Andreaeaceae),

Schnee-Klaffmoos, SnowRock-moss (Fig. 5.7)
In only six squares: 65, 66, 68, 71, 169, 170, on rock, highest altitude in squares 65, Niederjochferner and 66, at the discovery site of the Iceman, both TN/AT and TS/IT, ca. **3,200 m a.s.l.**, apart from that recorded only in TN/AT, lowest elevation at ca. 2,627 m a.s.l.

AT: the altitudinal range is ca. 1,900 – 3,000 m a.s.l., the latter measurement recorded from Kaunertal, TN. In TE up to 2,550 m a.s.l., Hochgarbe above Sillian. The species reaches 2,660 – 2,848 m a.s.l. in IT, Cima d'Asta, Trentino. Other altitudinal ranges/limits: CH: from 640 – 2,810 m a.s.l.; FR: 2,900 m a.s.l., Bonneval-sur-Arc.

Red list status: NT – potentially endangered (CH).



Fig. 5.7: Snow Rock-moss (*Andreaea nivalis*, reddish brown tuft) on a wet rock.

Andreaea rothii WEB. & MOHR ssp. *rothii*
(Andreaeaceae), Felsen-Klaffmoos, Dusky Rock-moss

Ten squares: 38, 42, 54, 65, 70, 71, 73, 108, 160, 166. A sample from square 65, Niederjochferner, with an exceptional height for that species of **ca. 3,200 m a.s.l.** (TN/AT and TS/IT), matches the characters of *A. rothii* s.l.; lowest records from 1,700 – 1,780 m a.s.l. (TS/IT) and 1,470 – 1,500 m a.s.l. (TN/AT),

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always on rock which may be periodically wetted by running water.

AT: up to 2,600 m a.s.l., Riepenspitze, TN. In IT highest record from 2,340 m a.s.l., Martelltal, TS. Further altitudinal ranges/limits are: CH (*A. r. agg.*): 650 – 2,800 m a.s.l. and FR: 2,650 m a.s.l., Sainte-Foy-Tarentaise. Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH), 3 – endangered (DE).

Andreaea rupestris HEDW. (Andreaeaceae), Stein-Klaffmoos, Black Rock-moss

Very abundant on rock and usually fruiting. 103 squares: 15-18, 20-29, 31, 33-40, 42, 44-52, 54, 56-58, 61-66, 68, 70, 71, 73-76, 78-84, 86-105, 107-112, 114, 115, 125, 127, 128, 131, 132, 135, 137, 149, 157, 159, 160, 163, 166-170, 200. Highest altitudinal occurrence in the squares 65 and 66, ca. 3,200 m a.s.l. (TN/AT and TS/IT), lowest ranges are 1,050 – 1,060 m a.s.l. (TS/IT) and 1,450 – 1,650 m a.s.l. (TN/AT).

AT: at an altitudinal range of 270 – **3,400 m a.s.l.** IT: highest occurrence at 3,000 – 3,190 m a.s.l. Aosta Valley, with an additional locality of 2,996 m a.s.l., Schafkopf at Graun, TS. In CH up to 3,260 m, Bernina. Recorded from the nival zone \geq 3,000 m in FR, Savoie.

Red list status: **r: 3** – locally endangered (AT), R – very rare (var. *papillosa*) to 3 – endangered (var. *rupestris*) in DE.

Aneura pinguis (L.) DUMORT.

(Aneuraceae), Fettglänzendes Ohnnervmoos, Greasewort

41 squares: 24, 38, 48, 49, 52, 53, 55, 58, 67, 70, 72-77, 81, 82, 85-90, 99, 104, 107-

109, 112, 113, 121, 122, 130, 134, 135, 157, 160, 163, 174, 198. Lowest elevations 1,160 – 1,320 m a.s.l. (TS/IT) and 1,450 – 1,650 m a.s.l. (TN/AT), highest altitudes recorded 2,350 – 2,610 m a.s.l. (TS/IT) and ca. 2,630 m a.s.l. (TN/AT), usually in sunny and wet to trickling rock and peaty substrates, also on soil, in springs or on track banks.

AT: a maximum elevation of ca. 2,300 m a.s.l., Rotmoos near Obergurgl, Ötztal, TN, can be given. In IT up to **2,700 – 2,710 m a.s.l.**, Piedmont, Col del Nivolet, and for TS recorded up to a elevation of 2,500 m a.s.l., Piz Tresero at Ortler. In CH 200 – 2,630 m a.s.l., very abundant and in FR 1,800 m a.s.l., Bonneval-sur-Arc.

Red list status: r: 3 – locally endangered (AT), NT – near threatened (IT), V – decreasing (DE).

Anomobryum julaceum (SCHRAD. ex GAERTN., MEYER & SCHERB.) SCHIMP. (Bryaceae), Kätzchenartiges Scheinbirnmoos, Slender Silver-moss

In six squares: 55, 76, 108, 109, 143, 149. Occurrences from ca. 750 – 1,930 m a.s.l. (TS/IT) and 1,450 – 2,220 m a.s.l. (TN/AT), on damp rock and soil.

AT: an altitudinal range of 750 – 2,600 m a.s.l.; further altitudinal limits: TN 2,400 m a.s.l., near Hochjochhospiz, and TE 2,600 m a.s.l., Möserling. Highest altitude measured for IT: TS at an elevation of 2,600 m a.s.l., below Schneebergscharte above St. Martin in Passeier. Other altitudinal ranges/limits are: CH: 680 – 2,140 m a.s.l. and FR: 2,800 m a.s.l., Termignon. For the Alps, without pre-

cise location the highest altitude given is **2,900 m a.s.l.**

Red list status: NT – potentially endangered (CH).

Anomodon attenuatus (HEDW.) HÜB.

(Anomodontaceae), Dünnästiger Wolfsfuß, Slender Tail-moss

A. a. occurred only in TS/IT, in 17 squares: 6, 7, 11, 13, 14, 17-19, 24, 141, 176-180, 184, 195, on rock and bark of deciduous trees, from 555 – 1,470 m a.s.l.

AT: maximum elevations of 1,900 m a.s.l. in TN, Tuxerjoch, and 1,200 – 1,400 m a.s.l., Debanttal, TE. In IT recorded up to 2,500 m a.s.l., Hühnerspiel, TS. In CH 194 – **2,580 m a.s.l.** and in FR 1,600 m a.s.l., Termignon.

Red list status: V – decreasing (DE).

Anomodon viticulosus (HEDW.) HOOK. & TAYL. (Anomodontaceae), Echter Wolfsfuß, Rambling Tail-moss (Fig. 5.8, 5.9)

Like the species just mentioned before and often occurring together, *A. v.* occurred only in TS/IT, in 21 squares: 5- 7, 10, 13-16, 18, 19, 24, 136, 145, 146, 177, 178, 181, 184, 193-195, on rock and bark of leafy trees, once on ground, from 525 – 1,510 m a.s.l.

AT: the elevation limit is 2,010 m a.s.l., Ködnitz, TE, in TN recorded up to 1,650 m a.s.l., Tuxer Voralpen. In IT highest occurrence is 1,980 m a.s.l., Falocia, Trentino. Further altitudinal ranges/limits are: CH: 200 – **2,100 m a.s.l.**, very abundant, and FR: 1,000 m a.s.l., Planay.

Red list status: V – decreasing (DE).

Anthelia julacea (L.) DUMORT.

(Antheliaceae), Polster-Schimmelmoos, Apine Silverwort

Only two records from the TN/AT area, squares 70 and 71, near the trail down from Similaunhütte to Martin-Busch-Hütte, in a snow patch and streamside at an altitudinal range of ca. 2,500 – 2,630 m a.s.l.

AT: an altitudinal range of 1,100 – **3,400 m a.s.l.** with the upper limits at Hinterer Spiegelkogel, TN; and 2,300 m a.s.l., Möserlingwand, TE. In IT up to 3,170 m a.s.l., summit of Becher in Ridnauntal, TS. Other altitudinal ranges/limits are: CH: 1,400 – 2,900 m a.s.l., Gornergrat; FR: 2,400 m a.s.l., Bonneval-sur-Arc (uncertain identification?).

Red list status: EN – endangered (IT, CH), 0 – extinct (DE).



Fig. 5.8: Rambling Tail-moss (*Anomodon viticulosus*) is found only at low altitudes of the study area, up to 1,510 m a.s.l.

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Anthelia juratzkana (LIMPR.) TREVIS.

(Antheliaceae), Krusten-Schimmelmoos, Scarce Silverwort
38 squares: 22, 23, 45, 47, 53, 54, 58, 60-65, 68, 70-74, 81, 82, 122-128, 157, 161, 164-167, 169, 170, 199, 200, almost only in snow beds, once (199) in a peat bog, always at higher elevation, starting from ca. 1,767 m a.s.l. (TS/IT) and 1,900 m a.s.l. (TN/AT), in square 65 (TN/AT and TS/IT) reaching ca. 3,200 m a.s.l.

AT: an altitudinal range of ca. 1,400 – **3,450 m a.s.l.**; in TN up to 3,450 m a.s.l., Ötztaler Alps, and in TE up to 3,000/3,200 m a.s.l., near Defereggerhütte; in IT up to 3,145 m a.s.l., Marzellkamm, TS; in CH 1,440 – 3,212 m a.s.l.; in FR 2,600 m a.s.l., Peisey-Nacroix.

Red list status: NT – near threatened (IT), R – very rare (DE).

Antitrichia curtispindula (HEDW.) BRID.

(Leucodontaceae), Hängemoos, Pendulous Wingmoss (Fig. 5.10, 5.11)

In all the main valleys, 43 squares: 1, 5, 6, 9-20, 24-26, 32-36, 39, 40, 42-44, 98, 105, 106, 108, 109, 111, 112, 114, 139, 140, 149, 177, 178, 184, 190, on rock. Altitudinal range: 550 – 1,950 m a.s.l. (TS/IT) and 1,450 – 1,650 m a.s.l. (TN/AT), usually on rock and sometimes on tree trunks.

AT: maximum elevations of **2,340 m a.s.l.**, Geisssteingipfel, TN, and 2,100 m a.s.l. for TE. In IT maximum altitudinal ranges of 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Gran Paradiso National Park, Aosta. Further altitudinal ranges/limits: CH:

270 – 1,880 m a.s.l.; FR: 1,558 m a.s.l., Sainte-Foy-Tarentaise.

Red list status: 3, r: 2 – endangered, locally severely endangered (AT), 2 – severely endangered (DE).

Aongstroemia longipes (SOMMERF.)

BRUCH & SCHIMP. (Dicranaceae), Alluvionenmoos, Spring-moss
Once in TN/AT below Martin-Busch-Hütte, square 74, ca. 2,250 m a.s.l. on sandy ground. AT: elevation limits of 2,500 m a.s.l. and for TN 2,170 – 2,250 m a.s.l., moraine of Alpeiner Glacier, Stubai and for TE 2,300 m a.s.l., Möserlingwand, were recorded. In IT reaching an altitude of 2,600 m a.s.l. in Rhemes-Notre Dame, Aosta. Other altitudinal ranges/limits are: CH: 442 – **2,800 m a.s.l.** and FR: 2,750 m a.s.l., Bonneval-sur-Arc.

Red list status: 3, r: 0 – endangered, locally extinct (AT), VU – vulnerable (CH), R – very rare (DE).



Fig. 5.10: Pendulous Wing-moss (*Antitrichia curtispindula*) growing on a boulder

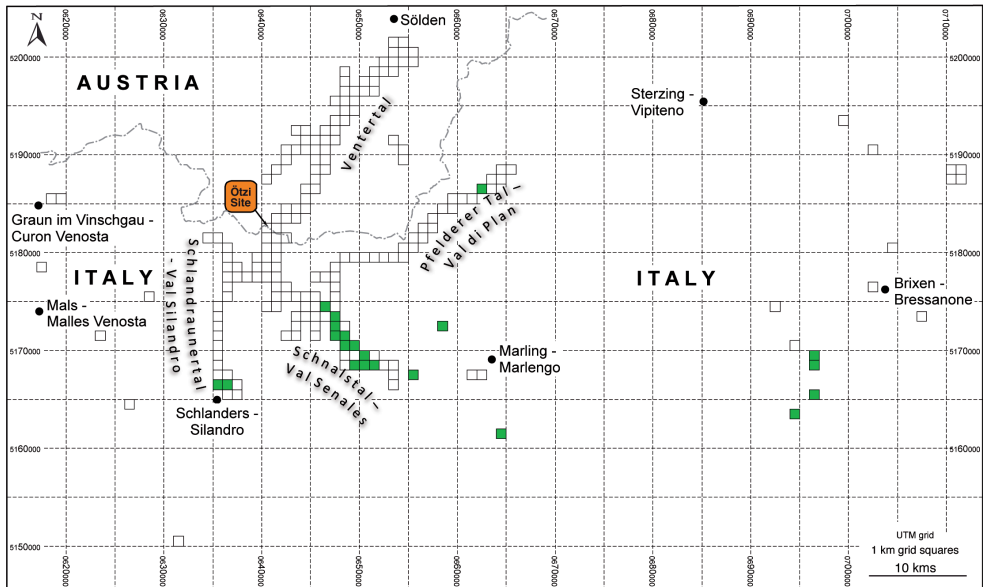


Fig. 5.9: Recorded distribution of *Anomodon viticulosus*

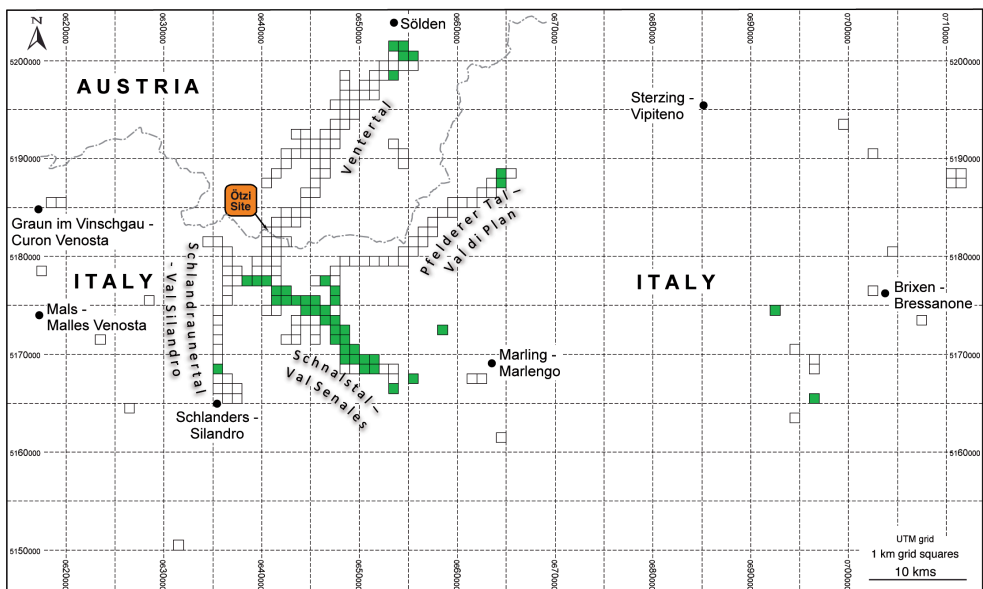


Fig. 5.11: Recorded distribution of *Antitrichia curtispindula*

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Apomarsupella revoluta (NEES) R. M. SCHUST.; Syn.: *Gymnomitrium revolutum* (NEES) H. PHILIB. (Gymnomitriaceae), Rollrandmoos, Recurved Rustwort

One find in square 58 (TS/IT), 2,434 m a.s.l. on rock and two records from the TN/AT area, squares 70 and 71, near the trail down from Similaunhütte to Martin-Busch-Hütte, on rock in an altitudinal range of ca. 2,500 – 2,630 m a.s.l.

AT: an altitudinal range of (1,500) 1,900 – 3,020 m a.s.l. In TN up to 3,007 m a.s.l., Praxmar, and in TE up to 2,300 – 2,500 m a.s.l., Zunig and Rottenkogel. For IT an upper altitudinal range of 2,500 – 3,000 m a.s.l. in Campisolo di Val di Rabbi, Trentino and in TS an elevation of 3,000 m a.s.l., Ortler, Tschengelser Hochwand. In CH 1,970 – **3,100 m a.s.l.**, Piz Flinana and in FR 2,950 m a.s.l., Bonneval-sur-Arc.

Red list status: EN – endangered (IT), CR – threatened from extinction (CH).

Apometzgeria pubescens (SCHRANK.)

KUWAH.; Syn.: *Metzgeria pubescens* (SCHRANK) RADDI (Metzgeriaceae), Behaartes Igel-Filzhaubenmoos, Downy Veilwort

Few records, for the TS/IT part only: in 13 squares: 12-17, 24, 25, 42, 43, 111, 112, and 149. On rock from 856 m a.s.l. to ca. 1,780 m a.s.l. AT: a maximum elevation of **2,860 m a.s.l.**, Hochgolling, Salzburg. In TN up to 1,740 m a.s.l., Gschnitztal, and in TE, Kasermendl, up to 2,500 m a.s.l. In IT in a range of 250 – 2,500 m a.s.l. with the upper extreme at Passo del Grosté, Trentino. Other altitudinal ranges/

limits are: CH: 200 – 2,640 m a.s.l.; FR: 1,800 m a.s.l., École in Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Athalamia hyalina (SOMMERF.) HATT.;

Syn.: *Clevea hyalina* (SOMMERF.) LINDB., Grossschuppenmoos, Hyaline Liverwort

One record for TS/IT, Pfelderertal below Labkofel, square 126, 2,400 – 2,571 m a.s.l., on damp ground.

AT: the altitudinal range is ca. 200 – **3,210 m a.s.l.** with the upper extreme in the Ötztaler Alps, TN, and in TE up to 2,100 m a.s.l., below Umbalkees. In IT recorded from 2,601 – 2,645 m a.s.l., at Laghi Ponton, Aosta, and 2,500 m a.s.l., Kühberg near Sulden, TS. In CH 475 – 3,020 m a.s.l. In FR recorded from the nival zone at 3,000 m a.s.l., Bessans.

Red list status: 4, r: 1 – potentially endangered, locally threatened from extinction (AT), CR – critically endangered (IT), VU – vulnerable (CH), V – decreasing (DE).

Atrichum angustatum (BRID.) BRUCH

& SCHIMP. (Polytrichaceae), Steifblättriges Katharinenmoos, Lesser Smoothcap

Once on a dry place near the Vintler waterfall, square 189, on ground, between 790 m a.s.l. and 820 m a.s.l., TS/IT.

AT: a maximum elevation of **1,700 m a.s.l.**, Luschariberg in Carinthia is documented. The highest altitude for TN is 1,600 m a.s.l., Venn at Brenner. Further elevation records are: CH: 194 – 1,120 m a.s.l.; in FR recorded from 340 m a.s.l., Aix-les-Bains, Savoy.

Red list status: 3 – endangered (DE).

Atrichum undulatum (HEDW.) P. BEAUV.

(Polytrichaceae), Welliges Katharinenmoos, Common Smoothcap

In 69 squares, abundant on ground, open soil in woodland and on roadbanks: 1, 4-7, 12-20, 24, 32, 33, 35, 54-56, 70, 85, 89, 90, 97, 101, 102, 104, 105, 108, 110, 111, 113, 114, 118, 129, 134-137, 139-141, 145, 148, 149, 151, 152, 157-159, 172, 177-180, 183, 184, 186-190, 192, 194-197; elevation records: 550 – 2,120 m a.s.l. (TS/IT) and 1,470 m a.s.l. to **2,500 – 2,540 m a.s.l.** (TN/AT).

AT: an elevation limit of 2,180 m a.s.l. with a maximum elevation of 2,030 m a.s.l., near Alpeinerhütte, TN, and 2,180 m a.s.l., Tauern, TE can be stated. For IT highest altitudes are of 2,000 m a.s.l., towards Alpe Arzola, Gran Paradiso National Park, Piedmont, and 1,950 m a.s.l., Buchenstein, TS; CH: 194 – 2,227 m a.s.l.; FR: 1,400 m a.s.l., Termignon, Savoy.

Aulacomnium androgynum (HEDW.)

SCHWAEGR. (Aulacomniaceae), Zwittriges Streifensternmoos, Drumsticks

Once above Castle Juval (TS/IT), square 12, ca. 1,600 m a.s.l., on rock. New to TS!

Previous records for Tyrol (AT) are doubtful. Until present not recorded for Trentino-Alto Adige (IT). In CH 440 – **2,315 m a.s.l.**, very scattered and in FR recorded up to an elevation of 1,400 m a.s.l., Termignon, Savoy.

Red list status: 3 – endangered (AT), VU – vulnerable (CH).

Aulacomnium palustre (HEDW.)

SCHWAEGR. (Aulacomniaceae), Sumpf-Streifensternmoos, Bog Bead-moss

Abundant, in 72 squares: 12, 22, 23, 30, 31, 38, 43, 44, 46-53, 55, 57-60, 70-87, 89-91, 101, 104, 105, 107, 121, 122, 127, 136, 140, 151-154, 157-163, 166-168, 170, 171, 175, 182, 197-199, always on moist or boggy places, elevations ca. 1,260 – 2,700 m a.s.l. (TS/IT), ca. 1,470 – 2,800 m a.s.l. (TN/AT). AT: a maximum elevation of 2,843 m a.s.l., in TN, Pirchkogel. In TE up to ca. 2,400 m a.s.l., above Johannishütte. For IT highest altitudes of 2,650 – 2,700 m a.s.l., Colle del Nivolet, Gran Paradiso National Park, Piedmont, and **3,500 m a.s.l.**, Monte Rosa, Aosta. Further altitudinal ranges/limits are: CH: 330 – 2,900 m a.s.l. and FR: 2,500 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Barbilophozia barbata (SCHMIDEL ex SCHREB.) LOESKE (Lophoziaaceae), Echtes Bart-Spitzmoos, Bearded Pawwort

In 24 squares: 6, 13, 14, 16, 20, 24, 25, 32, 34, 40, 86, 88, 94, 95, 97, 108, 111-113, 149, 150, 178, 188, 189, on rock and on ground, between 700 m a.s.l. and 1,950 m a.s.l. (TS/IT) and 1,470 m a.s.l. to 1,880 m a.s.l. (TN/AT). AT: an altitudinal limit of 2,590 m a.s.l., Knallstein, Sölk, Styria can be mentioned. In TN up to 2,450 m a.s.l., Vennatal. IT: up to **3,040 m a.s.l.**, Cogne, Aosta and in TS reaching 2,600 m a.s.l., Wormser Joch. Other measurements are: CH: 270 – 2,700 m a.s.l., and FR: 1,860 m a.s.l., Landry, Savoy.

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Red list status: NT – near threatened (IT), V – decreasing (DE).

Barbilophozia floerkei (WEB. & MOHR) LOESKE; Syn.: *Neoorthocaulis floerkei* (WEB. & MOHR) L. SÖDERSTR. (Lophoziaceae), Flörkes Bart-Spitzmoos, Common Pawwort
Only three times on ground, square 23, Klosteralm, ca. 2,550 m a.s.l., square 138, Pfelderertal near Pill, 1,380 – 1,430 m a.s.l. (both TS/IT), and square 105, at Zwieselstein, ca. 1,470 – 1,500 m a.s.l. (TN/AT).
AT: the altitudinal range is ca. 850 – 2,800 (3,000?) m a.s.l. In TN reaching 2,800 m a.s.l., Schartlkopf at Nauders, and in TE up to ca. 2,700 m a.s.l., Ködnitztal. In IT to 2,900 – 2,930 m a.s.l., Col de l’Arietta, Aosta; for TS elevations of 1,300 m a.s.l., Martelltal, and 1,350 m a.s.l., Marchtal, Vinschgau. CH: 862 – 2,900 m a.s.l.; FR: 2,000 m a.s.l., Lomban-des-Villards, Savoy. For Central Europe, the highest mentioned altitude is **3,000 m a.s.l.** (no further location given).
Red list status: NT – near threatened (IT), 3 – endangered (DE), AR – at risk (FR).

Barbilophozia hatcheri (EVANS) LOESKE (Lophoziaceae), Hatcher’s Bart-Spitzmoos, Hatcher’s Pawwort
Abundant, 61 squares 1, 18, 19, 22-26, 32, 34, 35, 40, 43-45, 47, 49, 50, 52, 54, 58, 60, 63, 70-73, 75-77, 81, 82, 84, 86, 89-92, 100, 102, 104, 106, 107, 109, 114, 115, 119, 125-127, 132, 133, 136, 168-170, 186, 187, 190, 191, 196, on ground, usually permanently damp, lime-free substrates on siliceous rock, especially at higher elevations, in square 63,

discovery place, reaching ca. 3,019 m a.s.l. (TN/AT and TS/IT), lowest records ca. 700 m a.s.l. (TS/IT) and 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of ca. 3,300 m a.s.l. In TN up to 2,500 m a.s.l., Großer Sulzkopf, and in TE up to ca. 2,700 m a.s.l., Ködnitztal. For IT a highest altitude of 2,580 – 2,680 m a.s.l., Lauson valley, Aosta. In TS up to 2,600 m a.s.l., St. Martin in Passeier. CH: 770 – **3,212 m a.s.l.**; FR: 2,530 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Barbilophozia lycopodioides (WALLR.)

LOESKE (Lophoziaceae), Großes Bart-Spitzmoos, Pawwort
Abundant in woodland and alpine vegetation, 66 squares: 17, 22, 26, 27, 29, 31, 36-39, 52, 53, 58, 62, 70-73, 76, 78, 79, 81-84, 86, 89-96, 99, 100, 102, 103, 107, 108, 114, 119-121, 128-132, 136, 137, 141, 158, 161, 171, 172, 174, 185-189, 194, 196, 198, 200. Highest altitude in square 62, 3,242 m a.s.l. on gravel (TN/AT and TS/IT), and lowest records are ca. 570 m a.s.l. (TS/IT) and 1,470 m a.s.l. (TN/AT).

AT: maximum elevations in TN, 3,150 m a.s.l., near Hochfirst, and TE, 2,600 m a.s.l., Katalberg. In IT up to ca. 3,300 m a.s.l., Corno Bianco, Vercelli; in Trentino in a range of 800 – 3,000 m a.s.l. CH: 500 – **3,350 m a.s.l.**, the latter measurement from Weisshorn. FR: 2,200 m a.s.l., Bessans, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Barbula bicolor (BRUCH & SCHIMP)
LINDB.; Syn.: *Gymnobarbula bicolor*
(BRUCH & SCHIMP) JAN KUČERA (Pot-
tiaceae), Zweifarbiges Bärtchenmoos,
no English name.

The species is regarded as an endemic of the Alps and has not been found elsewhere so far (Frahm 2013).

Only once, square 113, Pfosental (TS/IT), 1,590 – 1,700 m a.s.l., on ground on a roadbank.

AT: an altitudinal range of 1,500 – 2,900 m a.s.l. with maximum elevations of 2,620 m a.s.l., Riepenspitze, TN, and **2,900 m a.s.l.**, Glatzberg at Kals, TE. In IT in a range of 1,500 – 2,500 m a.s.l. in Trentino. CH: 1,900 – 2,640 m a.s.l., very rare. FR: 2,600 m a.s.l., Tignes, Savoy. An old record (Limpricht 1890) for the Bavarian Alps: from Kallersberg through the Fagstein until Schreiberstein to 3,130 m a.s.l., must be wrong, because not a single summit there reaches 3000 m a.s.l.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH).

Barbula convoluta HEDW.;

Syn.: *Streblotrichum convolutum* (HEDW.) P. BEAUV. (Pottiaceae), Rollblättriges Bärtchenmoos, Lesser Bird's-claw Beard-moss

Recorded for eight squares: 9, 88, 104, 134, 142, 172, 174, and 192, on stonewalls, ground, and roadbanks and on soil in orchards, ca. 850 – 1,610 m a.s.l. (TS/IT) and ca. 1,830 – 1,980 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,130 m a.s.l. with further altitudinal limits of 1,950 m a.s.l., Obergurgl, TN and 2,014 m a.s.l., Ködnitz,

TE. In IT/TS to an altitude of **2,600 m a.s.l.**, Wormser Joch. CH: 240 – 2,420 m a.s.l.; FR: 2,500 m a.s.l., Pralognan-la-Vanoise, Savoy.

Barbula sinuosa (MITT.) GAROV.;

Syn.: *Didymodon sinuosus* (MITT.)

DELOGN., Buchtiges Doppelzahnmoos, Wavy Beard-moss

One record, square 172, Matschertal (TS/IT), **1,370 – 1,434 m a.s.l.**, roadbank. First record for TS!

AT and IT: no elevations available, very rare. Until present not known for Trentino-Alto Adige. CH: 268 – 880 m a.s.l.

Red list status: 2 – severely endangered (AT), VU – vulnerable (CH), V – decreasing (DE).

Barbula unguiculata HEDW. (Pottiaceae),

Gekrümmtblättriges Bärtchenmoos, Bird's-claw Beard-moss.

Only in the TS/IT, in five squares: 8, 52, 172, 174, 185, on ground/base rich soil from ca. 650 m a.s.l. to ca. 2,153 m a.s.l.

AT: maximum elevations 2,750 m a.s.l., Ködnitztal, TE, and 2,281 m, Hafelekar, TN. IT: 2,600 m a.s.l., Rhemes-Notre Dame Aosta; 900 – 1,200 m a.s.l., Pustertal, TS. CH: 195 – **2,895 m a.s.l.**; FR: 453 m a.s.l., Brison-Saint-Innocent, Savoy.

Bartramia halleriana HEDW.

(Bartramiaceae), Hallers Apfelmoos, Haller's Apple-moss

Abundant, 74 squares: 1, 12-16, 18, 20, 21, 23-26, 28, 35, 36, 39-46, 50, 51, 54, 81-84, 86, 90, 91, 94, 95, 97, 98, 100, 102, 103, 105-107, 109, 111, 116, 117, 121, 127, 128,

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135-137, 139, 141, 148-151, 154, 160, 171, 174, 178, 180, 184-189, 191, 196. Usually on rock but may also occur on walls, recorded from ca. 700 m a.s.l. to 2,550 m a.s.l. (TS/IT) and 1,450 m a.s.l. to 2,250 m a.s.l. (TN/AT). AT: maximum elevations 2,700 m a.s.l. in Ötztal, TN, and 2,530 m a.s.l., Tauern, TE. IT: 2,413 – 2,670 m a.s.l., Lago di Motta, Gran Paradiso National Park, Piedmont, and 2,200 m a.s.l., Rittnerhorn, TS. CH: 327 m a.s.l. to **2,762 – 2,850 m a.s.l.**; FR: 1,703 m a.s.l., Beaufort-sur-Doron, Savoy. Red list status: r: 3 – locally endangered (AT), 3 – endangered (DE).

Bartramia ithiphylla BRID. (Bartramiaceae), Straffblättriges Apfelmoos, Stiff Apple-moss
Very abundant from low to high elevations, usually in rock crevices, 138 squares: 6, 12, 15, 17, 18, 20, 22-26, 29-32, 35-38, 40-47, 49-65, 67-97, 99-109, 111, 113-116, 118-135, 141, 149-154, 157-171, 174, 180, 185, 190, 196, 198, 200. Highest altitude recorded in square 65, Niederjochferner, ca. 3,200 m a.s.l. (TN/AT and TS/IT) on soil/snow patch, lowest altitudes are at ca. 790 m a.s.l. (TS/IT) and 1,450 m a.s.l. (TN/AT). AT: a range of 250 – 3,400 m a.s.l., the higher limit from Hinterer Spiegelkogel, TN; in TE up to 2,920 m a.s.l., Hohe Tauern. In IT up to **3,500 m a.s.l.**, Monte Rosa, Aosta with a further elevation limit of 2,750 m a.s.l., Stilsfer Joch for TS. CH: 470 – 3,260 m a.s.l., the latter from Piz Languard. FR: 2,700 m a.s.l., Val-D'Isere, Savoy. Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Bartramia pomiformis HEDW.

(Bartramiaceae), Echtes Apfelmoos, Common Apple-moss

Only in the TS/IT part, on ground/soil and on rock, nine squares: 7, 13, 14, 41, 132, 178, 180, 189, 195, between ca. 690 m a.s.l. and 1,700 m a.s.l.

The highest altitude AT/TN is 2,000 m a.s.l., Alfachalpe, Gschnitztal. For IT/TS the altitudinal limit is 2,000 m a.s.l., Hochfeiler. CH: 100 – **2,400 m a.s.l.**; FR: 1,690 m a.s.l., Peisey-Nancroix, Savoy. Extreme altitudes of 3,165 m a.s.l., Becca di Nonna, Aosta, IT, and 3,500 m a.s.l., CH (Vaccari 1913; 1914) seem odd and should be checked.

Red list status: V – decreasing (DE).

Bartramia subulata BRUCH & SCHIMP.

(Bartramiaceae), Pfriemen-Apfelmoos, no English name.

A single record for Klosteralm, TS/IT, Square 23, 2,240 – 2,550 m a.s.l., rock.

AT: an altitudinal range of 2,000 – **3,400 m a.s.l.** In TN up to 2,600 – 2,700 m a.s.l., Hohe Mut, Ötztal, and in TE (Ködnitztal) up to ca. 2,780 m a.s.l. For IT a maximum elevation of 2,600 m a.s.l., Nockspitze, Langtaufers, TS. CH: 2,300 – 2,680 m a.s.l., only few recent finds.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH).

Bazzania tricrenata (WAHLENB.) LINDB.

(Lepidoziaceae), Niederliegendes Peitschenmoos, Lesser Whipwort

A single find, square 70, above Martin-Busch-Hütte (TN/AT), 2,520 m a.s.l., on rock.

AT: an altitudinal range of ca. 600 – 2,700 m a.s.l. with altitudinal limits for TN up to 2,200 – 2,639 m a.s.l., Rosskogel and for TE of 2,500 m a.s.l., Neualpl. For IT in a range of 1,000 – 1,400 m a.s.l. in Trentino. CH: 260 – **3,600 m a.s.l.**, upper limit in Surley. FR: 2,491 m, Tignes, Savoy.

Red list status: r: 3 – locally endangered (AT), NT – near threatened (IT), V – decreasing (DE).

Blasia pusilla L. (Blasiaceae), Gewöhnliches Flaschenmoos, Common Kettlewort

In 18 squares: 18-20, 24-26, 35, 73, 77, 82, 88, 99, 102, 108, 179, 181, 186, 187. Usually on damp open ground/soil and on river banks, ca. 660 m a.s.l. to ca. 1,720 m a.s.l. in TS/IT and in TN/AT between ca. 1,470 m a.s.l. and a range of **2,320 – 2,490 m a.s.l.**, square 73, near Martin-Busch-Hütte.

AT: a maximum elevation 2,350 m a.s.l., Hintereisferner, Ötztaler Alps, TN. For TE a highest altitude of 1,250 m a.s.l., Kals. IT: 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Aosta and up to 800 m a.s.l. in Fra. Preghena e Lanza, Trentino. CH: 194 – 2,400 m a.s.l.; FR: 1,260 m a.s.l., Beaufort-sur-Doron, Savoy. Red list status: NT – near threatened (IT), VU – vulnerable (CH), V – decreasing (DE).

Blepharostoma trichophyllum (L.)

DUMORT. (Pseudolepicoleaceae), Gewöhnliches Wimpernmoos, Hairy Threadwort
34 squares: 1, 25, 26, 43, 51, 70, 73, 81, 83, 84, 86, 93, 94, 99, 103, 107, 108, 110, 121, 126, 127, 131, 132, 136, 157, 185-189, 191,

196, 198, 200, on rotten wood and lime-free ground/soil, measured altitudinal ranges: ca. 700 m a.s.l. to 2,571 m (TS/IT) and 1,470 m a.s.l. to ca. 2,600 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. (800) 1,200 – 2,800 m a.s.l., with the latter measurement for ssp. *brevirete* (BRYHN & KAAL.) R. M. SCHUST., and with further highest records in TN of 2,600 m a.s.l., rock crevices at Hippold and Gaisbergtal near Obergurgl. In TE (Ködnitztal) to ca. 2,700 m a.s.l.; IT: up to **3,500 m a.s.l.**, Monte Rosa, Aosta; in a range of 1,000 – **3,500 m a.s.l.** in Trentino; and 2,600 m a.s.l., near St. Martin in Passeier, TS. CH: 200 m a.s.l. to 3,080 m a.s.l.; FR: 2,900 m a.s.l., Bessans, Savoy. Elevation statements above 3,000 m a.s.l. should be checked. Red list status: NT – near threatened (IT), V – decreasing (DE).

Blindia acuta (HEDW.) BRUCH & SCHIMP. (Seligeriaceae), Spitzblättriges Blind-Moos, Sharp-leaved Blindia

51 squares: 22, 23, 26, 52, 53, 56-58, 64, 70, 71, 73-82, 84-86, 89, 90, 104, 112, 113, 116, 121-123, 127, 128, 130, 133, 134, 136-138, 140, 141, 157-163, 198, usually on wet rock, altitudinal ranges ca. 980 m a.s.l. to ca. 2,630 m a.s.l. (TS/IT) and ca. 1,770 m a.s.l. to 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,600 m a.s.l. with further altitudinal limits of 2,500 m a.s.l., Tarntal, TN and 2,530 – 2,600 m a.s.l., Gornitschamp, TE. IT: 2,580 – 2,680 m a.s.l., Lauson valley, Gran Paradiso National Park, Aosta, and 2,500 – 2,600 m a.s.l., Paziner-Alpe, Langtaufers, TS. CH: 200 – 2,977 m

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a.s.l.; FR: 2,500 m a.s.l., Bonneval-sur-Arc, Savoy. An extreme altitudinal record for IT of **3,500 m a.s.l.**, Monte Rosa, Aosta, should be checked.

Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Brachytheciastrum velutinum (HEDW.)

IGNATOV & HUTTUNEN;

Syn.: *Brachythecium velutinum* (HEDW.)

SCHIMP. (Brachytheciaceae),

Samt-Kurzbüchsenmoos, Samt-Kegelmoos,

Velvet Feather-moss

Abundant, 66 squares: 1, 3, 4, 6, 7, 9-12, 14-20, 23-26, 32, 33, 35, 49, 52, 54, 55, 57, 58, 60, 61, 70, 72, 84-86, 88, 89, 91, 101, 103, 107-109, 112, 116, 127, 128, 136, 140, 141, 143, 147, 148, 150, 157, 172, 174, 181, 184, 185, 188, 189, 193, 194, 196, typically on ground/soil between other bryophytes. Measured altitudinal ranges ca. 525 m a.s.l. to 2,680 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to ca. 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,740 m a.s.l., Rotheck, Styria with a highest altitude for TN at ca. 2,600 m a.s.l., Vennatal, Brenner. In IT up to **3,800 m a.s.l.**, Grivola, Aosta. CH: 194 – 3,212 m a.s.l.; FR: 2,180 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Brachythecium cirrosium (SCHWAEGR.)

SCHIMP.; Syn.: *Cirriphyllum cirrosium*

(SCHWAEGR.) GROUT (Brachytheciaceae),

Haar-Kurzbüchsenmoos, Feather-moss

Once in square 132, Pfelderertal near Pfeldersvillage (TS/IT) on alluvial deposits, in an altitudinal range of 1,630 – 1,700 m a.s.l.

AT: a maximum elevation of 3,000 m a.s.l. with a further limit of 2,950 m a.s.l., Kraxentrager, Vennatal, TN. IT: up to **3,550 m a.s.l.**, Grivola, Aosta, and 2,750 – 2,800 m a.s.l., between Hühnerspiel and Rollspitze, TS. CH: 470 – 3,300 m a.s.l., scattered to abundant. Recorded from the nival zone, 3,429 m a.s.l. in FR, Savoy, Bonneval-sur-Arc.

Brachythecium glareosum (BRUCH ex

SPRUCE) SCHIMP. (Brachytheciaceae),

Haarspitzen-Kurzbüchsenmoos, Kies-Kegel-

moos, Streaky Feather-moss

Recently the concept of the species has changed, so that the former *B. glareosum* var. *alpinum* (DE NOT.) LIMPR. (Hill et al. 2006) now is seen again as a distinct species: *B. tauriscorum* Moldendo (Hedenäs 2017). We did not accept this revision.

27 squares: 3, 10, 18-20, 24, 41, 73, 79, 82, 84, 87, 93, 95, 101, 103-105, 119, 127, 139-141, 143, 146, 172, 183, on ground/soil and on rock, altitudinal ranges are ca. 560 m a.s.l. to ca. 2,400 m a.s.l. (TS/IT) and ca. 1,470 m a.s.l. to ca. 2,490 m a.s.l. (TN/AT).

AT: maximum elevations of 2,800 m a.s.l. (var. *glareosum*), Gornitscham, TE and of up to 2,800 – **3,000 m a.s.l.** in TE (Ködnitztal). IT: 2,880 m a.s.l., Mathaunkopf at Graun, TS and for *B. tauriscorum* 2,900 m a.s.l., Mittereck at St. Valentin, TS. CH: 260 – 2,970 m a.s.l. Recorded from the nival zone, **3,000 m a.s.l.**, FR, Val-D'Isere, Savoy.

Red list status: V – decreasing (DE).

Brachythecium rivulare SCHIMP. (Brachytheciaceae), Bach-Kurzbüchsenmoos, Bach-Kegelmoos, River Feather-moss
In 41 squares: 7, 10, 14, 16, 18, 20, 24, 34-36, 41, 43, 44, 48, 55-58, 82, 85, 88-90, 96, 101, 105, 107, 111, 114, 118, 134-136, 138, 141, 157, 158, 172, 179, 181, 190, on ground, often on moist sites and riverbanks, often submerged. Altitudinal ranges ca. 660 m a.s.l. to ca. 2,300 m a.s.l. (TS/IT) and ca. 1,470 m a.s.l. to ca. 2,100 m a.s.l. (TN/AT).
AT: a maximum elevation of 2,600 m a.s.l. is given, with up to 2,280 m a.s.l., Riffelsee and Fuldaer Höhenweg, TN, and **2,600 m a.s.l.**, Gradental, TE. IT: 2,200 – 2,450 m a.s.l., Meye-d'en Haut, Gran Paradiso National Park, Aosta, and 2,200 m a.s.l., Ampezzaner Alps, Trentino. CH: 200 – 2,478 m a.s.l., very abundant. FR: 2,100 m a.s.l., Cevins, Savoy.

Brachythecium rutabulum (HEDW.) SCHIMP. (Brachytheciaceae), Raues-Kurzbüchsenmoos, Krücken-Kegelmoos, Rough-stalked Feather-moss
34 squares: 8, 10, 14, 15, 17, 19, 20, 24, 25, 58, 60, 64, 99, 105, 107, 109, 112, 121, 132, 135, 140, 141, 149, 158, 179, 181, 184, 186, 187, 190, 192, 194-196, on damp, shady ground/soil. Recorded from ca. 570 m a.s.l. to 2,550 – 2,580 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to ca. 2,100 m a.s.l. (TN/AT).
AT: maximum elevation of 2,200 m a.s.l. Pinnisjoch, TN. In IT up to **3,100 m a.s.l.**, Monte Rosa, Aosta, and 2,500 m a.s.l., Brenner, TS. CH: 200 – 2,502 m a.s.l. FR: 1,320 m a.s.l., Saint-Francois-de-Sales, Savoy.

Brachythecium salebrosum (HOFFM. ex WEB. & MOHR) SCHIMP. (Brachytheciaceae), Glattstieliges-Kurzbüchsenmoos, Geröll-Kegelmoos, Smooth-stalk Feather-moss
65 squares: 4-8, 10, 13, 14, 16, 17, 24, 26, 32, 47, 49, 52-56, 58, 59, 73, 78, 82, 83, 85, 88, 89, 104, 106-109, 113, 114, 116, 118-120, 122, 123, 126, 127, 129, 130, 132, 135, 138, 140-144, 147, 163, 173, 179, 181, 185-187, 190, 193, 196, usually on ground and rotten wood. Altitudinal ranges are 525 m a.s.l. to ca. 2,630 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to ca. 2,560 m a.s.l. (TN/AT).
AT: a maximum elevation of 2,500 m a.s.l., Gaisbergtal near Obergurgl, TN. IT: up to 2,928 m a.s.l., Piccolo S. Bernardo, Aosta, and 2,240 – 2,400 m a.s.l., Ornellatal, TS. CH: 200 – **3,212 m a.s.l.**; FR: 2,200 m a.s.l., Bessans, Savoy.

Breidleria pratensis (KOCH) LOESKE; Syn.: *Hypnum pratense* KOCH; *Stereodon pratensis* (W.D.J. KOCH ex SPRUCE) WARNST. (Hypnaceae), Wiesen-Schlafmoos, Plait-moss
Once, square 175 (TS/IT), a bog at Haidersee, 1,450 m a.s.l.
AT: a maximum elevation of 1,600 m a.s.l. with a range of 1,050 – 1,600 m a.s.l., Oberberg, TN. IT: in a range of 500 – 2,000 m a.s.l. in Rabbi, Trentino, and in TS highest record 1,475 m a.s.l., near Reschensee. CH: 407 – **2,283 m a.s.l.** FR: 2,100 m a.s.l., Peisey-Nancroix, Savoy. In DE highest altitude 1,810 m a.s.l., Bavaria.

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Red list status: 2 – severely endangered (AT), 2 – severely endangered (DE), AR – at risk (FR).

Bryoerythrophyllum alpigenum (VENT.)

CHEN (Pottiaceae), Rotblattmoos,

Red Beard-moss

Only once in Penaudtal (TS/IT), square 26, on roadbank, 1,690 m a.s.l.

Highest altitude AT: 2,300 m a.s.l., near St. Anton, TN. IT: in a range of 1,000 – **2,500 m a.s.l.** in Trentino, and at 2,000 m a.s.l., Langtauferer Tal, TS. CH: 375 m a.s.l. to 2,300 – 2,470 m a.s.l. (the latter: Murailgbach in Engadin), very scattered.

Red list status: VU – vulnerable (CH).

Bryoerythrophyllum recurvirostrum

(HEDW.) CHEN (Pottiaceae), Gemeines

Rotblattmoos, Red Beard-moss

36 squares: 3, 4, 7, 8, 15, 17, 18, 25, 32, 33, 42, 83, 84, 86, 94-97, 102, 105, 108, 109, 124, 126, 129, 132, 135, 136, 139, 142, 143, 159, 171, 181, 184, 195, often on open ground but also on rock, occasionally on walls or river banks. Measured elevations are ca. 560 m a.s.l. to ca. 2,790 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to 2,250 m a.s.l. (TN/AT).

AT: maximum elevations 2,880 m a.s.l., Rietzer Grieskogel, TN, and 3,000 – 3,200 m a.s.l., Hinterbichl at Defreggerhaus, TE. IT: up to **3,920 m a.s.l.**, Grivola, Aosta, and 2,700 m a.s.l., Wolfendorn, Brenner, TS. CH: 100 – 3,266 m a.s.l. (the latter: Rhätische Alpen at Piz Gallegione). FR: in the nival zone, 3,429 m a.s.l., Savoy, Bonneval-sur-Arc.

Bryum alpinum HUDS.; Syn.: *Imbribryum alpinum* (HUDS. ex WITH.) N.

PEDERSEN (Bryaceae),

Alpen-Birnmoos, Alpine Thread-moss

30 squares: 11, 14, 53, 58, 62, 63, 70, 73, 79, 84, 85, 87, 89, 94, 97, 99-101, 104, 112, 134-136, 138, 140, 158, 159, 163, 178, 183, usually on wet rock. In square 62, near trail to Similaun Spitz it reaches **3,242 m a.s.l.** (AT/IT), lowest records from ca. 650 m a.s.l. (IT) and ca. 1,470 m a.s.l. (AT).

AT: maximum elevations 2,500 m a.s.l., Kaiserjochhaus, Pitztal, TN and 2,600 m a.s.l. without details, and 2,700 m a.s.l., Glatzberg at Kals, TE. IT: 2,200 – 2,450 m a.s.l., Meye-d'en Haut, Aosta, and 2,210 m a.s.l., Wolfendorn, TS. CH: 200 – 3,000 m a.s.l. FR: 2,700 m a.s.l., Val-D'Isere, Savoy.

Red list status: r: 3 – locally endangered (AT), NT – potentially endangered (CH), 3 – endangered (DE).

Bryum argenteum HEDW.;

Syn.: *Anomobryum lanatum* (P.BEAUV.)

J.R. SPENCE & H.P.RAMSAY (Bryaceae),

Silber-Birnmoos, Silver-moss

Abundant, 73 squares: 2-11, 13-15, 17, 18, 32-34, 38, 41, 42, 54, 55, 57, 62, 63, 73, 81, 84, 85, 88, 89, 94-96, 101, 104, 105, 109, 112, 113, 117, 125, 129, 130, 132-136, 138, 141, 143-147, 149, 157-159, 165, 172, 174, 177, 178, 183-185, 191-193, 198, often on ground and roadbanks, occasionally also on walls and rock. In square 62, trail to Similaun Spitz (TN/AT and TS/IT) reaching 3,242 m a.s.l., on gravel. Lowest altitudes recorded ca.

525 m a.s.l. (TS/IT) and 1,450 m a.s.l. (TN/AT).

AT: maximum elevations of 3,425 m a.s.l., Spiegelkogel, TN, and 2,500 m a.s.l., Eisenhut at Turrach, TE. IT: 2,650 – 2,700 m a.s.l., Colle del Nivolet, Gran Paradiso National Park, and 3,000 m a.s.l., Langtaufferjöchl, TS. CH: 194 – **3,870 m a.s.l.** In the nival zone, 3,195 m a.s.l., FR, Savoy, Saint-Martin-de-Belleville.

Bryum capillare HEDW.; Syn.: *B. platyloma* SCHWAEGR.; *B. ruffolium* (DIXON)

DEMARET & R. WILCZEK;

Rosulabryum capillare (HEDW.) SPENCE;

Ptychostomum capillare (HEDW.) D.T.

HOLYOAK & N. PEDERSEN (Bryaceae),

Haarblättriges Birnmoos,

Capillary Thread-moss

Recorded from 23 squares: 4, 6, 20, 24, 25, 34, 88, 90, 104, 119, 129, 136, 158, 159, 170, 183, 184, 186-189, 194, 196, on ground/soil, rock, roadbank, once on a wet wall, elevations from ca. 570 m a.s.l. to 2,090 m a.s.l. (TS/IT) and ca. 1,770 m a.s.l. to 2,804 m a.s.l. (TN/AT).

AT: maximum elevation at 2,700 m a.s.l. with further altitudinal limits of 2,400 m a.s.l., Mädelegabel, TN, and 2,680 m a.s.l., Möserlingwand, TE. IT: up to **3,700 – 3,800 m a.s.l.**, Grivola, Aosta, 2,400 – 3,000 m a.s.l., around the Payerhütte at Ortler, TS, and 2,500 m a.s.l., Monte Cavallazzo, Trentino. CH: 100 m a.s.l. to 2,680 – 2,850 m a.s.l.; FR: 1,800 m a.s.l., Tignes, Savoy.

Bryum elegans NEES ex BRID.; Syn.: *B.*

stirtonii SCHIMP; *Rosulabryum elegans*

(NEES) OCHYRA (Bryaceae),

Zierliches Birnmoos, Thread-moss

On ground in five squares: 122, 126, 127, 134, in Pfossental and Pfelderertal (TS/IT) in a range of ca. 1,700 m a.s.l. to 2,610 m a.s.l. and once in square 169, near the Panoramatrail/Tiefenbach (TN/AT) at 2,700 m a.s.l.

AT: maximum elevations of 3,516 m a.s.l., Finailspitze TN, and 2,500 m a.s.l., Musing, TE. IT: 2,746 – 2,750 m a.s.l., Lago Nero, Aosta, and 2,800 m a.s.l., Habicherkopf at Graun, TS. CH: 265 – **3,870 m a.s.l.**; FR: 2,280 m a.s.l., Tignes, Savoy.

Bryum moravicum PODP.; Syn.: *Bryum*

subelegans auct. non KINDB.; *Bryum*

laevifilum SYED; *Bryum flaccidum* auct.

non BRID.; *Rosulabryum laevifilum* (SYED)

OCHYRA (Bryaceae), Schlaffes Birnmoos,

Syed's Thread-moss

Depending on the concept of species it is recognised differently (e.g. Hodgetts 2001).

Abundant, 73 squares: 3, 4, 6, 7, 9-20, 22, 24, 25, 33, 40, 42-45, 52, 96, 98, 102-104, 106-113, 116, 117, 129, 132, 134, 138, 140-143, 145-152, 168, 171, 172, 174, 176-178, 181, 183, 184, 188-190, 192-194, usually on ground, often near and at tree bases and on rotten wood. Elevations from ca. 525 m a.s.l. to 2,300 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to **2,660 m a.s.l.** (TN/AT) – highest altitude in square 168, collected near Panorama trail/Tiefenbach from ground.

AT: a maximum elevation of 2,450 m a.s.l. IT: 1,900 – 2,150 m a.s.l., Mt. Testa di Montzeuc,

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Gran Paradiso National Park, Aosta. CH: (as *B. moravicum*) 194 – 2,568 m a.s.l.; FR: 1,850 m a.s.l., Peisey-Nancroix, Savoy.

Bryum pallens SW.; Syn.: *B. rutilans* auct. eur. non BRID.; *B. subelegans* KINDB.;

Ptychostomum pallens (SW.) J.R. SPENCE (Bryaceae), Blasses Birnmoos,

Pale Thread-moss

25 squares: 26, 38, 50, 52, 53, 56, 58-60, 71, 82, 85, 88, 90, 103, 114, 117, 132, 134, 135, 138, 140, 149, 185, 198, usually on moist ground, trail banks, occasionally on wet rock. Elevations are ca. 1,260 m a.s.l. to ca. 2,413 m a.s.l. (TS/IT) and 1,770 m a.s.l. to 2,540 – 2,630 m a.s.l. (TN/AT).

AT: maximum elevations of 2,600 m a.s.l., shortly below Grüberferner, Stubai, TN and 2,800 – 2,900 m a.s.l., Glatzberg at Kals, TE. IT: up to **3,500 m a.s.l.**, Monte Rosa, Aosta and 2,470 – 2,560 m a.s.l., Ornellatal, TS. CH: 200 m a.s.l. to 2,980 m a.s.l.; FR: 2,500 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: V – decreasing (DE).

Bryum pallescens SCHLEICH. ex

SCHWAEGR.; Syn.: *B. obconicum* BRUCH & SCHIMP.; *B. lonchocaulon* C. MÜLL.;

B. cirrhatum HOPPE & HORNSCH.;

Ptychostomum pallescens (SCHLEICH) J.R. SPENCE (Bryaceae), Bleiches Birnmoos,

Tall-clustered Thread-moss

Twice; near Castle Juval on ground at an irrigation channel, square 7, in an altitudinal range of 980 – 1,300 m a.s.l. (TS/IT), and on a road bank in Ventertal near Gampe, square 88, 1,830 – 1,840 m a.s.l. (TN/AT).

AT: maximum elevations 2,808 m a.s.l., Schartlkopf at Nauders, TN, and 2,800 – 2,900 m a.s.l., Glatzberg at Kals, TE. IT: 3,010 m a.s.l., Nockspitze in Langtaufers, TS, and 2,423 – 2,670 m a.s.l., Lago di Motta, Piedmont. CH: 240 m a.s.l. – **3,266 m a.s.l.**; FR: 2,500 m a.s.l., Bonneval-sur-Arc, Savoy.

Bryum pseudotriquetrum (HEDW.)

SCHWAEGR.; Syn.: *B. ventricosum* DICKS.;

Ptychostomum pseudotriquetrum (HEDW.)

J.R. SPENCE & H.P. RAMSAY (Bryaceae),

Bauchiges Birnmoos, Marsh Bryum

Abundant, 87 squares: 10, 16, 20, 22-24, 26, 29-31, 34, 38, 42-44, 48-53, 55-58, 60, 64, 68, 70-85, 89, 93, 99-109, 112, 118, 119, 121-124, 126-130, 134, 136, 138, 141, 154, 157-163, 167, 175, 181, 188-190, usually on wet ground, bogs and flushes, springs and river banks, altitudes from ca. 660 m a.s.l. to ca. 2,895 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to 2,880 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,900 m a.s.l. with further altitudinal limits of 2,679 m a.s.l., Glungezer, TN, and 2,600 – 2,700 m a.s.l., Peischlerpaß at Kals, TE. IT: up to 3,350 – **3,480 m a.s.l.**, Theodulhorn, Aosta and 2,900 m a.s.l., Mittereck at St. Valentin, TS. CH: 240 – 3,300 m a.s.l.; FR: 2,500 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: V – decreasing (DE).

Bryum schleicheri LAM. & D.C. (Bryaceae)

Schleichers Birnmoos, Thread-moss

Only once, square 58, streamside, Tisental, near track to Similaun Hütte, in an altitudinal range of ca. 2030 – 2310 m a.s.l.

For AT a maximum elevation of 2700 m a.s.l. In IT up to 3050 m a.s.l., Aiguilles Grises. CH: 500 – 2700 m a.s.l.; FR: 2800 m a.s.l., Bonneval-sur-Arc, Savoy. For the central Alps, without precise location, a maximum elevation of 3250 m a.s.l.

Red list status: 3 – endangered (DE).

Bryum torquescens BRUCH & SCHIMP;

Syn.: *Rosulabryum torquescens* (BRUCH & SCHIMP.) SPENCE (Bryaceae),

Gedrehtes Birnmoos, Twisting Thread-moss

Recorded only at TS/IT, six squares: 2, 5, 35, 136, 149, 174. On ground, road bank or shaded rock, ca. 530 – 1,540 m a.s.l.

Not mentioned for AT. IT: **1,900 m a.s.l.**, Algund, TS. CH: 194 – 1,470 m a.s.l.; FR: 1,752 m a.s.l., Grignon, Savoy.

Red list status: G – risk assumed (DE).

Bryum weigelii SPRENG.;

Syn.: *B. duvalii* VOIT. (Bryaceae),

Weigels Birnmoos, Duval's Thread-moss

Only twice at TS/IT, in Penaudtal, square 30, boggy place, 2,075 – 2,200 m a.s.l. and square 136, Pfelderertal at Innerhütt, bog, 1,425 – 1,510 m a.s.l.

AT: maximum elevations of 2,700 m a.s.l., Zirmeggenkar near Obergurgl, TN, and ca. 2,560 m a.s.l. Ködnitztal, TE. IT: in a range of 1,000 – 2,500 m a.s.l. in Trentino and 2,600 m a.s.l., Langtauferer Ochsenalpe, TS. CH: 800 m a.s.l. to **2,665 – 2,850 m a.s.l.**; FR: 2,700 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: 3 – endangered (AT), 2 – severely endangered (DE).

Buxbaumia aphylla HEDW.

(Buxbaumiaceae), Blattloses Koboldmoos, Brown Shield-moss

Twice, square 102 (TN/AT), Martlaswald near Zwieselstein on a rotten stump together with *B. viridis*, ca. 1,690 m a.s.l., and square 136 (TS/IT), Pfelderertal at Innerhütt, on acid ground/soil in a damp woodland, ca. 1,425 – 1,510 m a.s.l.

AT: a maximum elevation of 1,600 m a.s.l., Schladming, Styria with further altitudinal limits of 900 m a.s.l., Judenstein, TN. IT: in a range of 500 – 1,000 m a.s.l. in Cavelonte, Trentino. CH: 385 – **2,200 m a.s.l.**

Red list status: 3 – endangered (AT), EN – endangered (CH), 2 – severely endangered (DE).

Buxbaumia viridis (MOUG. ex DC.) BRID.

ex MOUG. & NESTL. (Buxbaumiaceae), Grünes Koboldmoos, Green Shield-moss

Once in square 102 (TN/AT), Martlaswald near Zwieselstein, on a rotten stump together with *B. aphylla*, ca. 1,690 m a.s.l.

AT: a maximum elevation of 1,700 m a.s.l. with further limits of 1,200 m a.s.l., Sistrans, TN, and 1,400 m a.s.l., Matreier Tauerntal, TE. IT: 1,400 – 1,800 m a.s.l., Epinel, Aosta, and 1,430 m a.s.l., Val Sadole, Trentino. In a recent treatment, all registered records for TS are given with 900 m a.s.l. as lowest and **2,050 m a.s.l.** as highest elevation (Spitale et al. 2015). CH: 560 – 1,880 m a.s.l.; FR: 1,521 m, Rognaix, Savoy.

Red list status: 2 – severely endangered (AT), CR – critically endangered (IT), NT – potentially endangered (CH), 2 – severely en-

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dangered (DE). Protected species according to Annex II of the EEC FFH Directive (1992).

Calliergon cordifolium (HEDW.) KINDB. (Calliergonaceae), Herzblättriges Schönmoos, Heart-leaved Spear-moss

Once in Tisental, square 60 (TS/IT), on a boggy riverbank, 2,420 m a.s.l.

AT: a maximum elevation of 2,050 m a.s.l. with a further limit of 1,100 m a.s.l. in Steinach, TN. IT: up to 1,800 m a.s.l. in Trentino. CH: 420 – 2,320 m a.s.l.; FR: **2,700 m a.s.l.**, Val-D'Isere, Savoy.

Red list status: 3 – endangered (AT), VU – vulnerable (CH), V – decreasing (DE).

Calliergon giganteum (SCHIMP.) KINDB. (Calliergonaceae), Riesen Schönmoos, Giant Spear-moss

Twice, squares 107 (TN/AT), at Nachtberg, boggy place, ca. 1,780 – 1,850 m a.s.l. and 175 (TS/IT), Haidersee, "Schwingrasen", 1,450 m a.s.l.

AT: a maximum elevation of 2,100 m a.s.l., Lünensee towards Gefalljoch, Vorarlberg, with further limits of 1,850 m a.s.l., Grünsee, Nauders, TN, and 1,700 m a.s.l., Innervillgraten TE. IT: in a range up to **2,800 m a.s.l.** in Trentino; 2,150 – 2,200 m a.s.l., Col di Lana, TS, and 2,140 m a.s.l., Piccolo S. Bernardo, Aosta. CH: 380 – 2,590 m a.s.l. For DE the highest altitude is 2,000 m a.s.l., Bavaria. FR: 2,000 m a.s.l., Saint-Colombain-des-Villards, Savoy.

Red list status: 3, r: 1 – endangered, locally threatened from extinction (AT), 3 – endangered (DE).

Calliergon trifarium (WEB. & MOHR)

KINDB.; Syn.: *Drepanocladus trifarius* (WEB. & MOHR) BROTH ex PARIS;

Pseudocalliergon trifarium (WEB. & MOHR) LOESKE, (Calliergonaceae) Dreizeiliges Schönmoos, Three-ranked Spear-moss

Once, square 175 (TS/IT), Haidersee, "Schwingrasen", 1,450 m a.s.l.

AT: a maximum elevation of 2,350 m a.s.l., near St. Anton, TN. IT: 2,370 – 2,440 m a.s.l., Alpe Broillot, Gran Paradiso National Park, Aosta, in a range of 400 – 2,100 m a.s.l. in Trentino, and 2,000 m a.s.l., Schlern, TS. CH: 240 – 2,480 m a.s.l.; FR: **2,750 m a.s.l.**, Pralognan-la-Vanoise, Savoy.

Red list status: 3, r: 1 – endangered, locally threatened with extinction (AT), NT – potentially endangered (CH), 2 – severely endangered (DE).

Calliergonella cuspidata (HEDW.) LOESKE (Hypnaceae), Spießmoos, Pointed Spear-moss
27 squares: 2, 7, 13, 15, 26, 33, 60, 81, 82, 84, 85, 90, 99, 100, 107, 136, 139-141, 175, 184, 188-190, 192, 195, 197, usually on damp ground, once on concrete, within altitudinal ranges of ca. 530 m a.s.l. to 2,353 m a.s.l. (TS/IT) and ca. 1,525 m a.s.l. to ca. 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,400 m a.s.l. at Ganimitz, TE. IT: 1,800 – 2,300 m a.s.l., path to Money, Aosta, and ca. 1,750 m a.s.l., Ornellatal, TS. CH: 194 – **2,500 m a.s.l.**; FR: 2,088 m a.s.l., Tignes, Savoy.

Calliergonella lindbergii (MITT.)

HEDENÄS; Syn.: *Hypnum lindbergii* MITT. (Hypnaceae), Lindbergs Schlafmoos, Lindberg Plait-moss

Three times, squares 171 (TS/IT), Matscherthal, bog, 1,810 – 1,820 m a.s.l.; 175 (TS/IT), Haidersee, "Schwingrasen", 1,450 m a.s.l.; 198 (TN/AT), near Obergurgl "Zirbenwald", bog, in a range of 1550 - 2100 m a.s.l.

AT: a maximum elevation of **2,690 – 2,780 m a.s.l.**, Pinnisserjoch, TN, with further altitudinal limits of 2,000 – 2,200 m a.s.l., Patscherkofel, TN, and 1,700 m a.s.l., Kals-Matreier Törl, TE. IT: 1,050 – 1,100 m a.s.l., Noasca, Gran Paradiso National Park, Piedmont, and 2,000 m a.s.l., Stalleralpe at Antholz, TS. CH: 194 – 2,530 m a.s.l.; For DE, the highest altitude is 1,800 m a.s.l. (Bavaria).

Calypogeia arguta NEES & MONT.

(Calypogeiaceae), Zweispitziges Bartkelchmoos, Notched Pouchwort

Once, square 136 (TS/IT), in Pfelderertal at Innerhütt, on rotten wood in a damp woodland, ca. 1,425 – 1,510 m a.s.l.

AT: along an altitudinal range of ca. 400 – 650 m a.s.l.; CH: 270 – **2,525 m a.s.l.**; FR: 1,346 m a.s.l., Saint-Francois-de-Sales, Savoy. Red list status: NT – near threatened (IT), NT – potentially endangered (CH).

Calypogeia azurea STOTLER & CROTZ;

Syn.: *Kantia trichomanis* (L.) S.F. GRAY (Calypogeiaceae), Blaues Bartkelchmoos, Blue Pouchwort

Three times; in TN/AT twice, square 90, Ventertal at Winterstall, on ground, ca. 1,770

– 1,840 m a.s.l., and square 159, Rofental towards Rofenbergalm, on ground, 2,100 – 2,200 m a.s.l. and once in TS/IT, square 136, Pfelderertal at Innerhütt, acid ground in a damp woodland, ca. 1,425 – 1,510 m a.s.l.

AT: a range from 900 – 2,300 – 2,500 m a.s.l. can be stated, the upper limit at Klammerspitze at St. Jodok, TN, and 2,400 m a.s.l., Neualpl, TE. IT: up to 2,544 – 2,568 m a.s.l., Costa della Civetta lake, Gran Paradiso National Park. CH: 270 to **2,640 – 2,850 m a.s.l.**; FR: 2,260 m a.s.l., Bonneval, Savoy.

Red list status: NT – near threatened (IT).

Calypogeia fissa (L.) RADDI

(Calypogeiaceae), Eingeschnittenes Bartkelchmoos, Common Pouchwort

Nine squares: 22, 45, 54, 81, 86, 90, 134, 139, 190, on ground, elevations are ca. 1,310 – 2,300 m a.s.l. (TS/IT) and ca. 1,770 – 2,100 m a.s.l. (TN/AT).

AT: reaching a maximum elevation of ca. 900 m a.s.l., near Kitzbühel, TN. CH: 200 – 2,260 m a.s.l.; FR: **2,308 m a.s.l.**, Valloire, Savoy. In DE highest altitude 1,250 m a.s.l., Schwarzwald.

Red list status: NT – near threatened (IT).

Calypogeia muelleriana (SCHIFFN.) K.

MÜLL. (Calypogeiaceae), Müllers Bartkelchmoos, Mueller's Pouchwort

Recorded for six squares: 26, 107, 135-137, 198, on ground and banks, ca. 1,425 – 1,622 m a.s.l. (TS/IT) and ca. 1,780 – 2,100 m a.s.l. (TN/AT)

AT: a maximum elevation of 2,350 m a.s.l., Fuldaer Höhenweg, Pitztal, TN. CH: 270 –

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2,640 m a.s.l.; FR: 1,710 m a.s.l., Beaufort-sur-Doron, Savoy.

Red list status: NT – near threatened (IT).

Calypogeia neesiana (C.MASSAL. & CAREST.) K. MÜLL. (Calypogeiaceae), Nees' Bartkelchmoos, Nees' Pouchwort
16 squares 23-25, 32, 35, 52, 54, 84, 104, 107, 131, 185-187, 190, 196, usually on ground/soil, ca. 880 – 2,550 m a.s.l. (TS/IT) and ca. 1,780 – 1,980 m a.s.l. (TN/AT).

AT: reaching a maximum elevation of ca. 2,200 m a.s.l. with a limit of 2,000 m a.s.l. from several records in TN. IT: a range of 1,000 – 2,000 m a.s.l. in Trentino, and 2,423 – 2,470 m a.s.l., Lago Nero, Piedmont. CH: 420 – **2,677 m a.s.l.** In DE highest altitude at 1,800 m a.s.l., Bavaria. FR: 2,290 m a.s.l., Valloire, Savoy.

Red list status: NT – near threatened (IT).

Calypogeia suecica (ARNELL & J. PERSS.) K. MÜLL. (Calypogeiaceae), Schwedisches Bartkelchmoos, Swedish Pouchwort
Recorded only for five squares: 46, 71, 84, 89, 128, on rotten wood and ground, ca. 1,860 m a.s.l. to 2,200 m a.s.l. (TS/IT) and 1,840 m a.s.l. to **2,540 – 2,630 m a.s.l.** (TN/AT).

AT: reaching a maximum elevation of ca. 1,600 m a.s.l. with a range of 560 – 1,500 m a.s.l. in TN. CH: 400 – 2,358 m a.s.l.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Campyliadelphus chrysophyllus (BRID.) R.S. CHOPRA; Syn.: *Campylium chrysophyllum* (BRID.) J. LANGE

(Amblystegiaceae), Echtes Goldschlafmoos, Golden Feather-moss

Three times in TS/IT, square 112, Pfossental, wet rock, 1,450 – 1,590 m a.s.l., square 135, Pfelderertal at Krößbichl, rock, ca. 1,565 m a.s.l. and square 175, Haidersee near shore, ground, 1,450 m a.s.l.

AT: a maximum elevation of 2,700 m a.s.l. with further limits of 2,500 m a.s.l., Riepen Spitze, TN, and 2,600 m a.s.l., near Rainerkees, TE. IT: up to **2,928 m a.s.l.**, Piccolo S. Bernardo, Aosta, and 2,500 m a.s.l., Gidergitz, TS. CH: 200 – 2,900 m a.s.l.; FR: 2,770 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: V – decreasing (DE).

Campylium stellatum (HEDW.) J. LANGE & C. JENS. (Amblystegiaceae), Stern-Goldschlafmoos, Yellow Starry Feather-moss
60 squares: 6, 22-24, 38, 48, 49, 51-53, 55-58, 73-75, 79-87, 89, 90, 94, 97, 99-101, 103, 104, 107-109, 112, 121-123, 126, 127, 129, 130, 132, 134, 136, 141, 157, 158, 160, 174, 175, 181, 182, 192, 198, 199, usually on wet ground and in mires, occasionally in a peat bog, between ca. 660 m a.s.l. and ca. 2,630 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. and ca. 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,880 m a.s.l. with further altitudinal limits of 2,500 m a.s.l., Gurgl, Ötztal, TN, and of 2,800 m a.s.l., Bergertörl near Kals, TE. IT: 2,746 – 2,750 m a.s.l., Lago Nero, Gran Paradiso National Park, Aosta, and 2,530 m a.s.l., Wolfendorn, Brenner, TS; for var. *protensum* (BRID.) BRYHN ex GROUT a further altitude of **3,500 m a.s.l.**, Piccolo S. Bernardo, Aosta.

CH: 240 – 3,080 m a.s.l.; FR: 2,700 m a.s.l., Val-D'Isere, Savoy.

Red list status: V (var. *protensum*) to 3 – endangered (var. *stellatum*) in DE.

Campylopus fragilis (BRID.) BRUCH & SCHIMP. (Leucobryaceae), Zerbrechliches Krummstielmoos, Brittle Swan-neck Moss

Only three times in the TS/IT part: square 24, near Karthaus village, open larch woodland, on rock, 1,160 – 1,320 m a.s.l., square 34, at Lafezbach, larch woodland, on rock, ca. 1,425 – 1,480 m a.s.l., and square 64, Tisental, pioneer vegetation, on ground, **2,550 m a.s.l.**

AT: up to 1,575 m a.s.l., near St. Anton, TN. IT: 1,550 – 1,650 m a.s.l., near Rif. Noaschetta, GranParadiso National Park. CH: 270 – 2,310 m a.s.l.; FR: 1,700 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: 3 – endangered (AT).

Campylopus pilifer BRID. (Leucobryaceae), Behaartes Krummstielmoos, Stiff Swan-neck Moss

Twice in TS/IT: square 178, at Partschins near waterfall, rock, 700 – 1,100 m a.s.l. and square 193, near Cloister Säben, Tinnetal, ground near rock, 525 – 570 m a.s.l.

AT: an old record for Krimmler Tauernhaus, 1,200 m a.s.l., Salzburg. IT: ca. 770 m a.s.l., near Stroba, Gran Paradiso National Park; historic records for TS (Meran and Partschins) are without details. CH: 200 – **1,552 m a.s.l.** Red list status: VU – vulnerable (CH).

Campylopus subulatus SCHIMP. ex MILDE (Leucobryaceae), Pfriemen-Krummstielmoos, Awl-leaved Swan-neck Moss

Only four times in TS/IT, in Pfossental, squares 115-117, on rock and ground, ca. 1,700 – 2,020 m a.s.l., and once in Pfelderertal near Moos in Passeier, square 141, on rock, ca. 980 – 1,026 m a.s.l.

AT: maximum elevations of 2,100 m a.s.l., at Lucknerhaus, Kals, TE and 1,120 m a.s.l., Straßwalchschlucht, TN. It is remarkable that the species was collected for the first time at several places near Meran, TS/IT (Frahm 2012). CH: 230 – **2,826 m a.s.l.**; FR: 1,600 m a.s.l., Crest-Voland, Savoy.

Red list status: 3 – endangered (AT), EN – severely endangered (CH), 3 – endangered (DE).

Catocopium nigratum (HEDW.) BRID. (Catascopiaceae), Schwarzkopfmoss, Golfclub Moss

Just twice in TS/IT in Pfelderertal; square 130, at Pfelderertal, spring, 1,770 – 1,820 m a.s.l. and square 132, near Pfelders village, spring, 1,630 – 1,700 m a.s.l.

AT: an altitudinal range of ca. 350 – **2,800 m a.s.l.** with elevations of 2,700 m a.s.l., Granatenwand, Gaisbergtal, Oberurgl, TN. IT: a maximum altitudinal range of 2,580 – 2,680 m a.s.l., Lauson valley, Aosta, a range of 600 – 2,500 m a.s.l. in Trentino, and an altitude of 2,560 m a.s.l., Schlern, TS. CH: 380 – 2,670 m a.s.l.; FR: 2,680 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: VU – vulnerable (CH), 2 – severely endangered (DE).

5 Results

Cephalozia ambigua C.MASSAL.

(Cephaloziaceae), Zweifelhaftes Kopfsproßmoos, Snow Pincerwort

Rare, in six squares, only in high elevations, squares 64 (TS/IT), Tisental, ground, 2,580 m a.s.l., 66 (TN/AT and TS/IT), discovery place, rock, ca. 3,200 m a.s.l., 68 (TN/AT), snow bed, 2,620 – 2,880 m a.s.l., 122-124 (TS/IT), Pfosental near saddle near Stettiner Hütte, snow beds, 2,350 – 2,895 m a.s.l.

AT: an altitudinal range of ca. 1,800 – **3,516 m a.s.l.**, the upper limit from Finailspitze, TN. IT: 2,423 – 2,670 m a.s.l., at Lago di Motta, Piedmont, and in a range of 1,000 – 2,500 m a.s.l. in Torbiera del Vedes, Trentino. CH: 1,150 – 2,989 m a.s.l.; FR: 2,600 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: 4 – potentially endangered (AT), NT – near threatened (IT, CH).

Cephalozia bicuspidata (L.) DUMORT.

(Cephaloziaceae), Zweispitziges Kopfsproßmoos, Two-horned Pincerwort

Abundant in 51 squares: 10, 22, 24-26, 32, 34, 45, 46, 54, 55, 59, 60, 65, 67, 68, 70-74, 79, 81-84, 90, 93, 94, 96, 99, 102, 104, 107, 114, 126, 128, 130, 133-137, 171, 185-187, 190, 195, 196, 198, on ground and rotten wood, highest altitude recorded in square 65 (TN/AT and TS/IT), Niederjochferner, on ground, ca. **3,200 m a.s.l.**, lowest elevations are ca. 690 m a.s.l. (TS/IT) and ca. 1,525 m a.s.l. (TN/AT).

AT: a maximum elevation of ca. 2,800 m a.s.l. with further altitudinal limits of 2,500 m a.s.l., Kaunertal, TN, and 2,300 m a.s.l., Möserlingwand, TE. IT: 2,580 – 2,680 m a.s.l.,

Lauson valley, Aosta, Gran Paradiso National Park. CH: 200 – 2,848 m a.s.l.; FR: 2,700 m a.s.l., Bonneval-sur-Arc, Savoy.

Cephalozia lunulifolia (DUMORT.) DUMORT.; Syn.: *Fuscocephaloziopsis lunulifolia* (DUMORT.) VANA & L. SÖDERSTR.

(Cephaloziaceae), Mond-Kopfsprossmoos, Moon Pincerwort

Only once, square 185 (TS/IT), Kreuztal near Brixen, on ground and rock, ca. 1,980 – 2,050 m a.s.l.

AT: a maximum elevation of ca. **3,400 m a.s.l.**, Spiegelkogel, TN. IT: in a range of 1,000 – 2,000 m a.s.l. in Torbiera Palù die Bondone, Trentino. CH: 360 m a.s.l. to 2,700 – 2,850 m a.s.l.; FR: 2,300 m a.s.l., Bramans, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Cephalozia pleniceps (AUSTIN) LINDB.;

Syn.: *Fuscocephaloziopsis pleniceps* (AUSTIN) VÁŇA & L. SÖDERSTR. (Cephaloziaceae), Dickköpfiges Kopfsprossmoos, Blunt Pincerwort

Only in square 71, TN/AT, above Martin-Busch-Hütte, in a flush, ca. 2,540 – 2,630 m a.s.l.

AT: a maximum elevation of ca. 2,600 m a.s.l. with a limit of 1,800 m a.s.l., near Hall, Inntal, TN. IT: 2,423 – 2,470 m a.s.l., at Lago Nero, Gran Paradiso National Park, Piedmont. CH: 410 to 2,750 – **2,850 m a.s.l.**; FR: 2,103 m a.s.l., Beaufort-sur-Doron, Savoy.

Red list status: r: 3 – locally endangered (AT), CR – critically endangered (IT), 3 – endangered (DE), AR – at risk (FR).

Cephaloziella divaricata (SM.) SCHIFFN.
(Cephaloziellaceae), Spreizblättriges
Kleinkopfsproßmoos, Common Threadwort
Five times in ,TS/IT, squares 4, 10, 17, 139,
189, on ground and on rock, from about
750 m a.s.l. and ca. 1,460 m a.s.l.
AT: a maximum elevation of **>3,200 m a.s.l.**
with an elevation limit of >2,350 m a.s.l., near
Hochjochospitz, Rofental, TN. IT: 2,370 –
2,630 m a.s.l., Eaux-Ranges valley, Aosta, and
in a range up to 3,000 m a.s.l. in Trentino.
CH: 200 – 3,212 m a.s.l.; FR: 1,925 m a.s.l.,
Lanslebourg-Mont-Cenis, Savoy.
Red list status: NT – near threatened (IT).

Cephaloziella rubella (NEES) WARNST.
(Cephaloziellaceae), Rötliches Kleinkopf-
sproßmoos, Red Threadwort
Recorded for four squares: 66 (TN/AT and
TS/IT), near discovery place, rock, ca. 3,200 m
a.s.l., and in TS/IT: square 58, Tisental, rock,
2,357 m a.s.l.; in TN/AT: square 88, Ventertal
near Gampe, rock, ca. 1,830 – 1,840 m a.s.l.
and square 107, Nachtberg, rock, ca. 1,780 –
1,860 m a.s.l.
AT: a maximum elevation of 2,050 m a.s.l.,
Mauckspitz, TN. IT: in a range up to 1,300 m
a.s.l. close to Rovereto, Trentino. Recently
reported from the IT region Friuli-Venezia
Giulia, in an altitudinal range of 950 –
1,600 m a.s.l. CH: 330 – **3,207 m a.s.l.**;
FR: 2,550 m a.s.l., Lanslebourg-Mont-Cenis,
Savoy.
Red list status: NT – near threatened (IT).

Cephaloziella spinigera (LINDB.)
WARNST.; Syn.: *C. elachista* (JACK EX

GOTT. & RABENHORST) SCHIFFN.
(Cephaloziellaceae), Moor-Kleinkopfsproß-
moos, Spiny Threadwort
Once in Square 104, between Gaislachalm
and Silberbergalm (TN/AT), 1,900 – 1,980 m
a.s.l., on ground.
AT: an altitudinal range of 750 – ca. 2,000 m
a.s.l. with a further elevation limit of 1,850 m
a.s.l., Arlbergpass, TN. Not known for IT.
CH: 960 – **2,230 m a.s.l.**; FR: 2,150 m a.s.l.,
Pralognan-la-Vanoise, Savoy.
Red list status: VU – vulnerable (CH), AR – at
risk (FR).

Ceratodon purpureus (HEDW.) BRID.
(Ditrichaceae), Purpurrotes Hornzahnmoos,
Redshank
Very abundant, 130 squares: 2, 4-13, 15-22,
24-30, 32-36, 38, 41, 42, 46, 49, 50, 52-57,
60, 62-64, 73-78, 80-85, 87-92, 94-96, 101-
120, 122, 124-126, 128, 129, 133-136, 138,
142, 143, 146, 151, 152, 157-160, 163, 165,
166, 170-172, 174, 177, 178, 183-185, 188-
191, 193-196, 198, 200, on ground, banks,
and in orchards on open soil, from the lowest
elevations, ca. 525 m a.s.l. (IT), ca. 1,450 m
a.s.l. (AT) to the highest of the investigated
area, square 62 (AT/IT), gravel, 3,242 m a.s.l.
AT: a maximum elevation of 3,000 m a.s.l.
Habicht, TN is given with a further elevation
limit of 2,680 m a.s.l., Möserlingwand, TE.
IT: up to **3,400 – 3,500 m a.s.l.**, Grivola,
Aosta, and 2,600 – 2,800 m a.s.l., Nockspitze,
Langtaufers, TS. CH: 199 – 3,380 m a.s.l.;
FR: recorded from the nival zone, 3,195 m
a.s.l., Savoy, Saint-Martin-de-Belleville.

5 Results

Chiloscyphus pallescens (EHRH. ex HOFFM.) DUMORT. (Geocalyceae), Vielblütiges Lippenbechermoos, St Winifred's Moss

For quite some time prevailed uncertainties regarding the rank of this and the following taxon. Recent taxonomic studies by means of molecular and morphological data provide evidence that *C. pallescens* and *C. polyanthus* deserve the rank of distinct species (Hentschel et al. 2006).

Recorded for 12 squares: 6-8, 58, 70, 71, 73, 76, 94, 104, 137, 182, on wet places and in a bog, between 650 m a.s.l. and 2,357 m a.s.l. (TS/IT) and 1,699 m a.s.l. and **2,630 m a.s.l.** (TN/AT).

AT: a maximum elevation of ca. 2,000 m a.s.l., at Patscherkofel, TN. IT: 1,400 – 1,700 m a.s.l., Aosta, and 1,860 m a.s.l., near Bozen, TS. CH: 255 m a.s.l. to 2,255 m a.s.l.; FR: 1,779 m a.s.l., Saint-Colombain-des-Villards, Savoy.

Red list status: NT – near threatened (IT).

Chiloscyphus polyanthus (L.) CORDA

(Geocalyceae), Vielblütiges Lippenbechermoos, St. Winifred's Moss

In five squares: 39 (TS/IT), near Unser Frau village, river, 1,523 m a.s.l.; 106 (TN/AT), at Zwieselstein village, boggy place, ca. 1,470 m a.s.l.; 109 (TN/AT), Ötztal, river bank, 1,450 – 1,650 m a.s.l.; 158 (TN/AT), Rofental, river bank, 2,030 – 2,100 m a.s.l.; 174 (TS/IT), Langtaufertal, ground, 1,513 – 1,540 m a.s.l. AT: a maximum elevation of ca. 2,000 m a.s.l., Patscherkofel, TN. IT: 2,361 – **2,470 m a.s.l.**, Costa della Civetta lake and near Rif. Citta

di Chivasso, Gran Paradiso National Park. CH: 200 – 2,138 m a.s.l.; FR: 2,250 m a.s.l., Termignon, Savoy.

Red list status: NT – near threatened (IT).

Cinclidium stygium SW. (Cinclidiaceae), Dunkelblättriges Kuppelmoos, Lurid Cupolamoos

Only twice: in squares 22 (TS/IT), Klosteralm, bog, 1,980 – 2,300 m a.s.l. and 82 (TN/AT), above Vent, flush opposite Rofen village, ca. 1,970 m a.s.l.

AT: a maximum elevation of 2,150 m a.s.l. with a further limit of 1,850 m a.s.l., at Grünsee, Nauders, TN. IT: in a range of 1,000 – **2,500 m a.s.l.** at Lago della Polsa, Trentino. CH: 965 – 2,440 m a.s.l.; DE: Bavaria: at Watzmann 2,400 m a.s.l.; FR: 2,250 m a.s.l., Valloire, Savoy.

Red list status: 2 – severely endangered (AT), 2 – severely endangered (DE).

Cinclidotus fontinaloides (HEDW.) P.

BEAUV. (Pottiaceae), Großes Gitterzahnmoos, Smaller Lattice-moss

Recorded only in TS/IT, four squares: 6-9, from Tschars to Castle Juval and towards Lint, in irrigation channels, 650 m a.s.l. to ca. 1,200 m a.s.l.

AT: altitudinal limits 1,200 m a.s.l., Gschnitztal at Trins, TN and 1,500 m a.s.l., upper Gailtal, TE. IT: up to 1,460 m a.s.l., Val di Fassa, Trentino, IT and 500 m a.s.l., Gratsch near Meran, TS. CH: 200 – **2,266 m a.s.l.**; Also in DE, the species may reach 1,500 m a.s.l.; FR: 1,030 m a.s.l., Montcel, Savoy.

Red list status: V – decreasing (DE).

Cirriphyllum piliferum (HEDW.) GROUT
(Brachytheciaceae), Pinsel-Haarblattmoos,
Hair-pointed Feather-moss

33 squares: 7, 14-17, 24-26, 34, 37, 39, 64,
73, 89, 91, 102, 104, 126, 132, 135-137, 139,
141, 172-174, 179, 186-189, 196, on ground,
between ca. 780 m a.s.l. and ca. 2,580 m a.s.l.
(TS/IT); ca. 1,690 m a.s.l. and ca. 2,490 m
a.s.l. (TN/AT).

AT: a maximum elevation of ca. 2,000 m a.s.l.
with further limits of 1,650 m a.s.l., St Anton,
TN, and 1,950 m a.s.l., Möserlingwand, TE.
IT: 2,370 – **2,630 m a.s.l.**, Eaux-Ranges val-
ley, Gran Paradiso National Park, Aosta, and
1,950 m a.s.l., Faloria, Ampezzo, Trentino.
CH: 265 – 2,350 m a.s.l.; FR: 2,200 m a.s.l.,
Bessans, Savoy.

Cladopodiella fluitans (NEES) H. BUCH;
Syn.: *Odontoschisma fluitans* (NEES) L.
SÖDERSTR. & VANA (Cephaloziaceae),
Hochmoor-Fußsproßmoos, Bog Notchwort
Five squares: 38 (TS/IT), Mastaaunalpe, flush,
1,900 – 1,950 m a.s.l.; 46 (TS/IT), Gerstgras,
bog, ca. 1,900 – 2,200 m a.s.l.; 71 (TN/AT),
above Martin-Busch-Hütte, mire, 2,540 –
2,610 m a.s.l.; 73 (TN/AT), near Martin-
Busch-Hütte, wet ground, 2,320 – 2,490 m
a.s.l.; 198 (TN/AT), Obergurgl, Zirbenwald,
bog, 2,080 – 2,085 m a.s.l.

AT: a maximum elevation of 1,950 m a.s.l.;
IT: in a range of 1,000 – **3,000 m a.s.l.** in
Trentino, the upper limit at Torbiera del Vedes,
and 1,400 m a.s.l., Schlern near Bozen, TS.
CH: 420 – 2,000 m a.s.l.; FR: 1,600 m a.s.l.,
Crest-Volland, Savoy.

Red list status: 3 – endangered (AT), VU –
vulnerable (IT), NT – potentially endangered
(CH), 2 – severely endangered (DE).

Climacium dendroides (HEDW.) WEB. &
MOHR (Climaciaceae), Bäumchenmoos,
Tree-moss

Abundant, 90 squares: 13, 14, 16, 18, 20, 24,
25, 28, 30, 33-38, 45, 48, 49-52, 54-57, 60,
70, 73-76, 79, 81, 82, 84-87, 89, 90, 94-97,
100-110, 114, 116, 130-136, 138, 140, 149-
154, 157, 158, 160, 161, 163, 171, 175, 178,
183, 184, 186, 187, 190, 194-198, on wet
places and in bogs, ca. 570 m a.s.l. to 2,353 m
a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to ca.
2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,600 m a.s.l.,
Gradental bei Döllach in Carinthia with fur-
ther limits of 2,300 m a.s.l., Plenderleseen,
Kühtai, TN, and 2,470 m a.s.l., Peischlertörl,
TE. IT: 1,850 – 2,100 m a.s.l., above Alpe
Bouc, Gran Paradiso National Park, Aosta,
and 1,200 m a.s.l., Brixen, TS. CH: 194 –
2,530 m a.s.l.; FR: 2,491 m, Tignes, Savoy.

Conocephalum conicum (L.) DUMORT.
(Conocephalaceae), Kegelkopfmoss, Great
Scented Liverwort

Not separated from *Conocephalum*
salebrosum SZWEYKOWSKI,
BUCZKOVSKA & ODRZYKOSKI.

50 squares: 1, 3, 6-8, 10, 13, 14, 16-20, 24,
26, 33, 35, 41, 86, 89, 92, 94, 99, 103, 108,
110, 112, 113, 116, 129, 132-136, 138, 139,
141, 143, 145, 149, 178, 180, 181, 186-189,
193, 195, on shaded ground and rock and
moist places, ca. 525 m a.s.l. to ca. 1,940 m

5 Results

a.s.l. (TS/IT) and ca. 1,470 m a.s.l. to ca. 1,930 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,350 m a.s.l., Leutkirchnerhütte, St. Anton, TN. IT: up to **2,930 m a.s.l.**, Lancebranlette, Aosta. CH: 270 – 2,620 m a.s.l.; FR: 1,780 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: NT – near threatened (IT).

Conostomum tetragonum (HEDW.)

LINDB. (Bartramiaceae), Kegelmundmoos, Helmet-moss

19 squares: 23, 58, 63, 67, 68, 70-73, 76, 80, 83, 91, 127, 166, 168, 169, 185, 200, highest altitude in square 63 (TN/AT, TS/IT), on ground, **ca. 3,050 m a.s.l.**, lowest at 1,980 – 2,050 m a.s.l. (TS/IT) and 1,790 – 1,830 m a.s.l. (TN/AT).

AT: a range of 1,800 – 2,808 m a.s.l. with the upper limit at Schartlkopf, Nauders, TN and a further limit of 2,700 m a.s.l., Möserlingwand, TE. IT: a range of 1,500 – 3,000 m a.s.l. in Trentino, with the uppermost from Campisol in Val di Rabbi, and 2,996 m a.s.l., Schafkopf, Graun, TS. CH: 1,600 m a.s.l. to 2,750 – 2,850 m a.s.l.; FR: 2,620 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: NT – potentially endangered (CH), AR – at risk (FR).

Coscinodon cribrosus (HEDW.) SPRUCE

(Grimmiaceae), Siebzahnmoos, Sieve-tooth Moss

In 34 squares: 1, 17, 18, 20, 23, 24, 32, 41, 54, 62-66, 81, 95, 104-107, 109-112, 116, 117, 138, 157, 159, 161, 172, 185, 190, 193, usually on rock or on gravel on rock. Highest

altitude measured in square 62 (TN/AT, TS/IT), on gravel, 3,242 m a.s.l., lowest measured are ca. 525 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,520 m a.s.l.**, Ramolkogel above Obergurgl, TN, and a further limit at 2,300 m a.s.l., Schleinitz, TE. IT: up to 3,259 m a.s.l., Punta di Leppe, Aosta, and 2,700 m a.s.l., Mathaunkopf, Graun, TS. In CH from 200 to 3,500 m a.s.l., the upper limit at Jungfrauojoch. FR: 2,400 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Cratoneuron flicinum (HEDW.) SPRUCE

(Amblystegiaceae), Farnähnliches Starknervmoos, Fern-leaved Hook-moss

In 30 squares: 3, 4, 10, 16, 20, 24, 26, 43, 44, 49, 55, 86, 87, 94, 99, 100, 107, 112, 121, 128, 130, 138, 139, 143, 149, 162, 181, 188, 189, 195, usually on wet places, springs, river banks and wet rocks, often together with *Palustriella commutata* but not reaching the same elevation. Altitudinal ranges from ca. 560 m a.s.l. to 2,350 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to 2,412 m a.s.l. (TN/AT).

AT: maximum elevation up to ca. 3,000 m a.s.l., Ködnitztal, TE; 2,540 m a.s.l., at Großglockner and 2,800 m a.s.l., above Rotmoosferner, Ötztal, TN. IT: up to **3,400 – 3,500 m a.s.l.**, Grivola, Aosta, and 2,600 m a.s.l., Mollignon at Rosengarten, TS. CH: 200 – 2,895 m a.s.l.; FR: 2,491 m, Saint-Tibaud-de-Coux, Savoy.

Crossidium squamiferum (VIV.) JUR.
(Pottiaceae), Schuppiges Fransenmoos,
Once in east Schlanders (TS/IT), square 143,
ca. 750 – 850 m a.s.l., on dry ground.
AT: the highest occurrence at 1,330 m a.s.l.
Virgental, TE. IT: 1,630 – 1,680 m a.s.l.,
below Gimillon, Aosta, and 1,950 m a.s.l.,
Stilfserjoch, TS. CH: 370 – **2,000 m a.s.l.**;
FR: 1,181 m, Villarodin-Bourget, Savoy.
Red list status: 3 – endangered (AT), VU –
vulnerable (CH), 2 – severely endangered
(DE).

Ctenidium molluscum (HEDW.) MITT.
(Hypnaceae), Weiches Kamm-Moos,
Comb-moss
Recorded for five squares in TS/IT only,
Pfelderertal at Innerhütt (136), Pfelderertal
near Moos in Passeier (141), Vinschgau near
Partschins (178), Obertalmühle (181) and
near Villnoder village (195), always on rock
(lime?) in an altitudinal range from ca. 660 m
a.s.l. to 1,510 m a.s.l.
AT: a maximum elevation of 2,530 m a.s.l.
with further limits of 2,500 m a.s.l., Gidergitz,
Brenner, TN, and 2,400 m a.s.l., Teischnitz,
TE. IT: up to 2,600 – **2,845 m a.s.l.**, near Lago
Miserin, Aosta and 2,270 m a.s.l., Ornella-
tal, TS. CH: 200 – 2,770 m a.s.l.; FR: 1,650 m
a.s.l., Tignes, Savoy.
Red list status: V – decreasing (DE).

Cynodontium polycarpon (HEDW.)
SCHIMP. (Rhabdoweisiaceae), Vielfrüchtiges
Hundszahnmoos, Many-fruited Dog-tooth
41 squares: 5, 9, 12, 13, 15-17, 20, 21, 24, 26,
28, 33, 34, 37, 40, 42-44, 50, 52, 54, 77, 81,

85, 86, 90, 91, 111, 112, 114, 128, 135, 139,
151, 159, 160, 171, 184, 185, 192, usually
on rock, sometimes on ground, within range
550 m a.s.l. to 2,200 m a.s.l. (TS/IT) and ca.
1,770 m a.s.l. to 2,223 m a.s.l. (TN/AT).
AT: an elevation limit of 2,650 m a.s.l., Tar-
ntaler Köpfe, TN. IT: up to 2,960 m a.s.l.,
Mont du Mort, Aosta, and 1,140 m a.s.l.,
Primör, Val di Fassa, Trentino. CH: 200 m
a.s.l. to **3,260 m a.s.l.**, Piz Languard. FR:
1,659 m a.s.l., Tignes, Savoy.
Red list status: V – decreasing (DE).

Cynodontium strumiferum (HEDW.)
LINDB. (Rhabdoweisiaceae), Kropfiges
Hundszahnmoos, Strumose Dog-tooth
21 squares: 6, 7, 15, 17, 22-26, 40, 42, 48,
51, 52, 83, 99, 114, 115, 159, 170, 185, usu-
ally on rock, occasionally on ground, within
the elevation extension of ca. 790 m a.s.l. to
2,550 m a.s.l. (TS/IT) and ca. 1,525 m a.s.l.
to **2,800 m** (TN/AT).
AT: a maximum elevation of 2,500 m a.s.l.,
Matrei i.O., TE. IT: 1,870 – 1,940 m a.s.l.,
Piano di Eugio, Piedmont, and 2,600 m a.s.l.,
Schneeberg in Passeier, TS. Scattered in CH,
from 410 m a.s.l. to 2,740 m a.s.l.; FR: 1,743 m
a.s.l., Bourg-Saint-Maurice, Savoy.
Red list status: r: 3 – locally endangered (AT),
V – decreasing (DE).

Dichodontium palustre (DICKS.)
M. STECH; Syn.: *Dicranella palustris*
(DICKS.) CRUNDW. ex WARB.;
Diobelonella palustris (DICKS.)
OCHYRA (Rhabdoweisiaceae), Sparriges
Kleingabelzahnmoos, Marsh Forklet-moss

5 Results

Abundant, 55 squares: 1, 29, 31, 48, 50-53, 55, 56, 70, 71, 73-79, 81, 82, 84, 85, 87, 89, 90, 99-102, 104, 105, 107, 109, 121, 122, 128, 133, 134, 136-139, 141, 157-163, 190, 196, 198, 199, typically on wet ground, river banks, springs and mires. Within the measured altitudinal range of ca. 700 m a.s.l. to 2,610 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to 2,630 m a.s.l. (TN/AT).

AT: maximum elevations: 2,600 m a.s.l., above Peischlachtörl, TE and 1,900 – 2,200 m a.s.l., Ventertal, TN. IT: 2,200 – 2,450 m a.s.l., Meye-d'en Haut, Gran Paradiso National Park, Aosta, and 2,250 m a.s.l., Martelltal, TS. CH: 400 m a.s.l. to **2,900 m a.s.l.**; FR: 2,650 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: r: 3 – locally endangered (AT), 3 – endangered (DE).

Dichodontium pellucidum (HEDW.)

SCHIMP. (Rhabdoweisiaceae), Durchsichtiges Paarzahnmoos, Translucent Forklet-moss. Important characters for the distinction from the very similar *D. flavescens* (Dicks.) Lindb. are discussed in Werner (2002).

Only in four squares in TS/IT, near Kurzras village (49), bog, 1,920–2,020 m a.s.l., Pfelderertal at Pfelders village (132, 133), wet ground and river bank, 1,630 – 1,940 m a.s.l. and Pfelderertal near Moos in Passeier (141), wet rock, 980 – 1,026 m a.s.l.

AT: the elevation limit 2,640 m a.s.l., Riepen spitze, TN. IT: 2,928 m a.s.l., Lancebranlette, Aosta. CH: 200 – 2,680 m a.s.l.; FR: **3,100 m a.s.l.**, Bonneval-sur-Arc, Savoy.

Red list status: V – decreasing (DE).

Dicranella crispa (HEDW.) SCHIMP.;

Syn.: *Anisothecium vaginale* (DICKS.)

LOESKE (Dicranaceae), Gekräuselttes Kleingabelzahnmoos, Forklet-moss

Only four occurrences: square 25 (TS/IT), near Karthaus village, ground, 1,485 m a.s.l., square 89 (TN/AT), Ventertal at Koner Rinne, ground, ca. 1,840 – 1,860 m a.s.l., and in lower Schlandrauntal (TS/IT), squares 150 and 151, from ca. 1,483 to 1,823 m a.s.l.

AT: a maximum elevation of 1,800 m a.s.l., St. Anton, TN. IT: between Cogne and Lillaz, 1,560 – 1,600 m a.s.l., Aosta. Rare in CH, lowest site at 826 m a.s.l., highest at **2,641 m a.s.l.**

Red list status: 4 – potentially endangered (AT), 3 – endangered (DE).

Dicranella grevilleana (BRID.) SCHIMP.

(Dicranaceae), Greville-Kleingabelzahnmoos, Greville Forklet-moss

Only in five squares in TS/IT, squares 20, Brughhof, ground, 1,299 m a.s.l.; 21, Klosteralm, road bank, ca. 1,500 – 1,980 m a.s.l.; 23, Klosteralm, ground, ca. 2,240 – 2,550 m a.s.l.; 135, Pfelderertal at Krößbichl, rock, ca. 1,565 m a.s.l.; 185, Kreuztal, ground, 1,980 – 2,050 m a.s.l.

AT: a maximum elevation of 2,600 m a.s.l., Galtür, St. Anton, TN, a further limit is 2,400 m a.s.l., Mullwitzkees, TE. IT: in a range of 1,000 – 2,500 m a.s.l. in Trentino, and 2,050 – 2,500 m a.s.l., Lauson valley, Aosta. CH: 280 – **2,680 m a.s.l.**; FR: 2,500 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: EN – endangered (CH), AR – at risk (FR).

Dicranella heteromalla (HEDW.) SCHIMP.

(Dicranaceae), Einseitswendiges Kleingabelzahnmoos, Silky Forklet-moss

In 13 squares: 1, 6-8, 26, 53, 135, 183, 188-192, usually on ground on open soil, occasionally on rotten wood, in an altitudinal range of ca. 650 m a.s.l. to 2,210 m a.s.l.

AT: a maximum elevation of 2,280 m a.s.l. with a further limit of 700 – 2,200 m a.s.l., between Sill river and Wattens village, TN. IT: 1,170 – 1,310 m a.s.l., between Forzo and Gran Trasi, Piedmont, and 1,250 m a.s.l., Niederdorf, TS. CH: 200 m a.s.l. – **2,761 m a.s.l.**; FR: 1,701 m, Beaufort-sur-Doron, Savoy.

Dicranella subulata (HEDW.) SCHIMP.;

Syn.: *D. curvata* (HEDW.) SCHIMP.; *D.*

secunda LINDB. (Dicranaceae), Pfriemenblättriges Kleingabelzahnmoos, Forklet-moss
25 squares: 29, 32, 44, 52, 55, 59, 70, 71, 73, 81, 82, 84, 114, 126-128, 137, 139, 166, 171, 178, 179, 194, 196, 198, on ground, in altitudinal ranges of ca. 570 m a.s.l. to 2,571 m a.s.l. (TS/IT) and 1,895 m a.s.l. to 2,660 m a.s.l. (TN/AT).

AT: maximum elevations of **3,000 m a.s.l.**, Zischgeles at Praxmar, TN, 2,700 m a.s.l., trail to Ramolhütte, Obergurgl, and 2,470 m a.s.l., Peischlerpaß, TE. IT: up to 2,928 m a.s.l., Picolo S. Bernardo, Aosta, 2,000 – 2,150 m a.s.l., Mt. Arzola, Piedmont, and 2,180 m a.s.l., Spitzhörndl, TS. CH: 100 m a.s.l. to 2,750 m a.s.l.; FR: 2,300 m a.s.l., Macot-la-Plagne, Savoy.

Red list status: V – decreasing (DE).

Dicranella varia (HEDW.) SCHIMP.

(Dicranaceae), Rotes Kleingabelzahnmoos, Variable Forklet-moss

Only twice in TS/IT: 130 and 132, in Pfelderertal, Pfelderer Alm and at Pfelders village, on wet ground and on rock, ca. 1,630 – 1,820 m a.s.l.

AT: highest altitude 2,030 m a.s.l., Kopftörl, TN. IT: 1,800 – 1,920 m a.s.l., Rhemes-Notre Dame, Aosta, and 1,820 m a.s.l., ascend to Sasso di Formin, Trentino. CH: 196 – **2,620 m a.s.l.**; FR: 1,840 m a.s.l., Bellentre, Savoy.

Dicranodontium denudatum (BRID.)

BRITT. (Leucobryaceae), Bruchblattmoos, Beaked Bow-moss

26 squares: 13, 21, 24, 26, 29, 33, 37, 38, 47, 54, 81, 86, 90, 91, 94, 107, 114, 133, 136, 137, 139, 157, 171, 185, 190, 195, on rotten wood, rock and ground, within elevations of ca. 690 m a.s.l. to ca. 2,400 m a.s.l. (TS/IT) and ca. 1,699 m a.s.l. to 2,050 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,330 m a.s.l. with additional limits of 2,200 m a.s.l., Tulfeinalpe, TN, and 2,000 m a.s.l., at Kals and Matrei i.O., TE. IT: 1,870 – 1,940 m a.s.l., Piano di Eugio, Gran Paradiso National Park, Piedmont, with a range of 500 – 2,000 m a.s.l. in Trentino, and 1,250 m a.s.l., Ahrntal, TS. CH: 270 m a.s.l. to **2,640 m a.s.l.**; FR: 2,200 m a.s.l., Lanslebourg-Mont-Cenis, Savoy. Red list status: V – decreasing (DE).

5 Results

Dicranodontium uncinatum (HARV.) A. JAEGER (Leucobryaceae), Sichelblatt-Zweizinkenmoos, Curve-leaved Bow-moss
Once near Pfelders (TS/IT), square 134, 1,570 – 1,610 m a.s.l., on rock.
AT: an altitudinal range of ca. 1,150 – 2,400 m a.s.l. with further altitudinal limits of 2,000 m a.s.l., Rennalpe, St. Anton, TN, and **2,400 m a.s.l.**, Peischlachtörl above Kals, TE. In IT recorded from 1,700 m a.s.l., Lazzacher valley near Sterzing, TS. CH: 1,100 – 2,080 m a.s.l.
Red list status: 4 – potentially endangered (AT), CR – threatened from extinction (CH).

Dicranoweisia crispula (HEDW.) MILDE; Syn.: *Hymenoloma crispulum* (HEDW.) OCHYRA (Rhabdoweisiaceae), Kräusliges Gabelzahnperlmoos, Mountain Pincushion
Very abundant, 111 squares: 17, 22-38, 40, 42, 45-50, 52-54, 57, 60, 67, 70, 71, 73-78, 80-84, 86-99, 101-109, 114-116, 119-122, 124-129, 131-137, 148-152, 154, 157, 159, 160, 165-167, 169-171, 173, 174, 178, 184, 185, 190, 196, 198, typically on rock. Within the altitudinal ranges of ca. 700 m a.s.l. to 2,880 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to 2,788 m a.s.l. (TN/AT).
AT: maximum elevations 3,798 m a.s.l. at Großglockner, TE, and 3,739 m a.s.l., summit of Weisskugel, TN. IT: up to **3,800 m a.s.l.**, Monte Rosa, Aosta and 3,200 m a.s.l., Schöntaufspitze, Sulden, TS. CH: 377 m a.s.l. to 3,460 m a.s.l., the latter at Piz Corvatsch, Rhaetic Mountains. FR: 2,650 m a.s.l., Bonneval-sur-Arc, Savoy.
Red list status: V – decreasing (DE).

Dicranum bonjeanii DE NOT.; Syn.: *D. palustre* BRUCH & SCHIMP; *D. undulatum* TURNER (Dicranaceae), Sumpf-Gabelzahnmoos, Crisped Fork-moss
34 squares: 22, 23, 26, 31, 49, 52, 53, 56, 69, 70, 71, 73, 77, 82, 89, 104, 107, 114, 121, 127, 128, 130-133, 158-160, 162, 163, 170, 197-199, often on wet ground in bogs but also in alpine heath, within altitudinal ranges of ca. 1,395 m a.s.l. to ca. 2,550 m a.s.l. (TS/IT) and ca. 1,780 m a.s.l. to 2,788 m a.s.l. (TN/AT).
AT: a maximum elevation of 2,700 m a.s.l. Zirmeggenkar near Obergurgl, TN, is given with a further elevation limit of 2,340 m a.s.l., Teischnitz, TE. IT: 2,580 – 2,680 m a.s.l., Lauson valley, Gran Paradiso National Park, Aosta, and 1,400 – 1,690 m a.s.l., Ampezzo, Trentino. CH: 260 m a.s.l. to **2,890 m a.s.l.**; FR: 2,446 m a.s.l., Tignes, Savoy.
Red list status: 3 – endangered (AT), 3 – endangered (DE).

Dicranum elongatum SCHWÄGR.; Syn.: *D. sendtneri* LIMPR. (Dicranaceae), Verlängertes Gabelzahnmoos, Fork-moss
Only twice in TN/AT: squares 159, Rofental, rock, ca. 2,100 – 2,200 m a.s.l. and 167, Tiefenbach, ground, ca. 2,550 – 2,660 m a.s.l.
AT: in an altitudinal range of 800 – 3,000 m a.s.l., with further altitudinal limits of 3,000 m a.s.l., Hohe Geige, Pitztal, TN, and 2,800 m a.s.l., Hohe Tauern, TE. IT: in a range of 1,200 – **3,200 m a.s.l.** in Trentino. Only recorded for Trentino-Alto Adige before 1950. CH: 1,020 – 2,908 m a.s.l.; FR: 2,850 m a.s.l., Pralognan-la-Vanoise, Savoy.

Dicranum fuscescens SM. (Dicranaceae),
Braunes Gabelzahnmoos, Dusky Fork-moss
Once between Gaislachalm and Silberbergalm
(TN/AT), Square 104, in a spruce (*Picea abies*)
and larch (*Larix decidua*) woodland on ground/
soil, 1,900 – 1,980 m a.s.l.

AT: maximum elevations of 2,700 m a.s.l.,
Brunnenkogel at Sölden and Ramol trail,
Oberurgl, TN and 2,900 m a.s.l., Glatzberg
near Kals, TE. IT: up to **2,900 – 2,950 m a.s.l.**,
Monte Aemilius, Aosta, in a range up to
2,500 m a.s.l. in Trentino, and 2,100 m a.s.l.,
Spitzhörndl, Bruneck, TS. CH: 350 m a.s.l. to
2,840 m a.s.l.; FR: 2,000 m a.s.l., Beaufort-sur-
Doron, Savoy.

Red list status: V – decreasing (DE).

Dicranum majus SM. (Dicranaceae),

Großes Gabelzahnmoos, Greater Fork-moss
In seven squares: 6, 22, 85, 90, 94, 105, 184,
usually on ground, ca. 790 m a.s.l. to 2,300 m
a.s.l. (TS/IT) and ca. 1,470 m a.s.l. to 2,040 m
a.s.l. (TN/AT).

AT: a maximum elevation of 1,740 m a.s.l.,
Griesberg, TN, is given. IT: 1,580 m a.s.l.,
Brenner, TS. Recently reported from the IT
region Friuli-Venezia Giulia, in an altitudinal
range of 950 – 1,600 m a.s.l. CH: 304 m a.s.l.
to **2,600 m a.s.l.**; FR: 800 m a.s.l., Arvillard,
Savoy.

Red list status: 3 – endangered (AT), V – de-
creasing (DE), AR – at risk (FR).

Dicranum montanum HEDW.;

Syn.: *Orthodicranum montanum* (HEDW.)
LOESKE (Dicranaceae), Berg-Gabelzahn-
moos, Mountain Fork-moss

In 40 squares: 1, 6, 12, 13, 15-18, 20, 21, 24,
26, 33-36, 40, 46, 49, 50, 55, 56, 86, 98, 107,
108, 110, 111, 114, 118, 136, 137, 139, 147,
171 186-190, on bark of coniferous trees and
on, rotten wood, within altitudinal ranges of ca.
700 m a.s.l. to ca. 2,200 m a.s.l. (TS/IT) and
ca. 1,470 m a.s.l. to ca. 1,880 m a.s.l. (TN/AT).
AT: a maximum elevation of 2,450 m a.s.l.
with further altitudinal limits of 2,100 m
a.s.l., TE (without further specification),
and 2,000 m a.s.l., Kühtai, TN. IT: 1,670 –
1,840 m a.s.l., at Rif. Alpinisti Chiavassesi,
Gran Paradiso National Park, 2,200 m a.s.l.,
Ampezzo, Trentino, and 1,460 – 2,000 m a.s.l.,
Goldrainer-Alpe, Martelltal, TS. CH: 200 m
a.s.l. to **2,690 m a.s.l.**; DE: highest altitude
1,950 m a.s.l., Bavaria. FR: 1,485 m a.s.l.,
Beaufort-sur-Doron, Savoy.

Dicranum muehlenbeckii BRUCH &
SCHIMP. (Dicranaceae),

Weißfilziges Gabelzahnmoos, Fork-moss
18 squares: 17, 45, 52, 54, 58, 59, 61, 64,
70, 71, 81, 83, 119, 154, 163, 168-170, on
ground, within altitudinal ranges of ca. 980 m
a.s.l. to 2,680 m a.s.l. (TS/IT) and ca. 1,900 m
a.s.l. to 2,788 m a.s.l. (TN/AT).

AT: maximum elevations are 2,800 m a.s.l.,
Kraxentrager near Brenner, TN, and ca. 2,200
– 2,730 m a.s.l., Möserlingwand, TE; var.
neglectum (DE NOT.) PFEFF. up to **3,000 m**
a.s.l., Ölgrubenjoch, Pitztal, TN. IT: 2,712 –
2,730 m a.s.l. (var. *neglectum*), Gran Paradiso
National Park, and 2,270 – 2,400 m a.s.l.,
Ornellatal, TS. CH: 450 – 2,800 m a.s.l.

Red list status: 3 – endangered (AT), 2 –
severely endangered (DE).

5 Results

Dicranum polysetum SW.;

Syn.: *D. rugosum* BRID.; *D. undulatum* EHRH. (Dicranaceae), Gewelltblättriges Gabelzahnmoos, Rugose Fork-moss
In 29 squares: 22, 29, 36, 40, 57, 76, 81, 84, 90, 93, 102, 104, 114, 122, 128, 129, 131, 134, 141, 159, 160, 172, 174, 183, 186-189, 198, on ground, in altitudinal ranges from ca. 650 m a.s.l. to ca. **2,350 – 2,610 m a.s.l.** (TS/IT) and ca. 1,590 m a.s.l. to ca. 2,220 m a.s.l. (TN/AT).
AT: a maximum elevation of 2,300 m a.s.l. Rotmoostal near Obergurgl, TN, is given with an additional record of 1,700 m a.s.l., Kals, TE. CH: 400 m a.s.l. to 2,000 m a.s.l. In DE highest altitude 2,200 m a.s.l., Berchtesgaden in Oberbayern, Bavaria. FR: 2,200 m a.s.l., Peisey-Nancroix, Savoy.

Dicranum scoparium HEDW. (Dicranaceae), Besen-Gabelzahnmoos, Broom Fork-moss
Very abundant, 156 squares: 1, 6, 7, 9-61, 64, 70-84, 86-111, 114-116, 118-122, 127-131, 134-137, 139, 140, 142, 149-155, 157-163, 165-174, 178, 179, 181, 184-187, 190-192, 194-196, 198, on rock and on ground, occasionally on bark, ranges of ca. 570 to 2,700 m a.s.l. (TS/IT) and ca. 1,450 to ca. 2,844 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,800 m a.s.l., Schartlkopf, Nauders, TN, is given with a further elevation limit of 2,600 m a.s.l., Hohe Tauern, TE. IT: up to 2,960 m a.s.l., Mont Mort, Aosta, and **3,010 m a.s.l.**, Nockspitze, Langtaufers, TS. CH: 200 m a.s.l. to 2,800 – 2,850 m a.s.l.; FR: 2,200 m a.s.l., Modane, Savoy.

Dicranum undulatum SCHRAD. ex BRID.;

Syn.: *D. bergeri* BLAND. (Dicranaceae), Moor-Gabelzahnmoos, Waved Fork-moss
Once in a flush in Niedertal (TN/AT), square 79, ca. 2,050 – 2,110 m a.s.l.
AT: a maximum elevation of 2,600 m a.s.l., Galtür, TN, with further altitudinal limits of 2,210 m a.s.l., Steinacherjoch, TN and 2,300 m a.s.l., Neualpl-See, TE. IT: **2,800 m a.s.l.**, Cima di Campisol, Trentino. CH: 260 – 2,066 m a.s.l.; FR: 2,700 m a.s.l., Tignes, Savoy.
Red list status: r: 3 – locally endangered (AT), NT – potentially endangered (CH), 2 – severely endangered (DE).

Didymodon acutus (BRID.) K. SAITO;

Syn.: *Barbula acuta* (BRID.) BRID. (Pottiaceae), Spitzblättriges Doppelzahnmoos, Pointed Beard-moss
One record, TS/IT, square 135, Pfelderertal at Krößbichl, in a rock crevice at the river, ca. 1,550 – 1,565 m a.s.l.
AT: a maximum elevation of 1,329 m a.s.l., Riederkogel, TN, is given with a further elevation limit of 1,000 m a.s.l., Matrei i. O., TE. IT: 2,270 m a.s.l., Ornella, Trentino, and 1,700 m a.s.l., Penegal near Bozen, TS. CH: 220 m a.s.l. to **2,548 – 2,850 m a.s.l.**; FR: 1,220 m a.s.l., Villa-Rodon-Bourget, Savoy.
Red list status: 3 – endangered (AT, DE).

Didymodon fallax (HEDW.) ZANDER;

Syn.: *Barbula fallax* HEDW.; *B. adriatica* BAUMGARTNER (Pottiaceae), Täuschendes Doppelzahnmoos, False Beard-moss

Only in four squares in TS/IT: 5, track to Castle Juval, ground, 550 m a.s.l.; 8, Tschars, Schnalswaal track, orchard, 650 m a.s.l.; 181, Obertalmühle, river bank, ca. 660 m a.s.l.; 191, Pfunderer mine spoil, ground, ca. 970 – 1,010 m a.s.l.

AT: a maximum elevation of 2,275 m a.s.l., Hafelekar, TN. IT: 2,300 – 2,670 m a.s.l., Laghi Miserino, Aosta, and 2,500 m a.s.l., Monte Cavalazzo, Trentino. CH: 194 m a.s.l. to **2,750 m a.s.l.**; FR: 2,200 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Didymodon ferrugineus (SCHIMP.) M. HILL; Syn.: *Barbula reflexa* (BRID.) BRID. (Pottiaceae), Zurückgekrümmtes Doppelzahnmoos, Rusty Beard-moss

Only in six squares in TS/IT: 7, track from Juval to Schlossalm, dry waal, 780 – 820 m a.s.l.; 8, Tschars, Schnalswaal track, dry waal, 650 – 780 m a.s.l.; 58, Tisental, rock, 2,030 – 2,310 m a.s.l.; 134, at Pfelders village, rock, 1,570 – 1,610 m a.s.l.; 143, near Schlanders village, rock, ca. 750 – 850 m a.s.l.; 181 Obertalmühle, river bank, ca. 660 m a.s.l.

AT: a maximum elevation of 3,400 m a.s.l. is given with a further elevation limit of 2,220 m a.s.l., Sonnwendjoch, TN. IT: up to 2,800 m a.s.l., Col di Plan, Aosta, and 2,340 m a.s.l., Ornella, Trentino. CH: 250 – **3,600 m a.s.l.**, with the upper limit at Combin de Corbassieres. FR: 3,450 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: V – decreasing (DE).

Didymodon luridus HORNSCH.; Syn.: *Barbula lurida* HORNSCH. (Pottiaceae), Bräunliches Doppelzahnmoos, Dusky Beard-moss

Three times: 17 (TS/IT), Katharinaberg, ground, 980 – 1,245 m a.s.l.; 123 (TS/IT), Pfoßental towards Stettiner Hütte, rock, 2,610 – 2,630 m a.s.l.; 166 (TN/AT), Tiefenbach Panoramatrack, ground, 2,550 – 2,660 m a.s.l.

AT: highest record at ca. 650 m a.s.l., Schwaz, TN. IT: 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Aosta, and 1,700 m a.s.l., Penegal near Bozen, TS. CH: 255 – **2,780 m a.s.l.**; FR: 600 m a.s.l., Apremont, Savoy. Red list status: 3 – endangered (AT).

Didymodon rigidulus HEDW.; Syn.: *Barbula rigidula* (HEDW.) MILDE; *Didymodon mamillosus* (CRUNDW.) M. HILL (Pottiaceae), Steifes Doppelzahnmoos, Rigid Beard-moss

Only in three squares in TS/IT: 127, Pfelderertal below Labkofel, ground, 2,080 – 2,400 m a.s.l.; 149, lower Schlandrauntal, ground, 1,353 – 1,483 m a.s.l.; 191, Pfunderer mine spoil, ground, 970 – 1,010 m a.s.l.

AT: a maximum elevation of 2,960 m a.s.l. with further altitudinal limits of 2,150 m a.s.l., below Leutkirchner Hütte, St. Anton, TN, and ca. 2,100 m a.s.l., Ködnitztal, TE. IT: up to 2,900 – 2,930 m a.s.l., Col de l'Arietta, Aosta, and 1,950 m a.s.l., Ornella valley, Trentino. CH: 200 m a.s.l. to **3,547 m a.s.l.**; FR: 2,800 m a.s.l., Maurienne, Savoy.

5 Results

Diphyscium foliosum (HEDW.) MOHR (Buxbaumiaceae), Blasenmoos, Nut-moss
15 squares: 26, 45, 54, 58, 73, 105, 122, 131, 132, 136, 160, 165, 185, 190, 196, on ground and track banks, within altitudinal ranges of ca. 1,425 m a.s.l. to 2,610 m a.s.l. (TS/IT) and ca. 1,470 m a.s.l. to **2,844 m a.s.l.** (TN/AT) AT: a maximum elevation of 2,700 m a.s.l., Kraspestal, TN with a further elevation limit of 2,600 – 2,700 m a.s.l., ascend to Bergertörl near Kals, TE. IT: 2,423 – 2,670 m a.s.l., Lago di Motta, Piedmont, and > 650 m a.s.l., Vellauer-Tal, TS. CH: 200 m a.s.l. to 2,822 m a.s.l.; FR: 2,700 m a.s.l., Termignon, Savoy. Red list status: V – decreasing (DE).

Diplophyllum albicans (L.) DUMORT. (Scapaniaceae), Hellstreifiges Doppelblattmoos, White Earwort
10 squares: 22, 26, 38, 82, 91, 97, 107, 135, 136, 139, on rock, rotten wood and ground/soil, within altitudinal ranges of ca. 1,310 – 2,300 m a.s.l. (TS/IT) and ca. 1,600 – 2,100 m a.s.l. (TN/AT). AT: a maximum elevation of 2,840 m a.s.l., Schönliesens, TN, and up to **3,000 m a.s.l.**, near Lienz, TE. IT: 1,950 m a.s.l., Gran Paradiso National Park, and in a range of 500 – 2,500 m a.s.l. in Trentino. CH: up to 2,750 m a.s.l.; FR: 1,600 m a.s.l., Peisey-Nancroix, Savoy. Red list status: NT – near threatened (IT).

Diplophyllum obtusifolium (HOOK.) DUMORT. (Scapaniaceae), Stumpflappiges Doppelblattmoos, Blunt-leaved Earwort

In five squares: 26 (TS/IT), Penaudtal, track bank, 1,611 m a.s.l.; 89 (TN/AT), Ventertal at Koner Rinne, ground, ca. 1,840 – 1,860 m a.s.l.; 134 (TS/IT), at Pfelders village, rock, 1,570 – 1,610 m a.s.l.; 160 (TN/AT), Rofental, rock, 2,130 – 2,160 m a.s.l.; 185 (TS/IT), Kreuztal, rock, 1,980 – 2,050 m a.s.l. AT: maximum elevations 2,550 m a.s.l., near Chemnitzerhütte, TN, and 2,500 m a.s.l., Schleinitz, TE. IT: 2,550 – 2,630 m a.s.l., Vallone des Eaux-Rousses, Gran Paradiso National Park. CH: 200 m a.s.l. to **2,660 m a.s.l.**; FR: 2,400 m a.s.l., Cevins, Savoy. Red list status: NT – near threatened (IT), not endangered in CH according to the Swiss Online Flora, but presented as threatened in Itten (2002), V – decreasing (DE).

Diplophyllum taxifolium (WAHLENB.) DUMORT. (Scapaniaceae), Gebirgs-Doppelblattmoos. Alpine Earwort.
Abundant, 50 squares: 15, 22, 23, 25, 26, 29, 31, 35, 38, 42, 45-47, 50, 54, 55, 58, 60, 63, 64, 70, 71, 73, 81-83, 86, 91, 92, 94, 102, 103, 107, 124, 127, 128, 130-132, 134, 136, 137, 139, 157, 159, 160, 166, 169, 185, 198, typically on rock, in crevices. Reaching the highest measured point in square 63 (TN/AT, TS/IT), rock crevices, 3,019 m a.s.l., lowest records: ca. 1,310 m a.s.l. (TS/IT) and ca. 1,690 m a.s.l. (TN/AT). AT: an altitudinal range of ca. 1,100 – **3,230 m a.s.l.** with the upper limit at Hochfirst, TN, and a further record of 1,600 – 2,000 m a.s.l., Zunigalpe at Matrei i. O., TE. IT: 2,423 – 2,470 m a.s.l., at Lago Nero, Piedmont, and

2,550 m a.s.l., Wormser Joch, TS. CH: 220 m a.s.l. to 3,030 m a.s.l.; FR: 2,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: NT – near threatened (IT).

Distichium capillaceum (HEDW.)

BRUCH & SCHIMP. (Distichiaceae), Berg-Zweizeilmoos, Fine Distichium

This and the following species may be difficult to distinguish if no sporophytes are present, but Maier (1998) summarizes good vegetative and generative morphological characters that allow the determination of these closely related species even if no properly developed capsules are present.

Abundant, 64 squares: 34, 42, 44, 48, 51, 54, 56-58, 63, 70, 73-76, 80-90, 92, 95-97, 102, 103, 105-109, 111-113, 116, 121-123, 125-127, 129-132, 134, 138, 145, 149, 158, 160-162, 165, 166, 174, 185, 198, typically on rock, sometimes on ground, highest occurrence on square 63 (TN/AT, TS/IT), rock crevices, 3,019 m a.s.l.; lowest occurrences ca. 805 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,210 m a.s.l., between Liebenerspitze and Heuflerkogel, TN, with a further limit of 2,900 m a.s.l., Kals-Matreier Törl, TE. IT: up to **3,700 – 3,800 m a.s.l.**, Grivola, Aosta and 3,010 m a.s.l., Nockspitze, Langtaufers, TS. CH: 240 – 3,700 m a.s.l., the upper limit at Cima di Gargo. FR: 3,429 m a.s.l., Bonneval-sur-Arc, Savoy. Red list status: V – decreasing (DE).

Distichium inclinatum (HEDW.) BRUCH & SCHIMP. (Distichiaceae), Geneigtfrüchtiges Zweizeilmoos, Inclined Distichium

In five squares: 24 (TS/IT), at Karthaus village, rock, 1,160 – 1,320 m a.s.l.; 92 (TN/AT), Ventertal near Winterstall, rock, 1,726 – 1,750 m a.s.l.; 95 (TN/AT), Ventertal near Heiligkreuz, rock, 1,700 – 1,750 m a.s.l.; 166 (TN/AT), Tiefental, rock, 2,550 – 2,660 m a.s.l.; 185 (TS/IT), Kreuztal, rock, 1,980 – 2,050 m a.s.l.

AT: a maximum elevation of 2,600 – 2,900 m a.s.l., Grauer Kees, TE with a further limit of 2,500 m a.s.l., Wolfendorn, Brenner, TN. IT: up to 3,317 m a.s.l., Grauhaupt or Corno Bianco, Aosta, in a range of 700 – 3,000 m a.s.l. in Trentino, and 2,561 m, Schlern summit, TS. CH: 590 – 3,300 m a.s.l.; FR: 2,500 m a.s.l., Tignes, Savoy. The highest altitude given in literature is **3,800 m a.s.l.**, Alps, with no further indication.

Red list status: V – decreasing (DE).

Ditrichum cylindricum (HEDW.) GROUT;

Syn.: *Trichodon cylindricum* (HEDW.)

SCHIMP. (Ditrichaceae), Zylindrischfrüchtiges Doppelhaarmoos, Cylindric fruited Ditrichum

Once in square 137, TS/IT, Pfelderertal at Außerhütt, on ground, ca. 1,460 – 1,500 m a.s.l.

AT: recorded up to 2,200 m a.s.l., above Nickalpe, Kals, TE with a further elevation limit of 1,650 m a.s.l., Ötztal, TN. IT: 1,800 – 1,920 m a.s.l., Rhemes-Notre Dame, Gran Paradiso National Park, Aosta and in a range of 450 – 1,800 m a.s.l. in Trentino. CH: 196 m

5 Results

a.s.l. to **2,300 m a.s.l.**; FR: 2,000 m a.s.l., Bramans, Savoy.

Ditrichum flexicaule (SCHWAEGR.)

HAMPE (Ditrichaceae), Verbogenstieliges Doppelhaarmoos, Bendy Ditrichum

31 squares: 5, 18, 20, 24, 29, 37, 42, 45, 64, 81, 84, 87, 96, 105, 107, 119, 127, 129, 132, 134, 135, 149, 173, 174, 178, 181, 185, 190, 194, 195, 198, usually on rock, occasionally on ground or on walls, altitudinal ranges: ca. 550 m a.s.l. to 2,535 m a.s.l. (TS/IT) and ca. 1,470 m a.s.l. to 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,020 m a.s.l., between Festkogel and Granatenkogel, TN, with further altitudinal limits of ca. 3,000 m a.s.l., Ködnitztal and 2,925 m a.s.l., Hohe Tauern, both TE. IT: up to **3,400 – 3,800 m a.s.l.**, Grivola, Aosta; 2,750 m a.s.l., Faloria, Trentino, and 2,500 – 2,600 m a.s.l., Schlern, TS. CH: 277 – 3,600 m a.s.l., the latter at Combin de Corbassieres. FR: 2,000 m a.s.l., Saint-Sorlin-D'Arves, Savoy.

Red list status: V – decreasing (DE).

Ditrichum heteromallum (SCHIMP.)

BRITT.; Syn.: *D. homomallum* (HEDW.)

HAMPE (Ditrichaceae), Einseitswendiges

Doppelhaarmoos, Curve-leaved Ditrichum

Seven squares: 21, 26, 104, 116, 161, 180, 190, on rock, ground and track bank, ca. 800 m a.s.l. to ca. 1,980 m a.s.l. (TS/IT) and ca. 1,900 m a.s.l. to ca. 2,290 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,860 m a.s.l. is given with further altitudinal limits of 2,600 m a.s.l., Wurmbachtal, TN, and 2,010 m a.s.l., Felbertauern, TE. IT: 1,650 – 1,680 m

a.s.l., near Eaux-Rousses, Aosta, and 1,330 m a.s.l., Val Sadole, Trentino. CH: 300 – **2,900 m a.s.l.**; FR: 2,450 m a.s.l., Bramans, Savoy.

Red list status: V – decreasing (DE).

Encalypta affinis HEDW. (Encalyptaceae),

Prächtiges Glockenhutmoos, no English name. Single record: 151 (TS/IT), lower Schlandrauntal, rock, 1,740 – 1,823 m a.s.l.

AT: an altitudinal range of 950 – 2,700 m a.s.l. is given with further altitudinal limits of 2,530 m a.s.l., Wolfendorn, Brenner, TN, and 2,400 m a.s.l., Teischnitz, TE. IT: 2,450 – 2,500 m a.s.l., Colle del Nivolet, Gran Paradiso National Park, Aosta, in a range of 1,300 – **3,000 m a.s.l.** in Val di Fassa, Trentino, and 2,700 m a.s.l., Mathaunkopf at Graun, TS. CH: 1,350 – **3,000 m a.s.l.**, few recent records (see also Bergamini et al. 2010). FR: 2,700 m a.s.l., Val-D'Isere, Savoy.

Red list status: 4 – potentially endangered (AT), CR – threatened from extinction (CH).

Encalypta alpina SM.; Syn.: *E. commutata*

B.S.G. (Encalyptaceae), Alpen-Glockenhutmoos, Alpine Extinguisher-moss

Five records: 60 (TS/IT), Tisental, rock, 2,353 – 2,400 m a.s.l.; 76 (TN/AT), Niedertal, rock, ca. 2,130 – 2,220 m a.s.l.; 120 (TS/IT), Pfoessental near Eishof, rock, 2,090 – 2,180 m a.s.l.; 126 (TS/IT), Pfelderertal below Labkofel, rock, 2,400 – 2,571 m; 127 (TS/IT), Pfelderertal below Labkofel near saddle, 2,080 – 2,400 m a.s.l. AT: a range of ca. 1,500 – 3,025 m a.s.l. is given, the upper limit from the mountain ridge Faschaunernock, Melnikalm and at Sonnblick, Carinthia, with further altitudinal limits

of 2,900 m a.s.l., Kraxentrager near Brenner, TN, and 2,920 m a.s.l. Kalser Törl, TE. IT: **3,700 m a.s.l.**, Grivola, Aosta, and 2,370 – 2,470 m a.s.l., Pordoi, Trentino. Recently confirmed for TS in Düll-Wunder (2007). CH: 360 – 3,100 m a.s.l.; FR: 2,467 m a.s.l., Valloire, Savoy.

Encalypta ciliata HEDW. (Encalyptaceae),

Wimpern-Glockenhut,

Fringed Extinguisher-moss

Abundant, 66 squares: 6, 12, 13, 15, 18, 20, 23-25, 29, 32, 33, 35, 38, 40, 42, 43, 45, 49, 50, 52, 54, 56, 57, 60, 63, 65, 73, 76, 82-89, 92, 94, 95, 102, 105-107, 109, 111-113, 116, 121, 122, 129, 134, 135, 140, 142, 144, 149, 150, 158, 161, 165, 171, 172, 184, 185, usually on rock, occasionally on ground, reaching the highest record in square 65, at Niederjochferner, rock crevices, ca. **3,150 m a.s.l.** (TN/AT, TS/IT); lowest records ca. 790 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,000 m a.s.l., Schleinitz, TE, with a further elevation limit of 2,781 m, Rosenjoch, TN. IT: up to 2,800 m a.s.l., Piedmont, and 2,430 – 2,600 m a.s.l., Padon, Trentino. CH: 400 m a.s.l. to 2,960 m a.s.l., the upper limit from Parpaner Rothorn and Piz Lagalp, Bünden. In DE up to 2,470 m a.s.l., Bavaria. FR: 3,121 m, Savoy, Bessans. Red list status: r: 3 – locally endangered (AT), 2 – severely endangered (DE).

Encalypta microstoma BALSAMO & DE

NOT. (Encalyptaceae), Kleinmündiges

Glockenhutmoos, no English Name.

Only seven squares: 23, 54, 58, 63, 83, 85,

130, mostly on rock, occasionally on ground. Highest record in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, ground, ca. 3,050 m a.s.l. (see also Dickson & Horton 2010), lowest recordings ca. 1,770 – 1,820 m a.s.l. (TS/IT) and 1,920 – 2,040 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 1,000 m a.s.l. to 2,700 – 2,800 m a.s.l. (Silvretta, Vorarlberg) with further altitudinal limits of 2,650 m a.s.l., near Fotscher Ferner TN, and 2,700 m a.s.l., ascend to Berger-törl near Kals, TE. IT: 2,530 – 2,600 m a.s.l., Alpe Peradzà, Gran Paradiso National Park, in a range of 1,500 – 2,500 m a.s.l. in Trentino, and 2,800 m a.s.l., Soyjoch in Martelltal, TS. Recently confirmed for TS, 3,050 m a.s.l., Ötztal Alps, SE facingslope behind the Similaun hütte (Dickson & Horton 2010). CH: 1,210 m a.s.l. to **3,090 m a.s.l.** (Gornergrat). In the Bavarian Alps (DE) there is but one locality, in Allgäu at 1,560 m a.s.l.; FR: 2,467 m a.s.l., Valloire, Savoy.

Encalypta rhabtocarpa SCHWAEGR.

(Encalyptaceae), Streifenfrüchtiger Glockenhut, Ribbed Extinguisher-moss

29 squares: 23, 32, 54, 57, 58, 61, 70, 83, 85, 87, 90, 94, 104, 105, 111, 117, 121, 127, 129, 130, 132, 134, 149, 155, 158-160, 162, 185, on rock; ca. 1,353 – 2,680 m a.s.l. (TS/IT) and ca. 1,470 – 2,540 m a.s.l. (TN/AT).

AT: an altitudinal range of 800 – 3,460 m a.s.l., with the upper limit at Hohe Wilde, TN; and with a further limit of 2,500 – 2,880 m a.s.l., Bretterwandkopf, TE. IT: up to **3,500 – 3,700 m a.s.l.**, Grivola, Aosta, and 2,900 m

5 Results

a.s.l., Mittereck bei St. Valentin, TS. CH: 700 – 3,050 m a.s.l.; Vaccari (1913, 1914) gives a further elevation of 3,130 m a.s.l., Piz Gallegione, CH, although according to recent measurement the peak of this mountain reaches 3,107 m a.s.l.; FR: 1,885 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.
Red list status: 3 – endangered (DE).

Encalypta streptocarpa HEDW.

(Encalyptaceae), Gedrehtfrüchtiger Glockenhut, Spiral Extinguisher-moss
30 squares: 11, 24, 42, 92, 95-97, 99, 102, 106, 108, 109, 119, 129, 130, 132, 134, 135, 139, 145, 149, 173, 174, 181, 185, 188, 189, 193, 195, 198, usually on rock, occasionally on walls; ca. 525 – 2,090 m a.s.l. (TS/IT) and ca. 1,450 – 2,100 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,760 m a.s.l., Mädälsspitze, TE with a further altitudinal range of 650 – 2,200 m a.s.l., Seefeld to Halltal, TN. IT: up to **3,040 m a.s.l.**, Col de Lores, Aosta, 2,530 – 2,600 m a.s.l., Alpe Perazda, Gran Paradiso National Park, 2,400 – 2,500 m a.s.l., Ornella valley, Trentino. CH: 200 m a.s.l. to 2,850 m a.s.l.; FR: 1,330 m a.s.l., Saint-Francois-de-Sales, Savoy.
Red list status: V – decreasing (DE).

Encalypta vulgaris HEDW. (Encalyptaceae), Gemeiner Glockenhut,

Common Extinguisher-moss
27 squares: 5, 9-11, 46, 52, 58, 59, 64, 70, 84, 87-89, 113, 115, 117, 118, 122, 145, 158, 159, 163, 173, 174, 184, 193, usually on rock, measured ca. 525 – 2,610 m a.s.l. (TS/IT) and ca. 1,830 – 2,560 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,950 m a.s.l. with further altitudinal limits of 2,500 m a.s.l., Riepenspitze, TN, and 2,800 m at Glatzberg near Kals, TE. IT: up to **3,700 – 3,920 m a.s.l.**, Grivola, Aosta, and 2,500 m a.s.l. near St. Martin in Passeier, TS. CH: 200 m a.s.l. to 3,266 m a.s.l.; FR: 2,650 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: V – decreasing (DE).

Entodon concinnus (DE NOT.) PAR.

(Entodontaceae), Schöner Zwischenzahn, Montagne's Cylinder-moss
30 squares: 5, 6, 9-11, 15-18, 24, 41, 42, 54, 105, 107, 108, 111, 112, 116, 131, 140, 143, 145, 147, 148, 172, 181, 184, 189, 195, often on dry ground, also dry stonewalls and piles, ca. 550 – 2,050 m a.s.l. (TS/IT) and ca. 1,470 – 1,850 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,600 m a.s.l., Fimberpaß, TN and at Ganimitz and Teischnitz, TE. IT: 1,650 – 1,700 m a.s.l., Degioz near Tignet, Aosta, and 2,370 – 2,470 m a.s.l., boulder scree at Pecche, Trentino. CH: 250 – **2,825 m a.s.l.**; FR: 1,000 m a.s.l., Planay, Savoy.

Red list status: V – decreasing (DE).

Eucladium verticillatum (WITH.) BRUCH & SCHIMP. (Pottiaceae), Wirteliges Schönastmoos, Whorled Tufa-moss

Only in four squares in TS/IT: 10, Innerunterstell, spring, 1,439 m a.s.l.; 141, Pfelderental near Moos in Passeier, wet rock, ca. 980 – 1,026 m a.s.l.; 143, Schlanders village, spring, ca. 750 – 850 m a.s.l.; 181, Obertalmühle, spring with lime tufa, ca. 660 m a.s.l.

AT: 1,560 (1,600) m a.s.l., at Glanz at Falkenstein, TE, with a further limit of 1,200 m a.s.l., behind Glanalpe in Vomperloch, TN. IT: 1,900 – 2,150 m a.s.l., Mt. Testa di Montzeuc, Gran Paradiso National Park, Aosta. CH: 200 m a.s.l. to **2,710 m a.s.l.**; FR: 1,515 m a.s.l., Villemartin, Savoy.

Red list status: r: 3 – locally endangered (AT), 3 – endangered (DE).

Eurhynchiastrum pulchellum s.l. (HEDW.)

IGNATOV & HUTTUNEN; Syn.:

Eurhynchium pulchellum (HEDW.) JENN.

incl. *E. diversifolium* (SCHLEICH.) B.S.G.

(Brachytheciaceae), Hübsches Schönschnabelmoos, Elegant Feather-moss

No distinction between subtaxa

Abundant, 54 squares: 9-13, 15, 23, 25, 32, 35, 38, 42, 43, 50, 54-58, 70, 82-84, 86, 88, 91, 99, 101, 105-107, 109, 111-113, 116, 120, 122, 129, 130, 139, 142, 147, 149-151, 158-163, 174, 193, on ground and on rock, ca. 525 – 2,610 m a.s.l. (TS/IT) and ca. 1,450 – 2,560 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,380 m a.s.l., Liebener Spitze, TN, with further altitudinal limits of 2,800 m a.s.l., above Rotmoosferner, Ötztal, TN, and 2,530 m a.s.l., Neualpl at Lienz, TE. IT: up to **3,500 m a.s.l.**, Monte Rosa, Aosta, and 2,400 – 2,730 m a.s.l., Padonwände, Trentino. CH: 240 – 3,060 m a.s.l.; FR: 2,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Eurhynchium angustirete (BROTH.) T.J.

KOP. (Brachytheciaceae), Stumpfblättriges Schönschnabelmoos, no English name.

Recorded only in the TS/IT part, 14 squares:

1, 5, 10, 24, 177-179, 181, 183, 186-189, 195, on ground usually in woodland, ca. 550 – 1,460 m a.s.l.

AT: a maximum elevation of 1,500 m a.s.l. with a further limit of 1,350 m a.s.l., Bichl/Scheibrand, Pitztal, TN. IT: 1,030 m a.s.l., Lasinetto, Gran Paradiso National Park, in a range of 500 – 1,000 m a.s.l. in Tiarno di Sotto, Trentino, and 900 m a.s.l., Massulschlucht in Passeier, TS. CH: 270 – **1,805 m a.s.l.**; FR: 1,800 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Eurhynchium crassinervium (WILS.)

SCHIMP; Syn.: *Cirriphyllum crassinervium* (TAYLOR) LOESKE & M. FLEISCH. (Brachytheciaceae), Dickrippiges Schönschnabelmoos, Beech Feather-moss

Recorded for three squares in TS/IT only, in upper Pfossental on ground, squares 120, 122, 124, from ca. 2,090 – 2,180 m a.s.l. to **2,600 – 2,875 m a.s.l.**

AT: a maximum elevation of 1,660 m a.s.l., foot of Ackerlspitze, TN. CH: 200 m a.s.l. to 2,238 m a.s.l.; FR: 1,550 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: V – decreasing (DE).

Eurhynchium striatum (HEDW.) SCHIMP.

(Brachytheciaceae), Spitzblättriges Schönschnabelmoos, Common Striated Feather-moss
Only once in TN/AT: square 158, Rofental, Rofen towards Rofenbergalm, on ground, **2,030 – 2,100 m a.s.l.**

AT: a maximum elevation of 1,420 m a.s.l., Steinacherberg, TN, with a further limit of 1,400 m a.s.l., Peischlach, TE. IT: 1,300 –

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1,400 m a.s.l., Luttacher Wasserfall, TS. For DE the highest altitude given is 1,200 m a.s.l. (Southwestern DE). CH: 200 – 1,760 m a.s.l.; FR: 1,580 m a.s.l., La Thuile, Savoy.

Fabronia ciliaris (BRID.) BRID.

(Fabroniaceae), Fabronimoos,
no English name.

In seven squares in TS/IT only, south facing rocks, squares 4, 9, 10, 15, 17, 24, 147, ca. 750 m a.s.l. up to **1,462 m a.s.l. and above 1,500 m a.s.l.**

AT: a maximum elevation of ca. 1,070 m a.s.l., Thurnerberg, TE, with a further limit of 930 – 940 m a.s.l., Ötz, TN. Recently confirmed for 950 m a.s.l., Engelswand, Ötztal, TN (Hofbauer, 2007). CH: 196 – 1,130 m a.s.l., the upper limit from Bergell at Vicosoprano. Red list status: VU – vulnerable (CH).

Fissidens adianthoides HEDW.

(Fissidentaceae), Haarfarähnliches Spaltzahnmoos, Maidenhair Pocket-moss

In six squares, almost only in TN/AT, squares 85, 90, 101, 104, 109, on ground, ca. 1,450 – 2,040 m a.s.l. and once in TS/IT, square 112, Pfosental, on wet rock, 1,450 – 1,590 m a.s.l. AT: a maximum elevation of 2,400 m a.s.l., Rotmoos near Obergurgl, TN, with additional altitudinal limits of 2,200 m a.s.l., Steinach, TN and 1,500 m a.s.l., Spitzkofel, TE. IT: 2,200 – 2,450 m a.s.l., Meye-d'en Haut, Aosta, and 1,230 – 1,500 m a.s.l., Mortisa, Trentino. CH: 200 – **2,470 m a.s.l.**, the upper limit from Curaletschsee. FR: 2,500 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: r: 3 – locally endangered (AT), 3 – endangered (DE).

Fissidens bryoides HEDW. (Fissidentaceae),
Birnmoosähnliches Spaltzahnmoos,
Lesser Pocket-moss

In four squares in TS/IT only: squares 3, Naturns village, ground, ca. 525 m a.s.l.; 188, near Dörf village, ground, 780 – 800 m a.s.l.; 189, near Dörf village, ground, 790 – 820 m a.s.l.; 192, Elvas/Naz, ground, ca. 870 – 900 m a.s.l.

AT: a maximum elevation of 2,470 m a.s.l., at Teischnitzkees, TE. IT: 2,580 m a.s.l., above Meye-d'en Haut, Gran Paradiso National Park, Aosta, and 1,465 m a.s.l., Val Cigolera, Trentino. CH: 270 – 2,470 m a.s.l.; FR: **2,900 m a.s.l.**, Bessans, Savoy.

Fissidens crassipes WILS. (Fissidentaceae),
Dickstieliges Spaltzahnmoos,
Fatfoot Pocket-moss

In three squares in TS/IT, squares 6-8, from Tschars to Juval along the Schnalswaal trail in an irrigation channel, from 650 m a.s.l. to 830 m a.s.l.

AT: a maximum elevation of 1,200 – 1,300 m a.s.l., Rehbach, TN. IT: 1,330 m a.s.l., Brenner Therme, TS. CH: 265 – 900 m a.s.l.; FR: **1,740 m a.s.l.**, Peisey-Nancroix, Savoy. Red list status: 3 – endangered (AT), V – decreasing (DE).

Fissidens dubius P. BEAUV; Syn.: *F. cristatus* WILS.; *F. decipiens* DE NOT.
(Fissidentaceae), Kamm-Spaltzahnmoos,
Rock Pocket-moss

15 squares: 5, 38, 87, 99, 100, 104, 107, 138, 141, 177, 181, 183, 192, 194, 195, usually on ground, ca. 550 – 1,950 m a.s.l. (TS/IT) and ca. 1,525 – 1,980 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,550 m a.s.l., Matreier Törl, TE, with a further limit of 2,350 m a.s.l., St. Anton, TN. IT: 1,870 – 1,940 m a.s.l., Piano di Eugio, Gran Paradiso National Park, Piedmont. CH: 200 – 2,400 m a.s.l.; FR: 2,550 m a.s.l., Pralognan-la-Vanoise, Savoy. For European mountains, without further specification, the highest altitude mentioned is **2,600 m a.s.l.**

Red list status: V – decreasing (DE).

Fissidens osmundioides HEDW.

(Fissidentaceae), Königsfarnähnliches Spaltzahnmoos, Purple-stalked Pocket-moss
Five records: squares 22 (TS/IT), Klosteralm, ground, ca. 1,980 – 2,300 m a.s.l.; 70 (TN/AT), above Martin-Busch-Hütte, ground, ca. 2,500 – 2,540 m a.s.l.; 89 (TN/AT), Ventertal at Koner Rinne, wet ground, ca. 1,840 – 1,860 m a.s.l.; 104 (TN/AT), Gaislachalm, ground, ca. 1,900 – 1,980 m a.s.l.; 121 (TS/IT), Pfossental above Eishof, ground, 2,180 – 2,350 m a.s.l.

AT: up to 2,560 m a.s.l. in Ködnitztal, TE; further altitudinal limits are 2,400 m a.s.l., Hohe Mut, Obergurgl, TN. IT: 2,703 – 2,710 m a.s.l., Cole del Nivolet, Gran Paradiso National Park. CH: 194 m a.s.l. to **2,730 – 2,850 m a.s.l.**; FR: 2,680 m a.s.l., Bonneval-sur-Arc, Savoy. For European mountains, without further specification, a highest altitude of 2,800 m a.s.l.

Red list status: r: 3 – locally endangered (AT), 3 – endangered (CH, DE).

Fissidens pusillus (WILS.) MILDE

(Fissidentaceae), Zwerg-Spaltzahnmoos,
Petty Pocket-moss

Only once in TN/AT, square 109, Ötztal, rock, ca. 1,450 – 1,650 m a.s.l.

AT: a maximum elevation of 1,150 m a.s.l.; IT: 1,800 – **2,300 m a.s.l.**, path to Money, Gran Paradiso National Park. CH: 200 – 1,830 m a.s.l.

Fissidens taxifolius HEDW. (Fissidentaceae),
Eibenblättriges Spaltzahnmoos,

Common Pocket-moss

Three times in TS/IT only: squares 4, Unterstell, ground near waterfall, 750 – 990 m a.s.l.; 7, at Castle Juval, ground, 780 – 820 m a.s.l.; 192, Elvas/Naz, ground, ca. 870 – 900 m a.s.l. AT: a maximum elevation of 2,150 m a.s.l., Hinterbichl, TE, with a further limit of 1,910 m a.s.l., Zwölferkogel, TN. IT: 1,630 – 1,680 m a.s.l., below Gimillan, Gran Paradiso National Park, Aosta. CH: 200 – **2,410 m a.s.l.**; FR: 1,500 m a.s.l., Termignon, Savoy.

Fissidens viridulus (SW.) WAHLENB.

(Fissidentaceae), Zartgrünes Spaltzahnmoos,
Green Pocket-moss

Four times: squares 7 (TS/IT), near Castle Juval, ground, 980 – 1,300 m a.s.l.; 73 (TN/AT), near Martin-Busch-Hütte, rock, **ca. 2,320 – 2,490 m a.s.l.**; 106 (TN/AT), at Zwieselstein village, ground, ca. 1,470 – 1,520 m a.s.l.; 141 (TS/IT), Pfelderertal at village Moos in Passeier, ground, ca. 980 – 1,026 m a.s.l.

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No elevations revealed for AT and IT. Only recorded for Trentino-Alto Adige before 1950. CH: 350 – 1,989 m a.s.l., few recent records (until recently not distinguished). FR: 1,000 m a.s.l., Planay, Savoy.

Red list status: 4 – potentially endangered (AT), V – decreasing (DE).

Frullania dilatata (L.) DUMORT.

(Frullaniaceae), Breites Wassersackmoos, Dilated Scalewort

Abundant, 50 squares: 4, 5, 7, 9-13, 15-17, 20, 24, 32-35, 40, 41, 43, 87, 105, 108-111, 114, 134-136, 139, 141-148, 172, 178, 184, 186-189, 192-195, on rock and on bark of leafy trees, ca. 525 – 1,980 m a.s.l. (TS/IT) and ca. 1,450 – 1,940 m a.s.l. (TN/AT).

AT: a maximum elevation of 1,900 m a.s.l., Ködnitztal, TE with a further limit of 1,670 m a.s.l., between St. Leonhard and Tiefental Alm, Pitztal, TN. IT: 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Gran Paradiso National Park, Aosta. CH: 195 m a.s.l. to **2,420 m a.s.l.**; FR: 1,658 m a.s.l., Tignes, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Frullania fragilifolia (TAYLOR) GOTTSCHKE, LINDENB. & NEES

(Frullaniaceae), Bruchblättriges Wassersackmoos, Spotty Fingers

Six times, squares 18 (TS/IT), Katharinaberg, rock, bark, 1,050 – 1,060 m a.s.l.; 42 (TS/IT) at Vernagt reservoir, rock, 1,700 – 1,780 m a.s.l.; 83 (TN/AT), track to Mutsbichl, rock, ca. **2,130 – 2,250 m a.s.l.**; 106 (TN/AT), at

Zwieselstein village, rock, ca. 1,480 – 1,540 m a.s.l.; 108 (TN/AT), Ötztal, rock, ca. 1,470 – 1,500 m a.s.l.; 139 (TS/IT), Pfelderertal below Farmazon village, rock, ca. 1,310 – 1,350 m a.s.l.

AT: an altitudinal range of ca. 400 – 1,600 m a.s.l. with altitudinal limits of ca. 1,400 m a.s.l., Sagebachschlucht, Pitztal, TN; and ca. 1,400 m a.s.l., Kerschbaumer Alpe, near Lienz, TE. IT: 1,650 – 1,750 m a.s.l., Lillaz, Gran Paradiso National Park. In DE up to 1,250 m a.s.l., Bavaria. CH: 315 – 1,700 m a.s.l.; FR: 1,450 m a.s.l., Pralognan-la-Vanoise, Savoy. Red list status: 3 – endangered (AT, DE), NT – near threatened (IT).

Frullania tamarisci (L.) DUMORT.

(Frullaniaceae), Tamarisken-Wassersackmoos, Tamarisk Scalewort

19 squares: 1, 5-7, 15, 17, 20, 24-26, 33, 42, 87, 89, 108, 111, 116, 141, 192, on rock and on bark, ca. 550 – 1,870 m a.s.l. (TS/IT) and ca. 1,470 – 1,940 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 300 – **2,700 m a.s.l.** with the upper limit from Rotmoostal near Obergurgl and further altitudinal limits of 2,600 m a.s.l. at restaurant Hanneburger, Volders, TN, and 2,500 m a.s.l., Rottenkogel, TE. IT: 1,730 – 1,800 m a.s.l., near bridge of Gran Clapey, Gran Paradiso National Park. CH: 200 m a.s.l. to 2,500 m a.s.l.; FR: 1,800 m a.s.l., Jarsy, Savoy.

Red list status: 3, r: 2 – endangered, locally severely endangered (AT), NT – near threatened (IT, CH), 3 – endangered (DE).

***Funaria hygrometrica* HEDW.**

(Funariaceae), Wetteranzeigendes Drehmoos, Bonfire-moss

25 squares: 9, 10, 15, 18, 24, 33, 41, 42, 49, 84, 101, 104, 109, 130, 134, 152, 171, 173, 177, 184, 188-191, 193, on ground and road-bank, occasionally on wall and in plant pots, ca. 525 – 2,020 m a.s.l. (TS/IT) and ca. 1,450 – 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,000 m a.s.l. with several records from this elevation, e.g. ascent to Beilstein, Obergurgl, TN, or Leutkirchner Hütte, St. Anton, TN. IT: up to 2,400 – 2,500 m a.s.l., at Piccolo S. Bernardo, Aosta, and in TS reaching 2,750 m a.s.l., Stilfserjoch. CH: 195 m a.s.l. to **2,931 m a.s.l.**; FR: 2,540 m a.s.l., Bramans, Savoy.

***Grimmia alpestris* (WEB. & MOHR.)**

SCHLEICH. (Grimmiaceae),

Alpen-Kissenmoos, Alpine Grimmia

Four times recorded; in squares 58 (TS/IT), Tisental, rock, ca. 2,030 – 2,300 m a.s.l.; 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, rock, 3,019 m a.s.l.; 115 (TS/IT), Pfsental, rock, ca. 1,980 – 2,020 m a.s.l.; 185 (TS/IT), Kreuztal, rock, ca. 1,980 – 2,050 m a.s.l.

AT: altitudinal range of ca. 1,000 – **3,798 m a.s.l.**, Großglockner summit, TE/Carinthia, with further altitudinal limits of 3,460 – 3,472 m a.s.l., Hinterer Seelenkogel, TN, and 2,850 m a.s.l., Schleinitz, TE. IT: up to 3,400 m a.s.l., Cima del Largo, Aosta, and 2,996 m a.s.l., Schafkopf, TS. In CH 350 – 2,950 m a.s.l.; FR: 3150 m a.s.l., Savoy, Saint-Martin-de-Belleville.

Red list status: 2 – severely endangered (DE).

***Grimmia anodon* BRUCH & SCHIMP.**

(Grimmiaceae), Ohnzahn-Kissenmoos, Grimmia

Twice: squares 63 (AT/IT), Niederjoch near Similaunhütte, rock crevices, 3,019 m a.s.l.; 129 (TS/IT), Pfelderertal, Pfeldereralp, rock, 1,820 – 1,860 m a.s.l.

AT: a maximum elevation of 3,000 m a.s.l. with further altitudinal limits of 2,340 m a.s.l., Ellmauer Halt, TN, and 2,800 m a.s.l., Ködnitztal, TE. IT: up to 2,936 m a.s.l., Piccolo S. Bernardo, Aosta, 1,900 m a.s.l., Puffatsch, Seiseralpe, TS, and 2,100 m a.s.l., Cimone della Pala, Trentino. In CH from 410 m a.s.l. to **3,870 m a.s.l.** In DE up to the summit of Zugspitze, 2,962 m a.s.l.; FR: 2,850 m a.s.l., Bessans, Savoy.

Red list status: 3 – endangered (DE).

***Grimmia caespitica* (BRID.) JUR.;**

Syn.: *G. pyrenaica* KERN (Grimmiaceae),

Rasen-Kissenmoos, Grimmia

In 12 squares in the TS/IT part only, squares 34, 52-54, 58, 124, 130, 133-136, 173, on rock, ca. 1,300 – 2,895 m a.s.l.

AT: Grims (1999) gives altitudinal ranges of ca. 1,800 – 3,100 m a.s.l., with the uppermost altitude at Habicht, TN; further altitudinal limits are: 2,600 m a.s.l. Kühtai, TN, and 2,730 – 2,790 m a.s.l. Gornitschamp, TE. IT: up to **3,559 m a.s.l.**, Monte Aemilius, Aosta, in a range of 1,500 – 3,000 m a.s.l. in Trentino and 2,650 m a.s.l., Schneeberg in Passeier, TS, 2,600 m a.s.l., Niederjochferner, Schnals, TS. At Monte Rosa Massiv IT/CH up to 3,120 m a.s.l.; CH: from 1,260 – 3,120 m a.s.l.; FR: 2,650 m a.s.l., Pralognan-la-Vanoise, Savoy.

5 Results

Grimmia decipiens (SCHULTZ) LINDB.

(Grimmiaceae), Täuschendes Kissenmoos,
Great Grimmia

Once in TS/IT, square 140, Pfelderertal above
Weiherhof, rock, ca. 1,260 – 1,310 m a.s.l.

No elevations revealed for AT. IT: in TS only
known from Verdins at Meran, TS (without
altitude) and from 1,200 m, Monti del
Gennargentu, Sardinia. CH 260 – **1,950 m**
a.s.l.; FR: 900 m, Le Valtin, Vosges.

Red list status: 1 – threatened from extinction
(AT), VU – vulnerable (CH), 3 – endangered
(DE).

Grimmia donniana SM. (Grimmiaceae),

Stumpfdeckel-Kissenmoos, Donn's Grimmia
13 squares: 23, 49, 52, 63, 88, 99, 102, 106,
114, 121, 122, 124, 138, on rock. Highest
altitude measured in square 63 (TN/AT, TS/
IT), Niederjoch near Similaunhütte, on rock,
3,019 m a.s.l., and lowest elevation 1,380 m
a.s.l. (TS/IT) and 1,525 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,739 m a.s.l.,
summit of Weisskugel, with further altitudi-
nal limits of 3,530 m a.s.l., Marzellspitze (AT/
IT), and 2,730 – 2,800 m a.s.l., Gornitscham-
p, TE. IT: highest altitudes are 4,231 m a.s.l., at
Balmenhorn, and **4,200 – 4,300 m a.s.l.**,
Monte Rosa, Aosta; a further elevation limit
is 2,548 m a.s.l., Hörndlpass, Taufers, TS. In
CH from 400 m a.s.l. to 3,500 m a.s.l.; FR:
2,308 m a.s.l., Valloire, Savoy.

Red list status: 3 – endangered (DE).

Grimmia elatior BRUCH;

Syn.: *Dryptodon incurvus* (HORNSCH.)

BRID. (Grimmiaceae),

Hohes Kissenmoos, Grimmia

Abundant, 64 squares: 1, 3, 5-9, 12, 16-18,
21, 24, 27, 29, 30, 32, 33, 37, 39, 43, 44,
46, 48, 51, 54, 55, 57, 58, 71, 74, 75, 77,
86, 93, 95, 96, 100, 106, 108, 110, 114, 118,
119, 129, 130, 134-136, 140, 145-149, 158,
163, 172, 173, 178, 190, 192-194, on rock,
ca. 525 – 2,310 m a.s.l. (TS/IT) and ca. 1,470
– 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,270 m a.s.l.**,
at Pasterze, Carinthia, with a further limit of
2,600 m a.s.l. with records from various places,
e.g. Blechnerkamm, TN, and Schleinitz, TE.
IT: up to 2,800 m a.s.l., Piedmont, ca. 2,560 m
a.s.l. at Padon, Trentino, and 1,550 m a.s.l.,
Graun, TS. In CH from 240 m to 3,100 m
a.s.l., the upper limit at Zinal, Cabane de
Mountet. FR: 2,400 m a.s.l., Termigna, Savoy.
Red list status: 3 – endangered (DE).

Grimmia elongata KAULF.;

Syn.: *Dryptodon elongatus* (KAULF.)

HARTM. (Grimmiaceae), Verlängertes

Kissenmoos, Grimmia

17 squares: 6, 24, 33, 41, 42, 54, 55, 63, 91,
109, 115, 116, 129, 130, 134, 188, 189, on
rock. Highest point (3,019 m a.s.l.) in square
63 (TN/AT, TS/IT), recorded only above ca.
780 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l.
(TN/AT).

AT: an altitudinal range of ca. 1,800 –
3,535 m a.s.l., with the uppermost altitude at
Hochvernagtspitze, TN; up to ca. 3,500 m a.s.l.
at Großglockner and 2,900 m a.s.l., Mullwitz-

kees at Großvenediger. IT: up to 3,559 m a.s.l., Monte Aemilius, Aosta, 2,900 m a.s.l. Madritschjoch between Sulden and Martell, TS. At Monte Rosa Massif IT/CH up to 3,110 m a.s.l. In CH 350 – **3,980 m a.s.l.**, Gletscherhorn. FR: 3,000 m a.s.l., Savoy, Pralognan-la-Vanoise.

Red list status: VU – vulnerable (CH), R – extremely rare (DE).

Grimmia funalis (SCHWAEGR.) BRUCH & SCHIMP. (Grimmiaceae), Seilartiges

Kissenmoos, String Grimmia

14 squares: 15, 17, 58, 63, 66, 70, 79, 82, 89, 95, 109, 142, 160, 198, on rock. Highest record in square 66 (TN/AT, TS/IT), at discovery place, on rock, ca. 3,200 m a.s.l., only above 850 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 1,100 – 3,350 m a.s.l., the latter at Adlersruhe, Hohe Tauern, TE, with a further limit of 2,893 m a.s.l. Birkkogel, TN. IT: up to 3,559 m a.s.l., Monte Aemilius, Aosta, and 2,600 – 3,010 m a.s.l., Nockspitze in Langtaufers, TS. In CH from 200 m a.s.l. to **3,750 m a.s.l.**, Pointe de Zinal. FR: 3,195 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Red list status: 3 – endangered (DE).

Grimmia hartmannii SCHIMP.

(Grimmiaceae), Himbeer-Kissenmoos, Hartman's Grimmia

Six records, squares 20 (TS/IT), Burghof, rock, ca. 1,050 – 1,150 m a.s.l.; 24 (TS/IT), near Karthaus village, rock, ca. 1,250 – 1,280 m

a.s.l.; 73 (TN/AT), near Martin-Busch-Hütte, rock, ca. 2,320 – 2,490 m a.s.l.; 89, Ventertal at Koner Rinne, rock, 1,840 – 1,860 m a.s.l.; 104 (TN/AT), Gaislachalm, rock, ca. 1,900 – 1,980 m a.s.l.; 121 (TS/IT), Pfossental above Eishof, rock, 2,180 – 2,350 m a.s.l.

AT: a maximum elevation of 2,530 m a.s.l. with further altitudinal limits of 2,200 – 2,530 m a.s.l., Roßkogel, TN, and 2,080 – 2,200 m a.s.l., Teischnitz, TE. IT: 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Gran Paradiso National Park, Aosta, and 2,170 – 2,270 m a.s.l., Plöcken towards Selegazza, Trentino. In CH from 200 – **2,654 m a.s.l.**; FR: 1,762 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Red list status: V – decreasing (DE).

Grimmia incurva SCHWAEGR.;

Syn.: *Dryptodon contortus* (WAHLENB.)

BRID. (Grimmiaceae), Krummblatt-Kissenmoos, Black Grimmia

34 squares: 9, 22, 23, 47, 54, 58, 60, 62-67, 70, 71, 80, 83, 87, 88, 91, 95, 102, 108, 109, 115, 128, 130, 151, 153, 156, 159, 164-166, typically on rock. Highest measured point in square 62, track up to Similaun Spitz, on gravel, 3,242 m a.s.l. (TN/AT, TS/IT), only above ca. 1,400 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,463 m a.s.l., Adlersruhe am Großglockner, TE, with a further limit of 3,200 m a.s.l., Ramoljoch, TN. IT: up to **4,559 m a.s.l.**, Punta Gnifetti, Monte Rosa, Aosta, in a range of 1,500 – 3,000 m a.s.l. in Trentino, and 3,319 m a.s.l., Schöntaufspitze in Sulden, TS. In CH from

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950 m a.s.l. to 4,275 m a.s.l. FR: 3,270 m a.s.l., Savoy, Sainte-Foy-Tarentaise.

Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Grimmia laevigata (BRID.) BRID.

(Grimmiaceae), Graues Kissenmoos, Hoary Grimmia

26 squares: 4-7, 9, 10, 13, 15, 17-20, 33, 34, 63, 136, 138, 142-144, 146, 147, 183, 184, 192, 194, usually on rock. Almost only in TS/IT, but reaching the highest in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, on ground, **2,890 m a.s.l.**, lowest measurement ca. 550 m a.s.l.

AT: a maximum elevation of 1,800 m a.s.l., St. Anton, TN, with a further limit of 1,270 m a.s.l., Virgen, TE. IT: 1,980 – 2,030 m a.s.l., Vallon di Seyvaz, Gran Paradiso National Park, Aosta, and 1,550 m a.s.l., Graun, TS. In CH from 200 m a.s.l. to 2,400 m a.s.l.; FR: 1,400 m a.s.l., Pyrenees.

Red list status: 3 – endangered (DE).

Grimmia longirostris HOOK.;

Syn.: *Grimmia affinis* HORNSCH.

(Grimmiaceae), Langschnäbeliges Kissenmoos, North Grimmia

Abundant, 70 squares: 6-8, 10, 11, 13, 18, 22, 24, 28, 31, 32, 34-36, 38, 40-42, 45, 49, 50, 56, 57, 59, 61, 63, 68, 70, 72, 76, 78, 84, 88-92, 94, 96, 98, 101, 102, 104-106, 111, 112, 117, 120, 121, 124-126, 128, 131, 132, 144, 146, 150, 152, 154, 155, 157-159, 161-163, 173, on rock. Highest altitude in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, on rock, 3,019 m a.s.l., lowest

records from ca. 650 m a.s.l. (TS/IT) and ca. 1,470 m a.s.l. (TN/AT).

AT: highest occurrence at **3,180 m a.s.l.**, Ramolhaus, TN, with a further limit of 3,000 m a.s.l., Schleinitz, TE. IT: 2,800 m a.s.l., Mathaunkopf at Graun, TS. In CH from 200 m a.s.l. to 3,130 m a.s.l., Piz Gallegione. FR: 1,840 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: 3 – endangered (DE).

Grimmia mollis BRUCH & SCHIMP.;

Syn.: *Hydrogrimmia mollis* (BRUCH & SCHIMP.) LOESKE (Grimmiaceae), Wasser-Kissenmoos, Soft Grimmia (Fig. 5.12, 5.13)



Fig. 5.12: Soft Grimmia (*Grimmia mollis*) on a small boulder at a little stream at high altitude

Eight squares: 58, 63, 64, 68, 71, 72, 167, 169, usually on wet rock in rivulets. Highest point in square 63 (TN/AT, TS/IT), on wet rock, 2,890 m a.s.l., lowest at 2,278 m a.s.l. (TS/IT) and 2,627 m a.s.l. (TN/AT).

AT: an altitudinal range of 2,150 – **3,270 m a.s.l.**, with further altitudinal limits of 2,300 – 3,270 m a.s.l., Habicht, TN, 2,900 m a.s.l.,

near Ramolhaus, TN, and 3,206 m a.s.l., Großvenediger, TE. IT: 2,580 – 2,680 m a.s.l., Lauson valley, Aosta; in a range of 1,500 – 3,000 m a.s.l. in Trentino, and 2,750 m a.s.l., Madritschjoch, TS. CH: 1,600 m a.s.l. to 3,266 m a.s.l.; FR: 3,000 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: AR – at risk (FR).

Grimmia montana BRUCH & SCHIMP;

Syn.: *G. pilosissima* HERZOG (Grimmiaceae), Berg-Kissenmoos, Sun Grimmia

11 squares: 33, 54, 63, 70, 99, 100, 103, 109, 169, 188, 189 on rock. Highest point measured in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, in rock crevices, **3,019 m a.s.l.**, lowest records from ca. 780 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT). AT: an altitudinal range of ca. 600 – 2,750 m

a.s.l. with altitudinal limits of 2,600 m a.s.l., Glungezer summit, TN, and 2,750 m a.s.l., Zunig, TE. IT: in a range of 500 – 1,500 m a.s.l. in Val di Fassa, Trentino, and 2,600 m a.s.l., Nockspitz in Langtaufers, TS. In CH from 350 m a.s.l. to 2,560 m a.s.l.; FR: 2,000 m a.s.l., Montvalezan, Savoy.

Red list status: 4, r: 1 – potentially endangered, locally threatened from extinction (AT), V – decreasing (DE).

Grimmia orbicularis BRUCH (Grimmiaceae), Kugelfrucht-Kissenmoos, Grimmia

In four squares in TS/IT only, squares 24, at Karthaus village, rock, ca. 1,250 – 1,280 m a.s.l.; 34, at Lafezbach, rock, ca. 1,300 – 1,400 m a.s.l.; 129, Pfelderertal, Pfelderer Alm, rock, 1,820 – 1,860 m a.s.l.; 185, Kreuztal, rock, **1,980 – 2,050 m a.s.l.**

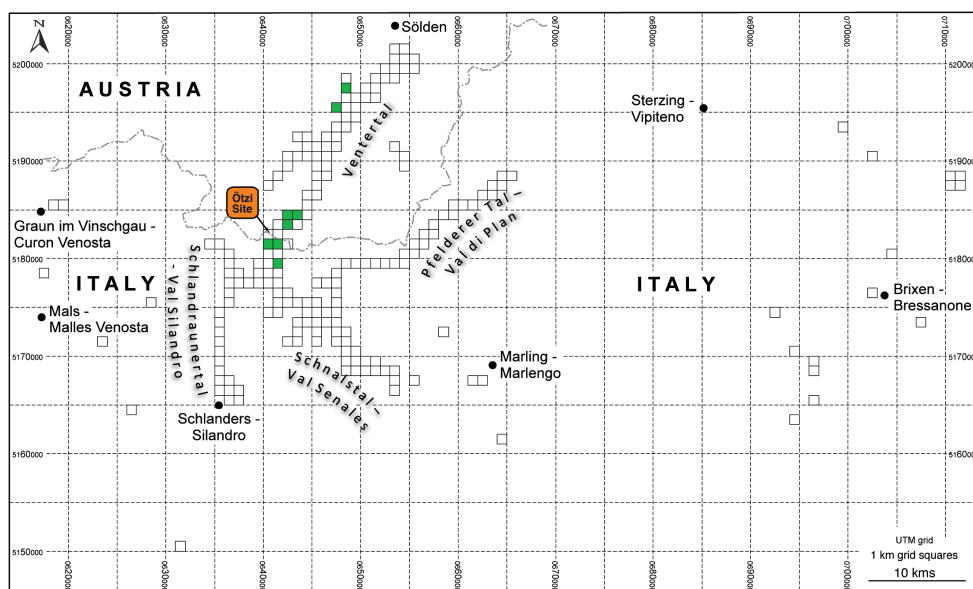


Fig. 5.13: Recorded distribution of *Grimmia mollis*

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AT: a maximum elevation of 1,000 – 1,140 m a.s.l., Virgen, TE. IT: 1,900 m a.s.l., above Lillaz, Aosta, and 1,700 m a.s.l., Penegal near Bozen, TS. In CH from 370 m a.s.l. to 1,098 m a.s.l.; FR: 1,220 m a.s.l., Villarodon-Bourget, Savoy.

Red list status: 3 – endangered (AT, DE).

Grimmia ovalis (HEDW.) LINDB.

(Grimmiaceae), Eifrüchtiges Kissenmoos, Flat-rock *Grimmia*

12 squares: 6, 9, 16, 20, 24, 85, 87, 94, 95, 104, 134, 190, on rock, ca. 790 m a.s.l. to ca. 1,610 m a.s.l. (TS/IT) and ca. 1,699 m a.s.l. to 2,040 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,500 – 3,000 m a.s.l., Habicht, TN, with further altitudinal limits of 2,200 m a.s.l., Obernbergtal, TN, and 2,600 m a.s.l., Möserling Wand, Matrei i.O., TE. IT: up to **3,647 m a.s.l.**, Monte Rosa, Aosta, and 1,600 m a.s.l., Trafoi, TS. In CH from 200 m a.s.l. to 3,620 m a.s.l.; FR: 1,750 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: 3 – endangered (DE).

Grimmia pulvinata (HEDW.) SM.

(Grimmiaceae), Polster-Kissenmoos, Grey-cushioned *Grimmia*

13 squares: 2, 24, 40, 41, 97, 142, 170, 171, 177, 181, 184, 193, 194, on rock, on walls and on concrete, ca. 525 – 1,820 m a.s.l. (TS/IT) and ca. 1,650 – **2,788 m a.s.l.** (TN/AT).

AT: a maximum elevation of 2,000 m a.s.l., Styria and Gschnitztal, TN. IT: 1,900 – 2,150 m a.s.l., Mt. Testa di Montzeuc, Gran Paradiso National Park, Aosta, 1,700 m a.s.l., Penegal near Bozen, TS, 1,460 m a.s.l.,

Predazzo, Trentino. For IT there exists an extreme record of 4,559 m a.s.l., Monte Rosa, Aosta (Vaccari 1914) but according to Maier & Geissler (1997) this record may be mistaken for a different species. In CH from 200 m a.s.l. to 1,870 m a.s.l.; FR: 1,880 m a.s.l., Val-D'Isere, Savoy.

Grimmia reflexidens MÜLL. HAL.;

Syn.: *G. sessitana* DE NOT.; *G. subsulcata* LIMPR. (Grimmiaceae), Flaches-Kissenmoos, no English name.

Seven squares: 24, 41, 63, 65, 70, 71, 138, on rock. Highest measured occurrence in square 65 (TN/AT, TS/IT), Niederjochferner, in rock crevices, ca. 3,200 m a.s.l., not recorded lower than 1,250 m a.s.l. (TS/IT) and 2,500 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 1,400 – 3,200 m a.s.l. with altitudinal limits of 3,200 m a.s.l., Ramoljoch, TN and 2,700 m a.s.l., Hohe Grabe, TE. IT: up to **4,550 m a.s.l.**, Signal-kuppe Monte Rosa, Aosta, in a range of 1,500 – 3,500 m a.s.l. in Trentino, and 3,319 m a.s.l., Schöntaufspitze at Sulden, TS. In CH from 300 m a.s.l. to 4,400 m a.s.l., Monte Rosa, Parrotspitze. FR: 2,520 m a.s.l., Mt. Cenis, Savoy.

Red list status: R – extremely rare (DE).

Grimmia tergestina TOMM. ex BRUCH &

SCHIMP. (Grimmiaceae), Echtes Triestiner Kissenmoos, Dapple-mouth *Grimmia*
Once, square 143 (TS/IT), at Schlanders village, rock, ca. 700 – 850 m a.s.l.

AT: a maximum elevation of 2,010 m a.s.l., Kopftörl, TN, with further altitudinal limits of

1,300 m a.s.l., at Tauernsteig, Matrei i.O., TE, and 1,750 m a.s.l. (*f. epilosa* Limpr.), between Arnbach and Winnebach, Innervillgratten, TE. IT: 1,400 – 1,800 m a.s.l., Epinel, Aosta, and 1,070 m a.s.l., Val di Fiemme, Trentino. CH: 430 – **3,400 m a.s.l.**; FR: 2,800 m a.s.l., Bramans, Savoy.

Red list status: V – decreasing (DE).

Grimmia torquata DRUMM. (Grimmiaceae), Dreh-Kissenmoos, Twisted Grimmia
Six times, squares 91 (TN/AT), Ventertal at Winterstall, rock, 1,790 – 1,850 m a.s.l.; 101 (TN/AT), Martlaswald, rock, 1,590 – 1,700 m a.s.l.; 113 (TS/IT), Pfosental, rock, 1,590 – 1,700 m a.s.l.; 127 (TS/IT), Pfelderertal below Labkofel near saddle, rock, 2,080 – 2,400 m a.s.l.; 136 (TS/IT), Pfelderertal at Innerhütt, rock, ca. 1,425 – 1,510 m a.s.l.; 137 (TS/IT), Pfelderertal at Außerhütt, rock, ca. 1,460 – 1,500 m a.s.l.

AT: an altitudinal range of ca. 1,000 – 3,460 m a.s.l., Hohe Wilde, TN, with further altitudinal limits of 2,893 m a.s.l., summit of Birkkogel, Ötztal, TN, 2,600 m a.s.l., Peischlachtörl and Kasermannl at Lienz, TE. IT: up to **3,450 – 3,480 m a.s.l.**, Testa del Ruitor, Aosta, in a range of 700 – 2,800 m a.s.l. in Trentino, and 2,880 m a.s.l., Mathaunkopf at Graun, TS. In CH from 540 m to 3,290 m a.s.l. FR: 2,800 m a.s.l., Termignon, Savoy.

Red list status: NT – potentially endangered (CH), 3 – endangered (DE).

Grimmia trichophylla GREV.

(Grimmiaceae), Haarblatt-Kissenmoos, Hair-pointed Grimmia

15 squares: 14, 17, 24, 32, 34, 40, 68, 103, 108, 127, 138, 140, 170, 184, 196, on rock, ca. 880 m to ca. 2,400 m a.s.l. (TS/IT) and ca. 1,470 m to 2,880 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,840 m a.s.l., Habicht, TN, with further altitudinal limits up to 1,900 m a.s.l., Ötztal, TN (*var. tenuis*), 1,500 m a.s.l., Villgratental, TE. IT: 2,423 – 2,670 m a.s.l., Lago di Motta, Gran Paradiso National Park, Piedmont, 1,620–2,300 m a.s.l., Padon, Trentino, and 1,600 m a.s.l., Trafoi, TS. In CH from 320 m to **3,212 m a.s.l.**; FR: 1,521 m a.s.l., Rognaix, Savoy.

Red list status: NT – potentially endangered (CH), V – decreasing (DE).

Grimmia triformis CAREST. & DE NOT.

(*G. donniana* ssp. *brevisetata*) (Grimmiaceae), Sumpfdeckel-Kissenmoos, Donn's Grimmia (Fig. 5.14)



Fig. 5.14: Donn's Grimmia (*Grimmia triformis*), in the study area only in rather exposed locations up to ca. 3,200 m a.s.l.

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The species is closely related to *G. donniana*, mainly differing in sporophytic characters. Greven (1995) treated *G. triformis* as a variety of *G. donniana* but Muñoz (1998) re-established it as a distinct species.

Recorded from nine squares: 66, 70, 71, 79, 81, 114, 119, 123, 135, always on rock. Highest altitude in square 66 (TN/AT, TS/IT), at discovery place, rock, **ca. 3,200 m a.s.l.**, not lower than ca. 1,565 m a.s.l. (TS/IT) and ca. 1,900 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,050 m a.s.l., Freigerscharte, Stubaital, TN with further altitudinal limits of 2,800 m a.s.l., Stubai Alps, and 2,300 m a.s.l., Roßkogel, TN. IT: 3,000 m a.s.l., Monte Stollenberg, Piemont, and up to 3,100 m a.s.l. in Schnalstal, TS. In www.grimmiasoftheworld.com a maximum elevation of 3,131 m a.s.l. for CH is noted. FR: 2,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Grimmia unicolor HOOK. (Grimmiaceae), Einfarbiges Kissenmoos, Dingy Grimmia
Six times, squares 87 (TN/AT), northwards from Vent, rock, ca. 1,870 – 1,940 m a.s.l.; 134 (TS/IT), Pfelderertal, Pfelders village, rock, 1,570 – 1,610 m a.s.l.; 135 (TS/IT), Pfelderertal at Krößbichl, rock at river, ca. 1,565 m a.s.l.; 136 (TS/IT), Pfelderertal at Innerhütt, rock, ca. 1,425 – 1,510 m a.s.l.; 140 (TS/IT), Pfelderertal above Weiherhof, rock, ca. 1,260 – 1,310 m a.s.l.; 158 (TN/AT), Rofental towards Rofenbergalm, rock, 2,030 – 2,100 m a.s.l.

AT: an altitudinal range of ca. 1,200 m a.s.l. to 2,700 – 2,800 m a.s.l. (Silvretta, Vorarlberg) with further altitudinal limits of 2,200 m a.s.l.,

Dorferalpe at Großvenediger, Hohe Tauern, TE, and 2,300 m a.s.l., Krehfelderhütte, Hohe Tauern, TE. IT: 2,370 – 2,630 m a.s.l., Eaux-Ranges valley, Gran Paradiso National Park, Aosta, and in a range of 700 – **3,500 m a.s.l.** in Trentino. In CH from 260 – 3,000 m a.s.l., Zinal, Cabane de Mountet. FR: 2,600 m a.s.l., Bonneval-sur-Arc, Savoy. An extreme elevation of 3,400 m a.s.l. is given for the Alps, without precise location.

Red list status: 4 – potentially endangered (AT), NT – potentially endangered (CH).

Gymnocolea inflata (HUDS.) DUMORT. (Lophoziaceae), Aufgeblasenes Nacktkelchmoos, Inflated Notchwort

Seven squares: 63, 73, 74, 82, 159, 160, 167, on wet ground, wet rock, in flushes and in a lake. Almost only in the TN/AT part, not below ca. 1,970 m a.s.l., in square 63 (TN/AT, TS/IT) reaching 2,700 m a.s.l.

AT: an altitudinal range of 600 – 2,700 m a.s.l. with altitudinal limits at 2,500 – 2,700 m a.s.l., Tarntalerköpfe, TN, 2300 m a.s.l., Rotmoostal above Obergurgl, TN, and 1,600 – 1,900 m a.s.l., Matreier Tauerntal, TE, and at 1,800 m a.s.l., at Schlattenkees, TE. IT: in a range of 1,500 – **3,000 m a.s.l.** in Trentino. CH: 866 m to 2,630 m a.s.l.; FR: 2,560 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Gymnomitrium concinnatum (LIGHTF.)

CORDA (Gymnomitriaceae), Zierliches Nacktmützenmoos, Braided Frostwort
37 squares: 22, 23, 45, 47, 54, 58, 61–68, 70–73,

81-83, 86, 91, 124, 125, 127, 128, 130, 157, 159, 160, 166, 167, 169, 170, 198, 200, on rock. Highest altitude in squares 65 (TN/AT, TS/IT), Niederjochferner, rock crevices, and 66 (TN/AT, TS/IT), at discovery place, rock, both ca. 3,200 m a.s.l. Not below ca. 1,767 m a.s.l. (TS/IT) and 1,790 m a.s.l. (TN/AT). AT: an altitudinal range of ca. 1,100 – **3,400 m a.s.l.** with altitudinal limits at 3,000 m a.s.l., Zischgeles at Praxmar, TN, and 3,000 – 3,200 m a.s.l., near Defreggerhaus at Großvenediger, TE. IT: up to 3,000 – 3,190 m a.s.l., Becca di Nonna, Aosta, and 2,850 m a.s.l., Soyjoch in Martelltal, TS. CH: 600 m a.s.l. to 3,212 m a.s.l.; FR: 2,350 m a.s.l., Pralognan-la-Vanoise, Savoy. Red list status: NT – near threatened (IT).

Gymnomitrium corallioides NEES

(Gymnomitriaceae), Korallen-Nacktmützenmoos, Coral Frostwort
17 squares: 46, 47, 54, 61, 63-65, 70, 71, 81-83, 124-128, on rock. Highest altitude measures in square 65 (TN/AT, TS/IT), Niederjochferner, rock crevices, ca. 3,200 m a.s.l. Not below 1,860 m a.s.l. (TS/IT) and 1,900 m a.s.l. (TN/AT). AT: altitudinal range of (1,100) 1,800 – **3,739 m a.s.l.** with the highest record from Weißkugel summit, TN; further altitudinal limits are ca. 3,280 m a.s.l., Habicht, Stubaital, TN, and 3,100 m a.s.l., Mullwitzkees am Venediger, Tauern, TE. IT: up to 3,500 m a.s.l., Monte Rosa, Aosta, and 2,920 m a.s.l., Stilsfer Joch, TS. CH: 890 m a.s.l. to 3,320 m a.s.l.; FR: 3,000 m a.s.l., Val-D'Isere, Savoy. Red list status: NT – near threatened (IT, CH).

Gymnostomum aeruginosum SM.

(Pottiaceae), Grünspan-Nacktmundmoos, Verdigris Tufa-moss
Twice in TS/IT only, squares 112, Pfossental, wet rock, 1,450 – 1,590 m a.s.l. and 124, Pfossental towards Stettiner Hütte, rock, ca. 2,600 – 2,875 m a.s.l. AT: a maximum elevation of 2,700 m a.s.l. with further altitudinal limits of 2,400 m a.s.l., Riepenspitze, Trins, TN, and 2,600 m a.s.l., Musing, TE. IT: up to **3,165 m a.s.l.**, Capanna, Aosta, 2,500 m a.s.l., Seiseralm, Schlern, TS. CH: 100 m a.s.l. to 2,745 m a.s.l.; FR: 2,600 m a.s.l., Peisey-Nancroix, Savoy. Red list status: V – decreasing (DE).

Gymnostomum calcareum NEES &

HORNSCH. (Pottiaceae), Kalk-Nacktmundmoos, Blunt-leaved Tufa-moss
Once in square 141 (TS/IT), Pfelderertal at Moos im Passeier, rock, ca. 980 – 1,026 m a.s.l. AT: highest altitude is 1,950 m a.s.l., Ködnitztal, TE, with a further limit of 1,900 m a.s.l., Navis and Schmirn, TN. IT: 2,300 m a.s.l., Lago di Loie, Aosta, and 1,100 m a.s.l., Kastelruth, TS. CH: 275 – **3,123 m a.s.l.**; FR: 2,070 m a.s.l., Lanslebourg-Mont-Cenis, Savoy. Red list status: 3 – endangered (DE).

Hamatocaulis vernicosus (MITT.)

HEDENÄS; Syn.: *Drepanocladus vernicosus* (MITT.) WARNST. (Calliergonaceae), Glänzender Krückstock, Firnisglänzendes Sichelmoos, Varnished Hook-moss
Once in square 52 (TS/IT), near Kurzras village, 2,015 – 2,200 m a.s.l., in a bog. AT: a maximum elevation of 2,050 m a.s.l.,

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Steinacherjoch, TN, with further altitudinal limits of 2,000 m a.s.l., near station of Hohe Mut Lift, Obergurgl, TN, and 2,000 m a.s.l., Zeltersfeld, TE. IT: 2,000 m a.s.l., Gsieserjöchel, TS, and 2,300 m a.s.l., Col di Lana, Trentino. Recently confirmed for the IT region Friuli-Venezia Giulia, in an altitudinal range of 950 – 1,600 m a.s.l. CH: 390 – **2,840 m a.s.l.**; FR: 2,550 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: 2 – severely endangered (AT), NT – potentially endangered (CH), 2 – severely endangered (DE). Protected species according to Annex II of the EEC FFH Directive (1992).

Haplomitrium hookeri (SM.) NEES

(Haplomitriaceae), Hookers Einmützenmoos, Hooker's Flapwort

Once in TN/AT, square 84, above Vent, on ground, 1,895 – 2,130 m a.s.l.

AT: an altitudinal range of 970 – 2,400 m a.s.l., reaching 2,000 m a.s.l., at Hoher Riffler, TN, and at Felbertauern, TE. IT: 2,423 – 2,470 m a.s.l., at Lago Nero, Piedmont. CH: 1,390 m to **2,610 m a.s.l.**; FR: 2,420 m a.s.l., Termignon, Savoy.

Red list status: 4 – potentially endangered (AT), CR – critically endangered (IT), VU – vulnerable (CH), 2 – severely endangered (DE).

Hedwigia ciliata (HEDW.) P. BEAUV.

(Hedwigiaceae), Wimpern-Hedwigsmoos, Hoar-moss

Very abundant, 109 squares: 1, 3-20, 24-29, 32-46, 48-50, 52, 54-57, 86, 87, 89-91, 94-96, 98, 99, 101-117, 134-138, 140, 142-147, 149, 150, 158, 160, 171-173, 177-179, 183,

184, 186-190, 192-196, on rock, ca. 525 m a.s.l. to ca. 2,300 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to 2,160 m a.s.l. (TN/AT).

AT: an altitudinal range of 200 – 2,300 m a.s.l., the latter measurement from near Chemnitzer Hütte, TN, with further altitudinal limits of 1,960 m a.s.l., Patscherkofel, TN, and ca. 1,900 m a.s.l. Ködnitztal, TE. IT: **2,602 – 2,645 m a.s.l.**, Laghi Ponton, Aosta, and 2,400 m a.s.l., Ornella valley, Padon, Trentino. CH: 200 – 2,560 m a.s.l.; FR: 1,700 m a.s.l., Saint-Colombain-des-Villards, Savoy.

Herzogiella seligeri (BRID.) IWATS.

(Plagiotheciaceae), Schlesisches Stumpfenmoos, Silesian Feather-moss

In five squares of TS/IT only, squares 1, at Platzerhof, ground, 700 – 1,120 m a.s.l.; 136, Pfelderertal at Innerhütt, rotten wood, ca. 1,425 – 1,510 m a.s.l.; 188, at Dörf, rotten wood, 780 – 800 m a.s.l.; 189, at Dörf, rotten wood, 790 – 820 m a.s.l.; 190, at Latzfons, rotten wood, 1,580 – 1,600 m a.s.l.

AT: a maximum elevation is given with 2,000 – 2,100 m a.s.l. from Tribes Bach near Obergurgl, TN, and a further limit is 1,700 m a.s.l., Kals and Matrei i.O., TE. IT: 1,465 m a.s.l., Primör, Trentino. CH: 200 – **2,360 m a.s.l.**; DE: highest altitude given is 1,700 m a.s.l. (Bavaria). FR: 1,600 m a.s.l., Termignon, Savoy.

Heterocladium dimorphum (BRID.)

SCHIMP.; Syn.: *H. squarrosulum* (VOIT) LINDB. (Pterigynandraceae), Sparriges Wechselzweigmoos, Dimorphous Tamariskmoss
Abundant, 38 squares: 17, 22, 23, 25, 35, 45-47, 54, 57, 58, 64, 73, 80-85, 87-91, 93-95,

104, 107, 114, 127, 128, 131, 133, 136, 137, 163, 196, on ground, ca. 980 m a.s.l. to ca. 2,590 m a.s.l. (TS/IT) and ca. 1,590 m a.s.l. to ca. 2,560 m a.s.l. (TN/AT).

AT: a maximum elevation of >2,800 m a.s.l., Rettenbachfall, TN, with further limits of 1,500 – 2,700 m a.s.l., Weißbeck, and 2,794 m a.s.l., Möserlingwand, TE. IT: up to **3,165 m a.s.l.**, Becca di Nonna, Aosta, and 2,800 m a.s.l., Habicherkopf at Graun, TS. CH: 360 – 3,120 m a.s.l.; FR: 2,150 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: 2 – severely endangered (DE).

Homalia trichomanoides (HEDW.) BRID.

(Neckeraceae), Streifenfarn-Flachmoos, Blunt Feather-moss

In four squares of the TS/IT part only, squares 13, Altratheis near Innerunterstell, rock, 856 – 880 m a.s.l.; 14, at Altratheis, rock, ca. 880 m a.s.l. and 186 plus 187, at Dörf, both on bark, 880 – 1,030 m a.s.l.

AT: a maximum elevation of 1,400 m a.s.l. (Carinthia) with a further limit of 1,250 m a.s.l., at Stuibenthal, Umhausen, Ötztal, TN. For IT no altitudinal limits could be revealed so far. CH: 195 – **1,540 m a.s.l.**; FR: 1,000 m a.s.l., Planay, Savoy.

Red list status: V – decreasing (DE).

Homalothecium lutescens (HEDW.)

ROBINS.; Syn.: *Camptothecium lutescens* (HEDW.) SCHIMP. (Brachytheciaceae), Echtes Goldmoos, Yellow Feather-moss

In six squares of TS/IT only, squares 10, at Innerunterstell, rock, 1,400 – 1,460 m a.s.l.; 13, Altratheis, near Innerunterstell, rock,

1,436 – 1,470 m a.s.l.; 14, at Altratheis, rock, ca. 880 – 900 m a.s.l.; 57, Finaital, rock, ca. 2,120 – 2,307 m a.s.l., 181, Obertalmühle, rock, ca. 660 m a.s.l.; 193, at Cloister Säben, Tinnetal, rock, 525 – 570 m a.s.l.

AT: a maximum elevation of 2,623 m a.s.l., Solstein, Innsbruck, TN, with further altitudinal limits of 2,190 m a.s.l., Totenkirchel, TN, and 1,500 m a.s.l., Falkenstein, TE. IT: up to **2,800 m a.s.l.**, Piedmont, 1,920 m a.s.l., Col di Lana, Trentino, and 1,000 m a.s.l., Ried, TS. CH: 194 – 2,489 m a.s.l.; FR: 1,920 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: V – decreasing (DE).

Homalothecium philippeanum (SPRUCE)

SCHIMP. (Brachytheciaceae), Langrippiges Goldmoos, no English name.

Only twice in TS/IT, squares 193 and 194, both at Cloister Säben, Tinnetal, on rock, 525 – 729 m a.s.l.

AT: a maximum elevation of 1,950 m a.s.l., Kitzbühler Horn TN, with a further limit of 1,200 m a.s.l., Stein, Matri, TE. IT: documented from an altitude up to **2,800 m a.s.l.**, Piedmont, 2,150 m a.s.l., Val di Fassa, Trentino. CH: 400 – 2,400 m a.s.l., the latter from Lenzer Alp. FR: 2,000 m a.s.l., Montvalezan, Savoy. Red list status: G – risk assumed (DE).

Homalothecium sericeum (HEDW.)

SCHIMP. (Brachytheciaceae), Seidenmoos, Silky Wall Feather-moss

Abundant, 50 squares: 1, 4-9, 13-20, 24, 40, 43, 85, 90, 95, 97, 105, 108, 109, 111-113, 132, 134, 136, 138, 140-149, 177-180, 184, 188, 189, 194, on rock, occasionally on ground

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and on walls, ca. 550 m a.s.l. to 1,800 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to 2,040 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,000 m a.s.l. with altitudinal limits of 1,650 m a.s.l., St. Anton/Galtür, TN, and 1,700 m a.s.l. at Matri i.O. and Kals, TE. IT: 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Gran Paradiso National Park, Aosta, and 1,920 m a.s.l., Col di Lana, Trentino. CH: 200 – **2,680 m a.s.l.** In DE highest altitude 1,820 m a.s.l. (Bavaria). FR: 1,950 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Homomallium incurvatum (SCHRAD. EX BRID.) LOESKE (Hypnaceae),

Felsenschlafmoos, Incurved Feather-moss
Once in square 3 (TS/IT), slopes at Naturns village, on ground, fruiting, 560 – 580 m a.s.l. For a maximum elevation of 2,500 m a.s.l., Gaisberg near Obergurgl, TN, with a further limit of 2,000 m a.s.l., Zillertaler Alpen, TN. IT: 2,370 – 2,630 m a.s.l., Eaux-Ranges valley, Gran Paradiso National Park, Aosta, and 1,390 m a.s.l., Buchenstein, Trentino. CH: 200 – **2,790 m a.s.l.**; FR: 2,400 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: V – decreasing (DE).

Hygroamblystegium fluviatile (HEDW.)

LOESKE; Syn.: *Amblystegium fluviatile* (HEDW.) SCHIMP. (Amblystegiaceae),
Fluß-Stumpfdeckel, Brook-side Feather-moss
In three squares of TS/IT only, squares 6-8, from Tschars to Juval along the Schnalswaalweg several times in an irrigation channel, 650 – 830 m a.s.l.

AT: a maximum elevation of **1,580 m a.s.l.**, Laponex, Gschnitztal, TN. No altitudinal limits for IT could be found so far. CH: 250 m to 900 m a.s.l.; FR: 234 m a.s.l., Aix-les-Bains, Savoy.

Red list status: VU – vulnerable (CH), V – decreasing (DE).

Hygroamblystegium humile (P. BEAUV.)

VANDERP., GOFFINET & HEDENÄS;

Syn.: *Amblystegium humile* (P. BEAUV.)

CRUNDW.; *A. radicale* (P. BEAUV.)

MITTEN (Amblystegiaceae),

Niedriges Wasserstumpfdeckelmoos,

Constricted Feather-moss

Only once, square 181 (TS/IT), Obertalmühle, river bank, ca. 660 m a.s.l.

AT: a maximum elevation of 1,000 m a.s.l. with a further limit of ca. 700 m a.s.l. for TN (without precise location given). In IT in a range of 200 – 400 m a.s.l. in Varigiano at Gavazzo in Arco, Trentino. CH: 200 – **1,091 m a.s.l.**

Red list status: 3 – endangered (AT), VU – vulnerable (CH), G – risk assumed (DE).

Hygroamblystegium tenax (HEDW.)

JENN.; Syn.: *Amblystegium tenax* (HEDW.)

JENS. (Amblystegiaceae), Starres Wasser-

stumpfdeckelmoos, Fountain Feather-moss

Once, square 180 (TS/IT), Marlingerberg below property Kofler, in river, ca. 800 m a.s.l.

AT: a maximum elevation of 1,900 m a.s.l., Wattener Lizum, TN, with a further limit of 1,425 m a.s.l., near St. Anton, TN. IT: 1,470 m a.s.l., below Cretaz, Aosta. CH: from 200 –

2,400 m a.s.l.; FR: 1,521 m, Rognaix, Savoy.
Red list status: V – decreasing (DE).

Hygrobrella laxifolia (HOOK.) SPRUCE

(Cephaloziaceae), Feuchtmoss,

Lax Notchwort

Once in TN/AT, square 71, above Martin-Busch-Hütte, bog, **ca. 2,540 – 2,630 m a.s.l.**
AT: an altitudinal range of 860 – 2,500 m a.s.l., the latter measurement from Schafsiddlkopf, TN; with a further limit of 2,400 m a.s.l., Nürnberger Hütte, Stubai, TN. No elevation limit for IT available so far. CH: 910 – 2,330 m a.s.l.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH), R – extremely rare (DE), AR – at risk (FR).

Hygrohypnum alpinum (LINDB.) LOESKE

(Amblystegiaceae),

Wasserschlafmoos, Brook-moss

Recorded twice, squares 64 (TS/IT), Tisental, river, ca. 2,580 – 2,590 m a.s.l. and 70 (TN/AT), above Martin-Busch-Hütte, boggy place, ca. 2,400 – 2,540 m a.s.l.

AT: an altitudinal range of ca. 1,050 – 2,700 m a.s.l. with the upper measurement from the vicinity of Breslauerhütte above Vent, TN, with further altitudinal limits of ca. 2,500 m a.s.l., Riffelsee, Pitztal, TN, and 2,560 m a.s.l., Peischlerpaß, TE. IT: in a range of 1,200 – 2,500 m a.s.l., Capanna Lipsia at M. Adamello, in Trentino, IT. CH: 1,080 – **2,780 m a.s.l.**; FR: 2,755 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: 4 – potentially endangered (AT), EN – endangered (CH).

Hygrohypnum duriusculum (DE NOT.)

JAMIESON; Syn.: *H. dilatatum* (WILS.)

LOESKE (Amblystegiaceae), Breites Wasserschlafmoos, Broad-leaved Brook-moss

13 squares: 6-8, 23, 38, 58, 73, 88, 93, 108, 118, 159, 171, on rock in rivers or boggy places, ca. 650 m a.s.l. to ca. 2,470 m a.s.l. (TS/IT) and ca. 1,470 m a.s.l. to ca. 2,490 m a.s.l. (TN/AT). AT: an altitudinal range of 560 – 2,500 m a.s.l. with the uppermost from Rendel mountain, TN, with further limits of 2,420 m a.s.l., Fuldaer Höhenweg, TN, and 2,300 m a.s.l., Felbertauern, TE. IT: **2,650 – 2,700 m a.s.l.**, Colle del Nivolet, Gran Paradiso National Park, Piedmont, 2,400 m a.s.l., in a range of 1,300 – 2,600 m a.s.l. in Trentino, and Malager Schafalpe, TS. CH: 410 – 2,665 m a.s.l.; FR: 2,600 m a.s.l., Champagny-en-Vanoise, Savoy. Red list status: r: 3 – locally endangered (AT), NT – potentially endangered (CH), 3 – endangered (DE).

Hygrohypnum luridum (HEDW.) JENN.;

Syn.: *Pictus scoticus* TOWNS.

(Amblystegiaceae), Bräunliches Wasserschlafmoos, Drab Brook-moss

Six records, squares 58 (TS/IT), Tisental, river, 2,141 m a.s.l.; 107 (TN/AT), Nachtberg, boggy place, ca. 1,780 – 1,850 m a.s.l.; 126 (TS/IT), Pfelderertal below Labkofel near saddle, spring, river, 2,400 – 2,571 m a.s.l.; 132 (TS/IT), Pfelderertal at Pfelders, rock, 1,630 – 1,700 m a.s.l.; 134 (TS/IT), Pfelderertal at Pfelders village, river, 1,570 – 1,610 m a.s.l.; 175 (TS/IT), Haidersee, on a bush in a bog, 1,450 m a.s.l. AT: a maximum elevation of 2,566 m a.s.l., Hochvogel, TN, with further limits of

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1,950 m a.s.l., Kitzbühler Horn, TN, and up to 2,500 m a.s.l. Hohe Tauern, TE. IT: 2,370 – 2,630 m a.s.l., Eaux-Ranges valley, Gran Paradiso National Park, Aosta, documented from an altitudinal range of 2,400 – 2,700 m a.s.l. in Piedmont, and 2,000 m a.s.l., Rieglerbach in Langtaufers and Madatschjoch at Ortler, TS. CH: 200 – **2,740 m a.s.l.**; FR: 2,180 m a.s.l., Lanslebourg-Mont-Cenis, Savoy. Red list status: V – decreasing (DE).

Hygrohypnum molle (HEDW.) LOESKE (Amblystegiaceae), Weiches Wasserschlafmoos, Soft Brook-moss
Recorded once for square 71 (TN/AT) only, above Martin-Busch-Hütte, dripping wet rocks, ca. 2,627 m a.s.l. and 2,635 m a.s.l. AT: an altitudinal range of ca. 1,200 – 2,700 m a.s.l. with the uppermost from Muttererjoch, Fotschertal, TN, with a further limit of 2,530 – 2,600 m a.s.l., Gornitscham, TE. IT: in a range of 1,500 – 2,600 m a.s.l. (the latter at Mandron) in Trentino, and 2,370 – 2,660 m a.s.l., Martelltal, TS. CH: 400 – 2,750 m a.s.l.; FR: **2,770 m a.s.l.**, Bonneval-sur-Arc, Savoy. Red list status: VU – vulnerable (CH).

Hylocomiastrum pyrenaicum (SPRUCE) M. FLEISCH.; Syn.: *Hylocomium pyrenaicum* (SPRUCE) LINDB. (Hylocomiaceae), Pyrenäen-Hainmoos, Oake's Wood-moss
17 squares: 30, 31, 48-52, 56, 82, 84, 93, 94, 107, 127, 128, 133, 157, usually on ground, ca. 1,700 – 2,400 m a.s.l. (TS/IT) and ca. 1,590 – 2,130 m a.s.l. (TN/AT). AT: an altitudinal range of ca. 800 – 2,730 m a.s.l., with the uppermost from 2,730 m a.s.l.,

Leiterköpfe, TE, with further limits of 2,530 m a.s.l., Roßkogel, Innsbruck, TN, and ca. 2,560 m a.s.l., Ködnitztal, TE. IT: 1,870 – 1,940 m a.s.l., Piano di Eugio, Piedmont, in a range of 1,000 – 2,600 m a.s.l. in Trentino, and 1,900 m a.s.l., Hühnerspiel, Brenner TS. CH: 240 – **3,400 m a.s.l.**; FR: 2,378 m a.s.l., Notre-Dame-de-Briançon, Savoy. Red list status: V – decreasing (DE).

Hylocomium splendens (HEDW.) SCHIMP. (Hylocomiaceae), Glanzmoos, Glittering Wood-moss
Very abundant, 152 squares: 1, 6, 7, 9, 11-17, 19-59, 70, 71, 76-84, 86-120, 127-132, 134-137, 139, 141, 142, 144-155, 157-160, 169, 170, 172-174, 178, 179, 181-198, typically on ground, occasionally on rock and in a degraded peat bog, ca. 525 m to ca. 2,700 m a.s.l. (TS/IT) and ca. 1,450 m to 2,788 m a.s.l. (TN/AT). AT: a maximum elevation of **3,000 m a.s.l.** (Carinthia) with further limits of 2,843 m a.s.l., Pirchkogel, Kühtai, TN, and 2,800 m a.s.l., Hohe Tauern, TE. IT: 2,423 – 2,470 m a.s.l., Mt. Lago Nero, Piedmont, and 2,900 m a.s.l., Mittereck, St. Valentin, TS. CH: 200 – 2,998 m a.s.l.; FR: 2,491 m a.s.l., Tignes, Savoy. Red list status: V – decreasing (DE).

Hymenostylium recurvirostre (HEDW.) DIX.; Syn.: *Gymnostomum recurvirostrum* HEDW. (Pottiaceae), Krummschnäbeliges Deckelsäulchenmoos, Hook-beak Tufa-moss
Three times in TS/IT only, squares 138, Pfelderertal at Bruggstein, waterfall, ca. 1,380 – 1,430 m a.s.l.; 143, northeast of Schlanders

village, on tufa, moist shady rock, ca. 850 m a.s.l., and 181, Obertalmühle, lime tufa and spring, ca. 660 m a.s.l.

AT: a maximum elevation of 3,000 m a.s.l., from Ködnitztal, TE, with further altitudinal limits of 2,600 m a.s.l., Granatenwand, Ober-
gurgl, TN, and 2,340 m a.s.l., at Tauernbach.

IT: up to 3,000 m a.s.l., Monte Stollemborg, Aosta, 2,200 m a.s.l., Valsunspitze, TS, and 2,174 – 2,210 m a.s.l., near Lago di Valparola, Trentino. CH: 270–2,800 m a.s.l.; FR: **3,429 m a.s.l.**, Bonneval-sur-Arc, Savoy.

Red list status: 3 – endangered (DE).

Hypnum callichroum BRID.;

Syn.: *Stereodon callichrous* (BRID.) LINDB.

(Hypnaceae), Schönfarbiges Schlafmoos,

Downy Plait-moss

Three times, squares 140 (TS/IT), Pfelderertal above Weiherhof, wet place, ca. 1,260 – 1,310 m a.s.l., 157 (TN/AT), Rofental towards Rofenbergalm, flush, 1,970–2,030 m a.s.l. and 197, Valsertal, degraded bog, 1395 m a.s.l.

AT: an altitudinal range of ca. 1,000 – **3,460 m a.s.l.** with the uppermost from Hochwilde, TN and further altitudinal limits of 2,530 m a.s.l., Riepenspitze, Gschnitztal, TN, and 2,000 m a.s.l., Rotsteinwand am Zettersfeld, Lienz, TE. IT: 2,600 m a.s.l., Brenner, TS. CH: 430 – 3,000 m a.s.l.; FR: 2,200 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: 3 – endangered (DE).

Hypnum cupressiforme HEDW.

(Hypnaceae), Zypressen-Schlafmoos,

Cypress-leaved Plait-moss

A detailed key for the *Hypnum cupressiforme*

complex was provided by Hedenäs (1994b).

Here we refer to *Hypnum cupressiforme* s.l.

Very abundant, 141 squares: 1, 3-20, 24-29, 32-36, 38-45, 48-50, 52-58, 60, 63, 64, 70, 71, 79, 81, 82, 84-90, 92-112, 114, 116, 118, 120, 121, 129-131, 135-152, 154, 159-161, 163, 169, 171-174, 176-181, 183-196, 198, on rock, ground and bark, lowest records are ca. 525 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT), highest are 2,600 m a.s.l. (square 63, TN/AT, TS/IT) and 2,720 m a.s.l. (TN/AT).

AT: a maximum elevation of >3000 m a.s.l. with further limits of 2,530 m a.s.l., Riepenspitze, Gschnitztal, TN, and 2,600 m a.s.l., Lienz, TE. IT: up to **3,480 m a.s.l.**, Theodulhorn, Aosta, 3,010 m a.s.l. Nockspitze, Langtaufers TS (var. *subjulaceum* MOLENDO), and 1,950 m a.s.l., Ornella valley, Buchenstein, Trentino (f. *petraea* MOLENDO). CH: 200 – 3,260 m a.s.l., the latter from Piz Languard. FR: 2,560 m a.s.l. (var. *subjulaceum* MOLENDO), Lanslebourg-Mont-Cenis, Savoy.

Hypnum revolutum (MITT.) LINDB.;

Syn.: *Roaldia revoluta* (MITT.) P.E.A.S.

CÂMARA & CARV.-SILVA (Hypnaceae),

Rollrand-Schlafmoos, Revolute Plait-moss

Abundant, 53 squares: 1, 7, 13-15, 17, 18, 20, 24, 26, 35, 36, 42, 50, 58-60, 63, 73, 77, 79, 80, 82, 83, 84, 91, 92, 95, 101-105, 107-109, 111-113, 116, 118, 123, 130, 134, 140, 143, 158, 161, 177, 178, 183, 185, 193, on rock and on ground. Highest record in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, 3,019 m a.s.l., lowest records ca. 525 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

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AT: an altitudinal range of ca. 1,800 – 3,460 m a.s.l., Hinterer Spiegelkogel, TN with further altitudinal limits of 2,800 m a.s.l., Scharlkopf, Nauders, TN, 2,900 m a.s.l., Rottenkogel, TE. IT: up to **3,500 – 3,700 m a.s.l.**, Grivola, Aosta, 3,319 m a.s.l., Schöntaufspitze, TS, 3,140 m a.s.l. Veltlin, and in a range of 1,500 – 2,700 m a.s.l. (Padon) in Trentino. CH: 318 – 3,650 m a.s.l., Combin de Corbassieres. FR: 3,195 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Hypnum vaucheri LESQ.;

Syn.: *Buckia vaucheri* (LESQ.) D. RÍOS, M.T. GALLEGÓ & J. GUERRA (Hypnaceae), Hohlblättriges Schlafmoos, Vaucher's Plait-moss

11 squares: 32, 45, 51, 54, 58, 63, 97, 105, 161, 163, 184, on rock and on ground. Highest record in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, rock crevices, 3,019 m a.s.l., lowest records ca. 1,070 m a.s.l. (TS/IT) and ca. 1,470 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,465 m a.s.l., Adlersruhe, Großglockner, TE (var. *coelophyllum* MOLENDÓ) with further limits of 2,800 m a.s.l., Ramolhaus, Ötztal, TN, and 2,400 m a.s.l., Geisstein, TN. IT: up to **3,800 m a.s.l.**, Grivola, Aosta, 1,500 m a.s.l., Reschen, TS, and 2,340 m a.s.l., Monte delle Donne, Durontal, Val di Fassa, Trentino. CH: 350 – 3,650 m a.s.l., Combin de Corbassieres. FR: 3,429 m a.s.l., Bonneval-sur-Arc, Savoy.

Isopterygiopsis muelleriana (SCHIMP.)

IVATS. (Plagiotheciaceae), Müllers Gleichflügelmoos, Mueller's Silk-moss

19 squares: 7, 8, 12, 19, 35, 57, 63, 64, 73, 82, 84, 88, 103, 115, 158, 159, 170, 171, 190, usually on ground. Highest record in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, rock crevices, **3,019 m a.s.l.**, lowest records ca. 650 m a.s.l. (TS/IT) and ca. 1,830 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,660 m a.s.l., Möserlingwand, Hohe Tauern, TE, with a further limit of 2,350 – 2,450 m a.s.l., Leutkirchner Hütte, St. Anton, TN. IT: in a range of 300 – 2,300 m a.s.l. in Trentino. CH: 230 – 2,333 m a.s.l.; FR: 2,480 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: V – decreasing (DE).

Isopterygiopsis pulchella (HEDW.) IWATS.

(Plagiotheciaceae), Hübsches Gleichflügelmoos, Neat Silk-moss

15 squares: 14, 25, 63, 73, 83-87, 89, 94, 102, 105, 107, 171, on rock and on ground. Highest record in square 63 (TN/AT, TS/IT), ground, ca. 2,700 m a.s.l., lowest recorded at ca. 880 m a.s.l. (TS/IT) and ca. 1,470 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,700 m a.s.l. with further limits at 2,550 m a.s.l., Hohe Mut, Obergurgl, TN, and 2,500 – 2,530 m a.s.l., at Steiner Kees, TE. IT: up to **3,198 – 3,350 m a.s.l.**, Pic Garin, Aosta, and 2,700 m a.s.l., Mataunkopf at Graun, TS. CH: 296 – 2,915 m a.s.l.; FR: 2,460 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: G – risk assumed (DE).

Isoetecium alopecuroides (LAM.) ISOV.
(Lembophyllaceae), Großes Mausschwanzmoos, Larger Mouse-tail Moss
Abundant, 37 squares: 1, 13-15, 24-26, 33, 34, 36, 40, 42, 43, 102, 103, 105, 107-112, 131, 134-137, 139-141, 149, 178, 180, 186-189, on rock and on bark, ca. 700 – 1,820 m a.s.l. (TS/IT) and ca. 1,450 – 1,850 m a.s.l. (TN/AT).
AT: a maximum elevation of 1,900 m a.s.l. with further limits of 1,875 m a.s.l., Arzler Alpl, TN, and ca. 1,800 m a.s.l., Ködnitztal, TE. IT: 1,800 – 2,300 m a.s.l., path to Money, Gran Paradiso National Park, and 2,300 m a.s.l., Schlern, TS. CH: 100 – **2,353 m a.s.l.**;
FR: 1,650 m a.s.l., Tignes, Savoy.
Red list status: V – decreasing (DE).

Jamesoniella autumnalis (DC.) STEPH.;
Syn.: *Syzygiella autumnalis* (DC.) K.
FELDBERG, VÁŇA, HENTSCHEL & HEINRICH (Lophoziaceae),
Echtes Herbstlebermoos, Autumn Flapwort
Three times, squares 94 (TN/AT), Ventertal at Heiligkreuz, ground, ca. 1,699 – 1,710 m a.s.l.; 99 (TN/AT), Ventertal at Bodeneck, rotten wood, ca. 1,525 – 1,530 m a.s.l.; 124 (TS/IT), Pfossental towards Stettiner Hütte, ground, ca. **2,600 – 2,875 m a.s.l.**
AT: a maximum elevation of 1,100 – 1,200 m a.s.l. (Styria) with further limits of 1,310 m a.s.l., Gander Alm, TN, and 1,000 m a.s.l., Stanzach, TN. CH: 400 m a.s.l. to 2,400 m a.s.l. For DE the highest altitude given is 1,470 m a.s.l. (Bavaria). FR: 1,573 m a.s.l., Crest-Voland, Savoy.
Red list status: CR – critically endangered (IT), EN – endangered (CH), V – decreasing (DE).

Jungermannia atrovirens DUMORT.;
Syn.: *Aplozia riparia* (TAYL.) DUM.
(Jungermanniaceae), Schwarzgrünes Jungermannmoos, Dark-green Flapwort
Twice in TS/IT only, squares 128, Pfelderertal at Lazins Alm, ground, 1,860 – 2,080 m a.s.l.; 181, Obertalmühle, wet ground, ca. 660 m a.s.l.
AT: altitudinal limit **ca. 3,000 m a.s.l.** with further limits of 2,200 m a.s.l., Fadasterbach, Gschnitztal, TN, and 2,400 m a.s.l., Hinterbichl, TE. IT: 2,722 – 2,770 m a.s.l., at Lago Trebecchi, Gran Paradiso National Park, Aosta, and 500 m a.s.l., Gröden, TS. CH: 273 m to 2,770 m a.s.l.; FR: 2,160 m a.s.l., Pralognan-la-Vanoise, Savoy.
Red list status: NT – near threatened (IT), V – decreasing (DE).

Jungermannia confertissima NEES;
Syn.: *Solenostoma confertissimum* (NEES) SCHLJAKOV; *Haplozia breidlerii* K.MÜLL.
(Jungermanniaceae), Dichtblättriges Jungermannmoos, Kidney Flapwort
Twice in TS/IT only, squares 58, Tisental, ground, 2,116 m a.s.l. and 134, Pfelderertal at Pfelders village, wet rock, 1,570 – 1,610 m a.s.l.
AT: an altitudinal range of ca. (500) 1,000 – 2,600 m a.s.l. with limits of 2,400 m a.s.l., Gaisbergtal, TN, 2,200 – 2,600 m a.s.l., Lüsenerntal, TN, and 1,800 m a.s.l., Möserlingwand, TE. IT: 2,423 – 2,670 m a.s.l., at Lago di Motta, Gran Paradiso National Park, Piedmonte. CH: 1,420 – 2,610 m a.s.l.; FR: **2,755 m a.s.l.**, Lanslebourg-Mont-Cenis, Savoy.
Red list status: CR – critically endangered (IT),

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NT – potentially endangered (CH), V – decreasing (DE).

Jungermannia exsertifolia STEPH. ssp.

cordifolia (DUMORT) VÁNA

(Jungermanniaceae), Herzblättriges Jungermannmoos, Heart-leaved Flapwort

Twice in TS/IT only, squares 134, Pfelderertal at Pfelders village, in river, 1,570 – 1,610 m a.s.l. and 136, Pfelderertal at Innerhütt, in water in bog, ca. 1,425 – 1,510 m a.s.l.

AT: an altitudinal range of ~1,400 – **2,700 m a.s.l.** with the uppermost from Ködnitztal, TE; with further altitudinal limits of 2,450 m a.s.l., towards Faselpfad Ferner, TN, and 2,500 m a.s.l., Neualpl near Lienz and Schleinitz, TE. For IT no altitudinal limits so far. CH: 1,040 m a.s.l. to 2,700 m a.s.l.; FR: 2,200 m a.s.l., Termignon, Savoy.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (IT, CH), R – extremely rare (DE).

Jungermannia gracillima SM.;

Syn.: *Solenostoma gracillimum* (SM.) R.M.

SCHUST.; *Haplozia crenulata* (SM.) DUM.

(Jungermanniaceae), Zierliches Jungermannmoos, Crenulated Flapwort

Twice in TS/IT only, squares 135, Pfelderertal at Krößbichl, rock, ca. 1,550 – 1,565 m a.s.l. and 136, Pfelderertal at Innerhütt, rotten wood, ca. 1,425 – 1,510 m a.s.l.

AT: a maximum elevation 2,000 m a.s.l., Pirchhüttbühel near Obergurgl, TN with further limits of 1,850 m a.s.l., Hinterkaiser, TN, 1,830 m a.s.l., below Mittelbergferner, Pitztal, TN, and 1,500 m a.s.l., Lienz, TE.

IT: 2,300 – 2,670 m a.s.l., at Laghi Miserino, Aosta, and in a range up to 2,500 m a.s.l. in Trentino. CH: 255 m a.s.l. to **2,770 m a.s.l.**; FR: 2,250 m a.s.l., Valloire, Savoy. For DE a highest altitude of 1,465 m a.s.l. is recorded (southern DE).

Red list status: NT – near threatened (IT).

Jungermannia hyalina LYELL;

Syn.: *Solenostoma hyalinum* (LYELL) MITT.;

Eucalyx hyalinus (LYELL) BREIDLER

(Jungermanniaceae), Helles Jungermannmoos, Transparent Flapwort

Twice in TN/AT only, squares 68, at Niederjochferner, rock, **ca. 2,620 – 2,880 m a.s.l.** and 70, above Martin-Busch-Hütte, river, ca. 2,500 – 2,540 m a.s.l.

AT: an altitudinal range of ca. 300 – 2,200 m a.s.l. with the uppermost from St. Anton, TN, with a further limit of 1,500 m a.s.l., near Neurur, Pitztal, TN. IT: 2,370 – 2,630 m a.s.l., Eaux-Ranges valley, Gran Paradiso National Park, Aosta. CH: 270 – 2,250 m a.s.l.; FR: 400 m a.s.l., Rognaix, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered.

Jungermannia leiantha GROLLE;

Syn.: *Liochlaena lanceolata* NEES

(Jungermanniaceae), Glattkelchiges

Jungermannmoos, Lance Flapwort

Once, square 172 (TS/IT), Matschertal, river bank, ca. 1,370 – 1,430 m a.s.l.

AT: an altitudinal range of ca. 200 to 1,400 – **2,100 m** with an altitudinal limit of 1,400 m a.s.l., St. Leonhard, Pitztal, TN. IT: in a range of 500 – 1,000 m a.s.l. in Montagna Grande

di Pergine, Trentino, and 1,200 m a.s.l., Pflerschertal, Gossensass, TS. CH: 500 – 2,080 m a.s.l.

Red list status: NT – near threatened (IT), VU – vulnerable (CH), V – decreasing (DE).

***Jungermannia sphaerocarpa* HOOK.;**

Syn.: *Solenostoma sphaerocarpum* (HOOK.) STEPH. (Jungermanniaceae), Kugelfrüchtiges Jungermannmoos, Round-fruited Flapwort
Twice in TN/AT only, squares 82, above Vent, ground, ca. 1,940 – 2,100 m a.s.l. and 169, Tiefenbach, ground, 2,695 m a.s.l.

AT: an altitudinal range of ca. 600 – 2,700 m a.s.l., the latter elevation from near Kals, TE and a further limit of 2,600 m a.s.l. from Rotmoostal and Kirchenkogel, Ötztal, TN and Ködnitztal, TE. IT: 2,550 – 2,630 m a.s.l., Aosta, and 2,400 m a.s.l., Schneeberg in Passeier, TS. CH: 450 m a.s.l. to **3,100 m a.s.l.**; FR: 1,850 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

***Kiaeria blyttii* (BRUCH & SCHIMP.)**

BROTH. (Rhabdoweisiaceae), Blytts Kropf-Gabelzahnmoos, Blytt's Fork-moss
Three squares in TS/IT only, squares 23, Klosteralm, ground, ca. 2,240 – 2,550 m a.s.l.; 47, Taschenjöchel, rock, ca. 2,400 m a.s.l.; 58, Tisental, ground, 2,357 m a.s.l.

AT: an altitudinal range of ca. 1,700 – 2,700 m a.s.l. with further limits of 2,212 m a.s.l., Patscherkofel, Innsbruck, TN, and 2,300 m a.s.l., Hinterbichl, TE. IT: 2,601 – 2,645 m a.s.l., Laghi Ponton, Aosta, in a range of 1,500 – 2,500 m a.s.l. in Trentino, and 2,600 –

2,700 m a.s.l., near St. Martin in Passeier, TS. CH: 1,002 – **2,975 m a.s.l.**; FR: 2,400 m a.s.l., Cevins, Savoy.

Red list status: 4 – potentially endangered (AT), 3 – endangered (DE).

***Kiaeria falcata* (HEDW.) HAG.**

(Rhabdoweisiaceae), Kropf-Gabelzahnmoos, Sickle-leaved Fork-moss
13 squares: 22, 23, 64, 67, 70, 71, 73, 82, 83, 124, 164, 169, 170, on ground and at snow patches, up to 2,875 m a.s.l. (TS/IT) and 2,788 m a.s.l. (TN/AT), not below 1,980 m a.s.l. (TS/IT) and 1,940 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 1,600 – 2,750 m a.s.l., the upper limit at Rotkogel, Ötztal, TN and Ködnitztal, TE, with further limits of 2,300 m a.s.l., Krummgampental, Gepatsch, TN, and 2,735 m a.s.l., Bergerpaß, TE. IT: in a range of 1,500 – 2,800 m a.s.l. in Trentino, and 2,700 m a.s.l., Wormser Joch, TS. CH: 1,000 m a.s.l. to **3,000 m a.s.l.**; FR: 2,500 m a.s.l., Bourg-Saint-Maurice, Savoy.

Red list status: R – extremely rare (DE).

***Kiaeria starkei* (WEB. & MOHR) HAG.**

(Rhabdoweisiaceae), Starkes Gabelzahnmoos, Starke's Fork-moss
10 squares: 61, 67, 70-74, 127, 128, 134, rock and (wet) ground, up to 2,680 m a.s.l. (TS/IT) and 2,630 m a.s.l. (TN/AT), not below 1,570 m a.s.l. (TS/IT) and 2,220 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 1,500 – 2,750 m a.s.l., the uppermost from Ködnitztal, TE, with further limits of 2,530 m a.s.l., Roßkogel, TN, and 2,300 m a.s.l., Matrei i.O., TE.

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IT: up to 2,960 m a.s.l., Mont Mort, Aosta, 3,000 m a.s.l., 2,270 m a.s.l., Ornella valley, Buchenstein, Trentino, and Schöntaufspitze, TS. CH: 530 – **3,210 m a.s.l.**; FR: 3,190 m a.s.l., Saint-Martin-de-Belleville, Savoy. Red list status: 3 – endangered (DE).

Leiocolea bantriensis (HOOK.) JÖRG.; Syn.: *L. alpestris* (WEB.) ISOVITA; *Mesoptychia bantriensis* (HOOK.) L. SÖDESTR. & VÁŇA (Lophoziaceae), Großes Glattkelch-moos, Bantry Notchwort Three times, squares 4 (TS/IT), Unterstell, near waterfall, 750 – 990 m a.s.l.; 85 (TN/AT), near Vent village, ground, ca. 1,920 – 2,040 m a.s.l.; 89 (TN/AT), Ventertal near Koner Rinne, wet ground, ca. 1,840 – 1,860 m a.s.l. AT: an altitudinal range of ca. 400 – 2,400 m a.s.l., the uppermost from Ködnitztal, TE, with a further limit of 2,100 m a.s.l., Finstertaler Seen, Kühtai, TN. IT: 2,300 – 2,670 m a.s.l., Laghi Miserino, Gran Paradiso National Park, Aosta, documented from an altitudinal range of 2,400 – 2,700 m a.s.l. in Piedmont, and 2,500 m a.s.l., Piz Tresero of Ortler group, TS. CH: 500 m a.s.l. to 2,450 m a.s.l.; FR: 2,317 m a.s.l., Termignon, Savoy. The highest indication for Europe, without precise location, is **3,100 m a.s.l.** Red list status: r: 3 – locally endangered (AT), NT – near threatened (IT), G – risk assumed (DE).

Leiocolea heterocolpos (THED. ex HARTM.) H. BUCH; Syn.: *Mesoptychia heterocolpos* (THED. ex. HARTM.) L. SÖDERSTR. & VÁŇA (Lophoziaceae), Brutkörpertragendes Glattkelchmoos, Ragged Notchwort Twice in TS/IT only, squares 58, Tisental, ground, 2,357 m a.s.l. and 129, Pfelderertal, Pfelderer Alm, rock, 1,820 – 1,860 m a.s.l. AT: an altitudinal range of ca. 450 – 2,500 m a.s.l. with a further local limit of 1,900 m a.s.l., Issanger, Halltal, TN. IT: of 2,703 – 2,710 m a.s.l., Gran Paradiso National Park, 2,400 – 2,700 m a.s.l., Piedmont, and 500 m a.s.l., Algund, Meran, TS. CH: 480 m a.s.l. to **2,660 – 2,850 m a.s.l.**; FR: 2,467 m a.s.l., Valloire, Savoy. Red list status: NT – near threatened (IT), G – risk assumed (DE).

Lejeunea cavifolia (EHRH.) LINDB. (Lejeuneaceae), Hohlblättriges Lappenmoos, Micheli's Least Pouncewort 16 squares: 1, 13-15, 18, 20, 24, 39, 88, 141, 150, 178, 186, 187, 189, 195, on bark and on rock, from ca. 690 m a.s.l. to 1,740 m a.s.l. (TS/IT), only once in TN/AT, square 88, Ventertal, bark and rock, 1,830 – 1,840 m a.s.l. AT: an altitudinal range of ca. 200 – 2,300 m a.s.l. with further limits of 1,680 m a.s.l., Totenkirchl, TN, and ca. 1,800 m a.s.l., Ködnitztal, TE. IT: 2,000 – 2,245 m a.s.l., Seyvaz valley, Gran Paradiso National Park, Aosta, an altitudinal range up to **2,800 m a.s.l.**, Piedmont, and 2,500 m a.s.l., Piz Tresero in Ortler group, TS. CH: 200 m a.s.l. – 2,240 m a.s.l.; FR: 1,650 m a.s.l., Tignes, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Lepidozia reptans (L.) DUMORT.

(Lepidoziaceae), Kleines Schuppenzweigmoos, Creeping Fingerwort
20 squares: 1, 24, 25, 35, 43, 46, 73, 86, 107, 114, 141, 178, 185-190, 195, 196, on rotten wood, ground and rock, ca. 690 – 2,200 m a.s.l. (TS/IT) and ca. 1,780 – 2,490 m a.s.l. (TN/AT).

AT: a maximum elevation of ca. 2,000 m a.s.l. (Styria) with further limits of 1,700 – 1,950 m a.s.l., Lüsens, TN, and 1,800 m a.s.l., Spitzkofel, TE. IT: in a range of 500 – 2,000 m a.s.l. in Montagna Grande di Pergine, Trentino. CH: 200 m a.s.l. to **2,550 m a.s.l.** In DE a highest altitude of 2,000 m a.s.l. (Bavaria). FR: 1,734 m a.s.l., Bourg-Saint-Maurice, Savoy.

Red list status: NT – near threatened (IT).

Leptobryum pyriforme (HEDW.) WILS.

(Meesiaceae), Echtes Seidenbirnmoos, Golden Thread-moss

Four times, squares 20 (TS/IT), Burghof, ground, 1,299 m a.s.l.; 135 (TS/IT), Pfelderertal at Krößbichl, stonewall, ca. 1,550 – 1,565 m a.s.l.; 184 (TS/IT), at Lajen village, ground, 1,070 – 1,090 m a.s.l.; 198 (TN/AT), Obergurgl near Zirbenwald, stone wall, 1,950 – 2,100 m a.s.l.

AT: a maximum elevation of 2,300 m a.s.l., Gurner at Matrei i.O., TE, with further limits at 2,250 m a.s.l., Gaisbachtal, Ötztal, TN, and 1,750 m a.s.l., Schlattenkees, TE. IT: up to 3,300 m a.s.l., Col Lauzon, Aosta, and 2,750 m

a.s.l., Stilfserjoch, TS. CH: 196 – 2,680 m a.s.l.; FR: **3,400 m a.s.l.**, Grands Mulets.

Leptodictyum riparium (HEDW.)

WARNST.; Syn.: *Amblystegium riparium* (HEDW.) SCHIMP. (Amblystegiaceae),

Ufermoos, Kneiff's Feather-moss

Twice in TS/IT only, squares 171, Matscherthal, river, 1,810 – 1,820 m a.s.l. and 176, near Oris village, wet ground, ca. 870 m a.s.l.

AT: a maximum elevation of 1,500 m a.s.l., St. Anton, TN. No altitudinal limits found for IT so far. CH: 200 – **2,180 m a.s.l.**; FR: 1,659 m a.s.l., Tignes, Savoy.

Leptodon smithii (HEDW.) WEB. &

MOHR (Leptodontaceae), Schneckenmoos, Prince-of-Wales Feather-moss

Once, square 5 (TS/IT), on rock at the entrance to the gorge of the Schnals river at Juval, 550 m a.s.l.

No altitudinal records for AT so far. IT: up to 1,400 m a.s.l., La Thuile, Aosta, and 650 m a.s.l., Vellauer Tal, TS. In CH 200 – **1,700 m a.s.l.**; FR: 236 m a.s.l., Yenne, Savoy.

Red list status: VU – vulnerable (CH), according to Hodgetts (2015) in DE 0 – extinct, but refound.

Lescuraea saxicola (SCHIMP.)

MOLENDO (Leskeaceae), Fels-Streifemoos, Rock veather-moss

Abundant, 57 squares: 29, 31, 36-38, 43, 46, 47, 49, 50, 52, 56, 57, 60, 61, 70, 75, 77-79, 81, 84, 86-92, 95-97, 100-102, 104-106, 114, 115, 118-120, 126, 127, 129-133, 152, 157-160, 169, 185, 198, usually on rock, ca.

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1,630 – 2,700 m a.s.l. (TS/IT) and ca. 1,470 – 2,700 m a.s.l. (TN/AT).

AT: an altitudinal range of 1,270 – 3,400 m a.s.l., the upper measurement from ascend to Gurner, TE with further altitudinal limits of 3,000 m a.s.l., Ölgrubenjoch, TN, and 2,700 m a.s.l., Zunig, TE. IT: up to **3,500 m a.s.l.**, Monte Rosa, Aosta, 2,500 m a.s.l., Val di Fassa, Trentino, and 2,900 m a.s.l., Mittereck at Graun, TS. CH: 450 – 3,300 m a.s.l., Piz Corvatsch. FR: 2,290 m a.s.l., Valloire, Savoy.

Red list status: R – extremely rare (DE).

Leucobryum glaucum (HEDW.) ÅNGSTR. (Leucobryaceae), Gemeines Weißmoos, Large White-moss

Five times, squares 48 (TS/IT), Marchegg, ground, ca. 1,930 m a.s.l.; 52 (TS/IT), near Kurzras village, wet ground, 2,011 – 2,153 m a.s.l.; 53 (TS/IT), near Kurzras village, ground, 2,153 – 2,210 m a.s.l.; 71 (TN/AT), above Martin-Busch-Hütte, ground, ca. 2,540 – 2,630 m a.s.l.; 104 (TN/AT), Gaislachalm, rock, ca. 1,900 – 1,980 m a.s.l.

AT: a maximum elevation of 2,300 m a.s.l. with a further limit of 2,050 m a.s.l., Hinterkaiser, TN. IT: 1,870 – 1,940 m a.s.l., Piano di Eugio, Piedmont. CH: 200 – **2,640 m a.s.l.**; FR: 2,400 m a.s.l., Pralognan-la-Vanoise, Savoy. Red list status: V – decreasing (DE).

Leucodon sciuroides (HEDW.)

SCHWAEGR. (Leucodontaceae),

Eichhörnchenschwanz-Moos, Squirrel-tail Moss (Fig. 5.15)



Fig. 5.15: Squirrel-tail Moss (*Leucodon sciuroides*), usually on rock but also on bark

Abundant, 67 squares: 4-20, 24-26, 32-35, 37-44, 48, 54, 55, 83, 85, 94, 95, 105, 108-112, 114, 127, 129, 134, 138, 140, 143-149, 177, 178, 181, 184, 186, 187, 193-195, on rock and on bark, ca. 525 m a.s.l. to ca. 2,400 m a.s.l. (TS/IT), ca. 1,450 – 2,250 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,660 m a.s.l.**, Mädälsspitze, TE, with a further limit of 2,000 m a.s.l., Alpeiner alpe, TN. IT: 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Aosta, Gran Paradiso National Park, and 1,950 m a.s.l., Mulatto, Predazzo, Trentino. CH: 194 – 2,480 m a.s.l.; FR: 2,280 m a.s.l., Tignes, Savoy.

Red list status: 3 – endangered (DE).

Lophocolea bidentata (L.) DUMORT.

(Geocalycyaceae), Zweizähliges Kammkelchmoos, Bifid Crestwort

Not separated from *L. coadunata* (SW.) MONT. Seven times, squares 14 (TS/IT),

at Altratheis, ground, ca. 880 – 900 m a.s.l.; 94 (TN/AT), Ventertal at Heiligkreuz, ground, ca. 1,699–1,710 m a.s.l.; 107 (TN/AT), Nachterberg, ground, ca. 1,780 – 1,850 m a.s.l.; 132 (TS/IT), Pfelderertal at Pfelders village, rock, 1,630 – 1,700 m a.s.l.; 141 (TS/IT), Pfelderertal at Moos im Passeier, ground, ca. 980 – 1,026 m a.s.l.; 179 (TS/IT), Marlingerberg at property Kofler, ground, ca. 1,100 m a.s.l., 190 (TS/IT), Latzfons, ground, 1580-1600 m a.s.l. AT: maximum elevation of ca. 1,200 m a.s.l. (*L. bidentata*) and ca. 1,700 m a.s.l. (*L. coadunata*) with a further elevation limit (without distinguishing subtaxa) of 1,400 m a.s.l., Lanserwald at Igls, TN. IT: in a range of 1,000 – 1,800 m a.s.l. in Trentino. CH: 200 m a.s.l. to **2,225 m a.s.l.**; In DE: highest altitude 1,250 m a.s.l. (Bavaria). FR: 1,700 m a.s.l., Tignes, Savoy. Red list status: NT – near threatened (IT).

Lophocolea heterophylla (SCHRAD.) DUMORT.; Syn.: *Chiloscyphus profundus* (NEES) ENGEL & R.M. SCHUST. (Geocalycycae), Verschiedenblättriges Kammkelchmoos, Variable-leaved Crestwort Seven squares: 91, 109, 136, 141, 172, 188, 189, on ground, bark, rock and river bank, ca. 780 – 1,510 m a.s.l. (TS/IT) and ca. 1,450 – 1,850 m a.s.l. (TN/AT). AT: a maximum elevation of 1,800 m a.s.l., Hochzeiger, Pitztal, TN. IT: 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Gran Paradiso National Park, Aosta. CH: 195 m a.s.l. to **2,543 m a.s.l.** The maximum elevation in Liechtenstein 1,800 m a.s.l.; FR: 1,734 m a.s.l., Bourg-Saint-Maurice, Savoy. Red list status: NT – near threatened (IT).

Lophocolea minor NEES; Syn.: *Chiloscyphus minor* (NEES) ENGEL & R.M. SCHUST. (Geocalycycae), Kleines Kammkelchmoos, no English name. 19 squares: 6, 13, 14, 18, 25, 32, 34, 54, 55, 90, 91, 102, 107, 108, 112, 130, 148, 172, 196, on ground, bark and rock, recorded within an altitudinal range of 790 – 2,051 m (TS/IT) and ca. 1,450 – 1,850 m a.s.l. (TN/AT). AT: a maximum elevation of 2,100 m a.s.l., Ködnitztal, TE, with a further limit of 1,900 m a.s.l., Obergurgl, TN. IT: 2,200 – 2,450 m a.s.l., Meye-d'en Haut, Gran Paradiso National Park, Aosta, in a range of 500 – 2,000 m a.s.l. in Trentino. CH: 271 – **2,775 m a.s.l.**; FR: 2,200 m a.s.l., Tignes, Savoy. Red list status: NT – near threatened (IT), V – decreasing (DE).

Lophozia ascendens (WARNST.) R.M. SCHUST. (Lophoziaaceae), Kleines Spitzmoos, Ascending Notchwort Twice in TS/IT only, squares 135, Pfelderertal at Krößbichl, rotten wood, ca. 1,550 – 1,565 m a.s.l. and 171, Matschertal, rotten wood, 1,810 – 1,820 m a.s.l. AT: an altitudinal range of (300) 600–1,700 m a.s.l., with the uppermost specimen found in Dorfertal, Kals, TE, and a further limit of 1,500 m a.s.l., Tulfes, TN. IT: 1,700 – **2,300 m a.s.l.**, between Lillaz and Lago di Loie, Aosta, and in a range of 700 – 1,500 m a.s.l. in Pinzolo, Trentino. CH: 900 – 1,996 m a.s.l. Red list status: VU – vulnerable (IT), AR – at risk (FR).

5 Results

Lophozia excisa (DICKS.) DUMORT.;
Syn.: *Lophozia excisa* (DICKS.)
KONSTANT. & VILNET (Lophoziaceae),
Salatkopf-Spitzmoos, Capitata Notchwort
One record, square 137 (TS/IT), Pfelderertal at
Außerhütt, ground, ca. 1,460 – 1,500 m a.s.l.
AT: a maximum elevation of 3,200 m a.s.l.
with a further limit of 2,000 m a.s.l., Riepen-
spitze, Gschnitztal, TN. IT: in a range of 100
– 1,000 m a.s.l. in Alba di Fassa, Trentino.
CH: 460 – **3,212m a.s.l.**; FR: 2,530 m a.s.l.,
Lanslebourg-Mont-Cenis, Savoy.
Red list status: NT – near threatened (IT), V –
decreasing (DE).

Lophozia incisa (SCHRAD.) DUMORT.;
Syn.: *Schistochilopsis incisa* (SCHRAD.)
KONSTANT. (Lophoziaceae), Blaugrünes
Spitzmoos, Jagged Notchwort
15 squares: 26, 43, 45, 46, 86, 92, 94, 114,
128, 135, 136, 167, 169, 174, 185, usually
on ground and on banks, occasionally on
rotten wood and in rock crevices, ca. 1,425 –
2,200 m a.s.l. (TS/IT) and ca. 1,699 – 2,700 m
a.s.l. (TN/AT).
AT: altitudinal range of ca. 500 – 2,600 m a.s.l.
(Hochgolling, Styria) with further altitudinal
limits of 2,500 m a.s.l., Zischgeles at Praxmar,
TN, and 2,560 m a.s.l., Ködnitztal, TE. IT:
2,722 – 2,770 m a.s.l., Lago Trebecchi, Gran
Paradiso National Park, Aosta, and 1,300 m
a.s.l., Niederdorf, Pustertal, TS. CH: 410 m
a.s.l. to **3,100 m a.s.l.**; FR: 2,600 m a.s.l.,
Peisey-Nancroix, Savoy.
Red list status: NT – near threatened (IT), 3 –
endangered (DE).

Lophozia longidens (LINDB.) MACOUN;
Syn.: *Lophozia longidens* (LINDB.)
KONSTANT. & VILNET (Lophoziaceae),
Horn-Spitzmoos, Horned Flapwort
Seven squares: 12, 15, 25, 34, 40, 43, 107, on
rotten wood and bark. In an altitudinal range
of ca. 1,300 – 1,780 m a.s.l. (TS/IT) and ca.
1,780 – 1,850 m a.s.l. (TN/AT).
AT: an altitudinal range of 300 – 1,800 m
a.s.l., with the uppermost from Winterstall/
Vent, Ötztal, TN. IT: up to **3,200 – 3,350**
m a.s.l., Val d'Arbole, Aosta. CH: 640 m
a.s.l. to 2,435 m a.s.l.; FR: 2,000 m a.s.l.,
Saint-Bon-Tarentaise, Savoy.
Red list status: NT – near threatened (IT), V –
decreasing (DE).

Lophozia opacifolia CULM. ex MEYL.; Syn.:
Schistochilopsis opacifolia (CULM. ex MEYL.)
KONSTANT. (Lophoziaceae), Schneeboden-
spitzmoos, Alpine Jagged Notchwort.
Three times, squares 77 (TN/AT), Niedertal, wet
rock, ca. 2,110 – 2,130 m a.s.l.; 86 (TN/AT),
near Vent village, ground, ca. 1,870 – 1,880 m
a.s.l., 124 (TS/IT), Pfossental towards Stettiner
Hütte, ground, ca. 2,600 – 2,875 m a.s.l.
AT: an altitudinal range of (1,070) 1,600 –
2,600 m a.s.l., the upper limit from Predigt-
berg at Galtür, TN, with a further limit of
2,100 m a.s.l., Messerlingbach, TE. IT: 2,370
– 2,440 m a.s.l., Alpe Broillot, Gran Paradiso
National Park, Aosta, and documented from
an altitudinal range of 2,400 – 2,700 m a.s.l.
for Piedmont. CH: 1,170 m a.s.l. to **3,100 m**
a.s.l.; FR: 2,600 m a.s.l., Pralognan-la-Valoise,
Savoy.
Red list status: CR – critically endangered (IT).

Lophozia sudetica (NEES ex HÜB.) GROLLE; Syn.: *Barbilophozia sudetica* (NEES ex HÜB.) L. SÖDERSTR., DE ROO & HEDD. (Lophoziaceae), Sudeten-Spitzmoos, Hill Notchwort

Abundant, 39 squares: 23, 26, 35, 42, 46, 47, 52, 54, 58, 59, 63, 64, 66-68, 70-74, 76, 80-82, 107, 114, 119, 120, 123, 125, 127, 128, 134, 156, 157, 160, 165, 166, 200, usually on ground and in snow patches. Highest record in square 66 (TN/AT, TS/IT), at discovery site, snow patch, ca. 3,200 m a.s.l., not below ca. 1,480 m a.s.l. (TS/IT) and ca. 1,780 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 500 – 3,200 m a.s.l., the uppermost from Hinterbichl, TE, with a further elevation limit of 2,800 m a.s.l., Pirchkogel, TN. IT: 2,600 m a.s.l., Vallon de Arbole, Aosta and 2,600 m a.s.l., Langtauferer Ochsenalpe, TS, and in a range of 800 – **3,500 m a.s.l.** in Trentino. CH: 500 m a.s.l. to 3,212 m a.s.l.; FR: 2,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Lophozia ventricosa (DICKS.) DUMORT. (Lophoziaceae), Gewöhnliches Spitzmoos, Tumid Notchwort

Abundant, 31 squares: 23, 26, 45, 50, 52, 54, 55, 58, 60, 61, 70, 71, 79, 81, 82, 84, 86, 91, 98, 99, 104, 107, 115, 122-124, 131, 168-170, 173, usually on ground, recorded in an altitudinal range from ca. 1,600 m a.s.l. to ca. 2,875 m a.s.l. (TS/IT) and ca. 1,525 m a.s.l. to ca. 2,800 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 300 to 2,300 –

2,500 m a.s.l., Zunigalpe, Schleinitz, TE, with further altitudinal limits of 2,300 m a.s.l., Gepatsch, Kaunertal, TN, and 2,400 m a.s.l., Ködnitztal, TE. IT: 2,300 – 2,670 m a.s.l., Laghi Miserino, Aosta, in a range of 800 – 3,000 m a.s.l. in Trentino, 2,600 m a.s.l., near St. Martin in Passeier, TS. CH: 400 m a.s.l. to **3,212 m a.s.l.**; FR: 2,900 m a.s.l., Bonneval-sur-Arc, Savoy. For DE the highest altitude is 1,900 m a.s.l. (Bavaria).

Red list status: NT – near threatened (IT).

Mannia fragrans (BALBIS) FRYE & L.CLARK (Aytoniaceae), Wohlriechendes Grimaldimoos, Fragrant Liverwort

In six squares in TS/IT only, squares 5, at Castle Juval, rock, 550 – 790 m a.s.l.; 7, at Castle Juval, ground, 980 – 1,300 m a.s.l.; 9, at Lint, ground, 1,386 – 1,400 m a.s.l.; 10, at Innerunterstell, steppe heath, 1,439 m a.s.l.; 11, at Ladurner property, ground dry, 770 – 780 m a.s.l.; 193, at Cloister Säben, Tinnetal, ground, 525 – 570 m a.s.l.

AT: a maximum elevation of 2,450 m a.s.l., St. Anton, TN, with a further limit of 2,243 m a.s.l., Hafelekar, TN. IT: 1,100 m a.s.l., Mollere, Aosta. CH: 200 m a.s.l. to 1,470 m a.s.l.; FR: **2,690 m a.s.l.**, Bonneval-sur-Arc, Savoy.

Red list status: 3 – endangered (AT), EN – endangered (IT), VU – vulnerable (CH), 2 – severely endangered (DE).

Marchantia polymorpha L.

(Marchantiaceae), Gemeines Brunnenlebermoos, Common Liverwort

5 Results

Recently the very polymorphic species was grouped into several subspecies from which three are occurring in Europe: *M. polymorpha* L. ssp. *polymorpha*, *M. polymorpha* L. ssp. *ruderalis* BISCHL. & BOISELLIER and *M. polymorpha* L. ssp. *montivagans* BISCHL. & BOISELLIER (Bischler-Causse & Boisselier-Dubayle 1991; Bischler-Causse 1993). In this work we have not distinguished between different subspecies, but according to checks we assume that most, if not all, occurrences we saw belong to ssp. *ruderalis*.

Abundant, 36 squares: 2, 3, 24, 26, 35, 52, 60, 73, 84, 86, 94-96, 100, 104, 107, 122, 128, 132, 134, 135, 139, 145, 152, 171, 174, 177, 186-190, 192-195, on ground, wet ground, river bank, cultured soil, flower pot and occasionally on shaded parts of stonewalls, ca. 525 – 2,610 m a.s.l. (TS/IT) and ca. 1,550 – 2,490 m a.s.l. (TN/AT).

AT: *M. polymorpha* s. l. with an altitudinal range of 500 – 2,560 m a.s.l., Ködnitztal, TE, with a further elevation limit of 2,465 m a.s.l., Ötztal, TN. IT: up to **2,930 m a.s.l.**, Col de l'Arietta, Aosta, and 2,500 m a.s.l., Stilsferjoch, Wolfendorn, TS. CH: 199 to 2,760 m a.s.l.; FR: 2,600 m a.s.l. (ssp. *polymorpha*), Pralognan-la-Valoise, Savoy.

Red list status: NT – near threatened (IT), V (only var. *polymorpha*) – decreasing (DE).

Marsupella alpina (GOTTSCHE ex HUSN.) BERNET;

Syn.: *Gymnomitrium alpinum* (HUSN.)

SCHIFFN. (Gymnomitriaceae),

Alpen-Geldbeutelmoos, Alpine Rustwort

Seven squares: 23, 53, 63, 80, 91, 122, 124,

on rock and in snow patches. Highest record in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, rock crevices, **3,019 m a.s.l.**, not below 2,153 m a.s.l. (TS/IT) and 1,790 m a.s.l. (TN/AT).

AT: an altitudinal range of 1,900 – 2,700 m a.s.l., the latter from Rendelspitze, TN. IT: 2,550 – 2,600 m a.s.l., Wormser Joch, TS. CH: 1,400 m a.s.l. to 2,900 m a.s.l., Gornergrat at Zermatt, few recent records. FR: 1,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH).

Marsupella brevissima (DUMORT.)

GROLLE; Syn.: *Gymnomitrium brevissimum*

(DUM.) WARNST. (Gymnomitriaceae),

Schneeboden-Geldbeutelmoos,

Snow Rustwort

18 squares: 54, 58, 60, 61, 64-68, 70-72, 74, 160, 164, 166, 169, 200, rock and snow patch. Highest records in squares 65 (TN/AT, TS/IT), Niederjochferner, snow patch, ~3,200 m a.s.l. and 66 (TN/AT, TS/IT), at discovery place, snow patch, ~3,200 m a.s.l., not below 2,030 m a.s.l. (TS/IT) and 2,130 m a.s.l. (TN/AT).

AT: an altitudinal range of 1,900 – **3,450 m a.s.l.**, the upper limit from Ötztal, TN, with further altitudinal limits of 2,600 m a.s.l. Timmelsjoch, TN, and 2,450 m a.s.l., Messerlingkogel, TE. IT: 2,300 – 2,670 m a.s.l., Laghi Miserino, Aosta, and 2,600 – 2,700 m a.s.l., near Schwarzsee at St. Martin in Passeier, TS. CH: 1,775 m a.s.l. to 3,050 m a.s.l.; FR: 2,600 m a.s.l., Lanslbουργ-Mont-Cenis, Savoy. Red list status: NT – near threatened (IT), AR – at risk (FR).

Marsupella commutata (LIMPR.) BERNET;
Syn.: *Gymnomitrium commutatum* (LIMPR.)
SCHIFFN. (Gymnomitriaceae),

Veränderliches Geldbeutelmoos, Rustwort
11 squares: 22, 23, 47, 54, 58, 63, 66, 70,
127, 128, 170, rock. Highest record in square
66 (TN/AT, TS/IT), at discovery place, rock,
ca. **3,200 m a.s.l.**, not below 1,860 m a.s.l.
(TS/IT) and 2,500 m a.s.l. (TN/AT).

AT: 1,900–2,700 m a.s.l., with the upper limit
from Gaisspitzjoch, Paznaun, TN. IT: up to
2,423–2,470 m a.s.l., Lago Nero, Piedmont.
CH: 1,940–2,805 m a.s.l.; FR: 2,350 m a.s.l.,
Pralognan-la-Valoise, Savoy.

Red list status: NT – near threatened (IT), VU
– vulnerable (CH), AR – at risk (FR).

Marsupella emarginata (EHRH.)

DUMORT. ssp. *aquatica* (LINDENB.)
DUMORT.; Syn.: *M. aquatica* (LINDENB.)
SCHIFFN. (LINDENB.) MEYL.

(Gymnomitriaceae), Ausgerandedetes Geld-
beutelmoos, Notched Rustwort

Three times, squares 26 (TS/IT), Penaudtal,
rock, 1,619 m a.s.l.; 159 (TN/AT), Rofental,
wet rock, 2,100–2,200 m a.s.l.; 160 (TN/
AT), Rofental, flush, 2,130–2,160 m a.s.l.

AT: an altitudinal range of (300) 800 m a.s.l.
to **2,800–3,000 m a.s.l.**, Vermunttal, Vor-
arlberg, with further altitudinal limits of
2,200 m a.s.l., Alfachalpe, Gschnitztal, TN,
and 2,500 m a.s.l., Zunigalpe, Matrei i.O.,
TE. IT: 2,601–2,645 m a.s.l., Laghi Ponton,
Gran Paradiso National Park, Aosta, in a range
of 800–2,500 m a.s.l. in Trentino, and
2,600 m a.s.l., Wienerhütte, Pfitschertal, TS.
CH: 540 m a.s.l. to 2,450–2,850 m a.s.l.;

FR: 2,500 m a.s.l., Bonneval-sur-Arc, Savoy.
Red list status: NT – near threatened (IT),
V (var. *emarginata*) – decreasing and 3 (var.
aquatica) – endangered in DE.

Marsupella sphacelata (GIESEKE ex
LINDENB.) DUMORT.

(Gymnomitriaceae), Brandfleckiges Geld-
beutelmoos, Speckled Rustwort

Five times, squares 63 (TN/AT, TS/IT), Nie-
derjoch near Similaunhütte, rock, 2,820 m
a.s.l.; 70 (TN/AT), above Martin-Busch-Hüte-
te, rock, ca. 2,500–2,540 m a.s.l.; 71 (TN/
AT), above Martin-Busch-Hütte, wet rock, ca.
2,540–2,630 m a.s.l.; 74 (TN/AT), Niedertal,
wet rock, 2,220–2,300 m a.s.l.; 122 (TS/IT),
Pfossental above Eishof, wet ground, 2,350–
2,610 m a.s.l.

AT: an altitudinal range of (700) 1,000–
2,650/2,800 m a.s.l., the latter between Hohe
Mut and Rotmoostal, Ötztal, TN, with further
altitudinal limits of 2,000 m a.s.l., Langental,
Stubai, TN, and 2,500 m a.s.l. Kasermandl,
TE. IT: 2,300–2,670 m a.s.l., Laghi Miserino,
Aosta, in a range of 1,000–**3,500 m a.s.l.** in
Trentino, and 2,400 m a.s.l., Schlüsseljoch, TS.
Recently confirmed for TS (Kiebacher & Mair
2015b). CH: 290 m a.s.l. to 2,750 m a.s.l.;
FR: 2,560 m a.s.l., Bonneval-sur-Arc, Savoy.
Red list status: r: 3 – locally endangered (AT),
CR – critically endangered (IT), 3 – en-
dangered (DE).

Meesia uliginosa HEDW. (Meesiaceae),

Haar-Bruchmoos, Broad-nerved Hump-moss
11 squares: 73-75, 83, 85, 121, 122, 126,
127, 157, 162, wet ground, flush or spring,

5 Results

2,180 m a.s.l. to 2,610 m a.s.l. (TS/IT) and 1,920 m a.s.l. to 2,490 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 700 – **3,000 m a.s.l.**, the latter from Ködnitztal, TE, with further altitudinal limits of 2,900 m a.s.l., Musing, Navistal, TE, and 2,500 m a.s.l., Hohe Mut – Ötztal, TN. IT: up to 2,800 m a.s.l., Col Fenêtre de Cogne, Aosta, from an altitudinal range of 2,400 – 2,700 m a.s.l., Piedmont, and 2,500 m a.s.l., Wolfendorn, TS. CH: 500 – 2,928 m a.s.l.; FR: 2,650 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: 3 – endangered (DE).

Metzgeria conjugata LINDB. (Metzgeriaceae), Breites Igelhaubenmoos, Rock Veilwort
In 11 squares in TS/IT only, squares 13-15, 112, 181, 186-189, 194, 195, on rock and on bark, ca. 570 – 1,590 m a.s.l.

AT: a maximum elevation of ca. 1,700 m a.s.l. with a further limit of 1,600 m a.s.l., near Neurur, Pitztal, TN. IT: 1,850 – 1,950 m a.s.l., towards Alpe Arzola, Gran Paradiso National Park, in a range of 500 – 1,500 m a.s.l. in Trentino. For IT (Dolomites) a highest altitude of **2,100 m a.s.l.**, without precise location. CH: 200 m a.s.l. to 1,900 m a.s.l.; FR: 1,001 m, Ecole, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Metzgeria furcata (L.) DUMORT.

(Metzgeriaceae), Gewöhnliches Igelhaubenmoos, Forked Veilwort

22 squares: 1, 3, 6, 13, 14, 18, 24, 25, 108, 109, 111-113, 141, 177, 178, 186-189, 194, 195, on bark and on rock, ca. 555 – 1,700 m

a.s.l. (TS/IT) and 1,450 – 1,650 m a.s.l. (TN/AT). Sometimes *f. ulvula* is recognised because of the intense production of propagules.

AT: a maximum elevation of 2,100 m a.s.l. with a further limit of 1,500 m a.s.l., Tulfes, TN. IT: 1,650 – 1,750 m a.s.l., Lillaz, Gran Paradiso National Park. CH: 195 m a.s.l. to 2,400 m a.s.l. and reaching **3,000 m a.s.l.** (Engadin). FR: 1,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Mielichhoferia elongata (HOPPE & HORNSCH.) HORNSCH.

(Mielichhoferiaceae), Verlängertes Mielichhofer-Moos, Elongate Copper-moss

The species belongs to a group of bryophytes which are regularly found at copper rich bed rock (Punz 1999).

10 squares: 23, 32, 66, 82, 84, 94, 114, 121, 160, 161, on rock. Highest record in square 66 (TN/AT, TS/IT), at discovery place, rock, ca. **3,200 m a.s.l.**, not below 1,659 m a.s.l. (TS/IT) and 1,699 m a.s.l. (TN/AT).

AT: Grims (1999) gives an altitudinal range of 700 – 3,000 m a.s.l. with altitudinal limits from 2,400 – 3,000 m a.s.l., Schleinitz, TE, and 2,850 m a.s.l., Kaunergrat, TN. IT: 1,600/2,000 m a.s.l., Röttal, TS. CH: 800 – 2,040 m a.s.l. up to 3,200 m a.s.l., Silvrettahorn. FR: 3,000 m a.s.l., Val-D'Isere Savoy.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH).

Mielichhoferia mielichhoferiana (FUNCK)
LOESKE (Mielichhoferiaceae),

Echtes Mielichhofer-Moos, Copper-moss

The species belongs to a group of bryophytes which are regularly found on copper rich bed rock (Punz 1999).

11 squares: 43, 52, 54, 60, 63, 70, 71, 73, 95, 162, 165, usually on rock. Highest record in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, ground, 3,019 m a.s.l., not below 1,700 m a.s.l. (TS/IT and TN/AT).

AT: an altitudinal range of 800 m a.s.l. to **3,739 m a.s.l.**, summit of Weisskugel, TN, with further altitudinal limits of 2,400 – 3,000 m a.s.l. Schleinitz, TE, and 3,000 m a.s.l., Ramolhaus, Obergurgl, TN. IT: up to ca. 3,480 m a.s.l., Theodulhorn, Aosta, and 1,860 m a.s.l., Schöntaufspitze, TS. CH: 400 – 3,000 m a.s.l.; FR: 2,650 m a.s.l., Pralognan-la-Valloise, Savoy.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH), R – extremely rare (DE).

Mnium hornum HEDW. (Mniaceae),
Schwanenhals-Sternmoos, Swan's neck
Thyme-moss

Three times, squares 12 (TS/IT), from Castle Juval to Schloßalm, ground, 1,350 – 1,700 m a.s.l.; 104 (TN/AT), Gaislachalm, ground, ca. 1,900 – 1,980 m a.s.l.; 141 (TS/IT), Pfelderertal at Moos in Passeier, ground, ca. 980 – 1,026 m a.s.l.

AT: a maximum elevation of 1,990 m a.s.l., Scheffauer, TN, with further altitudinal limits of 1,740 m a.s.l., between Oberiß and Alpein, TN, and 910 m a.s.l., Huben, TE.

IT: up to 2,000 m a.s.l., Bois-de-Roise. CH: 260 – 1,822 m a.s.l.; FR: up to **2,500 m a.s.l.**, Lechaux.

Mnium lycopodioides SCHWAEGR.; Syn.:
Mnium ambiguum H. MÜLL. (Mniaceae)

Zweihäusiges Sternmoos, Thyme-moss

18 squares: 24, 42, 51, 56, 74, 75, 82, 103, 106, 111-113, 116, 119, 143, 149, 158, 181, on ground, ca. 660 – 2,120 m a.s.l. (TS/IT) and ca. 1,480 – 2,320 m a.s.l. (TN/AT).

AT: a maximum elevation of ca. **2,750 m a.s.l.**, Ködnitztal, TE, with a further limit of 2,550 m a.s.l., Hohe Mut, Obergurgl, TN. IT: 1,800 – 1,920 m a.s.l., Rhemes-Notre Dame, Gran Paradiso National Park, Aosta. CH: 732 – 2,376 m a.s.l.; FR: 2,160 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: NT – potentially endangered (CH).

Mnium marginatum (DICKS.) P. BEAUV.
(Mniaceae), Gesäumtes Sternmoos, Bordered
Thyme-moss

22 squares: 6-8, 13, 14, 32, 54, 55, 79, 84-86, 95, 96, 108, 127, 132, 145, 149, 173, 174, 185, on ground and at an irrigation channel, ca. 650 – 2,400 m a.s.l. (TS/IT) and ca. 1,470 – 2,110 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,201 m a.s.l.**, Hochfirstjoch, TN with further altitudinal limits of 2,800 m a.s.l., Bergertörl near Kals, TE (var. *fillionii*), and 2,150 m a.s.l., Praxmar, TN. IT: up to 3,000 – 3,190 m a.s.l., near Passo Garin, Aosta, and 1,900 m a.s.l., St. Gertraud, Sulden, TS. CH: 273 – 2,989 m a.s.l.; FR: 2,491 m, Tignes, Savoy.

5 Results

Red list status: V – decreasing (DE).

Mnium spinosum (VOIT) SCHWAEGR.

(Mniaceae), Dornzähniges Sternmoos,

Thyme-moss

29 squares: 1, 16, 33, 36, 43, 52, 55, 58, 59, 73, 84, 86, 91, 92, 94, 97, 99, 102, 105, 108-110, 113, 136, 152, 174, 175, 178, 196, usually on ground, ca. 700 – 2,226 m a.s.l. (TS/IT) and ca. 1,450 – 2,490 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,500 m a.s.l. (Salzburg) with a further limit of 2,300 m a.s.l., Matreier Törl, TE. IT: 2,200 – 2,450 m a.s.l., Meye-d'en Haut, Aosta, in an altitudinal range up to 2,800 m a.s.l., Piedmont, and 2,500 m a.s.l., Wolfendorn, Brenner, TS. CH: 320 m a.s.l. to **2,680 – 2,850 m a.s.l.**; FR: 2,200 m a.s.l., Bessans, Savoy.

Red list status: 3 – endangered (DE).

Mnium spinulosum BRUCH & SCHIMP.

(Mniaceae), Gezähneltes Sternmoos, Thyme-moss

Once, square 9 (TS/IT), at Lint, ground, 1,155 – 1,260 m a.s.l.

AT: a maximum elevation of ca. 1,750 m a.s.l., Almajurjoch, St. Jakob, TN and Turner Alpe, Lienz, TE. IT: 2,245 m a.s.l., below ravine of Cesire, Gran Paradiso National Park, Aosta. CH: 470 – **2,400 m a.s.l.**; FR: 2,317 m a.s.l., Termignon, Savoy.

Red list status: 4 – potentially endangered (AT), 3 – endangered (DE).

Mnium stellare HEDW. (Mniaceae), Echtes Sternmoos, Starry Thyme-moss

18 squares: 20, 24, 25, 44, 55, 84, 89, 102, 103, 107-109, 116, 132, 174, 186, 187,

196, usually on ground, ca. 880 – 1,930 m a.s.l. (TS/IT) and ca. 1,450 – 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,240 m a.s.l., Rappenkamm, TN, with further altitudinal limits of 2,000 m a.s.l., at several locations, e.g. Ötztal, and ca. 2,480 m a.s.l., Ködnitztal, TE. IT: up to **2,900 – 2,930 m a.s.l.**, Col de l'Arietta, Aosta, and 1,880 m a.s.l., Val Fredda, Trentino. CH: 200 – 2,541 m. In DE highest altitude 2,243 m a.s.l. (Bavaria). FR: 2,200 m a.s.l., Bessans, Savoy.

Red list status: V – decreasing (DE).

Mnium thomsonii SCHIMP;

Syn.: *M. orhtorhynchum* LINDB. (Mniaceae), Geradschnäbliches Sternmoos, Thyme-moss 27 squares: 1, 10, 14, 16, 19, 24, 26, 51, 52, 55, 76, 81, 82, 84, 85, 89, 105, 108, 109, 121, 129, 134, 135, 149, 154, 162, 185, on ground and on rock, ca. 700 – 2,350 m a.s.l. (TS/IT) and ca. 1,450 – 2,412 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,472 m a.s.l.**, Hinterer Seelenkogel, TN, with further altitudinal limits of 2,800 m a.s.l., Bergertörl near Kals, TE, and 2,600 m a.s.l., at Glungezer, TN. IT: 3,300 m a.s.l., Schöntaufspitze, TS, and 2,800 m a.s.l., Col di Bon-Plan, Aosta. CH: 330 – 3,300 m a.s.l.; FR: 2,850 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: V – decreasing (DE).

Moerckia hibernica (HOOK.) GOTT-

SCHE; Syn.: *M. flotoviana* (NEES)

SCHIFFN. (according to Köckinger 2017) (Pallaviciniaceae), Irländisches Mörchmoos, Irish Ruffwort

In one square only: 134 (TS/IT), Pfelderertal near Pfelders village, on rock and on ground, 1,570 – 1,610 m a.s.l.

AT: a maximum elevation of ca. 2,000 m a.s.l. with a further limit of 1,450 m a.s.l., St. Anton, TN. IT: in a range of 500 – 1,000 m a.s.l. in Valle d'Ampola, Trentino. CH: 650 – 1,830 m a.s.l.; FR: **2,006 m a.s.l.**, Saint-Sorlin-D'Arves, Savoy.

Red list status: r: 3 – locally endangered (AT), EN – endangered (IT), 2 – severely endangered (DE), AR – at risk (FR).

Myurella julacea (SCHWAEGR.) SCHIMP. (Theliaceae), Kätzchenartiges Mäuseschwänzchenmoos, Small Mouse-tail Moss

16 squares: 76, 84-87, 89, 91, 95, 104, 105, 121, 129, 130, 132, 135, 185, on rock and occasionally on walls, ca. 1,550 – 2,350 m a.s.l. (TS/IT) and ca. 1,470 – 2,220 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,300 m a.s.l. with further altitudinal limits of 2,800 m a.s.l., Musing, TE, and 2,500 m a.s.l., Obergurgl, TN. IT: up to 3,400 – **3,500 m a.s.l.**, Grivola, Aosta, and 3,300 m a.s.l., Schöntaufspitze, TS. CH: 350 – 3,080 m a.s.l.; FR: 2,950 m a.s.l., Bessans, Savoy.

Red list status: r: 2 – locally severely endangered (AT), V – decreasing (DE).

Myurella tenerrima (BRID.) LINDB.

(Theliaceae), Mäuseschwänzchenmoos, Mousetail Moss

Twice, squares 84 (TN/AT), at Vent village, rock, ca. 1,895 – 2,130 m a.s.l. and 132 (TS/

IT), Pfelderertal at Pfelders village, rock, 1,630 – 1,700 m a.s.l.

AT: an altitudinal range of ca. 1,000 – **3,600 m a.s.l.**, the latter at Pasterze, TE, with a further limit of 3,400 m a.s.l., Hinterer Spiegelkogel, TN. IT: up to 2,936 m a.s.l., Bec-des-Rols, Aosta, and 2,180 m a.s.l., Enneberg, TS. CH: 680 – 2,900 m a.s.l.; FR: 2,650 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: NT – potentially endangered (CH), AR – at risk (FR).

Nardia compressa (HOOK.) GRAY

(Jungermanniaceae), Bach-Scheibenblattmoos, Compressed Flapwort

Once, square 74 (TN/AT), Niedertal, wet rock, ca. 2,220 – 2,300 m a.s.l.

AT: an altitudinal range of ca. 1,500 – **2,800 m a.s.l.**, the latter from Lußbachtal, Pitztal, TN, with a further limit of 2,300 m a.s.l., Felbertauern, TE. IT: 2,000 m a.s.l., Passo dell Orso, Piedmont. CH: 400 m a.s.l. to 2,420 m a.s.l.; FR: 2,453 m a.s.l., Valloire, Savoy.

Red list status: VU – vulnerable (IT), NT – potentially endangered (CH), 2 – severely endangered (DE).

Nardia geoscyphus (DE NOT.) LINDB.

(Jungermanniaceae), Kleines Scheibenblattmoos, Earth-cup Flapwort

Once, square 200 (TN/AT), Hohe Mut summit, ground, ca. 2,600 m a.s.l.

AT: an altitudinal range of ca. 400 – 2,600 m a.s.l., the latter at Muttererjoch, Sellrain, TN, with a further limit of again 2,600 m a.s.l., near Kals, TE. IT: 2,746 – 2,770 m a.s.l., at Lago Trebecchi, Gran Paradiso National

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Park, and in a range of 500 – 1,800 m a.s.l. in Trentino. CH: 1,390 m a.s.l. to **2,820 m a.s.l.**; FR: 2,660 m a.s.l., Bonneval-sur-Arc, Savoy. Red list status: NT – near threatened (IT), V – decreasing (DE).

Nardia scalaris GRAY (Jungermanniaceae),
Gewöhnliches Scheibenblattmoos, Ladder
Flapwort

In five squares in the TN/AT part only, squares 76, Niedertal, ground, ca. 2,130–2,220 m a.s.l.; 90, Ventertal at Winterstall, ground, 1,770 – 1,840 m a.s.l.; 157, Rofental, rock, 1,960 – 2,030 m a.s.l.; 160, Rofental, ground, 2,130 – 2,160 m a.s.l.; 169, Tiefenbach, ground, 2,700 m a.s.l.

AT: a maximum elevation of 2,900 m a.s.l., Ölgrubenjoch, TN. IT: in a range of 2,000 – **3,500 m a.s.l.** in Trentino, and up to 2,800 m a.s.l., Wormser Joch, TS. CH: 300 m a.s.l. to 2,703 m. a.s.l.; FR: 2,280 m a.s.l., Tignes, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Neckera bessi (LOBARZ.) JUR.; Syn.:
Homalia bessi LOBARZ. (Neckeraceae),
Bessers Neckermoss, Feather-moss

In three squares in the TS/IT part only, squares 141, Pfelderertal at Moos im Passeier, rock, ca. 980 – 1,026 m a.s.l.; 177, at Castle Tarantsberg, shady cliff, 555 m a.s.l.; 178, at Partschins village, rock, 700 – 1,100 m a.s.l.

AT: maximum elevation at 1,750 m a.s.l. with further altitudinal limits of 1,600 m a.s.l., Frosnitzal, TE, and 1,400 m a.s.l., Sölden, TN. IT: **1,990 m a.s.l.**, Col di Lana, Trentino,

1,570 – 1,600 m a.s.l., above Degioz, Aosta, and 1,200 m a.s.l., Klobenstein, Bozen, TS. CH: 200 – 1,700 m a.s.l.

Red list status: EN – endangered (CH), V – decreasing (DE).

Neckera complanata (HEDW.) HÜB.
(Neckeraceae), Glattes Neckermoss, Flat
Neckera (Fig. 5.16, 5.17)



Fig. 5.16: Flat Neckera (*Neckera complanata*), the crucial moss in Iceman bryology

In 28 squares in TS/IT only, squares 1, 5-7, 11-20, 24, 42, 43, 111, 139, 149, 177-181, 186, 194, 195, on rock and on bark, ca. 550 m a.s.l. to 1,768 m a.s.l. (highest record in square 42, at Vernagt reservoir). It is crucial that this species was found only in the Schnalstal, being the species that the Iceman apparently carried deliberately!

AT: a maximum elevation of 1,900 m a.s.l. with further altitudinal limits of 1,700 m a.s.l., Dorfertal at Kals, TE, and 1,500 m a.s.l., Gries, Ötztal, TN. IT: 1,700 – **2,300 m a.s.l.**, between Lillaz and Lago di Loie, Gran Paradiso National Park, Aosta, and 1,500 m

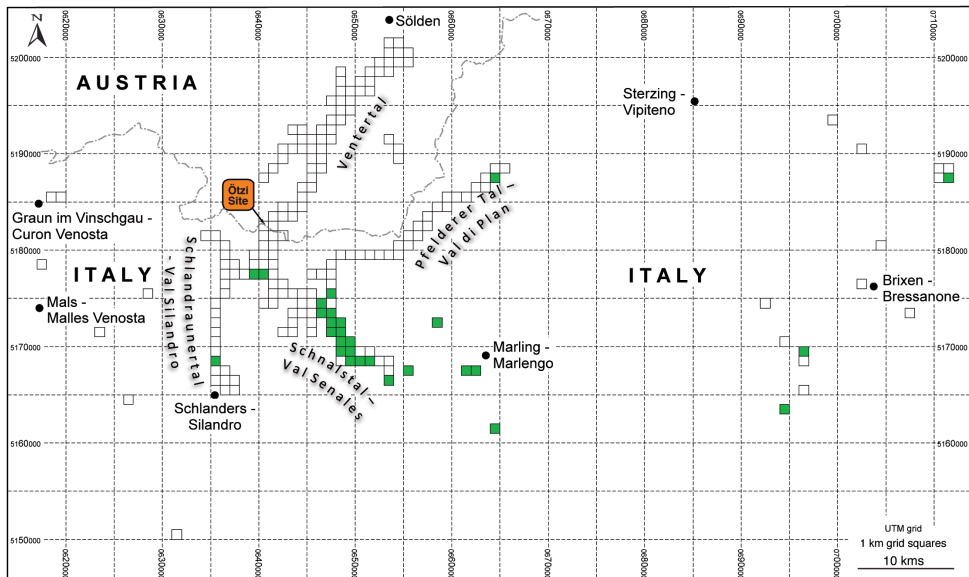


Fig. 5.17: Recorded distribution of *Neckera complanata*.

a.s.l., Alba di Fassa, Trentino. CH: 200 – 1,870 m a.s.l.; FR: 1,558 m a.s.l., Sainte-Foy-Tarentaise, Savoy.

Red list status: V – decreasing (DE).

Neckera crispata HEDW. (Neckeraceae),
Krauses Neckermoss, Crisped Neckera
(Fig. 5.18)

In 11 squares in the TS/IT only, squares 1, 11, 13, 14, 16, 18, 141, 181, 193-195, on rock and on bark, ca. 525 – 1,120 m a.s.l.

AT: a maximum elevation of 2,300 m a.s.l. (Schiedeck, Styria) with further altitudinal limits of 2,200 m a.s.l., Kleiner Rettenstein, TN, and 1,920 m a.s.l., Gschlöß, Hohe Tauern, TE. IT: 1,500 – 1,600 m a.s.l., near Valprato Soana, Gran Paradiso National Park, and 1,950 m a.s.l.,



Fig. 5.18: Crisped Neckera (*Neckera crispata*), occurs often with Flat Neckera (*Neckera complanata*) on base-rich rock and bark

Canazei, Trentino. CH: 200 – 2,500 m a.s.l.; FR: 1380 m a.s.l., Montcel, Savoy.
Red list status: V – decreasing (DE).

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Odontoschisma denudatum (MART.)

DUMORT. (Cephaloziaceae), Nacktes Schlitzkelchmoos, Bog-moss Flapwort
Twice, squares 107 (TN/AT), Nachtberg, ground, ca. 1,780 – 1,850 m a.s.l. and 190 (TS/IT), Latzfons, ground, 1,580 – 1,600 m a.s.l.

AT: a maximum elevation of ca. 1,700 m a.s.l., Zammer Moos, St. Anton, TN is given. A record of **2,350 m a.s.l.**, Plenderle-Seen, Kühtai, TN, should be checked. For IT no altitudinal limits could be revealed so far. CH: 400 m a.s.l. to 1,700 m a.s.l.

Red list status: r: 3 – locally endangered (AT), EN – endangered (IT), NT – potentially endangered (CH), 3 – endangered (DE).

Odontoschisma elongatum (LINDB.)

EVANS (Cephaloziaceae), Verlängertes Schlitzkelchmoos, Matchstick Flapwort
Abundant, 38 squares: 22, 23, 26, 38, 45, 47, 51, 53, 54, 58, 60, 64, 67, 68, 70, 71, 79, 81, 82, 85, 104, 114, 121, 122, 124-126, 128, 130, 133-137, 165, 169, 185, 198, usually on ground, occasionally on snow beds or wet rock. Not below 1,425 m a.s.l. (TS/IT) and 1,900 m a.s.l. (TN/AT), reaching remarkable altitudinal ranges up to **2,700 – 2,880 m** (TS/IT) and ca. **2,620 – 2,880 m** (TN/AT).

AT: an altitudinal range of ca. 1,200 – 2,500 m a.s.l.; IT: up to 2,580 – 2,680 m a.s.l., Lauson valley, Gran Paradiso National Park, Aosta. CH: 1,200 – 2,400 m a.s.l.; FR: 2,600 m a.s.l., Bramans, Savoy.

Red list status: 4 – potentially endangered (AT, DE), NT – near threatened (IT, CH), AR – at risk (FR).

Oligotrichum hercynicum (HEDW.) LAM. & DC. (Polytrichaceae), Harz-Armhaarmoos, Hercynian Haircap (Fig. 5.19)



Fig. 5.19: Hercynian Haircap (*Oligotrichum hercynicum*), whose altitudinal limit was extended significantly, up to ca. 3,200 m a.s.l. in the study area

Abundant, 80 squares: 16, 20, 22-26, 29-32, 36, 45-47, 52-54, 57-61, 63-68, 70-76, 79-86, 88, 90-94, 96, 97, 99, 102, 104, 118, 121, 122, 124, 127, 128, 132, 133, 135, 149, 153, 157, 159-163, 165-170, 198, 200, on ground and open soil, often trampled. Highest records in squares 65 (TN/AT, TS/IT), Niederjochferner near discovery place, soil, ca. **3,200 m a.s.l.** and 66 (TN/AT, TS/IT), at discovery place, ground, ca. **3,200 m a.s.l.**, not below 960 m a.s.l. (TS/IT) and 1,525 m a.s.l. (TN/AT). AT: a maximum elevation of 2,800 m a.s.l., Obersulzbachtal, Salzburg, with further altitudinal limits of 2,600 m a.s.l., Wurmbachtal at Pitztal, TN, and 2,200 m a.s.l., Gschlöß, Möserling, TE. IT: up to 3,050 m a.s.l., Monte Bianco, Aosta, and 2,650 m a.s.l., below Schneebergsscharte above St. Martin in Passeier,

TS. CH: 290 – 3,000 m a.s.l., Gornergrat. FR: 2,550 m a.s.l., Pralognan-la-Valoise, Savoy.

Oncophorus virens (HEDW.) BRID.

(Rhabdoweisiaceae), Grünes Hackenmoos, Green Spur-moss

32 squares: 22, 23, 31, 46, 48, 58, 59, 60, 68, 70, 71, 73-75, 79-84, 86, 104, 107, 116, 118, 122, 123, 157, 160, 161, 163, 196, always on wet ground, in flushes and bogs, ca. 1,580 – 2,630 m a.s.l. (TS/IT) and 1,780–2,880 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 1,200 – 2,300/2,900 m a.s.l., the latter from Hinterbichl, TE, with further altitudinal limits of 2,800 m a.s.l., Bergertörl near Kals, TE, and 2,600 m a.s.l., Fimberpaß, Paznaun, TN. IT: up to **3,165 m a.s.l.**, Becca di Nonna, Aosta, up to 2,800 m a.s.l., Faloria, Trentino, and 2,500 – 2,600 m a.s.l., Paziner Alpe, Graun, TS. CH: 240 – 3,000 m a.s.l.; FR: 2,650 m a.s.l., Bonneval-sur-Arc, Savoy.

Oncophorus wahlenbergii BRID.

(Rhabdoweisiaceae), Wahlenbergs Hackenmoos,

Once in square 198 (TN/AT), Obergurgl, near the middle station of the cable car to Hohe Mut, on moist ground, 1,950 – 2,100 m a.s.l. The characters of the plant are in line with a recent revision of the genus by Frahm et al. (1998).

AT: a maximum elevation of 2,700 m a.s.l., Bergertörl, TE with a further limit of 2,600 m a.s.l., Wurmbachtal at Pitztal, TN. IT: 1,500 – 2,100 m a.s.l., Aosta. CH: 1,800 – **3,000 m a.s.l.**, Gornergrat. FR: 2,491 m, Tignes, Savoy.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH), 0 – extinct or missing (DE).

Orthothecium intricatum (HARTM.)

SCHIMP. (Plagiotheciaceae), Kleines Seidenglanzmoos, Fine-leaved Leskea

Three squares in TS/IT only, squares 127, Pfelderertal below Labkofel near saddle, ground, ca. 2,400 m a.s.l.; 129, Pfelderertal, Pfelderer Alm, rock, 1,820 – 1,860 m a.s.l.; 132, Pfelderertal at Pfelders village, rock, 1,630 – 1,700 m a.s.l.; 174, Langtaufferstal, rock, ca. 1,513 – 1,540 m a.s.l.

AT: a maximum elevation of 2,800 m a.s.l., Ganimiz, TE, with further altitudinal limits of 2,730 m a.s.l., Rainerkees, Großvenediger, TE. IT: up to **3,480 m a.s.l.**, Theodulhorn, Aosta, and 2,600 m a.s.l., at Kleiner Schwarzersee above St. Martin in Passeier, TS, and 2,700 m a.s.l., Rollspitze at Brenner, TS. CH: 450 – 2,905 m a.s.l.; FR, 2,491 m, Tignes, Savoy.

Red list status: V – decreasing (DE).

Orthothecium rufescens (DICKS.)

SCHIMP. (Plagiotheciaceae),

Rötliches Seidenglanzmoos, Red Leskea

Once, square 132 (TS/IT), Pfelderertal at Pfelders village, rock, 1,630 – 1,700 m a.s.l.

AT: a maximum elevation of 2,810 m a.s.l. with further altitudinal limits of 2,700 m a.s.l., Grödez at Kals, TE, and 2,650 m a.s.l., Seejöchl – Schlicker Seespitze, Stubai, TN. IT: up to **3,400 – 3,550 m a.s.l.**, Grivola, Aosta, and 2,050 m a.s.l., Tabaretta, TS. CH: 300 – 2,570 m a.s.l., Val d'Agnelli at Julierpass. FR:

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1,942 m a.s.l., Termignon, Savoy.
Red list status: 3 – endangered (DE).

Orthotrichum affine SCHRAD.

(Orthotrichaceae), Verwandtes Goldhaarmoos, Wood Bristle-moss

14 squares: 10, 12, 13, 17, 108, 109, 140, 144, 172, 184, 186, 187, 192, 194, usually on bark, occasionally on rock, once on rotten wood, ca. 570 – 1,700 m a.s.l. (TS/IT) and ca. 1,450 – 1,650 m a.s.l. (TN/AT).

AT: a maximum elevation of (1,770 m a.s.l.?) 1,550 m a.s.l., Vintlalpl, TN, an additional limit of 1,300 m a.s.l., Froschputzen in Pitztal, TN and the same elevation in TE. IT: up to 1,500 – 1,600 m a.s.l., near Valprato Soana, Gran Paradiso National Park. CH: 195 – **2,000 m a.s.l.**; FR: 1,650 m a.s.l., Tignes, Savoy.

Red list status: V – decreasing (DE).

Orthotrichum alpestre BRUCH &

SCHIMP. (Orthotrichaceae),

Alpen-Goldhaarmoos, no English name.

Once in square 5 (TS/IT), at Castle Juval, rock, 550 m a.s.l.

AT: an altitudinal range of 1,100 – **3,050 m a.s.l.**, the latter at Schafkopf, Großglockner, Salzburg, with further altitudinal limits of 2,800 m a.s.l., Bergertörl at Kals, TE, and 2,360 m a.s.l., Geisstein, TN. IT: 1,850 – 1,950 m a.s.l., between Alpe Banc and Alpe Pianasse, Aosta, in a range of 1,300 – 2,800 m a.s.l. in Trentino, and 2,150 m a.s.l., Gröden, TS. CH: 570 – 2,800 m a.s.l., Parpaner Rothorn.

Red list status: 3 – endangered (AT), EN – endangered (CH).

Orthotrichum anomalum HEDW.

(Orthotrichaceae), Stein-Goldhaarmoos, Anomalous Bristle-moss

33 squares: 3, 4, 6-9, 13, 18, 33, 40, 54-56, 96, 108, 109, 113, 134, 135, 138, 143, 144, 146, 147, 171, 172, 178, 181, 184, 192-194, 198, on rock and occasionally on concrete, ca. 525 – 2,400 m a.s.l. (TS/IT) and ca. 1,450 – 2,100 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,150 m a.s.l., Gratalven, TE, with a further limit of 2,065 m a.s.l., Schutterfeldköpfe, TN. IT: 1,900 – 2,150 m a.s.l., Mt. Testa di Montzeuc, Gran Paradiso National Park, Aosta, and 2,300 m a.s.l., TS (without specific location). CH: 200 – **2,500 m a.s.l.**; FR: 1,410 m a.s.l., Les Deserts, Savoy.

Orthotrichum cupulatum HOFFM.

(Orthotrichaceae), Becherfrüchtiges

Goldhaarmoos, Hooded Bristle-moss

In five squares in TS/IT only, squares 15, Unterperfl, rock, 1,360 – 1,420 m a.s.l.; 33, Gurschlhof, rock, 1,305 m a.s.l.; 110, begin Pfossental, rock, 1,210 – 1,370 m a.s.l.; 111, begin Pfossental, rock, 1,380 – 1,450 m a.s.l.; 116, Pfossental between Mitterkaser and Vorderkaser, rock, 1,700 – 1,870 m a.s.l.

AT: a maximum elevation of 1,900 m a.s.l., Gurgl, Ötztal, TN with further altitudinal limits of 1,000 m a.s.l., at Kals, Matrei i.O. and Lienz, TE. IT: 2,722 – 2,770 m a.s.l., near Lago Trebecchi, Gran Paradiso National Park, Aosta, and 1,100 m a.s.l., Partschins, TS.

CH: 255 – 2,800 m a.s.l.; FR: **2,850 m a.s.l.**, Bessans, Savoy.

Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Orthotrichum diaphanum SCHRAD.

(Orthotrichaceae), Glashaartragendes Goldhaarmoos, White-tipped Bristle-moss
Eight squares: 2, 3, 99, 143, 171, 172, 193, 194, bark, rock, wall, concrete, ca. 525 m a.s.l. to **1,810 – 1,820 m a.s.l.** (TS/IT) and ca. 1,525 – 1,530 m a.s.l. (TN/AT).

AT: a maximum elevation of 1,500 m a.s.l., Kals, TE. IT: 1,630 – 1,680 m a.s.l., below Gimillan, Gran Paradiso National Park, Aosta, and 1,700 m a.s.l., TS (without precise location) and 1,175 m a.s.l., Innichen, TS. CH: 198 – 1,590 m a.s.l.; FR: 430 m a.s.l., Saint-Jean-de-la-Porte, Savoy.

Orthotrichum lyellii HOOK. & TAYLOR

(Orthotrichaceae), Lyell's Goldhaarmoos, Lyell's Bristle-moss

In five squares in TS/IT only, squares 10, Innerunterstell, bark, 1,400 – 1,460 m a.s.l., 147, Schlanders towards Tappein, rotten wood, ca. 1,500 – 1,800 m a.s.l.; 186, at Dörf village, bark, 880 – 900 m a.s.l.; 187, at Dörf village, bark, 900 – 1,030 m a.s.l.; 194, at Cloister Säben, Tinnetal, bark, 570 – 580 m a.s.l.

AT: a maximum elevation of 1,200 m a.s.l. (Lower Austria?) with a further limit of 750 m a.s.l., trail to Tristacher See, TE. No altitudinal limits for IT revealed so far. CH: 200 – **1,800 m a.s.l.**; FR: 1,700 m a.s.l., Termignon, Savoy.

Red list status: 3 – endangered (DE).

Orthotrichum obtusifolium BRID.

(Orthotrichaceae), Stumpfbliättriges Goldhaarmoos, Blunt-leaved Bristle-moss

Six times in TS/IT only, squares 3, at Naturns village, bark, ca. 525 m a.s.l.; 143, at Schlanders village, bark, ca. 700 – 850 m a.s.l.; 146, begin Schlandrauntal, bark, 780 – 900 m a.s.l.; 172, Matschertal, bark, ca. 1,370 – 1,430 m a.s.l.; 192, Elvas/Natz, bark, ca. 870 – 900 m a.s.l.; 194, Cloister Säben, Tinnetal, bark, 570 – 580 m a.s.l.

AT: a maximum elevation of 1,500 m a.s.l., Kals, TE, with a further limit of 1,400 m a.s.l., Schnann, TN. IT: up to **3,000 – 3,200 m a.s.l.**, Punta di Leppe, Aosta (this record should be checked!). CH: 400 – 2,010 m a.s.l.; DE: highest altitude 1,650 m a.s.l. (Bavaria). FR: 902 m a.s.l., Bourg-Saint-Maurice, Savoy. Red list status: 3 – endangered (DE).

Orthotrichum pallens BRUCH ex BRID.

(Orthotrichaceae), Blasses Goldhaarmoos, Pale Bristle-moss

Once in square 192 (TS/IT), Elvas/Natz, bark, ca. 870 – 900 m a.s.l.

AT: a maximum elevation of 1,980 m a.s.l., Kals, TE, with a further limit between 1,400 and 1,600 m a.s.l., St. Anton, TN. IT: up to 1,400 – 1,800 m a.s.l., Epinel, Gran Paradiso National Park, Aosta. CH: 260 – **2,360 m a.s.l.**; FR: 2,280 m a.s.l., Chambéry, Savoy.

Red list status: 2 – severely endangered (DE).

Orthotrichum pumilum SW.

(Orthotrichaceae), Zwerg-Goldhaarmoos, Dwarf Bristle-moss

5 Results

Once in square 184 (TS/IT), Lajen, bark, 1,070 – 1,090 m a.s.l.

AT: a maximum elevation of 1,700 m a.s.l. with further altitudinal limits of 1,200 m a.s.l., Pitzeschlucht, TN, and 1,040 m a.s.l., Matrei i.O., TE. IT: 1,630 – 1,680 m a.s.l., below Gimillan, Gran Paradiso National Park, Aosta. CH: 195 – **1,954 m a.s.l.**; FR: 1,695 m a.s.l., Aime, Savoy.

Red list status: 3 – endangered (DE).

Orthotrichum rupestre SCHLEICH.

(Orthotrichaceae), Felsen-Goldhaarmoos, Rock Bristle-moss

Abundant, 54 squares: 5-11, 16, 17, 19, 20, 24, 32, 34, 36, 40-42, 49, 54-56, 82, 84-89, 94-96, 99, 100, 104-106, 108, 109, 114, 118, 119, 134, 136, 138, 140, 143-145, 172-174, 184, 185, on rock, ca. 550 – 2,090 m a.s.l. (TS/IT) and ca. 1,450 – 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,530 m a.s.l., Nussing, var. *sturmii* (HORNSCH.) JUR., TE; further altitudinal limits are 2,200 m a.s.l., Rotmoostal, TN, and 1,500 m a.s.l., Froßnitz, TE. IT: 1,800 – 2,300 m a.s.l., path to Money, Gran Paradiso National Park, 2,700 m a.s.l., Schaubachhütte, Sulden, TS. CH: 200 – **3,212 m a.s.l.**; FR: 2,200 m a.s.l., Modane, Savoy.

Red list status: r: – locally endangered (AT), 3 – endangered (CH), 2 – severely endangered (DE).

Orthotrichum speciosum NEES

(Orthotrichaceae), Schönes Goldhaarmoos, Showy Bristle-moss

Six times, squares 104 (TN/AT), Gaislachalm, bark, ca. 1,900 – 1,980 m a.s.l.; 184 (TS/IT), Lajen, bark, 1,070 – 1,090 m a.s.l.; 186 (TS/IT), at Dörf village, bark, 880 – 900 m a.s.l.; 187 (TS/IT), at Dörf village, bark, 900 – 1,030 m a.s.l.; 192 (TS/IT), Elvas/Natz, bark, ca. 870 – 900 m a.s.l.; 195 (TS/IT), Villnoder, bark, 690 – 700 m a.s.l.

AT: a maximum elevation of 2,700 – 2,800 m a.s.l. (Silvretta, Vorarlberg) with further altitudinal limits of 2,550 m a.s.l., at Schwarzhorn, TN, 1,960 m a.s.l., Patscherkofel, TN, and 1,820 m a.s.l., Matreier Törl, TE. IT: up to **3,480 m a.s.l.**, Testa del Ruitor, Aosta. CH: 260 – 3,212 m a.s.l.; FR: 1,695 m a.s.l., Aime, Savoy.

Red list status: 3 – endangered (DE).

Orthotrichum striatum HEDW.

(Orthotrichaceae), Glatfrüchtiges Goldhaarmoos, Striated Bristle-moss

Four times in TS/IT only, squares 13, Alt-ratheis, rock, 1,436 – 1,470 m a.s.l.; 147, Schlanders towards Tappein, rock, ca. 1,500 – 1,800 m a.s.l.; 172, Matschertal, bark, ca. 1,370 – 1,470 m a.s.l.; 184, Lajen, bark, 1,070 – 1,090 m a.s.l.

AT: a maximum elevation of ca. 2,270 m a.s.l., Geisstein, TN, with further altitudinal limits of 1,600 m a.s.l., Galtür, TN, and 1,820 m a.s.l., Matreier Törl, TE. IT: **2,370 – 2,630 m a.s.l.**, Eaux-Ranges valley, Gran Paradiso National Park, Aosta. CH: 198 – 2,000 m a.s.l., Val Chamuera. FR: 1,000 m a.s.l., Planay, Savoy.

Red list status: 3 – endangered (DE).

Oxyrrhynchium hians (HEDW.) LOESKE;

Syn.: *O. swartzii* (TURNER) WARNST.;

Eurhynchium hians (HEDW.) LAC.

(Brachytheciaceae), Kleines Schönschnabelmoos, Swartz's Feather-moss

13 squares in TS/IT only, squares 2, 3, 6, 13-16, 19, 55, 141, 143, 176, 192, on ground and on road bank, ca. 530 – 1,930 m a.s.l.

AT: a maximum elevation of 1,850 m a.s.l., Zwölferkogel, TN, with a further elevation limit of 1,400 m a.s.l., Froschputzen, Pitztal, TN. IT: 1,670 – 1,700 m a.s.l., Giardine Alpino Paradisia, Gran Paradiso National Park. CH: 194 – **2,489 m a.s.l.**; FR: 1,030 m a.s.l., Montcel, Savoy.

Oxyrrhynchium schleicheri (R. HEDW.)

RÖLL; Syn.: *Eurhynchium schleicheri* (R.

HEDW.) Jur. (Brachytheciaceae),

Stolonen-Schönschnabelmoos,

Twist-tip Feather-moss

Once in TS/IT, square 135, Pfelderertal at Krößbichl, shaded rock, ca. 1,550 – 1,565 m a.s.l. AT: a maximum elevation of 1,260 m a.s.l., Steinacherberg, TN. IT: up to 1,700 – **2,300 m a.s.l.**, between Lillaz and Lago di Loie, Aosta. CH: 200 – 1,924 m a.s.l.; FR: 2,090 m a.s.l., Lanslebourg-Mont-Cenis, Savoy. Red list status: 3 – endangered (AT).

Paludella squarrosa (HEDW.) BRID.

(Meesiaceae), Sparriges Sumpfmooß,

Tufted Fen-moss

In five squares: 48 (TS/IT), Marchegg, boggy place, ca. 1,949 m a.s.l.; 79 (TN/AT), Niedertal, sunken Alp, flush, ca. 2,050 – 2,110 m a.s.l.; 82 (TN/AT), trail from Vent to Rofen,

flush, ca. 1,970 m a.s.l.; 157 (TN/AT), Rofental, 1,970 – 2,030 m a.s.l.; 182 (TS/IT), Martelltal, bog, 1,880 m a.s.l.

For this iconic rarity there are two new finds.

One in TS/IT, square 48, near Gerstgras/Marchegg in a bog above an old fish pond, ca. 1,949 m a.s.l., and the other in TN/AT in Niedertal, square 79, at the sunken alp, ca. 2,050 – 2,110 m a.s.l. All other findings in the investigation area confirmed already known occurrences which are documented and discussed in Cortini Pedrotti (1980, 1987), Andreis et al. (1988), Prosser (1994), Kiem (1994, 1995) and Decarli et al. (2017) for TS/IT and for AT/TN and they were mentioned for the Austrian and Italian part of Tyrol in Dalla Torre & Sarnthein (1904). For distribution in AT see also Krisai (1998). *Paludella* has a detailed late Quaternary history because it has been found frequently as a subfossil in various European countries, especially in early Holocene peats. Starting with Herzog (1926) or even earlier, its relict status has been highlighted many times; also see Cortini Pedrotti (1980) for Italy and Krisai (1985), who mentions a finding in Late Glacial deposits in Austria. AT: a maximum elevation of ca. 1,970 m a.s.l. with further altitudinal limits of 1,950 m a.s.l., Komperdellalm, TN, 1,900 m a.s.l., Truna Alm, TN. IT: in a range of 1,300 – 2,210 m a.s.l. in Trentino, the latter from Malga Stablaz in Val Maleda (2,210 m), and 2,100 m a.s.l., at Kurzras in Schnalstal, TS. CH: 1,000 m a.s.l. to **2,376 m a.s.l.**

Red list status: 2 – severely endangered (AT), EN – endangered (IT), VU – vulnerable (CH), 2 – severely endangered (DE).

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Palustriella commutata (HEDW.)

OCHYRA; Syn.: *Cratoneuron commutatum* (HEDW.) ROTH (Amblystegiaceae), Veränderliches Starknervmoos, Curled Hook-moss
Abundant, 71 squares: 3, 4, 10, 16, 20, 23, 24, 29, 35, 36, 38, 48, 49, 54-58, 73-82, 84-87, 89, 90, 93-95, 97, 99, 104, 105, 107-109, 112, 121-123, 126-134, 136, 138, 141, 143, 149, 157-160, 162, 163, 175, 180, 181, usually on wet ground, boggy places, bogs, wet rocks, springs, river banks and in rivers. From ca. 560 m a.s.l. to ca. 2,630 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to 2,630 m a.s.l. (TN/AT). AT: an altitudinal range of 600 – **3,500 m a.s.l.**, the latter at Ramolkogel, TN, with further altitudinal limits of 2,600 m a.s.l., Muttererjoch, Fotschertal, TN, 2,800 m a.s.l., at Grödez summit above Kals, TE. IT: up to 3,350 m a.s.l., Theodulhorn, Aosta [var. *sulcatum* (LINDB.) MOENCK.], 2,746–2,750 m a.s.l., Lago Nero, Gran Paradiso National Park, Aosta, 2,630 m a.s.l., Sasso di Bormin, Ampezzo, Trentino, 2,500 m a.s.l., Martelltal, TS. CH (*P. c.* s.l.): 265 – 3,000 m a.s.l., Hörnli. FR: 2,500 m a.s.l., Valloire, Savoy.
Red list status: 3 (var. *commutata*) – endangered (DE).

Palustriella decipiens (DE NOT.)

OCHYRA; Syn.: *Cratoneuron decipiens* (DE NOT.) LOESKE (Amblystegiaceae), Täuschendes Starknervmoos, Lesser Curled Hook-moss
Recorded only twice in TN/AT, square 109, Ötztal boggy place, ca. 1,450 – 1,650 m a.s.l.

and square 157, Rofental, flush, 1,970 – 2,030 m a.s.l.

AT: a maximum elevation of 2,500 m a.s.l., Gaisbergtal near Oberurgl, TN, with further altitudinal limits of 2,000 m a.s.l., Blaser, Gschnitztal, TN, ca. 2,000 m a.s.l., Ködnitztal, TE. IT: **2,601 – 2,645 m a.s.l.**, Laghi Ponton, Gran Paradiso National Park, Aosta. CH: 268 – 2,590 m a.s.l.; FR: 2,280 m a.s.l., Tignes, Savoy.
Red list status: 3 – endangered (DE).

Paraleucobryum enerve (THED.) LOESKE (Dicranaceae), Rippenloses Weissgabelzahnmoos, no English Name.

17 squares: 20, 22, 23, 54, 58, 60, 64, 66, 70, 71, 81, 156, 166, 168-170, 200, on rock and ground at higher altitudes, once on a river bank. Highest occurrence in square 66 (TN/AT, TS/IT), near discovery place of the Iceman, gravel, **3,225 m a.s.l.**, not below 1,050 m a.s.l. (TS/IT) and 1,900 m a.s.l. (TN/AT).
AT: an altitudinal range of 800 – 3,200 m a.s.l., the uppermost from Mitterkamp, TN, with a further limit of 2,920 m a.s.l., Hohe Tauern, TE. IT: 2,423 – 2,670 m a.s.l., Piedmonte, Lago di Motta, Gran Paradiso National Park, in a range of 1,400 – 3,200 m a.s.l. in Trentino, and 2,900 m a.s.l., Mittereck at St. Valentin, TS. CH: 800 – 3,207 m a.s.l.; FR: 2,491 m a.s.l., Tignes, Savoy.

Paraleucobryum longifolium (HEDW.)

LOESKE (Dicranaceae), Langblättriger Weißgabelzahn, Long-leaved Fork-moss
Abundant, 40 squares: 12, 15, 17, 20, 24-27,

29, 31, 34-38, 44, 70, 90-92, 94, 98, 99, 102, 103, 105, 107, 109, 111, 135-137, 139, 184, 186-190, 196, on rock, ca. 780 – 2,320 m a.s.l. (TS/IT) and ca. 1,450 – 2,520 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,350 m a.s.l., St. Anton, TN with a further elevation limit of 2,200 m a.s.l., near Kalser Törl, TE. IT: up to 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Gran Paradiso National Park, Aosta, and in a range of 500 – 2,500 m a.s.l. in Trentino. CH: 100 – **2,720 m a.s.l.**; FR: 1,850 m a.s.l., Bonneval-sur-Arc, Savoy. Red list status: V – decreasing (DE).

Pellia endiviifolia (DICKS.) DUMORT. (Pelliaceae), Kelch-Beckenmoos, Endive Pellia (Fig. 5.20)



Fig. 5.20: Endive Pellia (*Pellia endiviifolia*) in full fruit – not very abundant in the study area and mostly in basic habitats

Molecular studies (Fiedorow et al. 2001; Pacak et al. 2002) make the presence of cryptic species in *Pellia endiviifolia* and *P. epiphylla* likely, but in this work we followed the previous concepts.

13 squares: 4, 70, 99, 131-134, 141, 143, 172, 181, 186, 187, on ground and on rock, on trackbanks and at a spring, ca. 660 – 1,940 m a.s.l. (TS/IT) and ca. 1,525 m a.s.l. to 2,500 – 2,554 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,500 m a.s.l., Ködnitztal, TE with a further limit of 1,330 m a.s.l., Egersgrinn, TN. IT: 2,200 – 2,450 m a.s.l., Aosta, Meye-d'en Haut, Gran Paradiso National Park. CH: 200 to 2,227 m a.s.l.; FR: **2,650 m a.s.l.**, Termignon, Savoy. Red list status: NT – near threatened (IT).

Pellia epiphylla (L.) CORDA (Pelliaceae), Gemeines Beckenmoos, Overleaf Pellia. Nine squares: 6, 52, 53, 100, 107, 135, 139, 180, 198, on ground and rock and in a bog, ca. 790 – 2,210 m a.s.l. (TS/IT) and ca. 1,550 – 2,100 m a.s.l. (TN/AT).

AT: a maximum elevation of 1,800 – 2,200 m a.s.l., Längental, Sellrain, TN. IT: 1,700 m a.s.l., between Lentaz and Suppiaz, Gran Paradiso National Park, Aosta. CH: 200 to **2,478 m a.s.l.**; FR: 1,573 m a.s.l., Crest-Voland, Savoy. Red list status: NT – near threatened (IT).

Pellia neesiana (GOTTSCHE) LIMPR. (Pelliaceae), Nees' Beckenmoos, Nees' Pellia. 28 squares: 10, 25, 36, 38, 60, 71-73, 76, 81, 82, 86, 89-91, 94, 104, 105, 109, 114, 121, 132, 134, 138, 186-189, mostly on (wet) ground, once on a river bank, ca. 780 – 2,458 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. to ca. 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,560 m a.s.l., Ködnitztal, TE, with a further limit of 2,465 m a.s.l., Ötztal, TN. IT: up to 2,600 m

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a.s.l., Lancebranlette, Aosta, and in a range of 800 – **3,500 m a.s.l.** in Trentino (the latter should be checked). CH: 520 m a.s.l. to 2,500 – 2,850 m a.s.l.; DE: the highest altitude 2,050 m a.s.l. (Bavaria). FR: 2,400 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Phascum cuspidatum HEDW. (Pottiaceae), Spitzblatt-Glanzmoos, Cuspidate Earth-moss
Twice in the TS/IT part only, squares 10, Innerunterstell, ground, 1,400 – 1,460 m a.s.l. and 193, at Cloister Säben, Tinnetal, ground/road bank, 525 – 570 m a.s.l.

AT: a maximum elevation of 1,700 m a.s.l., Ködnitztal, TE, with an additional limit of 1,360 m a.s.l., Matrei i. O., TE. IT: 1,570 – 1,600 m a.s.l., above Degioz, Gran Paradiso National Park, Aosta, and 1,200 m a.s.l., Ampezzo, Trentino. CH: 200 m a.s.l. to **2,519 m a.s.l.**; FR: 730 m a.s.l., La Cote-D’Aime, Savoy.

Philonotis calcarea (BRUCH & SCHIMP) SCHIMP. (Bartramiaceae), Kalk-Quellmoos, Thick-nerved Apple-moss

Three times, squares 73 (TN/AT), at Martin-Busch-Hütte, streamside, ca. 2,320 – 2,490 m a.s.l.; 105 (TN/AT), at Zwieselstein village, boggy place, ca. 1,470 – 1,500 m a.s.l.; 138 (TS/IT), Pfelderertal at Bruggstein, at a waterfall, ca. 1,380 – 1,430 m a.s.l.

AT: a maximum elevation of 2,600 m a.s.l., Hippold, TN, with further altitudinal limits of 2,300 m a.s.l., Matreier Törl, TE, and 2,370 m a.s.l., Rendel. IT: up to 2,960 m

a.s.l., Monte Bianco, Aosta, 1,400 m a.s.l., Niederdorf, TS. CH: 300 m a.s.l. to **2,600 m a.s.l.**; FR: 2,600 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Red list status: 3 – endangered (DE).

Philonotis fontana (HEDW.) BRID.

(Bartramiaceae), Gemeines Quellmoos, Fountain Apple-moss

Abundant, 72 squares: 10, 22-24, 33, 35, 36, 44, 48, 50-52, 55-58, 68, 70-81, 84, 85, 88, 93, 94, 97, 99, 101, 102, 104, 105, 107, 109, 114, 116, 118, 121, 122, 124, 126, 127, 129-131, 133, 134, 136, 138, 139, 140, 150, 154, 157-163, 171, 182, 196, 198, in springs, boggy places, rivers, river banks, flushes and occasionally on wet rock, ca. 1,090 – 2,875 m a.s.l. (TS/IT) and ca. 1,450 – 2,880 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,988 m a.s.l., Musing, TE, with an additional limit of 2,900 m a.s.l., Gepatsch, Kaunertal, TN. IT: up to 3,000 m a.s.l., Monte Bianco, Aosta, 2,530 m a.s.l., Hörndljoch, Taufers, TS. CH: 194 – 3,000 m a.s.l.; FR: 2,600 m a.s.l., Bonneval-sur-Arc, Savoy. The highest altitude given for the central Alps is **3,100 m a.s.l.**, without precise location.

Red list status: V – decreasing (DE).

Philonotis seriata MITT. (Bartramiaceae),

Reihenblättriges Quellmoos, Spiral

Apple-moss

Abundant, 55 squares: 23, 26, 29, 31, 38, 49, 52, 53, 56-60, 63, 64, 67, 68, 70-73, 77, 79, 81-83, 85, 87-89, 94, 99, 100, 106, 108, 109, 118, 123-125, 128, 133, 134, 139, 141, 157-160, 163, 167, 172, 174, 198, 199, always on

wet open places, in rivers, river banks, springs, boggy places, springs, flushes, bogs, once on the margin of a peat bog, ca. 980 – **2,880 m a.s.l.** (TS/IT) and ca. 1,450 – **2,880 m a.s.l.** (TN/AT).

AT: an altitudinal range of ca. 800 – 2,800 m a.s.l. with further altitudinal limits of 2,650 m a.s.l., at Itlsee, Obergurgl, TN and ca. 2,560 m a.s.l., Ködnitztal, TE. IT from an altitudinal range up to 2,800 m a.s.l. in Piedmont, and 2,600 m a.s.l., Pazineralpe, Langtaufers, TS. CH: 480 – 2,860 m a.s.l.; FR: 2,700 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: V – decreasing (DE).

Physcomitrium pyriforme (HEDW.)

BRUCH & SCHIMP. (Funariaceae), Birnenförmiges Blasenmützenmoos, Common Bladder-moss (Fig. 5.21)



Fig. 5.21: Common Bladder-moss (*Physcomitrium pyriforme*), typically found on soil in arable fields and in orchards, but rare

Twice in TS/IT only, squares 10, Innerunterstell, ground, 1,400 – 1,460 m a.s.l. and 177,

at castle Tarantsberg, open soil in an apple plantation, 555 m a.s.l.

AT: a maximum elevation of **1,500 m a.s.l.** with a further limit of 1,150 m a.s.l., Trins, TN. For IT no altitudinal limits revealed so far. CH: 195 m a.s.l. to 1,291 m a.s.l.; FR: 800 m a.s.l., Arvillard, Savoy.

Plagiochila asplenioides (L. emend. TAYL.)

DUM. (Plagiochilaceae), Großes Muschelmoos, Greater Featherwort

24 squares: 6, 14, 16, 19, 20, 24, 25, 102, 103, 107, 129, 136, 137, 139, 141, 178, 179, 186-189, 194-196, usually on ground, occasionally on rock, ca. 570 – 1,860 m a.s.l. (TS/IT) and ca. 1,490 – 1,850 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,560 m a.s.l., Ködnitztal, TE, with further altitudinal limits of 2,530 m a.s.l., Serles, TN, and 2,400 m a.s.l., Gaisbergtal near Obergurgl, TN. IT: up to 1,700 m a.s.l., Champocher, Aosta. CH: 200 m a.s.l. to **2,850 m a.s.l.**; FR: 2,200 m a.s.l., Bessans, Savoy. DE: highest elevation 2,350 m a.s.l. (Bavaria).

Red list status: NT – near threatened (IT), V – decreasing (DE).

Plagiochila porelloides (TORREY ex NEES)

LINDENB. (Plagiochilaceae), Kleines Muschelmoos, Lesser Featherwort

Abundant, 46 squares: 4, 6, 14, 16, 17, 20, 24-26, 33, 35, 42, 49, 56, 84, 86, 90, 99, 102, 103, 107-111, 113, 121, 127, 130, 132, 136, 137, 139, 141, 149, 172, 174, 178, 181, 185, 188-190, 194, 195, 198, usually on ground, occasionally on rock, ca. 570 – 2,400 m a.s.l.

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(TS/IT) and ca. 1,450 – 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of ca. **3,000 m a.s.l.** with further altitudinal limits of 2,550 m a.s.l., TE (without precise location), and 1,700 m a.s.l., Mittelberg, Pitztal, TN. IT: 2,423 – 2,670 m a.s.l., Lago di Motta, both Gran Paradiso National Park, Piedmont. CH: 200 m a.s.l. to 2,940 m a.s.l.; FR: 2,000 m a.s.l., Bramans, Savoy.

Red list status: NT – near threatened (IT).

Plagiomnium affine (BLAND.) T. KOP.

(Plagiomniaceae), Verwandtes Kriechsternmoos, Many-fruited Thyme-moss

Abundant, 44 squares: 1, 4, 6, 12-14, 17-20, 24, 26, 33, 34, 43, 81, 93-97, 102, 104-106, 108, 109, 111, 136, 140, 141, 150, 171, 172, 174, 177, 184, 186-190, 194, 196, on ground, ca. 555 – 1,820 m a.s.l. (TS/IT) and ca. 1,450 – 2,050 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,470 m a.s.l. (Carinthia) with further altitudinal limits of 1,950 m a.s.l., Kals, TE, ca. 1,870 m a.s.l., Ködnitztal, TE, and 1,800 m a.s.l., Grünsee bei Nauders, TN. IT: up to 2,936 m a.s.l., Becdes-Rols, Aosta, and 1,475 m a.s.l., Reschensee, TS. CH: 193 – 2,890 m a.s.l.; FR: up to **3,000 m a.s.l.**, and 1,950 m a.s.l., Bramans, Savoy.

Plagiomnium cuspidatum (HEDW.)

T. KOP. (Plagiomniaceae), Spieß-Kriechsternmoos, Woodsy Thyme-moss

Abundant, 62 squares: 3-20, 24-26, 32, 36, 39, 41, 44, 54, 55, 82, 85, 90, 96, 103, 108, 111-114, 132, 134, 138, 140, 141, 143-149,

158, 171, 172, 174, 176, 178, 184, 186, 187, 190, 192, 194, usually on ground, occasionally on rock, ca. 550 – 1,980 m a.s.l. (TS/IT) and ca. 1,470 – 2,100 m a.s.l. (TN/AT).

AT: a maximum elevation of 1,400 m a.s.l., Steinach, TN with a further limit of 1,300 m a.s.l., Kals, TE. In IT up to 1,720 – 2,200 m a.s.l., Aosta. CH: 193 – **2,520 m a.s.l.**; FR: 1,762 m, Saint-Martin-de-Belleville, Savoy.

Plagiomnium elatum (BRUCH & SCHIMP.) T. KOP. (Plagiomniaceae),

Sumpf-Kriechsternmoos, Tall Thyme-moss
Five times, squares 89 (TN/AT), Ventertal at Koner Rinne, wet ground, ca. 1,840 – 1,860 m a.s.l.; 129 (TS/IT), Pfelderertal, Pfelderer Alm, ground, 1,820 – 1,860 m a.s.l.; 139 (TS/IT), Pfelderertal below Farmazon, wet place, ca. 1,310 – 1,350 m a.s.l.; 175 (TS/IT), at Haidersee, “Schwingrasen”, 1,450 m a.s.l.; 192 (TS/IT), Elvas/Natz, flush, ca. 870 – 900 m a.s.l.

AT: a maximum elevation of 1,900 m a.s.l., Mittelberg, Pitztal (same elevation also for Styria). IT: 1,850 – 1,950 m a.s.l., between Alpe Bouc and Alpe Pianasse, Gran Paradiso National Park, Aosta, and 1,475 m a.s.l., Reschensee, TS. CH: 270 – 2,240 m a.s.l.; FR: **2,491 m a.s.l.**, Tignes, Savoy.

Red list status: 3 – endangered (AT, DE).

Plagiomnium ellipticum (BRID.) T. KOP.

(Plagiomniaceae), Ellipsenblättriges Kriechsternmoos, Marsh Thyme-moss

Eight squares: 10, 15, 24, 55, 108, 138, 175, 183, usually on ground, once in a “Schwingrasen”, ca. 650 – 1,930 m a.s.l. (TS/IT) and ca. 1,470 – 1,500 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,250 m a.s.l. with a further limit of 1,000 m a.s.l., Volderwildbad, TN. IT: 1,550 – 1,650 m a.s.l., near Rif. Noaschetta, Gran Paradiso National Park, and in a range up to 2,000 m a.s.l. in Madonna di Campiglio, Trentino. CH: 380 – **2,400 m a.s.l.**; FR: 1,660 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: 3 – endangered (AT, DE).

Plagiomnium medium (BRUCH & SCHIMP.) T. KOP. (Plagiomniaceae), Mittleres Kriechsternmoos,

Alpine Thyme-moss

Nine squares: 10, 11, 24, 34, 58, 81, 179, 180, 195, on ground, occasionally on rock, ca. 690 – 2,148 m a.s.l. (TS/IT) and 2,040 – 2,100 m a.s.l. (TN/AT).

AT: a maximum elevation of >2,000 m a.s.l., Verwalltal, TN, with an additional limit of 1,750 m a.s.l., Innervillgrattenertal, TE. IT: 1,850 – 1,950 m a.s.l., Rhemes-Notre Dame, Gran Paradiso National Park, Aosta. CH: 355 – **2,190 m a.s.l.**; FR: 1,532 m, Peisey-Nancroix, Savoy.

Red list status: 3 – endangered (DE).

Plagiomnium rostratum (SCHRAD.)

T. KOP. (Plagiomniaceae), Geschnäbeltes Kriechsternmoos, Long-beaked Thyme-moss
Twice in TS/IT only, squares 181, at Oberalmühle, ground, ca. 660 m a.s.l. and 184, Lajen, ground, 1,070 – 1,090 m a.s.l.

AT: a maximum elevation of **2,470 m a.s.l.**, Teischnitz, TE, with further altitudinal limits of 2,175 m a.s.l., Kopfkragen, TN, and <1,900 m a.s.l., Steiner Alpe, TE. IT: up to

2,400 m a.s.l., Piccolo S. Bernardo, Aosta, and 1,920 m a.s.l., Costeana, Formin, Ampezzo, Trentino. CH: 200 – 2,256 m a.s.l.; FR: 1,320 m a.s.l., Saint-Francois-de-Sales, Savoy.

Plagiomnium undulatum (HEDW.) T.

KOP. (Plagiomniaceae), Gewelltblättriges Kriechsternmoos, Hart's-tongue Thyme-moss
32 squares: 1, 3, 6, 10, 13-16, 20, 58, 103, 110, 136, 139, 141, 145, 148, 149, 172, 177-179, 181, 184, 186-189, 192-195, usually on ground, ca. 525 m a.s.l. to **2,148 m a.s.l.** (TS/IT) and ca. 1,490 – 1,510 m a.s.l. (TN/AT).

AT: a maximum elevation of 1,600 m a.s.l., Hochzeiger, Pitztal. IT: up to 1,400 – 1,800 m a.s.l., Epinel, Aosta, Gran Paradiso National Park. CH: 193 – 1,912 m a.s.l.; FR: 908 m a.s.l., Novalaise, Savoy.

Plagiopus oederianus (SW.) CRUM & ANDERSON; Syn.: *Plagiopus oederi* (BRID.) LIMPR. (Bartramiaceae), Oeders Krummfußmoos, Oeder's Apple-moss

16 squares: 13, 15, 38, 54, 82, 84, 85, 94, 102, 105, 112, 127, 129, 132, 135, 149, on rock, ca. 856 – 2,400 m a.s.l. (TS/IT) and ca. 1,470 – 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,700 – 2,800 m a.s.l., Grödez near Kals, TE with further altitudinal limits of 2,730 m a.s.l., Hohe Tauern, TE and 2,640 m a.s.l., Padaster, TN. IT: up to **2,900 m a.s.l.**, Col d'Ollen, Aosta, and 2,530 m a.s.l., Brennerbad, Hühnerspiel, TS. CH: 370 m a.s.l. to 2,660 m a.s.l.; FR: 2,900 m a.s.l., Bessans, Savoy.

Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

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Plagiothecium cavifolium (BRID.) IWATS.
(Plagiotheciaceae), Hohlblättriges Plattmoos,
Round Silk-moss

Three times, squares 24 (TS/IT), at Karthaus
village, rock, 1,307 m a.s.l.; 135 (TS/IT),
Pfelderertal at Krößbichl, ground, ca. 1,565 m
a.s.l. and 158 (TN/AT), Rofental, ground,
2,030 – 2,100 m a.s.l.

AT: a maximum elevation of **2,800 m a.s.l.**,
Rettenbachferner, TN, with a further limit
of 2,540 m a.s.l., Ködnitzhaus, TE. IT: up to
2,530 – 2,600 m a.s.l., Alpe Perazda, Gran Pa-
radiso National Park. CH: 270 – 2,519 m a.s.l.;
FR: 280 m a.s.l., La Motte-Servolex, Savoy.

Plagiothecium denticulatum (HEDW.)

SCHIMP. (Plagiotheciaceae), Gezähntes
Plattmoos, Dentate Silk-moss

31 squares: 13, 15, 17, 21, 24, 32, 34, 37,
43, 54, 71, 73, 84, 85, 89, 94, 99, 103, 109,
128, 132, 140, 141, 160, 171, 174, 186-
190, on ground, occasionally on rock, ca.
780 – 2,080 m a.s.l. (TS/IT) and ca. 1,450
– 2,627 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,050 m a.s.l.,
Großglockner with further altitudinal limits
of 2,740 m a.s.l., Längental, TN, and 2,350 m
a.s.l., Katalalpe, TE. IT: 2,650 – 2,700 m a.s.l.,
Colle del Nivolet, Gran Paradiso National
Park, Aosta, up to 2,050 m a.s.l., Mulatto,
Val di Fiemme, Trentino, and 3,000 m a.s.l.,
Marzellkamm, TS. CH: 200 – **3,070 m a.s.l.**;
FR: 1,800 m a.s.l., Tignes, Savoy.

Plagiothecium laetum SCHIMP.

(Plagiotheciaceae), Glänzendes Plattmoos,
Bright Silk-moss

22 squares: 1, 6, 24, 86, 92, 99, 100, 107, 109-
111, 127, 135, 136, 139, 152, 157, 175, 179,
184, 191, 195, on ground, ca. 690 – 2,400 m
a.s.l. (TS/IT) and ca. 1,450 – 2,030 m a.s.l.
(TN/AT).

AT: a maximum elevation of **2,660 m a.s.l.**,
Möserlingwand, Hohe Tauern, TE, with a fur-
ther limit of 2,050 m a.s.l., Albona lakes, TN.
IT: up to 1,650 – 1,680 m a.s.l., near Eaux
Rousses, Gran Paradiso National Park, Aosta.
CH: 270 – 2,502 m a.s.l.; FR: 800 m a.s.l.,
Arvillard, Savoy.

Plagiothecium undulatum (HEDW.)

SCHIMP. (Plagiotheciaceae), Gewelltes
Plattmoos, Waved Silk-moss

Once in square 139 (TS/IT), Pfelderertal be-
low Farmazon, ground, ca. 1,310 – 1,350 m
a.s.l.

AT: a maximum elevation of 1,790 m a.s.l.,
Mellitz, Hohe Tauern, TE, with a further limit
of 1,650 m a.s.l., St. Anton, TN. IT: 1,650 –
1,750 m a.s.l., Lillaz, Gran Paradiso National
Park, Aosta. CH: 402 – **1,824 m a.s.l.**; FR:
1,701 m a.s.l., Beaufort-sur-Doron, Savoy.

Red list status: V – decreasing (DE).

Plasteurhynchium striatulum (SPRUCE)

M. FLEISCH.; Syn.: *Eurhynchium striatulum*
(SPRUCE) B.S.G.; *Isothecium striatulum*
(SPRUCE) KINDB. (Brachytheciaceae),
Kalk-Schönschnabelmoos, Lesser Striated
Feather-moss

Twice, squares 38 (TS/IT), Mastauntal, ground,
ca. 1,900 – 1,950 m a.s.l. and 83 (TN/AT),
Mutsbichl, ground, ca. 2,130 – 2,250 m a.s.l.

AT: a maximum elevation of 2,200 – 2,500 m

a.s.l., Tarntal, TN with further altitudinal limits of 1,450 m a.s.l., St. Anton, TN, and 1,140 m a.s.l., Glanzerberg, Matrei i.O., TE. IT: up to 2,370 – 2,630 m a.s.l., Eaux-Ranges valley, Gran Paradiso National Park, Aosta, and 520 m a.s.l., Gröden, TS. CH: 270 – **2,800 m a.s.l.**; FR: 600 m a.s.l., La Chapelle-du-Mont-du-Chat, Savoy.

Platygyrium repens (BRID.) SCHIMP.

(Hypnaceae), Kriechendes Breitringmoos, Flat-brocade Moss

Three times in TS/IT only, squares 10, Innerunterstell, bark, 1,455 m a.s.l.; 13, Altratheis, bark, 1,436 – 1,470 m a.s.l. and 172, Matscherthal, bark, ca. 1,370 – 1,430 m a.s.l.

AT: a maximum elevation of 1,740 m a.s.l., Blaser, TN, with a further limit of 1,330 m a.s.l., Prägraten, Materi i.O., TE. IT: up to 1,670 – 1,840 m a.s.l., at Rif. Alpinisti Chiavasessi, GranParadiso National Park, Aosta. CH: 195 – **2,000 m a.s.l.**, Val Champagna, Engadin.

Red list status: V – decreasing (DE).

Platyhypnidium riparioides (HEDW.)

DIXON; Syn.: *Rhynchostegium riparioides* (HEDW.) CARD. (Brachytheciaceae),

Ufer-Schnabeldeckelmoos, Feather-moss

11 squares: 1, 4, 6-8, 34, 106, 149, 180, 190, 196, usually on rocks in rivers, ca. 650 – 1,644 m a.s.l. (TS/IT) and in ca. 1,470 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,100 m a.s.l., Schönliesens, TN, with further altitudinal limits 1,480 m a.s.l., Hintertux TN, and 1,330 m a.s.l., Kaserbach, TS. IT: 1,630 – 1,680 m a.s.l.,

below Gimillan, Gran Paradiso National Park, Aosta. CH: 200 – 2,470 m a.s.l. DE: highest altitude 2,015 m a.s.l. (Bavaria). FR: **2,491 m a.s.l.**, Tignes, Savoy.

Pleuridium acuminatum LINDB.

(Ditrichaceae), Zugespitztblättriges Seitenköpfchenmoos, Taper-leaved Earth-moss

Once in square 183 (TS/IT), Tils at Brixen, on ground, 650 – 730 m a.s.l.

AT: a maximum elevation of 700 m a.s.l., Lienz, TE. IT: 700/800 m a.s.l., Vellau, TS. CH: 200 – **2,303 m a.s.l.**; FR: 800 m a.s.l., Arvillard, Savoy.

Red list status: V – decreasing (DE).

Pleurocladula albescens (HOOK.)

GROLLE; Syn.: *Fuscocephaloziopsis albescens* (HOOK.) VÁŇA & L. SÖDERSTR.

(Cephaloziaceae), Weissliches Seitenastmoos, Snow Threadwort

Five times, squares 23 (TS/IT), Klosteralm, snow patch, ca. 2,470 m a.s.l.; 62 (TN/AT, TS/IT), at Similaunhütte, gravel, **3,036 m a.s.l.**; 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, ground, **3,019 m a.s.l.**; 71 (TN/AT), above Martin-Busch-Hütte, ground, ca. 2,540 – 2,630 m a.s.l.; 168 (TN/AT), Tiefenbach, ground, 2,670 m a.s.l.

AT: an altitudinal range of ca. 1,600 – 2,900 m a.s.l., the latter from Krummgampental at Gepatsch, TN, with a further limit of 2,600 m a.s.l., Neualpl at Lienz TE. IT: 2,370 – 2,630 m a.s.l., Eaux-Ranges valley, Gran Paradiso National Park, Aosta, in a range of 2,000 – 3,000 m a.s.l., Gr. Lagorai, Trentino, 2,700 m a.s.l., near St. Martin in Passeier,

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TS. CH: 1,300 – 2,868 m a.s.l.; FR: 2,755 m a.s.l., Termignon, Savoy.

Red list status: VU – vulnerable (IT), R – extremely rare (DE), AR – at risk (FR).

Pleurozium schreberi (WILLD.) MITT.

(Hylocomiaceae), Schrebers Rotstengelmoos, Red-stemmed Feather-moos

Very abundant, 133 squares: 1, 6, 7, 9-15, 17, 19-56, 64, 70, 75-84, 86, 88-94, 96, 98-111, 113-116, 118-121, 127-131, 135-137, 139, 149-155, 157-161, 166, 168, 171, 178, 179, 182-193, 196-198, usually on ground but sometimes found on rock or in a peat bog, ca. 525 – 2,700 m (TS/IT) and ca. 1,450 – 2,660 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,808 m a.s.l.**, Schartlkopf, Nauders, TN. IT: up to 2,423 – 2,670 m a.s.l., Lago di Motta, both Gran Paradiso National Park, Piedmont. CH: 300 – 2,740 m a.s.l.; FR: 2,000 m a.s.l., e.g. Termignon, Savoy.

Pogonatum aloides (HEDW.) P. BEAUV.;

Syn.: *Polytrichum aloides* HEDW.

(Polytrichaceae), Aloeblättriges

Filzmützenmoos, Dwarf Haircap

Abundant, 44 squares: 7, 16, 18, 19, 21, 22, 24-26, 33, 35, 38, 44-46, 52, 55, 79, 86, 87, 94, 97, 101, 104, 105, 107, 110, 114, 132, 134, 135, 137, 139, 141, 149, 154, 178-180, 183, 185, 190, 191, 196, on ground and on banks, ca. 650 – 2,300 m a.s.l. (TS/IT) and ca. 1,470 – 2,110 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,350 m a.s.l., Fuldaer Höhenweg, Pitztal, TN, with a further limit 1,950 m a.s.l., Matreier Törl, TE.

IT: up to 2,840 m a.s.l., Aosta. CH: 194 m a.s.l. to **3,080 m a.s.l.**; FR: 2,103 m a.s.l., Granier, Savoy.

Red list status: V – decreasing (DE).

Pogonatum nanum (HEDW.) P. BEAUV.;

Syn.: *Polytrichum nanum* HEDW.

(Polytrichaceae), Kleines Filzmützenmoos,

Pygmy Haircap

Once in the TS/IT square 183, Tils near Brixen, on ground at a roadbank, in an altitudinal range of 650 – 730 m a.s.l. (voucher specimen confirmed by Neil Bell, RBGE).

AT: a maximum elevation of ca. 1,000 m a.s.l., Pitztal, TN. For IT no altitudinal limits revealed so far. CH: 280 m a.s.l. to **1,350 m a.s.l.**; FR: 800 m a.s.l., Arvillard, Savoy.

Red list status: 4 – potentially endangered (AT), CR – threatened with extinction (CH), 3 – endangered (DE).

Pogonatum urnigerum (HEDW.) P.

BEAUV.; Syn.: *Polytrichum urnigerum*

HEDW. (Polytrichaceae),

Großes Filzmützenmoos, Urn Haircap

Very abundant, 167 squares: 1, 4-7, 9-11, 13-47, 49-68, 70-77, 79-122, 124, 126-130, 132-137, 139-141, 143, 145, 146, 148-159, 161-163, 165-170, 172, 174, 177-180, 183, 185, 190, 191, 196, 198, 199, usually on ground, on soil banks, on trampled ground, occasionally on a hummock in a severely degraded peat bog, even on walls and on rocks. Highest records in squares 65 (TN/AT, TS/IT), Niederjochferner near discovery place, soil, ca. **3,200 m a.s.l.** and 66 (TN/AT, TS/IT), at discovery place, rock crevices, ca.

3,200 m a.s.l., lowest elevations are at ca. 550 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,600 m a.s.l., Hohe Mut, Obergurgl, TN and Hohe Tauern, TE. IT: 2,300 – 2,670 m a.s.l., Laghi Miserino, Gran Paradiso National Park, Aosta, and 1,100 m a.s.l., Puol, TS, 2,370 m a.s.l., Ornella valley, Mesola, Trentino. CH: 285 – 3,080 m a.s.l.; FR: 2,491 m a.s.l., Tignes, Savoy. Red list status: V – decreasing (DE).

Poblia andalusica (HÖHN.) BROTH.

(Mielichhoferiaceae), Andalusisches

Pohlmoos, Roth's Thread-moss

Four times, squares 86 (TN/AT), north of Vent village, ground, ca. 1,870–1,880 m a.s.l.; 102 (TN/AT), Martlaswald, ground, ca. 1,690 – 1,700 m a.s.l.; 130 (TS/IT), Pfelderertal, Pfelderer Alm, ground, 1,770 – 1,820 m a.s.l.; 185 (TS/IT), Kreuztal, ground, 1,980 – 2,050 m a.s.l. New to province Trentino-Alto Adige!

AT: an altitudinal range of 250 – 3,000 m a.s.l., the latter from ca. 3,000 m a.s.l., between Chemnitzerhütte and Hohe Geige, Pitztal, TN, and a further limit for TE of 1,400 m a.s.l., Kals. IT: up to 2,580 – 2,680 m a.s.l., Lauson valley, Gran Paradiso National Park, Aosta. Not recorded for Trentino-Alto Adige. CH: 194–**3,210 m a.s.l.**; FR: 3,150 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Red list status: G – risk assumed (DE).

Poblia annotina agg. (HEDW.) LINDB.

(Mielichhoferiaceae), Vorjähriges Pohlmoos, Pale-fruited Thread-moss

On some occasions, there were recognised plants of the *Poblia annotina* aggregate which could not be assigned to species level because of poor or unusual development. Six such forms occurred in four squares, 23 (TS/IT), Klosteralm, trackside, ca. 2,240 – 2,550 m a.s.l.; 24 (TS/IT), at Karthaus village, river bank, ca. 1,090 m a.s.l.; 59 (TS/IT), Tisental, ground, 2,120 m a.s.l.; 167 (TN/AT), Tiefenbach, ground, 2,654 m a.s.l.; 191 (TS/IT), Pfunderer mine, ground, 970 – 1,010 m a.s.l. AT: an altitudinal range of 400 – 1,800 m a.s.l. to up to ca. 2,750 m a.s.l., Ködnitztal, TE. IT: up to **3,000 m a.s.l.**, Monte Bianco, Aosta. CH (*P. a. s. str.*): 340 – 2,980 m a.s.l.; FR: 2,220 m a.s.l., Peisey-Nancroix, Savoy. Red list status: V – decreasing (DE).

Poblia cruda (HEDW.) LINDB.

(Mielichhoferiaceae), Hellgrünes Pohlmoos,

Opal Thread-moss

Very abundant, 102 squares: 4, 5, 7, 10, 12-17, 20, 22-25, 32, 34-36, 40, 42, 43, 48, 52, 54-57, 62-66, 68, 70-76, 81-84, 88-90, 92, 96-98, 101, 102, 104-109, 111-114, 117, 121, 127, 129, 130, 132, 134-141, 143, 145, 147-152, 157, 158, 160, 161, 165, 166, 169, 174, 177-179, 185, 196, 198-200, on ground and on rock. Highest record in square 62 (TN/AT, TS/IT), trail to Similaun Spitz, ground, 3,242 m, lowest measures ca. 550 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

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AT: a maximum elevation of 3,100 m a.s.l. with further altitudinal limits of 2,800 m a.s.l., Weißeck, Schartlkopf, Nauders, TN, and 2,900 m a.s.l., Ködnitztal, TE. IT: up to **3,500 m a.s.l.**, Monte Rosa, Aosta, and 2,880 m a.s.l., Malliaunkopf, Graun, TS. CH: 200 m a.s.l. to 3,300 m a.s.l., Piz Vadret. FR: 3,195 m a.s.l., Saint-Martin-de-Belleville, Savoy. Red list status: r – locally endangered (AT), V – decreasing (DE).

Poblia drummondii (C. MÜLL)

ANDREWS (Mielichhoferiaceae), Veränderliches Pohlmoos, Drummond's Thread-moss Abundant, 36 squares: 24, 52, 58, 60-66, 68, 70-73, 76, 80-82, 86, 88, 90, 114, 115, 120-122, 124-126, 128, 133, 157, 164, 169, 170, on (wet) ground, river banks, track bank and at springs. Highest record in square 62 (TN/AT, TS/IT), track to Similaun Spitz, gravel, 3,242 m, not below 1,090 m a.s.l. (TS/IT) and 1,770 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 1,000 – 3,739 m a.s.l., Weisskugel, TN, with further altitudinal limits of 3,460 m a.s.l., Hochwilde, TN, and 2,560 m a.s.l., Peischlerpaß, TE. IT: up to 3,500 m a.s.l., Monte Rosa, Aosta, and 3,000 m a.s.l., Schöntaufspitze, TS. CH: 408 – **3,800 m a.s.l.**, the latter from Matterhorn. FR: 2,700 m a.s.l., Val-D'Isère, Savoy. Red list status: V – decreasing (DE).

Poblia elongata HEDW.

(Mielichhoferiaceae), Verlängertes Pohlmoos, Long-fruited Thread-moss Abundant, 70 squares: 9, 15-17, 19-21, 23-26, 31, 32, 35, 36, 38-40, 42-46, 49, 51, 54,

57, 58, 73, 81, 82, 84, 86, 90, 91, 94, 95, 102, 104, 107, 112, 114-116, 120, 122, 126, 127, 130, 134-136, 138, 141, 149, 150, 152, 154, 155, 157, 159, 162, 171, 173, 178, 185, 188, 189, 196, 198, on ground, on rock and on banks, ca. 700 – 2,610 m a.s.l. (TS/IT) and ca. 1,690 – 2,490 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,530 m a.s.l.**, Marzellspitze, TN/TS with further altitudinal limits of 3,450 m a.s.l., Kreuzspitze, TN [var. *polymorpha* (HOPPE & HORNSCH.) NYH.], and 2,500 m a.s.l., Neualpl at Lienz, TE [var. *acuminata* (HOPPE & HORNSCH.) HUEB.]. IT: up to **3,530 m a.s.l.**, Marzellspitze, and 3,500 m a.s.l., Monte Rosa, Aosta. CH: 200 m a.s.l. to 2,990 m a.s.l.; FR: 2,800 m a.s.l., Termignon, Savoy. Red list status: 2 – severely endangered (DE).

Poblia ludwigii (SPRENG.) BROTH.

(Mielichhoferiaceae), Herablaufendes Pohlmoos, Ludwig's Thread-moss Six times, squares 23 (TS/IT), Klosteralm, ground, ca. 2,240 – 2,550 m a.s.l.; 60 (TS/IT), Tisental, track to Similaun Hütte, wet ground, 2400 m a.s.l.; 70 (TN/AT), above Martin-Busch-Hütte, snow patch, ca. 2,500 – 2,540 m a.s.l.; 71 (TN/AT), above Martin-Busch-Hütte, snow patch, ca. 2,540 – 2,630 m a.s.l.; 72 (TN/AT), above Martin-Busch-Hütte, ground, ca. 2,630 m a.s.l.; 73 (TN/AT), at Martin-Busch-Hütte, ground, ca. 2,320 – 2,490 m a.s.l.

AT: an altitudinal range of ca. 1,400 – **3,000 m a.s.l.**, the uppermost from Zischgeles, Praxmar, TN, with a further elevation limit of 2,800 m a.s.l., Ganimiz and Grädez summits near Kals, TE. IT: 2,600 m a.s.l., Piccolo S. Bernardo,

Aosta, in a range of 1,500 – 2,700 m a.s.l. in Trentino, and 2,700 m a.s.l., Stilfser Joch, TS. CH: 700 – **3,000 m a.s.l.**; FR: 2,500 m a.s.l., Saint-Martin-de-Belleville, Savoy.
Red list status: 2 – severely endangered (DE).

Poblia nutans (HEDW.) LINDB.

(Mielichhoferiaceae), Nickendes Pohlmoos, Nodding Thread-moss

Abundant, 70 squares: 5, 9, 10, 15, 20, 22, 23, 32-34, 41-43, 47, 50, 52-54, 56-58, 63, 66-68, 70, 73, 80-84, 88, 99, 103, 107-110, 112-116, 119-123, 134, 135, 138, 139, 141, 149, 157, 159, 162, 163, 168, 171-174, 176, 183-185, 190, 198, on ground, rock, road banks and occasionally walls. Highest in square 66 (TN/AT, TS/IT), at discovery place, soil/snow patch, ca. 3,200 m a.s.l., lowest measurements ca. 550 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,000 m a.s.l., Lienz, TE, with further altitudinal limits of 2,750 m a.s.l., Rotkogeljoch Hütte, Ötztal, TN, and 2,900 m a.s.l., Glatzberg near Kals, TE. IT: up to **3,550 m a.s.l.**, Cresta dell' Ecco, Aosta, 2,730 m a.s.l., Padon, Val di Fassa, Trentino, and 2,600 – 2,700 m a.s.l., St. Martin in Passeier, TS. CH: 200 m a.s.l. to 3,210 m a.s.l.; FR: 2,250 m a.s.l., Termignon, Savoy.

Poblia proligera (KINDB.) LINDB.

(Mielichhoferiaceae), Brutbildendes Pohlmoos, Pale-fruited Thread-moss

In the TS/IT part only, in nine squares: 25, 26, 32, 52, 115, 114, 133, 134, 171, ground and track banks, ca. 1,333 – 2,153 m a.s.l.

AT: a maximum elevation of 2,550 m a.s.l. with a further limit of 2,300 m a.s.l., Rotmoos, Obergurgl, TN. IT: up to 1,800 – 2,300 m a.s.l., path to Money, Gran Paradiso National Park, in a range of 1,200 – 1,800 m a.s.l., near Rabbi towards Val Cercena, Trentino, and 1,250 m a.s.l., Niederdorf, Pustertal, TS. CH: 280 – **2,900 m a.s.l.**; FR: 2,500 m a.s.l., Valloire, Savoy.

Red list status: NT – potentially endangered (CH), V – decreasing (DE).

Poblia wahlenbergii (WEB. & MOHR)

ANDR. ssp. *glacialis* (BRID.) WARB.

(Mielichhoferiaceae), Weißliches Pohlmoos, Mountain Thread-moss

The observed forms of *Poblia wahlenbergii* belong to ssp. *glacialis*, recorded for ten squares: 29, 50, 54, 71, 73, 83, 84, 133, 172, 185, on ground, rock and river bank, ca. 1,370 – 2,075 m a.s.l. (TS/IT) and ca. 1,895 – 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of ca. 3,000 m a.s.l., Ködnitztal, TE, with further altitudinal limits of 2,700 m a.s.l., St. Anton, TN. IT: 2,900 – 2,930 m a.s.l., Col de l' Arietta, Aosta, and 3,000 m a.s.l., Schöntaufspitze, TS. CH (*P. w.* s. l.): 200 m a.s.l. to **3,266 m a.s.l.** (*P. w.*, no mention ssp.). FR: 2,000 m a.s.l., Termignon, Savoy.

Polytrichastrum alpinum (HEDW.) SM.;

Syn.: *Polytrichum alpinum* HEDW.

(Polytrichaceae), Alpen-Widertonmoos, Alpine Haircap

Very abundant, 124 squares: 6, 16, 17, 20-23, 25-31, 33-39, 42-54, 56-63, 65-67, 70-76,

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78, 79, 81-94, 96-100, 102-104, 107-111, 113-116, 118, 119, 122, 127-137, 139, 140, 142, 143, 149, 150, 152-155, 157, 159, 161, 163, 165-172, 185, 196, 200, on ground and on rock and track banks. Highest records in squares 65 (TN/AT, TS/IT), Niederjochferner near discovery place, soil, ca. 3,200 m a.s.l. and 66 (TN/AT, TS/IT), at discovery place, soil/rock crevice, ca. 3,200 m a.s.l., lowest measurements are ca. 790 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation is 3,460 m a.s.l., north summit of Hochwilde, TN, with further altitudinal limits of 2,808 m a.s.l., Schartlkopf, Nauders, TN, 2,730 m a.s.l., Hohe Tauern, TE. IT: up to **3,500 – 3,700 m a.s.l.**, Grivola, and 3,570 m a.s.l., Monte Rosa, Aosta and 2,900 m a.s.l., Mittereck at Graun/St. Valentin, TS. CH (*P. a. s. l.*): 590 m

a.s.l. to 3,256 m a.s.l.; FR: 3,270 m a.s.l., Sainte-oy-Tarentaise, Savoy.

Red list status: V – decreasing (DE).

Polytrichastrum formosum (HEDW.) SM.;

Syn.: *Polytrichum formosum* HEDW.

(Polytrichaceae), Schönes Widertonmoos, Bank Haircap

Abundant, 48 squares: 1, 6, 7, 13, 14, 22, 24, 33, 35, 40, 47, 54, 84, 86, 90, 91, 94, 99, 101-103, 105, 107, 111, 116, 127, 134-136, 139, 171, 174, 178-180, 183-192, 195, 196, 198, on ground and occasionally on rock, ca. 650 – 2,400 m a.s.l. (TS/IT) and ca. 1,470 – 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,970 m a.s.l.**, Galzig, St. Anton, TN, with a further limit of 2,345 m a.s.l., Grünsee, TE. IT: 1,500 m a.s.l., La Thuile, Aosta, and 2,370 – 2,470 m a.s.l.,

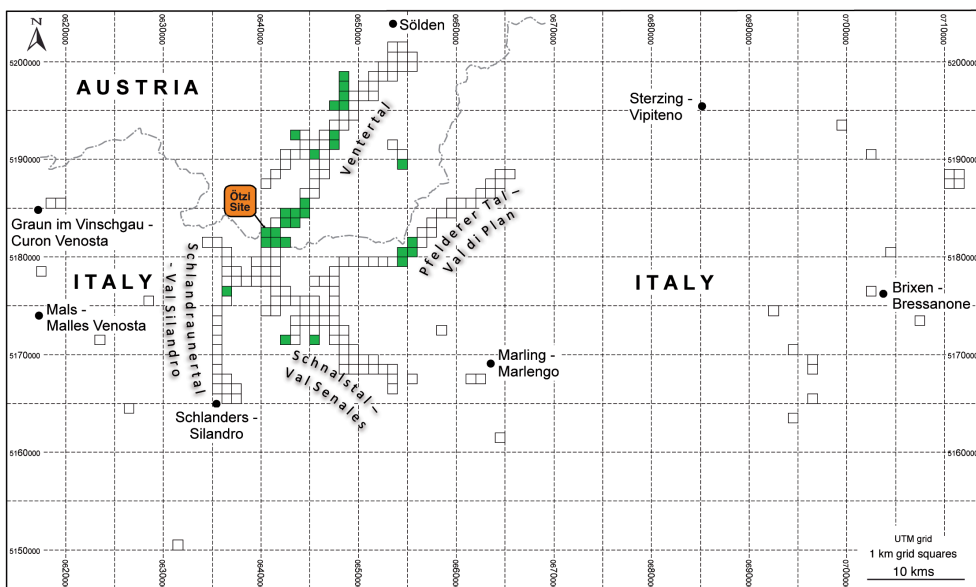


Fig. 5.22: Recorded distribution of *Polytrichastrum sexangulare*

Pordoijoch, Buchenstein, Trentino. CH: 194 – 2,640 m a.s.l.; FR: 1,700 m a.s.l., Bellentre, Savoy. For DE highest altitude 2420 m a.s.l. (Bavaria).

Polytrichastrum sexangulare (BRID.) SM.;

Syn.: *Polytrichum sexangulare* BRID.

(Polytrichaceae), Norwegisches Haarmützenmoos, Northern Haircap (Fig. 5.22)

28 squares: 23, 31, 47, 62-68, 70-73, 82, 83, 86, 123-126, 165-170, 199, typically in snow patches and on rock at high altitude. Highest records in squares 65 (TN/AT, TS/IT), Niederjochferner near discovery place, gravel/rock crevice, ca. 3,200 m a.s.l. and 66 (TN/AT, TS/IT), at discovery place, rock, ca. 3,200 m a.s.l., not below 2,200 m a.s.l. (TS/IT) and 1,870 m a.s.l. (TN/AT).

AT: a maximum elevation up to **3,739 m a.s.l.**, Weißkogel, TN, with further altitudinal limits of 3,460 – 3,472 m, Hinterer Seelenkogel, TN, 3,150 m a.s.l., Mittagskogel, Pitztal, TN, and 3,000 m a.s.l., Schleinitz, TE. IT: up to 3,300 m a.s.l., La Thuile, Aosta, 3,000 m a.s.l., Schöntaufspitze, TS. CH: 1,175 m a.s.l. to 3,212 m a.s.l.; FR: 2,680 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

Polytrichum commune HEDW.

(Polytrichaceae), Gemeines Widertonmoos, Common Haircap

Six times, squares 52 (TS/IT), Kurzras, ground, 2,011 – 2,153 m a.s.l.; 55 (TS/IT), at Raffenerhof, ground, ca. 1,866 – 1,930 m a.s.l.; 107 (TN/AT), at Nachtberg, ground, ca. 1,780 – 1,850 m a.s.l.; 114 (TS/IT), Pfossental, Grafbach, ground, 1,760 – 1,980 m a.s.l.; 135 (TS/

IT), Pfelderertal at Krößbach, ground/woodland, ca. 1,565 m a.s.l.; 197 (TS/IT), Valsertal, degraded peat bog, 1,395 m a.s.l.

AT: a maximum elevation of **2,690 – 2,780 m a.s.l.**, Pinnisjoch, TN, with a further limit of 2,300 m a.s.l., Grünsee, TE. IT: 1,900 m a.s.l., Valsun, Brenner, TS. CH (*P. c. s. l.*): 300 m a.s.l. to 2,640 m a.s.l.; FR: 2,320 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Polytrichum juniperinum HEDW.

(Polytrichaceae), Wacholder Widertonmoos, Juniper Haircap

Abundant, 93 squares: 4, 6, 7, 9, 10, 12, 16, 17, 19-23, 27, 29, 32, 34, 40-42, 49, 51-58, 60, 61, 64, 66, 69-71, 73-76, 79, 88, 89, 90, 94, 96, 99, 101, 102, 104-107, 109, 110, 113, 115, 116, 118-122, 125, 127, 129-132, 134, 135, 141, 143, 144, 147, 150, 151, 153, 158, 159, 161, 162, 164, 165, 170, 180, 183-185, 190, 192, 198, 200, on ground and on rock, once on a stump. Highest record in square 66 (TN/AT, TS/IT), at discovery place, soil/rock crevices, ca. 3,200 m a.s.l., lowest measures are ca. 650 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,650 m a.s.l.** with further altitudinal limits of 3,150 m a.s.l., Mittagskogel, TN, and 2,660 m a.s.l., PeischlachTörl, TE. IT: up to 3,259 m a.s.l., Punta di Leppe, Aosta, and 2,240 – 2400 m a.s.l., Padon, Val di Fassa, Trentino. CH: 195 – **3,650 m a.s.l.**, Combin de Corbassieres. FR: 2,550 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.

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Polytrichum piliferum HEDW.

(Polytrichaceae), Ganzhaar-Widertonmoos, Bristly Haircap (Fig. 5.23)



Fig. 5.23: Bristly Haircap (*Polytrichum piliferum*), very widespread and in diverse habitats, usually on rock

Very abundant, 164 squares: 4, 5, 7, 9-12, 14-18, 20-97, 99-109, 111-136, 138, 140, 142, 143, 146, 148-170, 172, 178, 183, 185, 188, 189, 190, 196, 198, on rock and on ground. Highest record in square 62 (TN/AT, TS/IT), trail to Similaun Spitz, gravel, 3,242 m a.s.l., lowest measures are ca. 550 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,739 m a.s.l.**, Weisskugel, TN, with further altitudinal limits of 3,200 m a.s.l., Ramoljoch, Vent, TN, and 2,730 m a.s.l., Hohe Tauern, TE. IT: up to 3,500 m a.s.l., Monte Rosa, Aosta, 2,700 m a.s.l., Sulden, TS, 2,470 m a.s.l., Padon, Val di Fassa, Trentino. CH: 230 m a.s.l. to ca. 3,400 m a.s.l., Piz Corvatsch. FR: 3,270 m a.s.l., Sainte-Foy-Tarentaise, Savoy.

Polytrichum strictum MENZIES

(Polytrichaceae), Moor-Widertonmoos, Strict Haircap

18 squares: 22, 31, 48, 49, 51-53, 82, 104, 107, 151, 153, 157, 163, 175, 185, 197, 198, usually in bogs, ca. 1,395 – 2,320 m a.s.l. (TS/IT) and ca. 1,780 – 2,560 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,700 m a.s.l.**, Zirmeggenkar near Obergurgl, TN, with further altitudinal limits of 2,500 m a.s.l., Kals, TE, and 1,600 – 2,200 m a.s.l., Steinacherjoch, TN. IT: 1,475 m a.s.l., Reschensee, TS, and ca. 2,150 – 2,270 m a.s.l., Pordoijoch, Buchenstein, Trentino. CH: 300 to 2,376 m a.s.l.; FR: 2,500 m a.s.l., Val-D'Isere, Savoy.

Red list status: r: 3 – locally endangered (AT), NT – potentially endangered (CH), 3 – endangered (DE).

Porella cordaeana (HUEBENER) MOORE

(Porellaceae), Bach-Kahlfruchtmoos, Cliff Scalewort

Eight squares: 10, 15, 17, 24, 106, 109, 149, 172, on rock, ca. 980 – 1,483 m a.s.l. (TS/IT) and ca. 1,450 – 1,650 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. (500) 1,000 – 2,300 m a.s.l. with a further limit of 1,900 m a.s.l. Gurgler Tal near Obergurgl, TN. IT: up to 1,900 m a.s.l., Lillaz, Aosta. CH: 275 m a.s.l. to 2,465 m a.s.l.; FR: 2,500 m a.s.l., Pralognan-la-Vanoise, Savoy. DE: 1,900 m a.s.l. (**2,600 m a.s.l.**), Bavaria.

Red list status: r: 3 – locally endangered (AT), NT – near threatened (IT), EN – endangered (CH), V – decreasing (DE).

Porella platyphylla (L.) PFEIFF.

(Porellaceae), Flachblättriges Kahlfruchtmoos, Wall Scalewort

Abundant, 46 squares: 1, 3-8, 10, 11, 13, 14, 16-19, 24, 32, 33, 40, 64, 89, 94, 95, 101, 105, 108, 109, 111, 112, 136, 138, 140-143, 146, 148, 172, 177-181, 184, 193, 194, on rock and on bark, ca. 525 m a.s.l. to ca. **2,580 m a.s.l.** (TS/IT) and ca. 1,450 – 1,860 m a.s.l. (TN/AT).

AT: a maximum elevation of ca. 2,000 m a.s.l. (Styria) with further altitudinal limits of 1,650 m a.s.l., Tulfes, TN, and 1,400 – 1,800 m a.s.l., Froßnitztal, TE. IT: 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Aosta, 2,000 m a.s.l., Cassetta di Saent, Trentino, and 700 m a.s.l., Martelltal, TS. CH: 195 m a.s.l. to 2,470 m a.s.l.; FR: 1,700 m a.s.l., Termignon, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Preissia quadrata (SCOP) NEES

(Marchantiaceae), Quadratisches Preissmoos, Narrow Mushroom-headed Liverwort

24 squares: 76, 84, 86, 94, 97, 99, 100, 101, 116, 119, 121, 126, 127, 129-132, 134, 135, 138, 141, 162, 173, 181, on rock and on ground, occasionally on walls or stone piles, ca. 660 – 2,571 m a.s.l. (TS/IT) and ca. 1,525 – 2,412 m (TN/AT).

AT: a maximum elevation of **3,080 m a.s.l.**, Rotmoosferner, TN, with further altitudinal limits of 2,800 m a.s.l., Grödez near Kals, TE, and 2,475 m a.s.l., above Kaiserjochhaus, St. Anton, TN. IT: up to 2,650 – 2,700 m a.s.l., Colle del Nivolet, Gran Paradiso National Park, 2,650 m a.s.l., Stilsfer Joch, TS. CH: 290 m a.s.l.

to 2,870 m a.s.l.; FR: 2,900 m a.s.l., Bessans, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Pseudoleskea incurvata (HEDW.) LOESKE;

Syn.: *Lescuraea incurvata* (HEDW.) LAWTON (Leskeaceae), Gekrümmtes Schein-Leskemoos, Brown Mountain Leskea

21 squares: 45, 52, 54, 64, 70, 73, 74, 77, 85, 90, 96, 99, 102, 109, 121, 123, 124, 133, 162, 165, 169, on rock, ca. 1,700 – 2,800 m a.s.l. (TS/IT) and ca. 1,450 – 2,844 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,800 m a.s.l. with further altitudinal limits of 2,700 m a.s.l., Granatenwand, Gaisbergtal, Obergurgl, TN, and 2,650 m a.s.l., at Kals, Matrei and Hinterbichl, TE. IT: up to **3,550 m a.s.l.**, Piedmont Alps, up to 2,300 – 2,670 m a.s.l., Laghi Miserino, both Gran Paradiso National Park, Aosta, 2,400 – 2,540 m a.s.l., Marmolata, Val di Fassa, Trentino, and 2,530 m a.s.l., below Tabarettagletscher, Trafoi, TS. CH: 240 – 2,850 m a.s.l., Piz Arlas. FR: 2,850 m a.s.l., Bessans, Savoy.

Red list status: V – decreasing (DE).

Pseudoleskea patens (LINDB.) KINDB.;

Syn.: *Lescuraea patens* LINDB. (Leskeaceae), Spreizblättriges Scheinleskemoos, Patent Leskea

Seven squares: 23, 58, 60, 80, 122, 128, 163, on rock, in elevation extensions of 1,860 – 2,610 m a.s.l. (TS/IT) and 2,030 – 2,560 m a.s.l. (TN/AT).

AT: an altitudinal range of 1,360 – 2,400 m a.s.l. with a further limit of 1,900 m a.s.l.,

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Steisbachtal, TN. IT: 2,700 m a.s.l., Stilsfer Joch, TS. CH: 536 – **2,900 m a.s.l.**; FR: 2,550 m a.s.l., Pralognan-la-Vanoise, Savoy.
Red list status: 4 – potentially endangered (AT).

Pseudoleskea radicata (MITT.) MACOUN & KINDB.; Syn.: *Lescuraea radicata* (MITT.) MÖNK. (Leskeaceae), Bewurzeltes Scheinleskeemoos, no English name.
Nine squares: 17, 22, 54, 59, 76, 78, 80, 82, 90, on rock, ca. 980 – 2,300 m a.s.l. (IT) and ca. 1,770 – 2,500 m a.s.l. (TN/AT).
AT: an altitudinal range of ca. 1,300 – 2,804 m a.s.l., the latter at Gornitschamp, TE, with further altitudinal limits of 2,200 – 2,700 m a.s.l., Rosenjoch, TN. IT: 2,700 – 2,730 m a.s.l., outflow of Laghetto d’Asta, Valsugana, Trentino, and 2,600 – 2,700 m a.s.l., Langtauferer Ochsenalpe, TS. CH: 200 – **2,820 m a.s.l.**; FR: 2,800 m a.s.l., Termignon, Savoy.
Red list status: R – extremely rare (DE).

Pseudoleskeella nervosa (BRID.) NYHOLM; Syn.: *Leskeella nervosa* (BRID.) LOESKE (Leskeaceae), Baum-Kettenmoos, Nerved Leskea
Abundant, 53 squares: 6, 7, 13-16, 18, 19, 24, 25, 33, 34, 41, 49, 54-56, 86, 89, 94, 95, 105, 107-109, 111-114, 116-118, 125-127, 129-133, 136-138, 146, 147, 171-174, 181, 186, 187, 198, on rock, occasionally on concrete, ca. 660 m a.s.l. to 2,700 – 2,880 m a.s.l. (IT) and ca. 1,450 – 2,100 m a.s.l. (TN/AT).
AT: a maximum elevation of 2,600 m a.s.l., Bretterwandkopf, TE, with a further limit of 2,550 m a.s.l., Hippold, TN. IT: up to **3,940 m a.s.l.**, Grivola, Aosta, and 1,620 m a.s.l.,

Mulatto, Val di Fiemme, Trentino. CH: 200 – 2,650 m a.s.l.; FR: 2,630 m a.s.l., Lanslebourg-Mont-Cenis, Savoy.
Red list status: 3 – endangered (DE).

Pseudoleskeella tectorum (FUNK ex BRID.) KINDB. x BROTH. (Leskeaceae), Dach-Kettenmoos, no English name
Once, square 94 (TN/AT), Ventertal at Heiligkreuz, rock, ca. 1,699 – 1,710 m a.s.l.
AT: a maximum elevation of ca. 2,955 – 2,965 m a.s.l. (Rhätikon, Vorarlberg) with a further limit of ca. 1,200 m a.s.l., Schnanner Alm, St. Anton, TN. IT: 1,500 m a.s.l., at Andraz near Livinalongo, Trentino, ca. 1,200 m a.s.l., Dädar north of Innichen, TS. CH: 390 – 2,577 m a.s.l.; FR: **3150 m a.s.l.**, Savoy, Pralognan-la-Vanoise.
Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH), 3 – endangered (DE).

Pseudoscleropodium purum (HEDW.) M. FLEISCH.; Syn.: *Scleropodium purum* (HEDW.) LIMPR. (Brachytheciaceae), Großes Grünstängelmoos, Neat Feather-moss
Four times, squares 14 (TS/IT), Altratheis, ground, ca. 880 – 900 m a.s.l.; 107 (TN/AT), Nachtberg, ground, ca. 1,780 – 1,850 m a.s.l.; 179 (TS/IT), Marlengerberg at property Kofler, ground/bank, ca. 1,100 m a.s.l.; 195 (TS/IT), ground, 690 – 700 m a.s.l.
AT: a maximum elevation of 2,050 m a.s.l., Patscherkofel, TN, with a further limit of 910 – 975 m a.s.l., Iseltal, between Matrei i.O. and Huben, TE. IT: 1,750 – 1,950 m a.s.l., Col di Lana, Trentino, and 2,200 m a.s.l., between Grödnerjoch and Sellajoch, TS. CH: 200 –

2,307 m a.s.l.; FR: 1,200 m a.s.l., Les Deserts, Savoy.

Pseudotaxiphyllum elegans (BRID.)

IWATS.; Syn.: *Isopterygium elegans* (HOOK.)

LINDB. (Plagiotheciaceae), Zierliches

Gleichflügelmoos, Elegant Silk-moss

Once, in square 24 (TS/IT), at Karthaus vil-
lage, rock, ca. 1,300 m a.s.l.

AT: a maximum elevation of ca. 2,000 m a.s.l.,
Löppenbach waterfall, TE, with a further limit
of 1,500 m a.s.l., Neurur, Pitztal, TN. IT: up to
2,423 – 2,470 m a.s.l., Lago Nero, both Gran
Paradiso National Park, Piedmont. CH: 200 –
2,380 m a.s.l.; FR: **2,500 m a.s.l.**, Pralognan-
la-Vanoise, Savoy.

Pterigynandrum filiforme HEDW.

(Pterigynandraceae), Fädiges Zwirnmoss,

Capillary Wing-moss

Very abundant, 126 squares: 1, 5, 9-21, 23-27,
29, 32-46, 48-52, 54-58, 60, 74, 77, 81-118,
120, 129-139, 147, 149-155, 157-162, 169-
174, 178, 185-187, 190, 192, 196, usually
on rock, occasionally on ground and rotten
wood, ca. 550 – 2,550 m a.s.l. (TS/IT) and
ca. 1,450 – 2,780 m a.s.l. (TN/AT).

AT: a maximum elevation of ca. 2,800 m a.s.l.,
Schartlkopf, Nauders, TN, with a further limit
of 2,730 m a.s.l., Hohe Tauern, TE. IT: up to
3,500 m a.s.l. (should be checked!), Monte
Rosa, Aosta, 2,630 – 2,730 m a.s.l., Padon, Val
di Fassa, Trentino, and 2,870 m a.s.l., Pfaffen-
lücke, Taufers, TS. CH: 200 – 2,990 m a.s.l.;
FR: 1,800 m a.s.l., Bonneval-sur-Arc, Savoy.
Red list status: 3 – endangered (DE).

Pterogonium gracile (HEDW.) SM;

Syn.: *Nogopterium gracile* (HEDW.)

CROSBY & W.R. BUCK (Leucodontaceae),

Zartes Vogelfußmoos, Bird's-food Wing-moss

Three times in TS/IT only, squares 5, at Castle

Juval, rock, 550 m a.s.l.; 6, at Tschars village,

ground, 790 – 933 m a.s.l.; 177, at Castle

Tarantsberg, rock, 555 m a.s.l.

AT: an altitudinal range of 800 – 900 m a.s.l.

with a further limit of 850 m a.s.l. Peischlach,

Hohe Tauern, TE. IT: up to 1,000 m a.s.l.,

Cogne, Aosta, and 975 m a.s.l., Verdins, TS.

CH: 240 – 1,180 m a.s.l.; FR: **1,800 m a.s.l.**,

Tignes, Savoy.

Red list status: 0 – extinct (AT), VU – vulner-
able (CH), 3 – endangered (DE).

Ptilidium ciliare (L.) HAMPE (Ptilidiaceae),

Großes Federchenmoos, Ciliated Fringewort

27 squares: 28, 29, 38, 85, 87, 90-92, 95, 96,

98-105, 107-109, 112, 154, 155, 159, 169,

196, on ground, ca. 1,450 – 2,400 m a.s.l. (TS/
IT) and ca. 1,450 – 2,700 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 400 – 2,800 m

a.s.l., the latter at Schartlkopf, Nauders, TN,

with a further elevation limit of 1,700 m

a.s.l., Zunigalpe, Matrei i.O., TE. IT: 2,580 –

2,680 m a.s.l., Lauson valley, Aosta, and in a

range of 1,000 – **3,000 m a.s.l.** in Trentino.

Recently confirmed for the IT region Friuli-

Venezia Giulia, in an altitudinal range of 950 –

1,600 m a.s.l.; CH: 660 m a.s.l. to 2,820 –

2,850 m a.s.l.; FR: 2,550 m a.s.l., Bonneval-sur-

Arc, Savoy.

Red list status: VU – vulnerable (IT), V – de-

creasing (DE).

5 Results

Ptilidium pulcherrimum (WEB.) VAINIO
(Ptilidiaceae), Schönes Federchenmoos,
Tree Fringewort
22 squares: 10, 12, 29, 33-35, 37-39, 81-83,
91, 96, 101, 107, 109, 136, 137, 185, 191,
196, on bark (of conifers) and rotten wood,
ca. 970 – 2,075 m a.s.l. (TS/IT) and ca. 1,450
– 2,250 m a.s.l. (TN/AT).
AT: an altitudinal range of ca. 300 – 2,350 m
a.s.l., the latter at St. Jakob, TN, with a further
limit of 2,000 m a.s.l., Alfachalpe, TN. IT: up
to 1,795 – 1,850 m a.s.l., Gran Paradiso National
Park, IT. CH: 385 to **2,680 m a.s.l.**;
FR: 2,103 m a.s.l., Granier-sur-Aime, Savoy.
Red list status: VU – vulnerable (IT).

Ptilium crista-castrensis (HEDW.)
DE NOT. (Hypnaceae), Federmoos,
Ostrich-plume Feathermoss
35 squares: 12, 21, 25-27, 29, 31, 33, 35-38,
42, 48, 49, 52, 54, 78, 88, 92, 94-96, 102,
107, 109, 114, 115, 137, 139, 186, 187, 190-
192, on ground, ca. 870 – 2,400 m a.s.l. (TS/
IT) and ca. 1,450 – 2,140 m a.s.l. (TN/AT).
AT: a maximum elevation of **2,450 m a.s.l.**
with further limits of 2,100 m a.s.l., Tulfes,
TN, and 1,200 – 1,500 m a.s.l., Matreier
Tauerntal, TE. IT: 2,100 m a.s.l., Martelltal and
Passeiertal. CH: 260 – 2,445 m a.s.l. (Tessin).
FR: 1,734 m a.s.l., Bourg-Saint-Maurice, Savoy.
Red list status: V – decreasing (DE).

Ptychodium plicatum (WEB. & MOHR)
SCHIMP. (Leskeaceae), Faltblattmoos,
Plaited Leskea
Recorded three times in TS/IT only, squares
37, Mastauntal, ground, ca. 1,790 – 1,900 m

a.s.l.; 127, Pfelderertal below Labkofel near
saddle, ground, 2,080 – 2,400 m a.s.l.; 132,
Pfelderertal at Pfelders village, ground, 1,630
– 1,700 m a.s.l.
AT: an altitudinal range of 750 – 2,890 m
a.s.l., Pirchkogel, Kühtai, TN, with further al-
titudinal limits of 2,800 m a.s.l., Bergertörl
near Kals, TE, and 2,620 m a.s.l., Solstein,
TN. IT: up to **2,960 m a.s.l.**, Piedmont Alps,
2,530 m a.s.l., Tabaretta, TS, 2,370 – 2,470 m
a.s.l., Pordoijoch, Trentino. CH: 440 – 2,857 m
a.s.l.; FR: 2,200 m a.s.l., Bessans, Savoy.
Red list status: V – decreasing (DE).

Ptychomitrium polyphyllum (DICKS.)
BRUCH & SCHIMP. (Ptychomitriaceae),
Vielblättrige Faltenmütze, Greater
Pincushion
Once, square 1 (TS/IT), at Platzerhof, rock,
700 – 1,120 m a.s.l.
Not known for AT so far. IT: 975 m a.s.l., Ma-
sulschlucht at Verdins, TS. CH: 200 m a.s.l.
to **2,100 m a.s.l.**; FR: 420 m a.s.l., Rognaix,
Savoy.
Red list status: VU – vulnerable (CH), 3 – en-
dangered (DE).

Pylaisia polyantha (HEDW.) SCHIMP.
(Hypnaceae), Vielfruchtmoos,
Many-flowered Leskea
Recorded in 17 squares in TS/IT only, squares
9, 13, 14, 20, 143, 144, 146, 147, 171, 172,
176, 186-189, 194, 195, usually on bark of
twigs of living trees, occasionally on rotten
wood, ca. 570 – 1,820 m a.s.l.
AT: a maximum elevation of 1,670 m a.s.l.
with further altitudinal limits of 1,600 m

a.s.l., Plangeroß, Pitztal, TN, and 1,170 m a.s.l., Hohe Tauern, TE. IT: 1,400 – 1,430 m a.s.l., Pieve, Buchenstein, Trentino. CH: 194 – **2,400 m a.s.l.**; FR: 1,096 m a.s.l., Meyrieux-Trouet, Savoy.
Red list status: 3 – endangered (DE).

Racomitrium aciculare (HEDW.) BRID.;

Syn: *Codriophorus acicularis* (HEDW.) P. BEAUV. (Grimmiaceae), Nadelschnäblige Zackenmütze, Yellow Fringemoss

Twice, squares 141 (TS/IT), Pfelderertal at Moos in Passeier, rock, ca. 980 – 1,026 m a.s.l. and 159 (TN/AT), Rofental, wet rock, 2,100 – 2,200 m a.s.l.

AT: a maximum elevation of 2,370 – 2,470 m a.s.l., Habicht, TN, with a further limit of 2,400 m a.s.l., Möserlingwand, TE. IT: up to 1,870 – 1,940 m a.s.l., Piano di Eugio, Gran Paradiso National Park, Piedmont, 1,750 – 1,950 m a.s.l., Col di Lana, Trentino. In CH from 240 – 2,495 m a.s.l.; FR: 2,200 m a.s.l., Termignon, Savoy. For the Alps, without precise location, a highest altitude of **2,890 m a.s.l.** is given.

Red list status: V – decreasing (DE).

Racomitrium affine (WEB. & MOHR)

LINDB.; Syn.: *Bucklandiella affinis* (WEB. & MOHR.) BEDNAREK-OCHYRA & OCHYRA (Grimmiaceae), Verwandte Zackenmütze, Lesser Fringemoss

Abundant, 38 squares: 5, 17, 23, 24, 38, 43, 49, 50, 52, 61, 70, 73, 79-81, 87, 88, 90, 91, 94, 96, 99, 100, 121, 124, 126, 128, 132, 140, 141, 157-160, 167, 168, 178, 198, usually on rock, occasionally on a river bank, ca.

550 – 2,875 m a.s.l. (TS/IT) and ca. 1,525 – 2,670 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,950 m a.s.l.**, Pitztaler Jöchle, TN, is given with a further elevation limit of 2,900 m a.s.l., Schwarzseekogel above Hochsölden, TN. IT: up to 2,423 – 2,670 m a.s.l., Lago Nero, Gran Paradiso National Park, Piedmont, 2,600 m a.s.l., Schneeberg in Passeier, TS. In CH from 390 m a.s.l. to 2,710 m a.s.l.; FR: 1,710 m a.s.l., Les Allues, Savoy.

Red list status: r: 2 – locally severely endangered (AT).

Racomitrium canescens (HEDW.) BRID.

ssp. *canescens*

Only once in square 88 (TN/AT), ca. 1,830 – 1,840 m a.s.l., on silt covered rock in Venter river. It was growing inundated in the river and showed an unusual appearance with very blunt black leaves.

This taxon, formerly called *Racomitrium mollissimum* H. PHILIB. or *Racomitrium canescens* (HEDW.) BRID. ssp. *mollissimum* (H. PHILIB.) J.J. AMANN, later was reduced to synonymy of *Racomitrium canescens* (HEDW.) BRID. ssp. *canescens*. All other collected species of the *R. canescens* complex belong to the following two species.

AT: a maximum elevation of 3,480 m a.s.l., Grossglockner, with further altitudinal limits of 3,460 – 3,472 m, Hinterer Seelenkogel, TN, 3,200 m a.s.l., Mitterkamp, Gurgler Ferner, TN, and 3,000/3,200 m a.s.l., below Umbalkees, TE. IT: up to 3,559 m a.s.l., Monte Aemilius, Aosta, and 3,300 m a.s.l., Schöntaufspitze, TS. In CH from 240 – **3,700 m**

5 Results

a.s.l. (W-Alps), Combin de Corbassieres. FR: 2,900 m a.s.l., Val-D'Isere, Savoy. The typus of the found forma was collected first at an elevation from 1,800 – 2,000 m a.s.l., Val d'Annivers-en-Valais, CH (Philibert 1885).
Red list status: V – decreasing (DE).

Racomitrium elongatum FRIESV.; Syn.:

Niphotrichum elongatum (FRIESV.)

BEDNAREK-OCHYRA & Ochyra

(Grimmiaceae), Verlängerte Zackenmütze,

Long Fringe-moss

Very abundant, 128 squares: 1, 6, 9, 10, 13, 17, 20, 22-24, 26, 27, 29-32, 34, 36-38, 40-42, 45-65, 68-109, 114-123, 126, 128-134, 138, 151-170, 174, 185, 198, on ground, rock, soil, gravel. Highest record in square 62 (TN/AT, TS/IT), trail to Similaun Spitz, gravel, **3,242 m a.s.l.**, lowest measures ca. 700 m a.s.l. (TS/IT) and ca. 1,450 m a.s.l. (TN/AT).

The taxon was recognised only recently to be widespread in the Alps, therefore there is still a lack on altitudinal information.

AT: a maximum elevation of 2,400 m a.s.l. (Vorarlberg), with a further elevation limit of ca. 960 m a.s.l., Stanzach, TN. IT: 2,544 – 2,568 m a.s.l., near Costa della Civetta, Gran Paradiso National Park. In CH from 500 m a.s.l. to 3,000 m a.s.l.; FR: 2,006 m a.s.l., Saint-Sorlin-D'Arves, Savoy.

Red list status: V – decreasing (DE).

Racomitrium ericoides (BRID.) BRID.;

Syn.: *Niphotrichum ericoides* (BRID.)

BEDNAREK-OCHYRA & OCHYRA (Grimmiaceae), Heide-Zackenmütze,

Dense Fringe-moss

16 squares: 10, 37, 58, 64, 67, 81, 90, 105, 122-124, 127, 157, 159, 161, 163, on ground and on rock, ca. 1,400 – 2,875 m a.s.l. (TS/IT) and ca. 1,470 – 2,620 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,400 m a.s.l., Wurmbachtal, TN, with a further limit of 2,000 m a.s.l., Längental, Kühtai, Roßkogel and Alfachalpe, TN. IT: up to **3,400 m a.s.l.**, Pic Garin, Aosta. In CH from 760 m a.s.l. to 3,212 m a.s.l.; FR: 1,734 m a.s.l., Bourg-Saint-Maurice, Savoy.

Red list status: V – decreasing (DE).

Racomitrium fasciculare (HEDW.) BRID.;

Syn.: *Codriophorus fascicularis* (HEDW.)

BEDNAREK-OCHYRA & OCHYRA

(Grimmiaceae), Büschel-Zackenmütze, Green Mountain Fringe-moss

21 squares: 17, 23, 38, 57, 70, 76, 81, 99, 101-103, 105, 107, 114, 126-128, 130, 134, 157, 159, on rock and ground, ca. 980 – 2,571 m a.s.l. (TS/IT) and ca. 1,470 – 2,540 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,500 m a.s.l., with further altitudinal limits of 2,400 m a.s.l., above Schönlisens, Sellrain, TN, 2,200 – 2,370 m a.s.l., Roßkogel, TN, and 2,200 m a.s.l., Hinterbichl, TE. IT: 2,423 – 2,470 m a.s.l., Lago Nero, Gran Paradiso National Park, Piedmont, in a range of 1,000 – 2,000 m a.s.l. in Trentino, and 2,870 m a.s.l., Pfaffenlücke, Taufers, TS. In CH from 620 to **2,698 m a.s.l.**; FR: 2,400 m a.s.l., Cevins, Savoy.

Red list status: VU – vulnerable (CH), V – decreasing (DE).

Racomitrium heterostichum (HEDW.)

BRID.; Syn: *Bucklandiella heterosticha* (HEDW.) BEDNAREK-OCHYRA & OCHYRA (Grimmiaceae), Ungleichhästige Zackenmütze, Bristly Fringe-moss

Abundant, 40 squares: 23, 24, 26, 37, 39, 43, 46, 47, 70, 72, 74, 76, 78, 82, 84, 86, 87, 89, 90-92, 94, 95, 97, 99-105, 107, 116, 127, 136, 137, 163, 166, 167, 169, on rock and on ground, ca. 1,160 – 2,700 m a.s.l. (TS/IT) and ca. 1,470 – 2,700 m a.s.l. (TN/AT).

AT: an altitudinal range of 280 m a.s.l. to 2,600 – 2,814 m a.s.l., Horntalerjoch, TN, with further altitudinal limits of 2,375 m a.s.l., Darmstädter Hütte, St. Anton, TN, 1,100 – 1,600 m a.s.l., Matreier Tauern, TE. IT: 850 m a.s.l., Verdins, TS. In CH from 400 m a.s.l. to **2,800 – 2,850 m a.s.l.**; FR: 1,590 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: V – decreasing (DE).

Racomitrium lanuginosum (HEDW.) BRID.

(Grimmiaceae), Zottige Zackenmütze, Woolly Fringe-moss

25 squares: 22, 23, 27, 36-38, 47, 51, 59, 60, 62-66, 70, 71, 104, 114, 127, 132, 155, 157, 160, 166, on rock and soil/ground. Highest records in squares 65 (TN/AT, TS/IT), Niederjochferner near discovery place, soil/snow patch, ca. 3,200 m a.s.l. and 66, at discovery place, ground, ca. 3,200 m a.s.l., not below 1,630 m a.s.l. (TS/IT) and 1,760 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,739 m a.s.l., Weisskugel, with further altitudinal limits of 3,450 m a.s.l., Schrankogel, TN, and 3,480 m a.s.l., Großglockner, TE. IT: up to 3,570 m

a.s.l., Monte Rosa, Aosta, 3,010 m a.s.l., Nockspitze, Langtaufers, TS, 1,950 m a.s.l., Mulatto, Predazzo, Trentino. In CH from 370 m a.s.l. to **3,980 m a.s.l.**, Gletscherhorn. FR: 1,750 m a.s.l., Saint-Colombain-des-Villards, Savoy. Red list status: r: 3 – locally endangered (AT), NT – potentially endangered (CH), V – decreasing (DE).

Racomitrium macounii KINDB.; Syn.:

Bucklandiella macounii (KINDB.) BEDNAREK-OCHYRA & OCHYRA (Grimmiaceae), Macoun-Zackenmützenmoos, Macoun's Fringe-moss

Recorded in four squares in TS/IT only, squares 22, Klosteralm, rock, ca. 1,980 – 2,300 m a.s.l.; 58, Tisental, rock, 2,400 m a.s.l.; 122, Pfossental above Eishof, wet rock, 2,350 – 2,610 m a.s.l.; 132, Pfeldlerertal at Pfelders village, rock, 1,630 – 1,700 m.

AT: an altitudinal range of ca. 1,900 – 2,700 m a.s.l. (ssp. *macounii*) and a maximum elevation of 2,550 m a.s.l. at Hohe Mut [ssp. *alpinum* (Lawt.) Frisvoll]; with further altitudinal limits: ssp. *macounii* up to 2,700 m a.s.l., Hochsölden, TN, ca. 2,100 m a.s.l., near Johannishütte at Großvenediger, TE, and ssp. *alpinum* up to 2,200 m a.s.l., below St. Pölter Hütte, TE. IT: 2,580 – 2,680 m a.s.l., Lauson valley, Gran Paradiso National Park, Aosta; ssp. *macounii*: 2,500 – 2,600 m a.s.l., St. Martin, TS. In CH (*R. m. s. l.*) from 460 to **2,790 m a.s.l.**; FR: ssp. *alpinum*: 2,000 m a.s.l., Saint-Colombain-des-Villards; ssp. *macounii*: 2,378 m a.s.l., Notre-Dame-de-Briançon, Savoy. Red list status: 0 (ssp. *alpinum*) – extinct or missing (DE).

5 Results

Racomitrium microcarpon (HEDW.)

BRID.; Syn.: *Bucklandiella microcarpa* (HEDW.) BEDNAREK-OCHYRA & OCHYRA (Grimmiaceae), Kleinfrüchtige Zackenmütze, no English name

Once in square 128 (TS/IT), Pfelderertal at Lazins Alm, rock, 1,860 – 2,080 m a.s.l.

AT: a maximum elevation of 2,600 m a.s.l. with further altitudinal limits of 2,500 m a.s.l., Stubaier Alps, TN, and 2,300 m a.s.l., Hinterbichl, TE. IT: in a range of 1,000 – 2,500 m a.s.l. in Trentino, and 2,510 m a.s.l., Speikboden, TS. In CH from 800 m a.s.l. to **2,830 m a.s.l.**; FR: 2,350 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: VU – vulnerable (CH), 3 – endangered (DE), AR – at risk (FR).

Racomitrium sudeticum (FUNCK)

BRUCH & SCHIMP.; Syn.: *Bucklandiella sudetica* (FUNCK) BEDNAREK-OCHYRA & OCHYRA (Grimmiaceae), Sudeten-Zackenmütze, Slender Fringemoss

Six times, squares 7 (TS/IT), at Castle Juval, rock, 980 – 1,300 m a.s.l.; 22 (TS/IT), Klosteralm, rock, ca. 1,980 – 2,300 m a.s.l.; 64 (TS/IT), Tisental, rock, 2,580 m a.s.l.; 71 (TN/AT), above Martin-Busch-Hütte, rock, ca. 2,540 – 2,630 m a.s.l.; 84 (TN/AT), at Vent village, rock, 1,895 – 1,900 m a.s.l.; 160 (TN/AT), Rofental, rock, 2,130 – 2,160 m a.s.l.

AT: maximum elevation at 3,000 m a.s.l., with further altitudinal limits of 2,900 m a.s.l., Schwarzseekogel, TN, 2,893 m a.s.l., Pirchkogel, TN, and 2,400 m a.s.l., Zunig, TE. IT: up to 3,450 – 3,480 m a.s.l., La Thuile, Aosta, 2,870 m a.s.l., Pfaffenlücke, Taufers, TS,

2,500 m a.s.l., Monte Cavallazzo, Trentino. In CH from 480 m a.s.l. to **3,630 m a.s.l.**; FR: 2,500 m a.s.l., Bramans, Savoy.

Red list status: 3 – endangered (DE).

Radula complanata (L.) DUMORT.

(Radulaceae), Gewöhnliches Kratzmoos, Even Scalewort

Abundant, 62 squares: 1, 6, 7, 12-15, 17-19, 24, 25, 33, 34, 36, 39, 40, 42, 49, 54-56, 78, 82, 83, 86, 88-91, 94, 95, 101-105, 108, 109-112, 114, 121, 127, 132, 134-136, 138, 140, 141, 146, 150, 172-174, 176, 186-189, on rock and on bark, ca. 700 – 2,400 m a.s.l. (TS/IT) and ca. 1,450 – 2,250 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,530 m a.s.l., Tarntaler Köpfe, TN, with further limit of ca. 2,400 m a.s.l., Neunerkogel in Kraspestal TN, and 1,700 m a.s.l., Tauernhaus, Matrei i.O., TE. IT: up to 2,000 – 2,300 m a.s.l., Rio del Carro, Gran Paradiso National Park, Piedmont, 1,500 m a.s.l., Martelltal, TS. CH: 265 m a.s.l. to **3,700 m a.s.l.** (should be checked!), Bernina. FR: 1,700 m a.s.l., Termignon, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Radula lindenbergiana GOTTSCHKE

ex C. HARTM.; Syn.: *Radula complanata* ssp. *lindenbergiana* (C. HARTM.) R.M.

SCHUST. (Radulaceae), Lindenbergs Kratzmoos, Lindenbergs Scalewort

Recorded only once, square 134 (TS/IT), Pfelderertal at Pfelders village, on rock and on bark, 1,570 – 1,610 m a.s.l.

AT: an altitudinal range of ca. 300 – 2,600 m a.s.l. (TN without precise location) with a

further limit of 1,900 m a.s.l., Grabenkar, Oberiß, Stubai, TN. IT: in a range of 1,000 – 2,500 m a.s.l. in Trentino. CH: 196 m a.s.l. to **2,700 – 2,850 m a.s.l.**; FR: 2,600 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: NT – near threatened (IT), G – risk assumed (DE), AR – at risk (FR).

Rhabdoweisia fugax (HEDW.) BRUCH & SCHIMP. (Rhabdoweisiaceae), Schmalblättriges Streifenperlmoos, Dwarf Streak-moss
21 squares: 17, 21, 23, 37, 50, 52, 54, 58, 60, 63, 83, 89, 91, 103, 107, 136, 138, 140, 160, 170, 185, rock, ground and banks, ca. 980 – 2,550 m a.s.l. (TS/IT) and ca. 1,780 – 2,804 m a.s.l. (TN/AT), and in square 63 (TS/IT + TN/AT) up to 2,700 m a.s.l.

AT: a maximum elevation of 2,900 m a.s.l., Hinterbichl, TE, with additional altitudinal limits of 2,650 m a.s.l., Fotschertal between glacier and Hochgrafjoch, TN, 2,643 m a.s.l., below Roßkogel summit, TN, and 2,500 m a.s.l., Neualpl, TE. IT: up to 2,710 m a.s.l., Monte Crabun, Aosta, in a range of 300 – 2,500 m a.s.l. in Trentino, and 2,500 m a.s.l., St. Wolfgang im Reintal, TS. CH: 200 to **3,000 m a.s.l.**; FR: 2,500 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: V – decreasing (DE).

Rhizomnium magnifolium (HORIK.) T. KOP. (Cinclidiaceae), Großblättriges Wurzelsternmoos, Large-leaf Thyme-moss
Five times, squares 26 (TS/IT), Penaudtal, wet ground, 1,681 m a.s.l.; 29 (IT), Penaudtal, flush, 1,860 – 2,075 m a.s.l.; 86 (TN/AT), north of Vent village, river bank, ca. 1,870 –

1,880 m a.s.l.; 89 (TN/AT), Ventertal at Koner Rinne, river, ca. 1,840 – 1,860 m a.s.l.; 134 (TS/IT), Pfelderertal at Pfelders village, river bank, 1,570 – 1,610 m a.s.l.

AT: a maximum elevation of 2,465 m a.s.l., Mörderkogel, TN, with further altitudinal limits of 2,200 m a.s.l., Stubai, TN, 1,600 – 1,900 m a.s.l., Innervillgraten, TE. IT: up to 2,400 – 2,700 m a.s.l., Piedmont, in a range of 1,500 – **3,300 m a.s.l.** in Trentino. CH: 193 – 2,600 m a.s.l.; FR: 2,500 m a.s.l., Bramans, Savoy.

Red list status: r 3 – locally endangered (AT), 3 – endangered (CH), V – decreasing (DE).

Rhizomnium pseudopunctatum (BRUCH & SCHIMP.) T. KOP. (Cinclidiaceae), Falsches punktiertes Wurzelsternmoos, Felted Thyme-moss

Four times, squares 79 (TN/AT), Niedertal, flush, ca. 2,050 – 2,110 m a.s.l.; 82 (TN/AT), above Vent village, wet ground, ca. 1,940 – 2,100 m a.s.l.; 157 (TN/AT), Rofental, flush, 1,970 – 2,030 m a.s.l.; 182 (TS/IT), Martelltal, bog, 1,880 m a.s.l.

AT: an altitudinal range of ca. 1,300 – 2,600 m a.s.l., with further altitudinal limits of ca. 2,560 m a.s.l., Ködnitztal, TE, and 2,450 m a.s.l., Großer Sulzkopf, St. Anton, TN. IT: up to 2,470 m a.s.l., Gran S. Bernardo, Aosta, documented from an altitudinal range of 2,400 – **2,700 m a.s.l.** in Piedmont. CH: 300 – 2,480 m a.s.l.; FR: 2,300 m a.s.l., e.g. Pralognan-la-Vanoise, Savoy.

Red list status: 3 – endangered (AT, DE).

5 Results

Rhizomnium punctatum (HEDW.) KOP.

(Cinclidiaceae), Punktiertes Wurzelsternmoos, Dotted Thyme-moss
Abundant, 44 squares: 6-8, 14, 16, 17, 19, 20, 25, 26, 34, 49, 52, 53, 56, 73, 74, 84, 85, 89, 90, 101, 104, 107-109, 114, 127, 128, 132, 135, 136, 139, 145, 179-181, 186-190, 195, 196, (wet) ground, spring, river bank, boggy place, bog, occasionally on wet rotten wood, ca. 650 – 2,400 m a.s.l. (TS/IT) and ca. 1,450 – 2,490 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,200 – 2,300 m a.s.l., Rotmoostal, Obergurgl, TN, with a further limit of 1,700 m a.s.l., Matrei i.O., TE. IT: up to 2,423 – 2,470 m a.s.l., Lago Nero, Gran Paradiso National Park, Piedmont, and 2,100 m a.s.l., Col di Lana, Buchenstein, Trentino. CH: 200 to **2,540 – 2,850 m a.s.l.**; FR: 1,650 m a.s.l., Tignes, Savoy.

Rhodobryum roseum (HEDW.) LIMPR.

(Bryaceae), Rosettiges Rosenmoos, Rose-moss
12 squares: 33-35, 84, 89, 91, 94, 97, 102, 109, 194, 195, ground, ca. 570 – 1,617 m a.s.l. (TS/IT) and ca. 1,450 – 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,150 m a.s.l., Nicklalpe, TE, with further limits of 1,900 m a.s.l., meadow near Gurgler Ache, TN, and 1,600 m a.s.l., Griesberg, TN. IT: 1,870 – 1,940 m a.s.l., Piano di Eugio, Gran Paradiso National Park, Piedmont, and 1,360 m a.s.l., Brenner, TS. CH: 200 – **2,390 m a.s.l.**; FR: 2,150 m a.s.l., Sollières-Sardières, Savoy.

Red list status: V – decreasing (DE).

Rhynchostegium murale (HEDW.)

SCHIMP. (Brachytheciaceae), Mauer-Schnabeldeckelmoos, Wall Feather-moss
Recorded twice in TS/IT only, squares 5, at Castle Juval, ground/rock, 550 – 790 m a.s.l. and 149, lower Schlandrauntal, rock, 1,353 – 1,483 m a.s.l.

AT: a maximum elevation of **2,400 m a.s.l.** (Vorarlberg), with further altitudinal limits of 2,180 m a.s.l., Kals, TE, 1,880 m a.s.l., Ködnitz, TE, and 1,550 m a.s.l., Köfels, TN. IT: 1,400 – 1,800 m a.s.l., Epinel, Gran Paradiso National Park, Aosta, and 1,640 m a.s.l., Cristallotal, Trentino. CH: 200 – 2,392 m a.s.l.; FR: 2,200 m a.s.l., Bessans, Savoy.

Rhytidiadelphus squarrosus (HEDW.)

WARNST. (Hylocomiaceae),
Sparriges Kranzmoos, Springy Turf-moss
23 squares 25, 33, 55, 90, 99, 106, 107, 116, 134-137, 139-141, 171, 172, 179, 184, 186-189, ground, ca. 780 – 1,970 m a.s.l. (TS/IT) and ca. 1,470 – 1,850 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,450 m a.s.l.**, Großer Sulzkopf, St. Anton, TN (but record doubted), with further altitudinal limits of 2,200 m a.s.l., Rauheck, TN, 1,563 m a.s.l., Kleiner Pölven, TN, and 1,500 m a.s.l., Kals, TE. IT: up to 1,400 – 1,800 m a.s.l., Epinel, Gran Paradiso National Park, Aosta, and 1,820 – 1,880 m a.s.l. Torre d'Avèrran, Ampezzo, Trentino. CH: 265 – 2,040 m a.s.l.; FR: 1,705 m a.s.l., Beaufort-sur-Doron, Savoy.

Rhytidiadelphus subpinnatus (LINDB.)

T. KOP. (Hylocomiaceae),

Gefiedertes Kranzmoos, Scarce Turf-moss

Six times, squares 33 (TS/IT), Gurschlhof, ground, 1,300 – 1,310 m a.s.l.; 36 (TS/IT), Mastauntal, ground, ca. 1,640 – 1,790 m a.s.l.; 86 (TN/AT), north of Vent village, ground, ca. 1,870 – 1,880 m a.s.l.; 94 (TN/AT), Venteral at Heiligkreuz, ground, ca. 1,699 – 1,710 m a.s.l.; 137 (TS/IT), Pfelderertal at Außerhütt, ground in woodland, ca. 1460 – 1500 m a.s.l.; 139 (TS/IT), Pfelderertal below Farmazon, ground, ca. 1,310 – 1,350 m a.s.l.

AT: a maximum elevation of **2,260 m a.s.l.** (Tyrol, without precise location), with further altitudinal limits of 1,900 m a.s.l., Kellerjoch, TN, 1,440 m a.s.l., Innervillgraten, TE. IT: up to 1,950 m a.s.l., Lago di Teleccio, Gran Paradiso National Park. CH: 360 – 1,970 m a.s.l.; FR: 1,770 m a.s.l., Peisey-Nancroix, Savoy. Red list status: G – risk assumed (DE).

Rhytidiadelphus triquetrus (HEDW.)

WARNST. (Hylocomiaceae),

Großes Kranzmoos, Big Shaggy-moss

Very abundant, 108 squares: 1, 6, 7, 12-22, 24-26, 29, 30, 33-36, 38, 40, 42-45, 48, 49, 51, 52, 54, 55, 81-84, 86, 87, 89-97, 99-103, 105-112, 114-117, 129, 131, 132, 134-137, 139, 141, 143, 145, 148, 150, 151, 154, 157, 158, 171-174, 177-181, 183-196, 198, on ground, ca. 525 – 2,300 m a.s.l. (TS/IT) and ca. 1,450 – 2,250 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,500 m a.s.l. with further altitudinal limits of 2,300 m a.s.l., Schindlerspitze towards Arlensattel, St. Anton, TN, and 2,050 – 2,200 m a.s.l., Sonn-

wendjoch, TN. IT: up to **2,936 m a.s.l.**, Piccolo S. Bernardino, Aosta, and 1,950 m a.s.l., Ornella valley, Buchenstein, Trentino. CH: 200 – 2,640 m a.s.l.; FR: 2,200 m a.s.l., Peisey-Nancroix, Savoy. Red list status: V – decreasing (DE).

Rhytidium rugosum (HEDW.) KINDB.

(Rhytidiaceae), Runzelmoos,

Wrinkle-leaved Feather-moss (Fig. 5.24)



Fig. 5.24: Wrinkle-leaved Feather-moss (*Rhytidium rugosum*), typically in dry habitats

Very abundant, 123 squares: 1, 4-6, 9-20, 23-26, 28, 29, 32-44, 47, 48, 50-52, 54-61, 64, 70, 71, 73, 80-85, 87-90, 92-95, 101-106, 108-117, 129, 130, 134-136, 138, 140, 142-155, 158-161, 166-170, 172, 178, 181, 183, 184, 188, 189, 192-194, 196, on ground and on rock, ca. 525 – 2,700 m a.s.l. (TS/IT) and ca. 1,450 – 2,804 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,000 – 3,200 m a.s.l.**, above Defreggerhaus in Hinterbichl, TE, with further altitudinal limits of 2,800 m a.s.l., Schartlkopf at Nauders, TN, and 910 –

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2,800 m a.s.l., Hohe Tauern, TE. IT: up to 1,700–2,300 m a.s.l., between Lillaz and Lago di Loie, Gran Paradiso National Park, Aosta, 2,370–2,530 m a.s.l., Pordoi, Val di Fassa, Trentino, and 2,530 m a.s.l., Gidergitz, Valsun, TS. CH: 200–2,980 m a.s.l.; FR: 2,100 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: 3 – endangered (DE).

Riccardia palmata (HEDW.) CARRUTH.

(Aneuraceae), Handförmiges Riccardimoos, Palmate Germanderwort

Three times, in TN/AT only, squares 93, Ventertal, ground, ca. 1,590–1,700 m a.s.l.; 107, at Nachtberg, rotten wood, ca. 1,780–1,850 m a.s.l.; 163, towards Breslauer Hütte, rotten wood, **2,030–2,560 m a.s.l.**

AT: a maximum elevation of 1,900 m a.s.l. with a further limit of 1,400 m a.s.l., Ötztal, TN. IT: in a range up to 1,800 m a.s.l. in Cavellonte, Trentino. CH: 390 m a.s.l.–1,870 m a.s.l.; FR: 1,550 m a.s.l., Termignon, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Riccia ciliifera LINK ex LINDENB.

(Ricciaceae), Haartragendes Sternlebermoos, no English name

In six squares in TS/IT only, squares 4, Unterstell, steppe heath, 750–990 m a.s.l.; 5, at Castle Juval, steppe heath, 550–790 m a.s.l.; 9, at Lint, ground, 1,464 m a.s.l.; 10, Innerunterstell, steppe heath, 1,439 m a.s.l.; 11, at Ladurner, dry ground, 770–780 m a.s.l.; 15, Unterperfl, dry ground, 1,392 m.

AT: only an altitudinal range for Leithagebirge, Burgenland, of 150–180 m a.s.l.; IT: up to

2,580 m a.s.l., above Meye-d'en Haut, Gran Paradiso National Park, Aosta. CH: 480 m a.s.l.–2,568 m a.s.l.; FR: 2,350 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: 2 – severely endangered (AT), NT – near threatened (IT), VU – vulnerable (CH), V – decreasing (DE).

Saelania glaucescens (HEDW.) BROTH.

(Ditrichaceae), Blaumoos, Blue Dew-moss

Nine squares: 7, 24, 40, 44, 76, 134, 141, 145, 177, an ground an on rock, ca. 555–1,900 m a.s.l. (TS/IT) and 2,130–2,220 m a.s.l. (TN/AT).

AT: limits of 2,470 m a.s.l., Ganimiz, TE, 2,350 m a.s.l., Geißstein, TN, and 2,300 m a.s.l., Martatal, TN. IT: 2,000–2,245 m a.s.l., Seyvaz valley, Gran Paradiso National Park, Aosta, 1,570 m a.s.l., Pemmern, Ritten, TS, 2,200–2,340 m a.s.l., Sasso di Formin, Ampezzo, Trentino. CH: 200 m a.s.l. to **2,750 m a.s.l.**, rather scattered. FR: 2,700 m a.s.l., Val-D'Isere, Savoy.

Red list status: EN – endangered (CH), G – risk assumed (DE).

Sanionia uncinata (HEDW.) LOESKE

(Amblystegiaceae), Hakenmoos,

Sickle-leaved Hook-moss

Very abundant, 143 squares: 7, 12, 13, 15, 17, 20, 22-29, 31-61, 64, 67, 68, 70-109, 114-116, 118-123, 126-129, 131, 132, 134-137, 139, 143, 145, 147, 149-152, 154, 156-163, 165-174, 184-187, 190, 191, 196, 198, 200, on ground and on rock, occasionally on wall, ca. 700–2,844 m a.s.l. (TS/IT) and ca. 1,450–2,880 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,200 m a.s.l., Mitterkamp, Gurgler Ferner, TN, with a further limit of 2,000 – 2,700 m a.s.l., Zunig, Matrei i.O., TE. IT: up to **3,320 m a.s.l.**, Corneo Bianco, Aosta, 3,010 m a.s.l., Nockspitze, Langtaufers, TS. CH: 100 – 3,260 m a.s.l., Piz Languard. FR: 2,200 m a.s.l., Modane, Savoy. Red list status: V – decreasing (DE).

Scapania calcicola (ARNELL & J. PERSS.) INGHAM (Scapaniaceae), Kalk-Spatenmoos, Calcicolous Earwort

Only once, square 26 (TS/IT), Penaudtal, ground, 1,600 – 1,720 m a.s.l.

AT: an altitudinal range of ca. 300 – 2,300 m a.s.l. with a further limit of 1,800 m a.s.l., Roßkopf, TN. IT: a highest altitude of 1,480 m a.s.l., Rhemes-Saint-Georges, Aosta. CH: 1,050 – 2,270 m a.s.l.; FR: **2,680 m a.s.l.**, Lanslebourg-Mont-Cenis, Savoy.

Red list status: 4 – potentially endangered (AT), NT – near threatened (IT), VU – vulnerable (CH), G – risk assumed (DE).

Scapania curta (Scapaniaceae),

Spatenmoos, Least Earwort

19 squares: 15, 22, 25, 26, 35, 45, 54, 73, 81, 99, 101, 105, 114, 118, 121, 126, 127, 130, 133, on (wet) ground and road banks, ca. 1,360 – 2,571 m (TS/IT) and ca. 1,470 – 2,490 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,404 m a.s.l., Nockspitze, Stubai, TN, with a further limit of 1,830 m a.s.l., Pitztal, TN. IT: up to 2,370 – 2,440 m a.s.l., Alpe Briolet, Gran Paradiso National Park, Aosta, and in a range of 200 – 1,000 m a.s.l. in Trentino. CH: 500 m a.s.l. to

2,660 m a.s.l.

Red list status: NT – near threatened (IT), EN – endangered (CH).

Scapania irrigua (NEES) NEES (Scapaniaceae), Gelbgrünes Spatenmoos,

Thick-set Earwort

Three times, squares 64 (TS/IT), Tisental, ground, 2,535 m a.s.l.; 90 (TN/AT), Ventertal at Winterstall, ground, ca. 1,770 – 1,840 m a.s.l.; 132 (TS/IT), Pfelderertal at Pfelders village, ground, 1,630 – 1,700 m a.s.l.

AT: a maximum elevation of 2,400 m a.s.l., Großeck in Styria and in Tyrol, with further altitudinal limits of >2,350 m a.s.l., between Hochjochospiz and Hintereisferner, Ötztal, TN, 2,200 m a.s.l., Valmerizjoch, TN, and 2,000 m a.s.l., Zettersfeld, Lienz, TE. IT: up to **3,100 m a.s.l.**, Monte Rosa, Aosta, and in a range of 1,000 – 2,000 m a.s.l. in Trentino. CH: 1,349 m a.s.l. to 2,450 – 2,850 m a.s.l.; FR: 2,755 m a.s.l., Termignon, Savoy.

Red list status: r: 3 – locally endangered (AT), NT – near threatened (IT), V – decreasing (DE).

Scapania mucronata H. BUCH

(Scapaniaceae), Stachelspitziges Spatenmoos, no English name

Recorded in three squares in TS/IT only, squares 25, at Karthaus village, ground, 1,485 m a.s.l.; 58, Tisental, ground, 2,357 m a.s.l.; 64, Tisental, ground, 2,535 m a.s.l.

AT: For an altitudinal range of ca. 800 – **2,950 m a.s.l.** with further altitudinal limits of 1,500 m a.s.l., Großer Friedhof, Kaisergebirge, TN, and 1,150 m a.s.l., Proseggklamm,

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TE. IT: up to 2,601 – 2,645 m a.s.l., Laghi Ponton, Gran Paradiso National Park, Aosta. CH: 450 – 2,200 m a.s.l.

Red list status: 4 – potentially endangered (AT), NT – near threatened (IT, CH), V – decreasing (DE).

Scapania nemorea (L.) GROLLE

(Scapaniaceae), Hain-Spatenmoos,

Grove Earwort Seven times, squares 16 (TS/IT), Neuratheis, wet ground, ca. 960 – 980 m a.s.l.; 38 (TS/IT), Mastauntal, flush, ca. 1,900 – 1,950 m a.s.l.; 88 (TN/AT), Ventertal near Gampe, river bank, ca. 1,830 – 1,840 m a.s.l.; 157 (TN/AT), Rofental, flush, 1,970 – 2,030 m a.s.l.; 139 (TS/IT), Pfelderertal at Farmazon and Platt, rock, ca. 1310 – 1350 m a.s.l.; 141 (TS/IT), Pfelderertal at Moos im Passeier, rock, ca. 980 – 1026 m a.s.l.; 179 (TS/IT), Marlingerberg at property Kofler, ground, ca. 1,100 m a.s.l.

AT: a maximum elevation of 1,710 m a.s.l., Taschachschlucht, Pitztal, TN, with further altitudinal limits of 1,260 m a.s.l., Heiligwasser, TN, and 1,400 m a.s.l., Landecksäge, Matreier Tauerntal, TE. IT: up to 1,870 – 1,940 m a.s.l., Piano di Eugio, Gran Paradiso National Park, Aosta. CH: 200 – **2,160 m a.s.l.**; FR: 1,400 m a.s.l., Aillon-le-Jeune, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Scapania paludicola LOESKE & K. MÜLL.

(Scapaniaceae), Moor-Spatenmoos,

Bog Earwort

Recorded in three squares in TN/AT only, squares 81, Niedertal, flush, ca. 1,900 –

2,050 m a.s.l.; 89, Ventertal at Koner Rinne, river, ca. 1,840 – 1,860 m a.s.l.; 104, Gaislachalm, ground, ca. 1,900 – 1,980 m a.s.l.

AT: an altitudinal range of ca. 500 – 2,000 m a.s.l., with a further limit of 2,450 m a.s.l., großer Sulzkopf, St. Anton, TN. IT: up to 1,700 – 2,300 m a.s.l., Aosta, between Lillaz and Lago di Loie, IT. CH: 848 – **2,530 m a.s.l.**; FR: 1,900 m a.s.l., Sainte-Foy-Tarentaise, Savoy.

Red list status: 3 – endangered (AT, DE), NT – near threatened (IT), AR – at risk (FR).

Scapania paludosa (K. MÜLL.) K. MÜLL.

(Scapaniaceae), Herzlappiges Spatenmoos,

Floppy Earwort

Once, square 79 (TN/AT), Niedertal, flush, ca. 2,050 – 2,110 m a.s.l.

AT: a maximum elevation of 2,280 m a.s.l., in Obergurgl and below Timmelsjoch, TN. IT: in a range of 1,000 – **2,500 m a.s.l.** in Trentino. CH: 897 – 2,435 m a.s.l.; FR: **2,500 m a.s.l.**, Bramans, Savoy.

Red list status: 4 – potentially endangered (AT), NT – near threatened (IT), 3 – endangered (DE), AR – at risk (FR).

Scapania subalpina (NEES ex LINDENB.)

DUMORT. (Scapaniaceae), Großlappiges

Quell-Spatenmoos, Northern Earwort

12 squares: 23, 68, 70, 72, 82, 88, 90, 93, 94, 122, 127, 166, (wet) ground, bog, river/river bank, spring, ca. 2,240 – 2,610 m a.s.l. (TS/IT) and ca. 1,590 m a.s.l. to **2,620 – 2,880 m a.s.l.** (TN/AT).

AT: an altitudinal range of ca. 1,000 – 2,600 m a.s.l., with further altitudinal limits of 2,000 m

a.s.l., Stalleralpe, Antholz, TE, and 2,000 m a.s.l., trail to Ramolhaus, Obergurgl, TN. IT: up to 2,412 – 2,470 m a.s.l., Lago Nero, Gran Paradiso National Park, Piedmont, and in a range of 1,000 – 2,000 m a.s.l. in Trentino. CH: 800 – 2,800 m a.s.l.; FR: 2,690 m a.s.l., Termignon, Savoy.

Red list status: NT – near threatened (IT), 3 – endangered (DE).

Scapania uliginosa (SW. ex LINDENB.) DUMORT. (Scapaniaceae), Nierenlappiges Spatenmoos, Marsh Earwort

20 squares: 22, 23, 26, 38, 46, 51-53, 64, 70, 71, 82, 89, 94, 128, 159, 161-163, 198, wet ground, flush, bog, spring, river and river bank, wet rock, ca. 1,692 m to 2,585 – 2,590 m a.s.l. (TS/IT) and ca. 1,699 m a.s.l. to 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,700 m a.s.l.**, ascend to Ramolhaus with further altitudinal limits of 2,600 m a.s.l., Rendel, St. Anton, TN and Möserlingwand, TE, and 2,370 – 2,530 m a.s.l., Habicht, TN. IT: in a range of 1,500 – 2,500 m a.s.l. in Trentino, and 2,400 m a.s.l. Schneeberg, Passeier, TS. CH: 407 – 2,575 m a.s.l.

Red list status: NT – near threatened (IT), 1 – threatened from extinction (DE).

Scapania umbrosa (SCHRAD.) DUMORT. (Scapaniaceae), Spitzlappiges Spatenmoos, Shady Earwort

Three times, squares 58 (TS/IT), Tisental, ground, ca. 2,030 – 2,300 m a.s.l.; 102 (TN/AT), Martlaswald, rotten wood, ca. 1,690 – 1,700 m a.s.l.; 135 (TS/IT), Pfelderertal at

Krößbichl, rotten wood, ca. 1,565 m a.s.l.

AT: an altitudinal range of ca. 600 – 1,900 m a.s.l., with further altitudinal limits of 1,300 m a.s.l., Kleiner Ahornboden, TN, and 1,700 m a.s.l., St. Anton, TN. IT: in a range of 600 – 1,000 m a.s.l. in Trentino, and recently confirmed for the IT region Friuli-Venezia Giulia, in an altitudinal range of 950 – 1,600 m a.s.l.; CH: 430 – **2,650 m a.s.l.**; FR: 1,573 m a.s.l., Crest-Voland, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Scapania undulata (L.) DUMORT.

(Scapaniaceae), Bach-Spatenmoos, Water Earwort

14 squares: 49, 52, 60, 64, 71, 73, 74, 82, 89, 104, 134, 157, 160, 199 ground, boggy places, river, river bank, flush, wet rock, ca. 1,570 – 2,585 m a.s.l. (TS/IT) and ca. 1,840 – 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,300 – 2,600 m a.s.l., Lüsenerntal, TN, with further altitudinal limits of 2,520 m a.s.l., and 2,300 m a.s.l., Neualpl at Lienz, TE. IT: up to 2,361 – 2,470 m a.s.l., near Rif. Città di Chivasso, Piedmont, and 2,600 m a.s.l., Wormser Joch, TS. CH: 240 – 2,600 m a.s.l.; FR: **2,755 m a.s.l.**, Termignon, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Schistidium apocarpum (HEDW.) BRUCH & SCHIMP. (Grimmiaceae), Versteckfrüchtiges Spalhhütchen, Sessile Grimmia
Altitude measurements from older literature can be problematic, because the whole genus

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was completely revised with many new species erected (Blom 1996, 1998), recently through detailed morphological and molecular treatment (Milyutina et al. 2007, Hofbauer et al. 2016). Still there are new species discovered every year, even in the Alps (Blom et al. 2016). 30 squares: 1, 5, 17, 19, 24, 41, 77, 95, 97, 100, 102, 103, 105, 107-113, 130, 141, 160, 170, 177, 178, 181, 194-196, rock, ca. 550 – 1,820 m a.s.l. (TS/IT) and ca. 1,450 – 2,788 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,440 m a.s.l., Großglockner, TE, with further altitudinal limits of 2,700 m a.s.l., Serles summit, TN, and 2,827 m a.s.l., Sellrain, TN. IT: up to **3,940 m a.s.l.**, Grivola, Aosta, 1,230 – 1,500 m a.s.l., between Campo and Mortisa, Ampezzo, Trentino. CH: 500 m a.s.l. to 3,500 m a.s.l., Jungfrauoch. FR: 1,695 m a.s.l., Aime, Savoy.

Schistidium confertum (FUNCK) BRUCH & SCHIMP. (Grimmiaceae), Dichtes Spalthütchen, Compact Grimmia

Recorded in three squares in TS/IT only, squares 115, Pfossental, ground, 1,980 – 2,020 m a.s.l.; 135, Pfelderertal at Krößbichl, rock, ca. 1,565 m a.s.l.; 138, Pfelderertal at Bruggstein, stone pile, ca. 1,380 – 1,430 m a.s.l. AT: a maximum elevation of 3,460 m a.s.l., Adlersruhe at Großglockner, TE, with further altitudinal limits of 2,370 m a.s.l., Karwendel, TN and 2,700 – 2,900 m a.s.l., Nussing, TE. IT: up to 3,647 m a.s.l., Monte Rosa, Aosta, 2,700 m a.s.l., Hühnerspiel, TS. CH: 400 m – **3,650 m a.s.l.**, Combin de Corbassieres. FR: 3,195 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Schistidium crassipilum H. H. BLOM (Grimmiaceae), Dickhaar-Spalthütchen, no English name

11 squares: 41, 42, 96, 135, 141, 143, 172, 174, 186, 187, 193, usually on rock, ca. 525 – 570 m a.s.l. to 1700 – 1780 m a.s.l. (TS/IT) and in a range of 1590 – 1610 m a.s.l. (TN/AT).

For AT and IT no altitudinal information can be revealed so far. CH: 275 m a.s.l. to **2,250 m a.s.l.**; FR: 1,400 m a.s.l., Aillon-le-Jeune, Savoy.

Schistidium dupretii (THÉR.) W. A.

WEBER (Grimmiaceae), Kurzhaar-Spalthütchen, Duprett's Grimmia
18 squares: 10, 41, 42, 64, 107, 120, 122, 126, 129, 130, 132, 134, 135, 173, 147, 193, 195, 198, rock and wall, ca. 525 – 2,610 m a.s.l. (TS/IT) and ca. 1,780 – 2,100 m a.s.l. (TN/AT). AT: a maximum elevation of ca. 3,000 m a.s.l., without precise location. IT: altitudinal range of 950 – 1,600 m a.s.l., recently recorded from the IT region Friuli-Venezia Giulia. CH: 538 m a.s.l. to **2,950 m a.s.l.**; FR: 2,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Schistidium elegantulum H. H. BLOM (Grimmiaceae), Elegantes Spalthütchen, Elegant Grimmia

Eight times, squares 3 (TS/IT), Naturns village, concrete, 560 – 580 m a.s.l.; 24 (TS/IT), at Karthaus village, rock, ca. 1,090 m a.s.l.; 33 (TS/IT), at Gurschlhof, boulders, 1,300 – 1,310 m a.s.l.; 42 (TS/IT), at Vernagt reservoir, wall, ca. 1,700 – 1,780 m a.s.l.; 141 (TS/IT), Pfelderertal, Moos im Passeier, on rock and wall, ca. 980-1026 m a.s.l.; 158 (TS/AT),

Rofental, rock, **2,030 – 2,100 m a.s.l.**; 173 (TS/IT), Langtaufertal, rock, ca. 1,600 – 1,620 m a.s.l.; 174 (TS/IT), begin Langtaufertal, rock, ca. 1513-1540 m a.s.l.

AT: a maximum elevation of 1,000 m a.s.l. without precise location. CH: 425 m a.s.l. to 2,000 m a.s.l.; FR: 1,580 m a.s.l., La Thuile, Savoy.

Schistidium flaccidum (DE NOT.)

OCHYRA (Grimmiaceae),

Kissen-Spalthütchen, Goblet Grimmia

Once, square 138 (TS/IT), Pfelderertal at Bruggstein, rock near waterfall, ca. 1,430 m a.s.l.

AT: a maximum elevation of 2,900 m a.s.l., with further altitudinal limits of 2,400 m a.s.l., Glungezer, TN, and 2,300 m a.s.l., Zabernitzkofel at Lienz, TE. IT: up to **4,559 m a.s.l.**, Monte Rosa, Aosta, 2,200 m a.s.l., Valsun at Brenner, TS. CH: 350 m a.s.l. to 3,020 m a.s.l.; FR: 2,500 m a.s.l., Bramans, Savoy.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH), 2 – severely endangered (DE).

Schistidium papillosum CULM.

(Grimmiaceae), Papillen-Spalthütchen,

Rough Grimmia

Abundant, 44 squares: 17, 18, 20, 24, 33-35, 38, 40, 42, 70, 78, 84, 88-90, 94-96, 99, 101, 102, 104-106, 114, 116, 128, 131, 134, 138, 139, 143, 146, 147, 159, 161, 174, 179, 185, 188-190, 198, on rock, occasionally on concrete, ca. 700 – 2,080 m a.s.l. (TS/IT) and ca. 1,470 – 2,540 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,000 m a.s.l., with further altitudinal limits of ca. 2,800 m a.s.l., Nussing, TE, 2,350 m a.s.l., Messerlingwand, TE, 2,600 m a.s.l., Glungezer, TN, 2,400 – 2,600 m a.s.l. Fimberpaß at Paznaun, TN. IT: **3,210 m a.s.l.**, Payer Hütte, Ortler, TS. CH: 250 m a.s.l. to 3,100 m a.s.l.; FR: 1,675 m a.s.l., Bourget-en-Huile, Savoy.

Red list status: r: 3 – regionally endangered (AT).

Schistidium platyphyllum (MITT.) H.

PERSS. (Grimmiaceae), Breitblättriges

Spalthütchenmoos, Broad-leaved Grimmia

The situation for *S. platyphyllum* in TN/AT and TS/IT seems in a state of confusion. In older studies, this species has already been recorded for both countries, but because of nomenclatural uncertainties (see Blom 1998), these old records are doubtful and the authors did not distinguish between *S. platyphyllum* and *S. sordidum*. Nevertheless, for AT both *S. platyphyllum* and *S. sordidum* have been found recently (see also discussion for *S. sordidum*).

Once, square 172 (TS/IT), Matschertal, rock in river, ca. 1,370 – 1,430 m a.s.l. – new to Italy? AT: only recently discovered with certainty for Austria (in Vorarlberg, Lower Austria and Upper Austria), with a maximum elevation 1,425 m a.s.l., Allgäuer Alpen, Vorarlberg (Amann et al. 2013). According to Düll (1991) in TN up to 2,306 m a.s.l., Hochvogel, in TE **2,800 m a.s.l.**, Bergertörl, and in TS/IT reaching 2,550 m a.s.l., Engelsspitze, but not differentiated from *S. sordidum* – therefore records given are doubtful! Listed as doubtful re-

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cord before 1950 only in Aleffi et al. (2008) for the province Trentino-Alto Adige. CH: 1,030 – 2,320 m a.s.l.; FR: 2,750 m a.s.l., Pralognan-la-Vanoise, Savoy.

Schistidium rivulare (BRID.) PODP.

(Grimmiaceae), Bach-Spalthütchen,

River Grimmia

Eight squares: 6, 84, 88, 108, 133, 135, 171, 172, usually at rock, boulders in rivers, ca. 820 – 1,940 m a.s.l. (TS/IT) and ca. 1,470 – 1,893 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,800 m a.s.l. with further altitudinal limits of 1,900 m a.s.l., Senderstal, TN, 2,600 m a.s.l., Schleinitz, Lienz, TE and ca. 2,650 m a.s.l., Ködnitztal, TE. IT: up to 3,450 – 3,480 m a.s.l., Testa del Ruitor, Aosta, and in a range of 700 – **3,800 m a.s.l.** in Trentino. CH: 200 m a.s.l. to

2,900 m a.s.l., Gornergrat. FR: 2,378 m a.s.l., Notre-Dame-de-Briancon, Savoy.

Red list status: V – decreasing (DE).

Schistidium sordidum I.HAGEN

(Grimmiaceae), Rundblättriges Spalthütchenmoos, no English name.

Recently the taxonomy and nomenclature of this species was discussed in Kiebacher & Köckinger (2015).

Once, square 124 (TS/IT), Pfoßental towards Stettiner Hütte, rock, ca. 2,895 m a.s.l.

Only recently discovered with certainty for Austria (in Vorarlberg, Salzburg and Upper Austria) with a maximum elevation of **2,965 m a.s.l.** (Amann et al. 2013). For IT documented recently for the Veneto region with an elevation of 2,594 m a.s.l. and for TS, summit of Peitlerkofel, with an elevation of 2,870 m

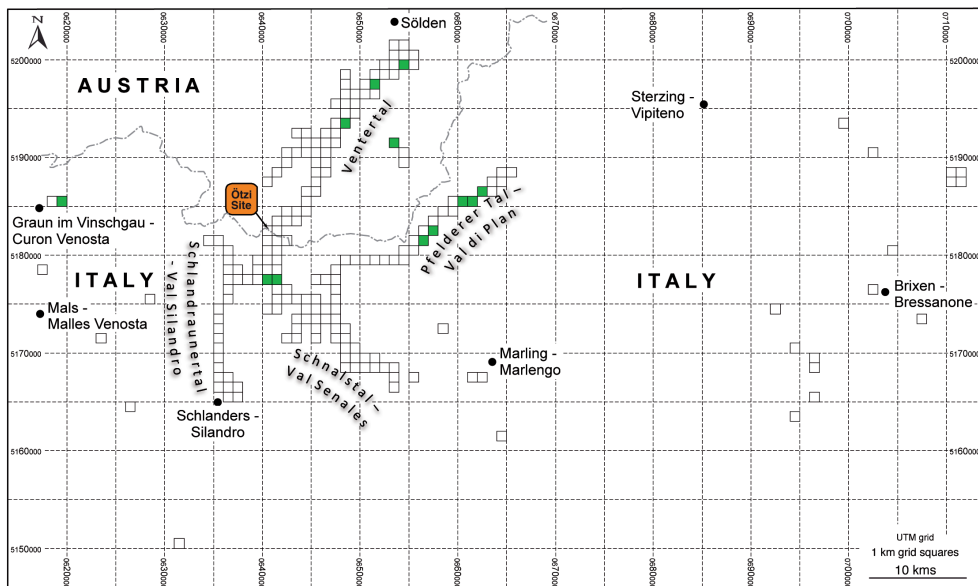


Fig. 5.25: Recorded distribution of *Schistidium trichodon*

a.s.l.; CH: 2,338 – 2,809 m a.s.l.; FR: 2,850 m a.s.l., Aussois, Savoy.

Schistidium trichodon (BRID.) POELT
(Grimmiaceae), Haarzahn-Spalthütchen, Stook Grimmia (Fig. 5.25)
12 squares: 41, 42, 88, 96, 102, 127, 129, 134-136, 173, 198, on rock, occasionally on walls and concrete, ca. 1,425 – 2,400 m a.s.l. (TS/IT) and ca. 1,590 – 2,100 m a.s.l. (TN/AT). AT: a maximum elevation of **3,160 m a.s.l.**, Sill and Brenner area, TN, with further altitudinal limits of 1,800 m a.s.l., Hall, TN and 1,810 m a.s.l., Stripsenkopf, TN. IT: up to 2,900 m a.s.l., Col de l'Arieta, Aosta, and in a range of 400 – 700 m a.s.l. in Trentino. CH: 375 m a.s.l. to 3,000 m a.s.l., Gornergrat. FR: 2,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Schistostega pennata (HEDW.) WEB. & MOHR (Schistostegaceae), Feder-Leuchtmoss, Goblin Gold
Six times, squares 21 (TS/IT), Klosteralm, soil overhang, ca. 1,980 m a.s.l.; 82 (TN/AT), above Vent village, rock hole, 2,100 m a.s.l.; 83 (TN/AT), Mutsbichl, hole beneath rock, 2,220 m a.s.l.; 93 (TN/AT), Ventertal, hole, ca. 1,590–1,790 m a.s.l.; 100 (TN/AT), Ventertal at Freistabl, hole, ca. 1,550 – 1,560 m a.s.l.; 134 (TS/IT), Pfelderertal at Pfelders village, rock overhang, 1,570 – 1,610 m a.s.l.
AT: a maximum elevation of **2,530 m a.s.l.**, Grafmarterjoch, TN, with further altitudinal limits of 1,950 m a.s.l., Obergurgl, TN, ca. 1,800 m a.s.l., Ködnitztal, TE. IT: up to 1,800 – 2,300 m a.s.l., path to Money, Gran Paradiso National Park. CH: 430 – 2,100 m a.s.l.

FR: 1,600 m a.s.l., Peisey-Nancroix, Savoy.
Red list status: VU – vulnerable (CH), V – decreasing (DE).

Sciuro-hypnum glaciale (SCHIMP.)
IGNATOV & HUTTUNEN;
Syn.: *Brachythecium glaciale* SCHIMP.
(Brachytheciaceae), Gletscher-Schweifchenastmoos, Snow Feather-moss
Eight squares: 16, 70, 113, 119, 124, 127, 140, 161, on ground, ca. 1,260 – 2,790 m a.s.l. (TS/IT) and ca. 2,160 – 2,540 m a.s.l. (TN/AT). AT: a maximum elevation 2,920 m a.s.l., Böses Weibele, Kals, TE, with a further elevation limit of 2,900 m a.s.l., Ramolhaus, TN. IT: up to **3,400 m a.s.l.**, Val di Cogne, Aosta, 3,020 m a.s.l., above Payer Hütte, Ortler, TS, 2,500 – 3,000 m a.s.l., Schöntaufspitze, TS, 2,700 – 2,730 m a.s.l., outflow of Laghetto d'Asta, Valsugana, Trentino. CH: 1,170 – 3,200 m a.s.l. (W-Alps), Gorner Grat. FR: 2,700 m a.s.l., Val-D'Isere, Savoy.

Sciuro-hypnum populeum (HEDW.)
IGNATOV & HUTTUNEN;
Syn.: *Brachythecium populeum* (HEDW.)
SCHIMP. (Brachytheciaceae), Pappel-Kurzbüchsenmoos, Pappel-Kegelmoss, Matted Feather-moss
Recorded in two squares in the TS/IT part only, squares 14, Altratheis, boulder at river, ca. 878 m a.s.l. and 178, at Partschins village, ground, 700 – 1,100 m a.s.l.
AT: a maximum elevation of 2,350 m a.s.l., Matrei i.O., TE, with further altitudinal limits of 2,010 – 2,150 m a.s.l., Gralalven, TE, 2,000 m a.s.l., Alpeinerferner, Stubai, TN, and

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1,500 m a.s.l., St. Anton, TN. IT: up to **3,500 m a.s.l.** (should be checked!), Monte Rosa, with another measurement up to 2,000 – 2,245 m a.s.l., Seyvaz valley, Gran Paradiso National Park, Aosta, 1,000 m a.s.l., Riol at Franzensfeste, TS, 1,800 m a.s.l., Val Lagorai, Val di Fiemme, Trentino. CH: 200 – 2,760 m a.s.l.; FR: 440 m a.s.l., Chambéry, Savoy.

Sciuro-hypnum reflexum (STARKE)

IGNATOV & HUTTUNEN;

Syn.: *Brachythecium reflexum* (STARKE)

SCHIMP. (Brachytheciaceae), Kleines Berg-Kurzbüchsenmoos, Reflexed Feather-moss
Nine squares: 59, 64, 71, 85, 89, 94, 118, 132, 184, on ground, ca. 1,070 – 2,590 m a.s.l. (TS/IT) and ca. 1,699 – 2,630 m a.s.l. (TN/AT).

AT: an altitudinal range of 700 – 2,700 m a.s.l. with further altitudinal limits of 2,475 m a.s.l., above Kaiserjochhaus, St. Anton, TN, 2,350 m a.s.l., upper Padaster, Gschnitztal, TN, and 2,270 m a.s.l., Tugurien, upper Teischnitz, TE. IT: up to 2,470 m a.s.l., Gran S. Bernardo, Aosta, in an altitudinal range of 2,400 – 2,700 m a.s.l. in Piedmont, 2,600 – 2,700 m a.s.l., Schwarzer See above St. Martin in Passeier, TS. CH: 200 – 2,770 m a.s.l.; FR: 2,500 m a.s.l., Lanslebourg-Mont-Cenis, Savoy. For Europe an elevational range of 1,000 m a.s.l. to **3,000 m a.s.l.** is mentioned, without precise locations.

Red list status: V – decreasing (DE).

Sciuro-hypnum starkei (BRID.) IGNATOV & HUTTUNEN; Syn.: *Brachythecium starkei* (BRID.) SCHIMP. (Brachytheciaceae),

Berg-Kurzbüchsenmoos, Feather-moss

Five times, in the TN/AT part only, squares 71, above Martin-Busch-Hütte, ground, ca. 2,540 – 2,630 m a.s.l.; 74, Niedertal, ground, ca. 2,220 – 2,300 m a.s.l.; 83, Mutsbichl, ground, ca. 2,130 – 2,250 m a.s.l.; 86, north of Vent village, ground, ca. 1,870 – 1,880 m a.s.l.; 91, Ventertal near Winterstall, ground, ca. 1,790 – 1,850 m a.s.l.

AT: an altitudinal range of ca. 700 – 2,900 m a.s.l., with further altitudinal limits 2,450 m a.s.l., Darmstädter Hütte, Paznaun, TN, 2,200 – 2,360 m a.s.l., Geisstein, TN, and 2,180 – 2,340 m a.s.l., Teischnitz, Kaiser Törl, TE. IT: up to **3,480 m a.s.l.** (should be checked!), Testa del Ruitor, Aosta 2,700 m a.s.l., above St. Martin in Passeier, TS, 2,370 – 2,570 m a.s.l., Padon, Val di Fassa, Trentino. CH: 420 – 2,989 m a.s.l.; FR: 2,200 m a.s.l., Bessans, Savoy.

Scorpidium revolvens (SW.) RUBERS;

Syn.: *Drepanocladus revolvens* (SW.)

WARNST.; *Limprichtia revolvens* (SW.)

LOESKE (Calliergonaceae),

Rollblatt-Sichelmoos, Rusty Hook-moss

29 squares: 23, 45, 48-52, 72-74, 78-80, 82, 84, 85, 88-90, 104, 107, 136, 154, 157, 158, 161, 163, 198, 199, wet ground, bog, flush, occasionally on wet rock, ca. 1,425 – 2,550 m a.s.l. (TS/IT) and ca. 1,770 – 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,564 m a.s.l., TN, with further altitudinal limits of 2,550 m a.s.l., Wurmbergjoch, Pitztal, TN, and 2,400 m a.s.l., Schwarzer See, TE. IT: up to **3,200 m a.s.l.**, Punta di Leppe, Aosta, 2,000 m a.s.l.,

Gsieserjöchl, TS. CH: 420 – 2,319 m a.s.l.
Red list status: 3 – endangered (DE).

Scorpidium scorpidioides (HEDW.)

LIMPR. (Calliergonaceae), Echtes Skorpionsmoos, Hooked Scorpion-moss

Once, square 79 (TN/AT), Niedertal, flush, ca. 2,050 – 2,110 m a.s.l.

AT: a maximum elevation of 2,000 m a.s.l. (Großvermont, Vorarlberg) with a further elevation limit of 1,850 m a.s.l., Grünsee, Nauders, TN. IT: up to 2,370 – 2,440 m a.s.l., Alpe Broillot, Gran Paradiso National Park, Aosta, and 1,475 m a.s.l., Reschensee, TS. CH: 260 – **2,500 m a.s.l.**; FR: 2,308 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Red list status: 2 – severely endangered (AT), VU – vulnerable (CH), 3 – endangered (DE).

Seligeria brevifolia (LINDB.) LINDB

(Seligeriaceae), Kurzblättriges Zwergmoos, Short Rock-bristle

Once, square 185 (TS/IT), Kreuztal, on shaded rock at a road bank, 1,995 m a.s.l. – new to Italy!

AT: a maximum elevation of 2,300 m a.s.l.; CH: 1,200 m a.s.l. to **2,800 m a.s.l.** Very rare in DE with a highest record from 930 m a.s.l. Red list status: 4 – potentially endangered (AT), CR – threatened from extinction (CH).

Sphagnum capillifolium (EHRH.) HEDW.;

Syn.: *S. nemoreum* SCOP. (Sphagnaceae), Spitzblättriges Torfmoos, Acute-leaved Bog-moss

Abundant, 54 squares: 22, 23, 27, 30, 31, 36, 37, 46, 48-53, 70, 71, 73-79, 81, 82, 84, 86, 87, 89, 90, 92, 93, 102-104, 107, 127, 128,

135, 136, 151, 153, 154, 157-161, 163, 182, 185, 197-199, usually on wet ground, flushes and in peat bogs, ca. 1,395 – 2,550 m a.s.l. (TS/IT) and ca. 1,590 – 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,700 m a.s.l., Riffital at Kaunertal, TN, with further altitudinal limits of 2,500/2,650 m a.s.l., at Neue Samoar Hütte, Ötztal, TN, and 2,500 m a.s.l., Peischlerpass, Tauern, TE. IT: up to 2,530 – 2,600 m a.s.l., Alpe Perazda, Gran Paradiso National Park, Aosta, **>3,000 m a.s.l.**, Soyjoch, Martelltal, TS, 2,600 m a.s.l., Trentino. CH: 290 m a.s.l. to 2,610 m a.s.l.; FR: 2,560 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: NT – potentially endangered (CH), V – decreasing (DE).

Sphagnum centrale JENSEN (Sphagnaceae),

Zweifarbige Torfmoos, no English name

Once, Square 82 (TN/AT), above Vent village towards Rofen, flush, ca. 1,940 – 2,100 m a.s.l.

AT: a maximum elevation of 2,100 m a.s.l., Zirbenwald near Obergurgl, TN, with further altitudinal limits of 1,870 m a.s.l., Mittelberg, Pitztal, TN, and 1,500 m a.s.l., Fotschertal, TN. IT: 1,680 m a.s.l., between Valnontey and Valmianaz, Gran Paradiso National Park, in a range of 400 – 1,500 m a.s.l. in Trentino. CH: 410 m – **2,220 m a.s.l.**; FR: 1,521 m, Rognax, Savoy.

Red list status: 3 – endangered (AT, DE).

Sphagnum compactum LAM. & DC.

(Sphagnaceae), Dichtes Torfmoos, Compact Bog-moss

Eight squares: 31, 53, 70, 71, 82, 157, 198, 199, on wet ground, in flushes and bogs, ca.

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2,153 – 2,320 m a.s.l. (TS/IT) and ca. 1,940 – 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,730 m a.s.l., bog at Delorette trail at Vent, TN, with further altitudinal limits of 2,700 m a.s.l., Zirmeggenkar near Obergurgl, TN, 2,500 m a.s.l., Predigtberg, Galtür, TN, 2,400 m a.s.l., Schwarzenstein, Zillertal, TN, and 2,000 – 2,200 m a.s.l., Dorferalpe, Venediger, TE. Highest occurrence in the Alps (AT), without precise location is **2,750 m a.s.l.**; IT: up to 2,220 – 2,300 m a.s.l., Alpe Gran Piano, Gran Paradiso National Park, 2,300 m a.s.l., Martelltal, TS, 2,150 – 2,200 m a.s.l., Fedajapaß, Val di Fassa, Trentino. CH: 380 m a.s.l. to 2,680 m a.s.l.; FR: 2,560 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: r: 3 – locally endangered (AT), 3 – endangered (DE).

Sphagnum contortum SCHULTZ

(Sphagnaceae), Gedrehtes Torfmoos,

Twisted Bog-moss

Once, square 175 (TS/IT), at Haidersee, “Schwingrasen”, 1,450 m a.s.l.

AT: a maximum elevation of **1,900/2,200 m a.s.l.**, Komperdellalm, TN, with further altitudinal limits of 2,000 m a.s.l., Zeinisjoch, St. Anton, TN, and 1,500 m a.s.l., Kartitschsattel at Sillian, TE. CH: 340 m a.s.l. to 2,010 m a.s.l.; FR: 1,980 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Red list status: 2 – severely endangered (AT, DE).

Sphagnum cuspidatum EHRH.

(Sphagnaceae), Spieß-Torfmoos,

Feathery Bog-moss

Once, square 82 (TN/AT), above Vent village towards Rofen, flush, ca. 1,940 – 2,100 m a.s.l.

AT: a maximum elevation of **2,150 m a.s.l.**, Hohe Tauern, TE, with a further elevation limit of 1,300 – 1,560 m a.s.l., Windau, TN. IT: in a range of 500 – 1,200 m a.s.l. in Trentino, 2,086 m a.s.l., Rittnerhorn, TS. CH: 400 m a.s.l. to 2,050 m a.s.l.

Red list status: 3, r: 2 – endangered, regionally severely endangered (AT), NT – potentially endangered (CH), 3 – endangered (DE).

Sphagnum fallax (KLINGGR.) KLINGGR.

(Sphagnaceae), Trügerisches Torfmoos,

Flat-topped Bog-moss

Seven times, squares 22 (TS/IT), Klosteralm, bog, ca. 1980 – 2300 m a.s.l.; 46 (TS/IT), at Gerstgras, bog, ca. **1,900 – 2,200 m a.s.l.**; 49 (TS/IT), near Kurzras, bog, ca. 1,920 – 2,020 m a.s.l.; 81 (TN/AT), Niedertal, flush, ca. 1,900 – 2,050 m a.s.l.; 82 (TN/AT), above Vent village towards Rofen, flush, ca. 1,970 m a.s.l.; 90 (TN/AT), Ventertal at Winterstall, gully, ca. 1,770 – 1,840 m a.s.l.; 97 (TN/AT), Ventertal towards Zwieselstein, wet place, ca. 1,600 – 1,670 m a.s.l.

AT: a maximum elevation of 2,000 m a.s.l., Ötztal, TN. CH: 402 m to 1,920 m a.s.l.; FR: 1,707 m a.s.l., Beaufort-sur-Doron, Savoy.

Red list status: 3 – endangered (AT), NT – potentially endangered (CH).

Sphagnum flexuosum DOZY & MOLK.

(Sphagnaceae), Gekrümmtes Torfmoos,
Flexuous Bog-moss

Once, square 157 (TN/AT), Rofental, flush,
1,970 – 2,030 m a.s.l.

AT: a maximum elevation of 1,750 m a.s.l.,
St. Anton, TN. IT: 1,870 – 1,940 m a.s.l.,
Piano di Eugio, Gran Paradiso National Park,
Piedmont. CH: 360 m a.s.l. to 1,960 m a.s.l.;
FR: 1,800 m a.s.l., Presle, Savoy.

Red list status: 3, r: 2 – endangered, regionally
severely endangered (AT), NT – potentially
endangered (CH), V – decreasing (DE).

Sphagnum fuscum (SCHIMP.) KLINGGR.

(Sphagnaceae), Braunes Torfmoos,
Rusty Bog-moss

14 squares: 48, 52, 53, 82, 87, 89, 90, 104,
107, 157, 158, 160, 197, 198, in boggy place,
flush, bog and peat bog, ca. 1,395 – 2,210 m
a.s.l. (TS/IT) and ca. 1,770 m a.s.l. to ca.
2,340 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,250 m a.s.l.,
Ramolweg near Manigenbach, TN, with fur-
ther altitudinal limits of 2,050 m a.s.l., Stein-
acherjoch, TN, and 2,000 m a.s.l., above Gais-
lacheralpe, Ventertal, TN. IT: in a range of
800 – 1,500 m a.s.l. in Trentino, and 1,475 m
a.s.l., Reschensee, TS. CH: 417 m a.s.l. to
2,230 m a.s.l.; **FR: 2,500 m a.s.l.**, Bramans
and Valloire, Savoy.

Red list status: 3 – endangered (AT), VU – vul-
nerable (CH), 2 – severely endangered (DE).

Sphagnum girgensohnii RUSS.

(Sphagnaceae), Girgensohnsches Torfmoos,
Girgensohn's Bog-moss

27 squares: 29-31, 43, 44, 48, 50, 52, 70,
77, 79, 81, 82, 90, 92-94, 97, 103, 104, 134,
135, 152, 159, 160, 163, 198, on wet ground,
boggy places, flush, bog and peat bog, ca.
1,565 m a.s.l. to 2,320 m a.s.l. (TS/IT) and
ca. 1,600 m a.s.l. to highest measures of ca.
2,560 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,500 m a.s.l.,
Viggarspitze, TN, and 2,500 m a.s.l., Peischler-
pass, TE. IT: 2,300 m a.s.l., Martelltal, TS.
CH: 330 m a.s.l. to 2,400 m a.s.l.; FR: 2,280 m
a.s.l., Termignon, Savoy.

Red list status: V – decreasing (DE).

Sphagnum imbricatum HORNSCH.

(Sphagnaceae), Kamm-Torfmoos,
Imbricate Bog-moss

In respect of *Sphagnum imbricatum* s.l. it is
now widely accepted that there is an aggregate
of three taxa, distinct not just taxonomi-
cally but also geographically and ecologically
(Thingsgaard 2001, 2002; Andrus 1987;
Flatberg 1984). Two of them occur in Europe:
S. austinii (SULL.) FLATBERG and *S.*
affine (REN. & CARDOT.) FLATBERG. The
former is hyperoceanic and confined to om-
brotrophic mires and the latter is suboceanic
and confined to minerotrophic mire com-
munities (see also Dierssen 2001).

At present *Sphagnum imbricatum* s.l. is not
existing in the investigated area; it was found
only in the colon of the Iceman (Dickson et al.
2005). For bryogeographical reasons it is listed
as *Sphagnum* cf. *affine*.

AT: rare and only from stations which are quite
remote to the discovery place. AT: a maximum
elevation given is 810 m a.s.l., Mandlinger

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Moor, Salzburg with a further elevation limit of 664 m a.s.l., peat bog called the “Schwemm” near Walchsee, TN (Oeggl 1988). Never recorded for IT and Trentino-Alto Adige according to Aleffi et al. (2008). New to IT? – see Dickson et al. (2005). In CH (as *Sphagnum affine*) 840 m a.s.l. to **2,093 m a.s.l.**

Red list status: 1 – threatened with extinction (AT), VU – vulnerable (CH), 2 (both species in question) – severely endangered (DE), AR (*S. affine*) – at risk (FR).

Sphagnum magellanicum BRID.

(Sphagnaceae), Mittleres Torfmoos, Magellanic Bog-moss

Four times in the TN/AT part only, squares 81, Niedertal, flush, ca. 1,900 – 2,050 m a.s.l.; 82, above Vent towards Rofen, flush, ca. 1,940 – 2,100 m a.s.l.; 107, at Nachtberg, boggy place, ca. 1,780 – 1,850 m a.s.l.; 198, Obergurgl, Zirbenwaldmoos, peat bog, ca. 2,080 – 2,085 m a.s.l.

AT: a maximum elevation of **2,500 – 3,100 m a.s.l.**, near Johannishütte, Mullwitzkees am Großvenediger, TE, with a further elevation limit of 2,000 m a.s.l., Rotmoostal, Obergurgl, TN. IT: up to 1,800 – 1,850 m a.s.l., near Lago di Eugio, Gran Paradiso National Park, Piedmont. CH: 360 m a.s.l. to 2,230 m a.s.l.; FR: 1,707 m a.s.l., Beaufort-sur-Dordon, Savoy. Red list status: r: 3 – locally endangered (AT), NT – potentially endangered (CH), 3 – endangered (DE).

Sphagnum majus (RUSSOW) JENSEN

(Sphagnaceae), Großes Torfmoos, Olive Bog-moss

Once, square 107 (TN/AT), at Nachtberg, boggy place, ca. 1,780 – 1,850 m a.s.l.

AT: a maximum elevation ca. 2,000 m a.s.l., with further altitudinal limits of 750 m a.s.l., Schwarzsee at Kitzbühel, TN, and 664 m a.s.l., Schwemm at Walchsee, TN. IT: 1,680 m a.s.l., between Valnontey and Valmianaz, Gran Paradiso National Park, and ca. 1,300 m a.s.l., Deutschnofen, TS. CH: 420 m a.s.l. to **2,230 m a.s.l.**

Red list status: 3, r: 2 – endangered, regionally severely endangered (AT), 2 – severely endangered (DE), AR – at risk (FR).

Sphagnum palustre L. (Sphagnaceae),

Kahnblättriges Torfmoos, Blunt-leaved Bog-moss

Once, square 136 (TS/IT), Pfelderertal at Innerhütt, bog, ca. 1,425 – 1,510 m a.s.l.

AT: a maximum elevation of **2,150 m a.s.l.**, Möserlingwand, TE, with further altitudinal limits of 1,970/2,000 m a.s.l., above Sölden, TN, and 2,000 m a.s.l., Alfachalpe, TN. IT: up to 1,850 – 1,950 m a.s.l., towards Alpe Arzola, Gran Paradiso National Park, Piedmont. CH: 270 m a.s.l. to 2,028 m a.s.l.; FR: 1,660 m a.s.l., Bourget-en-Huile, Savoy.

Red list status: r: 3 – locally endangered (AT).

Sphagnum platyphyllum (LINDB.)

WARNST. (Sphagnaceae), Gleichblättriges Torfmoos, Flat-leaved Bog-moss (Fig. 5.26) Eight squares: 52, 82, 84, 150, 157, 182, 198, 199, wet ground, flush, bog and peat bog, ca. 1,483 – 2,200 m a.s.l. (TS/IT) and 1,895 – 2,280 m a.s.l. (TN/AT). In square 199 (TN/AT), Rotmoos, peat bog, 2,275 – 2,280 m

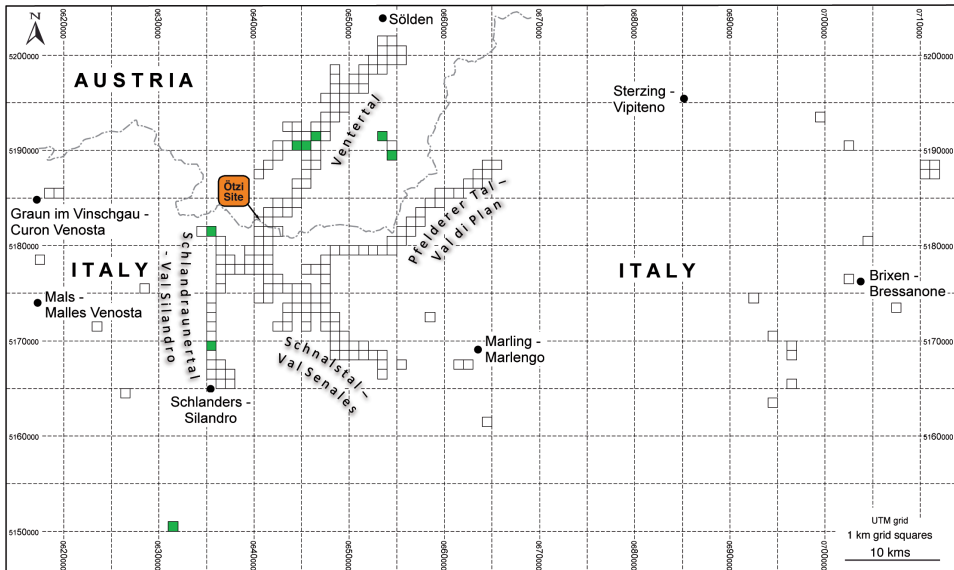


Fig. 5.26: Recorded distribution of *Sphagnum platyphyllum*

a.s.l., additionally to the typical form also var. *turgescens* WARNST. (Warnstorf 1884) occurred which shows almost no branching.

AT: a maximum elevation of 2,400 m a.s.l., between Berliner Hütte and Schwarzenstein See, Zillertal, TN, with a further elevation limit of 2,000 m a.s.l., Obergurgl, TN. No altitudinal limits for IT revealed so far. CH: 270 m a.s.l. to **2,420 m a.s.l.**; FR: 2,200 m a.s.l., Champagny-en-Vanoise, Savoy.

Red list status: 3 – endangered (AT), 2 – severely endangered (DE), AR – at risk (FR).

Sphagnum quinquefarium (BRAITHW.) WARNST. (Sphagnaceae), Fünfeiliges Torfmoos, Five-ranked Bog-moss
 Nine squares: 26, 36, 90, 92, 94, 107, 134, 137, 139, on ground (in woodland), wet place,

gully and bog, ca. 1,310 – 1,790 m a.s.l. (TS/IT) and ca. 1,699 – 1,850 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,100 m a.s.l., above Sölden, TN, with further altitudinal limits of 2,000 m a.s.l., Matrei i.O., TE, 1,650 m a.s.l., Galtür, TN, and 1,180 m a.s.l., Seefeld, TN. IT: 1,250 m a.s.l., Hauensteiner Wald, Ratzes, TS, and 1,000 m a.s.l., Trentino. CH: 420 to **2,255 m a.s.l.**; FR: 1,573 m a.s.l., Crest-Voland, Savoy.

Red list status: 3 – endangered (DE).

Sphagnum rubellum WILS. (Sphagnaceae), Rötliches Torfmoos, Red Bog-moss
 Once in square 107 (TN/AT), at Nachtberg, boggy place, ca. 1,780 – 1,850 m a.s.l.
 AT: a maximum elevation of **2,400 – 3,100 m a.s.l.**, Mullwitzkees, Großvenediger, TE, with a further elevation limit of 2,100 m a.s.l.,

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above Sölden, TN, 2,000 m a.s.l., Vent and Kühtai, TN. CH: 380 m a.s.l. to 2,100 m a.s.l.; FR: 1,950 m a.s.l., Saint-Martin-de-Belleville, Savoy.

Red list status: 3 – endangered (AT), NT – potentially endangered (CH), G – risk assumed (DE).

Sphagnum russowii WARNST.

(Sphagnaceae), Derbes Torfmoos,

Russow's Bog-moss

14 squares: 22, 38, 43, 46, 48, 49, 52, 98, 128, 130, 153, 154, 160, 198, in wet places, flush, bog and peat bog, ca. 1,700 – 2,300 m a.s.l. (TS/IT) and ca. 1,560 – 2,160 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,500 m a.s.l., Zeinisjoch and at Kraxentrager, TN, with further altitudinal limits of 2,000/2,200 m a.s.l., Obergurgl towards Ramolhaus, TN, and 2,100 m a.s.l., Kals, TE. IT: up to **2,650 – 2,700 m a.s.l.**, Colle del Nivolet, Gran Paradiso National Park, Piedmont, 2,300 m a.s.l., Martelltal, TS. CH: 408 m a.s.l. to 2,600 m a.s.l.; FR: 2,400 m a.s.l., Cevins, Savoy.

Red list status: r: 3 – locally endangered (AT), NT – potentially endangered (CH), V – decreasing (DE).

Sphagnum squarrosum CROME

(Sphagnaceae), Sparriges Torfmoos,

Spiky Bog-moss

Five times, squares 90 (TN/AT), Ventertal at Winterstall, flush, ca. 1,770 – 1,840 m a.s.l.; 135 (TS/IT), Pfelderertal at Krößbichl, bog, ca. 1,550 – 1,565 m a.s.l.; 136 (TS/IT), Pfelderertal at Innerhütt, bog, ca. 1,425 – 1,510 m

a.s.l.; 137 (TS/IT), Pfelderertal at Außerhütt, ground in woodland, ca. 1,460 – 1,500 m a.s.l.; 175 (TS/IT), at Haidersee, "Schwingrasen", 1,450 m a.s.l.

AT: a maximum elevation of 2,230 m a.s.l., Riffelsee, TN, with further altitudinal limits of 2,100 m a.s.l., Gurgler-Tal near Obergurgl, TN, and 1,865 m a.s.l., Schönliesens, TN. IT: up to 2,000 m a.s.l., Piccolo S. Bernardo, Aosta, and ca. 1,500 m a.s.l., above Platt, Passeiertal, TS. CH: 330 m a.s.l. to 2,400 m a.s.l.; FR: **2,650 m a.s.l.**, Pralognan-la-Vanoise, Savoy.

Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Sphagnum subnitens RUSS. & WARNST.

(Sphagnaceae), Feder-Torfmoos,

Lustrous Bog-moss

Nine squares: 26, 37, 43, 52, 104, 185-187, 191, on ground, wet place, flush and bog, ca. 880 – 2,200 m a.s.l. (TS/IT) and ca. 1,900 – 1,980 m a.s.l. (TN/AT)

AT: a maximum elevation of 2,250 m a.s.l., St. Anton/Galtür, TN, with further altitudinal limits of 1,950 m a.s.l., Obergurgl, TN, and 1,800 m a.s.l., Zwieselstein, Ötztal, TN. For IT no altitudinal limits revealed so far. CH: 340 m a.s.l. to 2,100 m a.s.l.; FR: **2,300 m a.s.l.**, Termignon, Savoy.

Red list status: 2 – severely endangered (AT), 3 – endangered (DE).

Sphagnum subsecundum NEES

(Sphagnaceae), Einseitswendiges Torfmoos,

Slender Cow-horn Bog-moss

Seven squares: 81, 82, 87, 104, 107, 135, 199, boggy place, flush, bog, peat bog, ca.

1,550 – 1,565 m a.s.l. (TS/IT) and ca. 1,780 – 2,275 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,560 – 2,650 m a.s.l.**, at Neue Samoahütte, Vent, TN, with further altitudinal limits of 2,465 m a.s.l., Mörderkogel, TN, 2,400 m a.s.l., Berliner Hütte, Zillertal, TN, and 2,000 m a.s.l., Zettersfeld, Lienz, TE. IT: up to 2,220 – 2,300 m a.s.l., Alpe Gran Piano, Gran Paradiso National Park, and 1,900 m a.s.l., Griesbergalpe, Brenner, TS. CH: 360 m a.s.l. to 2,400 m a.s.l.; FR: 2,308 m a.s.l., Valloire, Savoy.

Red list status: 3 – endangered (AT, DE).

***Sphagnum teres* (SCHIMP.) ÅNGSTR.**

(Sphagnaceae), Rundes Torfmoos,

Rigid Bog-moss (Fig. 5.27)

24 squares: 29, 44, 46, 48-53, 79, 81-83, 90, 101, 104, 109, 137, 151, 157, 160, 175, 182,

198, wet ground, road bank, boggy place, flush, bog, “Schwingrasen” and peat bog, ca. 1,450 – 2,210 m a.s.l.(TS/IT) and ca. 1,450 – 2,250 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,200 m a.s.l., Obergurgl towards Ramolhaus, TN, with further altitudinal limits of 2,000 m a.s.l., Gschnitztal, TN, 1,800 m a.s.l., between Sölden and Vent, Ötztal, TN, and ca. 1,300 m a.s.l., Sillian, TE. IT: up to 2,300 m a.s.l., Piccolo S. Bernardo, Aosta, and 1,475 m a.s.l., Reschensee, TS. CH: 450 m a.s.l. to **2,380 m a.s.l.**; FR: 2,280 m a.s.l., Termignon, Savoy. Red list status: 3 – endangered (AT, DE).

***Sphagnum warnstorffii* RUSS.**

(Sphagnaceae), Warnstorfs Torfmoos,

Warnstorf’s Bog-moss

23 squares: 22, 23, 30, 43, 46, 49-52, 71, 79,

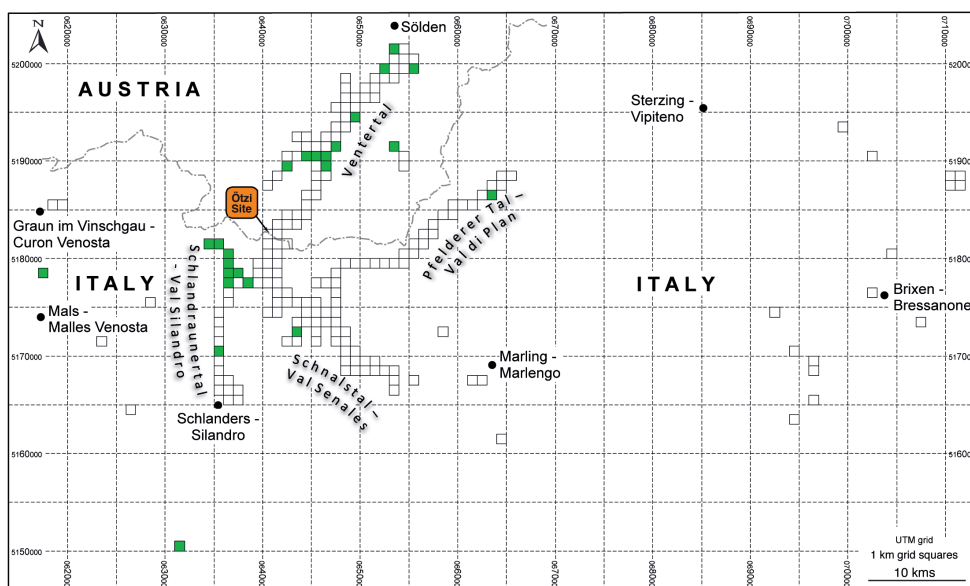


Fig. 5.27: Recorded distribution of *Sphagnum teres*

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81, 82, 104, 135, 136, 151, 158, 160, 161, 163, 197, 198, wet ground, flush, bog, peat bog, ca. 1,395 – 2,550 m a.s.l. (TS/IT) and ca. 1,900 m a.s.l. to **2,630 m a.s.l.** (TN/AT).

AT: a maximum elevation of 2,000 – 2,200 m a.s.l., Obergurgl towards Ramolhaus, TN, with further altitudinal limits of 1,500 m a.s.l., Fotschertal, TN. IT: 2,300 m a.s.l., TS and Trentino. CH: 467 m to 2,400 m a.s.l.; FR: 2,400 m a.s.l., Sainte-Foy-Tarentaise, Savoy. Red list status: 3 – endangered (AT), 2 – severely endangered (DE).

Splachnum sphaericum HEDW.

(Splachnaceae), Kugelfrüchtiges Schirmmoos, Round-fruited Collar-moss

13 squares: 23, 28, 30, 36-38, 43, 52, 70, 83, 86, 90, 115, typically on dung, ca. 1,640 – 2,550 m a.s.l. (TS/IT) and ca. 1,770 – 2,540 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,550 m a.s.l., Rendel at St. Anton, TN and Kals-Matreier Törl, TE, with further altitudinal limits of 2,450 m a.s.l., Wurmbachtal, TN, 2,500 m a.s.l., Tarntaler Köpfe, TN, and 2,400 m a.s.l., between Peischler- and Kalser Törl, TE. IT: up to **2,900 m a.s.l.**, Col d'Ollen, Aosta, in a range of 700 – 2,500 m a.s.l. in Trentino, and 2,270 m a.s.l., Schlern, TS. CH: 1,200 – 2,530 m a.s.l.; FR: 2,600 m a.s.l., Bramans, Savoy.

Red list status: according to Hodgetts (2015) in IT declined, 2 – severely endangered (DE), AR – at risk (FR).

Straminergon stramineum (BRID.)

HEDENÄS; Syn.: *Calliergon stramineum* (BRID.) KINDB. (Calliergonaceae),

Strohgelbes Schönmoos, Straw Spear-moss

26 squares: 22, 23, 44, 46, 48, 50, 52, 53, 70, 71, 76, 78, 79, 81, 82, 84, 89, 90, 104, 107, 157, 161, 163, 182, 198, 199, wet ground, wet rock, water bodies, flush, bog and peat bog, ca. 1,720 – 2,550 m a.s.l. (TS/IT) and ca. 1,770 – 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,800 m a.s.l.**, with further altitudinal limits of 2,600 m a.s.l., Peischlacher Törl, TE, 2,400 m a.s.l., Riffelsee, Pitztal, TN, and 2,250 m a.s.l., Sondergrund, Zillertal, TN. IT: up to 2,580 – 2,680 m a.s.l., Lauson valley, Gran Paradiso National Park, Aosta, 2,000 m a.s.l., Stalleralpe, Antholz, TS, and 1,790 m a.s.l., Val Sadole, Ziano, Trentino. CH: 407 – 2,530 m a.s.l.; FR: 2,755 m a.s.l., Termignon, Savoy. Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Syntrichia laevipila BRID.;

Syn.: *Tortula pagorum* (MILDE) DE NOT.;

Syntrichia pagorum (MILDE) AMANN

(Pottiaceae), Brutblatt-Drehzahn,

Small Hairy Screw-moss

Recorded twice in the TS/IT part only, squares 3, Naturns village, bark, ca. 525 m a.s.l. and 193, at Cloister Säben, Tinnetal, artificial wall, 525 – 570 m a.s.l.

AT: highest altitude **1,300 – 1,350 m a.s.l.** (Carinthia). IT: It is remarkable that the species was collected for the first time on rocks of

the Küchelberg (320 – 500 m a.s.l.) in Meran, TS, and is still growing there (Frahm 2012). CH (*Syntrichia laevipila* s. l.): 195 m a.s.l. to 1,260 m a.s.l.; FR: 343 m a.s.l., Saint-Jeoire-Prieure, Savoy. Red list status: 3 – endangered (AT), VU – vulnerable (CH).

Syntrichia norvegica WEB.;

Syn.: *Tortula norvegica* (WEB.) LINDB. (Pottiaceae), Norwegisches Verbundzahnmoos, Norway Screw-moss

Abundant, 65 squares: 7, 15, 17, 23, 28, 33, 34, 38, 40, 41, 59-61, 63, 64, 71, 76, 78-91, 94-97, 99, 102, 104, 106-109, 115, 119, 121-135, 143, 151, 163, 170, 171, 198, ground and rock, occasionally on roof, ca. 750 – 2,880 m a.s.l. (TS/IT) and ca. 1,450 – 2,804 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,814 m a.s.l., Horntalerjoch, TN, with further altitudinal limits of 2,800 m a.s.l., Bergertörl near Kals, TE (the same elevation also in Vorarlberg, Sulzfluh), 2,700 m a.s.l., Fimberpass, TN, 2,750 m a.s.l., and Zunig, TE. IT: up to **3,960 m a.s.l.**, Grivola, Aosta, an altitudinal range of 2,400 – 2,700 m a.s.l. in Piedmont, 2,700 m a.s.l., Wolfendorn, TS, and 2,440 – 2,600 m a.s.l., Padon, Val di Fassa, Trentino. CH: 570 – 3,620 m a.s.l., 2,450 – 2,850 m a.s.l., Isla Persa, (Oostendorp-Bourgonjon 1977). FR: 2,500 m a.s.l., Tignes, Savoy.

Syntrichia papillosa (WILS.) JUR.;

Syn.: *Tortula papillosa* WILS. (Pottiaceae), Warziges Haarmoos, Marble Screw-moss

Recorded in seven squares in the TS/IT part only, squares 3, 146, 147, 172, 184, 192, 194, on bark and on rock, ca. 525 m a.s.l. to 1,500 – 1,800 m a.s.l.

AT: a maximum elevation of 900 m a.s.l., with a further elevation limit of 870 m a.s.l., Arzl in Pitztal, TN. IT: **2,420 m a.s.l.**, above Lago Angel, Gran Paradiso National Park, Piedmont. CH: 195 m a.s.l. to 1,376 m a.s.l.; FR: 806 m a.s.l., Aime, Savoy.

Red list status: 3 – endangered (DE).

Syntrichia ruralis (HEDW.) WEB. & MOHR; Syn.: *Tortula ruralis* (HEDW.)

GAERTN., MEY. & SCHERB. (Pottiaceae), Erd-Drehzahn, Great Hairy Screw-moss
Very abundant, 152 squares: 3-7, 9-20, 23-28, 32-36, 38-45, 47-50, 52-61, 63, 64, 70, 73-86, 88-90, 92-97, 99-121, 124, 129, 130, 133-138, 140-155, 157-163, 165, 167-170, 172-174, 178, 183-189, 193-195, 198, 200, on ground and rock, occasionally on walls and concrete. Highest occurrence in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, ground, 3,019 m a.s.l., lowest records are ca. 525 m a.s.l. (TS/IT) and 1,450 m a.s.l. (TN/AT). AT: a maximum elevation of 3,480 m a.s.l., with further altitudinal limits of 3,465 m a.s.l., Adlersruhe, Hohe Tauern, TE, and 3,450 m a.s.l., Kreuzspitze, TN. IT: up to 3,450 – 3,559 m a.s.l., Monte Aemilius, Aosta, 3,300 m a.s.l., Schöntaufspitze, TS, and 2,630 – 2,700 m a.s.l., Padon, Val di Fassa, Trentino. CH: 200 m a.s.l. to **3,600 m a.s.l.**, Combin de Corbassieres. FR: 3,429 m a.s.l., Bonneval-sur-Arc, Savoy.

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Syntrichia sinensis (C. MÜLL.) OCHYRA;
Syn.: *Tortula sinensis* (C. MÜLL.) BROTH.
(Pottiaceae), Chinesisches Verbundzahnmoos,
no English name

Three times in TS/IT only, squares 4, Unterstell, ground in hollow way, 750 – 990 m a.s.l.; 5, at Castle Juval, ground in hollow way, 996 – 1,155 m a.s.l.; 9, at Lint, ground in hollow way, 1,155 – 1,260 m a.s.l.

AT: a maximum elevation of **2,500 m a.s.l.**, towards Kaiserjochhaus, St. Anton, TN, with further altitudinal limits of 2,340 m a.s.l. [*S. alpina* (BR. EUR.) JUR. as synonym], Ellmauer Halt, TN, and 1,600 m a.s.l., Froßnitztal, TE. IT: in a range of 600 – 2,000 m a.s.l. in Trentino, and 1,950 m a.s.l., Schlern, TS. CH: 320 m a.s.l. to 2,000 m a.s.l. Red list status: 3 – endangered (AT), CR – threatened from extinction (CH), 0 – extinct or missing (DE).

Syntrichia virescens (DE NOT.) OCHYRA;
Syn.: *Syntrichia pulvinata* (JUR.) JUR.;
Tortula virescens (DE NOT.) DE NOT.
(Pottiaceae), Grünes Verbundzahnmoos,
Lesser Screw-moss

Once in square 146 (TS/IT), Schlanders village at the entrance of Schlandrauntal, bark, 780 – 900 m a.s.l.

AT: a maximum elevation of 1,520 m a.s.l., Kohllahner Sattel, TN, with further altitudinal limits of 1,000 m a.s.l., Wattens, TN, and 980 m a.s.l., St. Margarethen, Pitztal, TN. IT: up to 1,630 – 1,680 m a.s.l., below Gimillan, Gran Paradiso National Park, Aosta. CH:

255 m a.s.l. to **1,840 m a.s.l.**; FR: 1,465 m a.s.l., Aussois, Savoy.

Red list status: V – decreasing (DE).

Tayloria froelichiana (HEDW.) MITT.
(Splachnaceae), Froelich-Halsmoos,
no English name

Twice in TS/IT only, squares 23, Klosteralm, soil, ca. 2,240 – 2,550 m a.s.l.; 126, Pfelderertal below Labkofel near saddle, snow patch, 2,400 – 2,571 m.

AT: a maximum elevation of 3,000 m a.s.l., Schleinitz, TE, with further altitudinal limits of 2,720 m a.s.l., Kesselspitze, Gschnitztal, TN, and 2,900 m a.s.l., Kalser Tauern, TE. IT: up to **3,200 m a.s.l.**, Capanna Linty, Aosta, in a range up to 3,200 m a.s.l. in Trentino, and 2,900 m a.s.l., Mittereck bei St. Valentin, TS. CH: 1,380 – 3,100 m a.s.l.; FR: 2,550 m a.s.l., Pralognan-la-Vanoise, Savoy.

Tetraphis pellucida HEDW.

(Tetraphidaceae), Durchsichtiges

Georgsmoos, Pellucid Four-tooth Moss

Abundant, 42 squares: 1, 17, 18, 20, 21, 24, 26, 27, 35-38, 43, 45, 49, 86, 93, 94, 99, 102, 103, 107, 109, 114, 134-137, 139, 149, 150, 171, 178, 185-191, 195, 196, on rotten wood and rock, ca. 690 – 2,050 m a.s.l. (TS/IT) and ca. 1,450 – 1,930 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,365 m a.s.l., Wurmtaljoch, Pitztal, TN, with further altitudinal limits of 2,200 m a.s.l., Patscherkofel, TN, and 1,700 m a.s.l., Kalser Törl, TE. IT: up to 1,700 – 2,300 m a.s.l., between Lillaz and Lago di Loie, Gran Paradiso National Park,

Aosta, CH: 300 m a.s.l. to **2,400 m a.s.l.**; FR: 1,703 m a.s.l., Beaufort-sur-Doron, Savoy.

Tetraplodon angustatus (HEDW.)

BRUCH & SCHIMP. (Splachnaceae),
Schmalfrüchtiges Vierzackmoos,
Narrow Cruet-moss

Three times in TS/IT only, squares 35, at Lafezbach, dung, ca. 1,480 – 1,520 m a.s.l.; 37, Mastauntal, dung, ca. 1,790 – 1,900 m a.s.l.; 56, Finailtal, dung on boulder, ca. 1,950 – 2,020 m a.s.l.

AT: a maximum elevation of 2,400 m a.s.l., Almindalpe, Fotschertal, Sellrain, TN, with further altitudinal limits of 2,100 m a.s.l., Mitterkogel, Inzing, TN, and 1,700 m a.s.l., Großbachlat, Innervillgraten, TE. IT: in a range of 1,400 – 2,300 m a.s.l. in Trentino, 1,260 – 1,420 m a.s.l., Mühlwald, Taufers, TS. CH: 1,150 – **2,541 m a.s.l.**

Red list status: 4 – potentially endangered (AT), EN – endangered (CH), 3 – endangered (DE).

Tetraplodon mnioides (HEDW.)

BRUCH & SCHIMP. (Splachnaceae),
Sternmoosartiges Vierzackmoos,
Slender Cruet-moss (Fig. 5.28)

Eight squares: 38, 49, 83, 86, 92, 95, 120, 127, on dung, ca. 1,900 – 2,400 m a.s.l. (TS/IT) and ca. 1,700 – 2,250 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,660 m a.s.l.**, Neualpe at Lienz, TE, with further altitudinal limits of 2,600 – 2,650 m a.s.l., between Fotscherferner, Hochgrafjoch and Hippold, TN, 2,643 m a.s.l., Roßkogel, TN, and 2,600 m a.s.l., Predigtberg, Galtür, TN. For IT, no altitudinal limits revealed so far. CH:



Fig. 5.28: Slender Cruet-moss (*Tetraplodon mnioides*) typically growing on dung, but rare

820 – 2,500 m a.s.l.

Red list status: 4 – potentially endangered (AT), VU – vulnerable (CH), 3 – endangered (DE), AR – at risk (FR).

Thamnobryum alopecurum (HEDW.)

GANGULEE (Neckeraceae), Fuchsschwanz-Bäumchenmoos, Fox-tail Feather-moss

Five times: squares 13 (TS/IT), near Altratheis, ground, 856 – 880 m a.s.l.; 14 (TS/IT), at Altratheis, ground, ca. 880 – 900 m a.s.l.; 101 (TN/AT), Martlaswald, ground, ca. 16,90 – 1,700 m a.s.l.; 105 (TN/AT), at Zwieselstein village, ground, ca. 1,470 – 1,500 m a.s.l.; 195 (TS/IT), Villnoder, ground, 690 – 700 m a.s.l. AT: a maximum elevation of 1,400 m a.s.l., with further altitudinal limits of 1,000 m a.s.l., Voldertal, TN, and ca. 750 m a.s.l.,

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Pfister at Lienz, TE. IT: 1,050 – 1,100 m a.s.l., at Noasca, Gran Paradiso National Park, Aosta, and 1,000 – 1,100 m a.s.l., Reinbachfall, Taufers, TS. CH: 200 – **1,864 m a.s.l.** For DE a highest altitude 1,320 m a.s.l. (Bavaria). FR: 1,030 m a.s.l., Montcel, Savoy.
Red list status: V – decreasing (DE).

Thuidium assimile (HEDW.) JAEGER;

Syn.: *Thuidium philibertii* Limpr.

(Thuidiaceae), Haarspitzen-Thujamoos,

Philibert's Tamrisk-moss

34 squares: 1, 6, 13-20, 24, 25, 32, 33, 87, 108, 110-113, 140, 148, 151, 172, 177, 178, 180, 181, 183, 184, 190, 192, 194, 197, ground, once in a degraded peat bog, ca. 555 – 1,950 m a.s.l. (TS/IT) and ca. 1,470 – 1,940 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,400 m a.s.l.**, with further limits of 1,550 m a.s.l., St. Anton, TN, 1,450 m a.s.l., Aschbach and Hochzeiger, TN. IT: up to 1,700 – 1,720 m a.s.l., between Valnontey and Valmianaz, Gran Paradiso National Park, Aosta, in a range of 500 – 1,200 m a.s.l. in Trentino, and ca. 1,000 m a.s.l., above Partschins and Meran, TS. CH: 200 – 2,340 m a.s.l.; FR: 1,550 m a.s.l., Saint-Jain-de-Belleville, Savoy.

Red list status: V – decreasing (DE).

Thuidium delicatulum (HEDW.) SCHIMP.

(Thuidiaceae), Zartes Thujamoos,

Delicate Tamarisk-moss

Recorded for two squares in TS/IT only, squares 16, Neuratheis, rock, ca. 960 – 980 m a.s.l. and 130, Pfelderertal, Pfelderer Alm, ground, 1,770 – 1,820 m a.s.l.

AT: a maximum elevation of **2,600 m a.s.l.**, with further limits of 2,000 m a.s.l., Steiner-alpe, TE, 1,700 m a.s.l., Kals, TE, and 1,600 m a.s.l., Praxmar, Sellrain, TN. IT: up to 1,870 – 1,940 m a.s.l., Piano di Eugio, Gran Paradiso National Park, Piedmont. CH: 194 – 2,294 m a.s.l. For DE a highest altitude of 2,115 m a.s.l. (Bavaria). FR: 2,000 m a.s.l., Saint-Sorlin-D'Arves, Savoy.

Red list status: V – decreasing (DE).

Thuidium tamariscinum (HEDW.)

SCHIMP. (Thuidiaceae), Tamarisken-

Thujamoos, Common Tamarisk-moss

Recorded for two squares in TS/IT only, squares 141, Pfelderertal at Moos in Passeier, ground, ca. 980 – 1,026 m a.s.l. and 195, Villnoder, ground, 690 – 700 m a.s.l.

AT: a maximum elevation of **2,470 m a.s.l.**, Möserlingwand, TE, with further altitudinal limits of 2,200 – 2,360 m a.s.l., Geisstein, TN, and 1,450 m a.s.l., near Stripsenjoch, TN. IT: ca. 770 m a.s.l., near Stroba, Gran Paradiso National Park, and 2,240 – 2,400 m a.s.l., Padon, Val di Fassa, Trentino. CH: 294 – 2,460 m a.s.l.; FR: 2,000 m a.s.l., Modane, Savoy.

Timmia austriaca HEDW. (Timmiaceae),

Österreichisches Grobzahnmoos,

Sheathed Timmia

12 squares: 35, 39, 42, 43, 83, 84, 90, 99, 109, 127, 132, 173, on rock and ground, ca. 1,508 – 2,400 m a.s.l. (TS/IT) and ca. 1,450 – 2,250 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,600 m a.s.l., Mellitz, TE, with further altitudinal limits of

2,500 m a.s.l., Hohe Mut, Obergurgl, TN, and 2,400 m a.s.l., Neunerkogel, Sellrain, TN. IT: up to **2,900 m a.s.l.**, Lancebranlette, Aosta, documented from an altitudinal range of 2,400 – 2,700 m a.s.l. in Piedmont, 2,340 – 2,600 m a.s.l., Padon, Val di Fassa, Trentino, and 2,200 m a.s.l., Valsunspitze, Brenner, TS. CH: 550 – 2,762 m a.s.l.; FR: **2,900 m a.s.l.**, Pralognan-la-Vanoise, Savoy. Red list status: G – risk assumed (DE).

Timmia bavarica HESSL. (Timmiaaceae),

Bayerisches Grobzahnmoos,
no English name

Four times, squares 81 (TN/AT), Niedertal, ground, ca. 1,900–2,050 m a.s.l.; 82 (TN/AT), above Vent village towards Rofen, ground, ca. 1,940 – 2,100 m a.s.l.; 83 (TN/AT), Mutsbichl, ground, 2,250 m a.s.l.; 129 (TS/IT), Pfelderertal, Pfelderer Alm, ground, 1,820 – 1,860 m a.s.l.

AT: an altitudinal range of 450 – 2,750 m a.s.l., with further limits of 2,600 m a.s.l., Tauern, TE, 2,120 – 2,340 m a.s.l., Stubai Alps, TN. IT: up to **3,200 – 3,300 m a.s.l.**, Col Lauzon, Aosta, 2,370 – 2,470 m a.s.l., Pordoijoch, Val di Fassa, Trentino, and 2,650 m a.s.l., Lenkjochhütte at Kasern, TS. CH: 200 – 2,790 m a.s.l.; FR: 2,730 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: G – risk assumed (DE).

Tomentypnum nitens (HEDW.) LOESKE;

Syn.: *Homalothecium nitens* (HEDW.)

ROBINS. (Amblystegiaceae), Glänzendes Filzschlafmoos, Woolly Feather-moss

Nine squares: 43, 44, 81, 82, 104, 158, 175, 182, 195, bog, flush and "Schwinggras", ca. 1,450 – 1,900 m a.s.l. (TS/IT) and ca. 1,900 – 2,100 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,640 m a.s.l.** (Lungau, Salzburg), with further altitudinal limits of 1,990 m a.s.l., Kitzbühler Horn, TN, and 920 m a.s.l., Klauswald, Matrei i.O., TE. IT: 1,680 m a.s.l., between Valnontey and Valmianaz, Gran Paradiso National Park, Aosta, 2,110 – 2,200 m a.s.l., Pordoijoch, Buchenstein, Trentino, 1,475 m a.s.l., Reschensee, TS. CH: 200 – 2,590 m a.s.l.; FR: 2,500 m a.s.l., Pralognan-la-Vanoise, Savoy.

Red list status: 3 – endangered (AT), 2 – severely endangered (DE).

Tortella fragilis (HOOK. & WILS.)

LIMPR. (Pottiaceae), Zerbrechliches

Spiralzahnmoos, Fragile Twisted Moss

34 squares: 23, 55, 58, 59, 60, 64, 70, 71, 74, 76, 78, 83-85, 89, 92, 94, 95, 103, 108, 117, 121, 122, 124, 126, 127, 132, 134, 135, 160-163, 185, rock and ground, occasionally on a wall, ca. 1,550 – 2,790 m a.s.l. (TS/IT) and ca. 1,470 – 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,160 m a.s.l., crest between Granatenkogel and Hochfirst, TN, with further altitudinal limits of 3,020 m a.s.l., crest between Festkogel and Granatenkogel, Ötztal, TN, 2,300/2,900 m a.s.l., between Johannishütte and Defregger Haus, TE, and 2,689 m a.s.l., Möserlingwand, TE. IT: up to 3,330 m a.s.l., La Thuile, Aosta, 2,340 – 2,600 m a.s.l., Padon, Val di Fassa, Trentino, and 3,300 m a.s.l., Schöntaufspitze,

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Sulden, TS. CH: 429 m a.s.l. to 3,260 m a.s.l., Piz Languard, and **3,800 m a.s.l.**, Matterhorn. FR: 2,800 m a.s.l., Bonneval-sur-Arc, Savoy. Red list status: G – risk assumed (DE).

Tortella inclinata (R. HEDW.) LIMPR.
(Pottiaceae), Geneigtes Spiralzahnmoos,
Bent Twisted Moss

Three records, squares 88 (TN/AT), Ventertal near Gampe, river bank, ca. 1,830 – 1,840 m a.s.l.; 126 (TS/IT), Pfelderertal below Labkofel near saddle, ground/gravel, 2,400 – 2,571 m a.s.l.; 130 (TS/IT), Pfelderertal, Pfelderer Alm, gravel, 1,770 – 1,820 m a.s.l.

AT: a maximum elevation of 2,600 m a.s.l., e.g. Neunerkogel, Sellrain, TN, with a further elevation limit of 2,400 m a.s.l., Musing, TE. IT: up to 2,650 – 2,700 m a.s.l., Colle del Nivolet, Gran Paradiso National Park, Aosta, 1,600 m a.s.l., Monte Baldo, Trentino, and 1,470 m a.s.l., Graun, TS. CH: 200 – **2,867 m a.s.l.**; FR: 2,500 m a.s.l., Bessans, Savoy. Red list status: V – decreasing (DE).

Tortella tortuosa (HEDW.) LIMPR.
(Pottiaceae), Gekräuselttes Spiralzahnmoos,
Frizzled Crisp-moss (Fig. 5.29)

Very abundant, 113 squares: 1, 5, 7, 9-11, 13-15, 17, 18, 24-26, 32, 35, 38, 41, 42, 44, 47, 49, 52, 54-60, 64, 70, 73-77, 79-81, 83-90, 92, 94-96, 99-101, 103-107, 109, 111-113, 115-119, 121-123, 126-136, 138, 141, 143, 145, 148-153, 157-163, 173, 174, 177, 178, 180, 181, 185, 188, 189, 193-195, 198, on rock and on ground, ca. 525 – 2,700 m a.s.l. (TS/IT) and ca. 1,450 – 2,560 m a.s.l. (TN/AT).



Fig. 5.29: Frizzled Crisp-moss (*Tortella tortuosa*), usually on rock but also on ground, reaching 2,700 m a.s.l. in TS/IT

AT: a maximum elevation of 2,920 m a.s.l., Tauern, TE, with a further elevation limit of 2,700 m a.s.l., Grieser Grieskogel, Sellrain, TN. IT: up to **3,920 m a.s.l.**, Grivola, Aosta, 2,900 m a.s.l., Mittereck bei St. Valentin, TS, 2,760 m a.s.l., Sorapiss in Ampezzo, Trentino. CH: 200 m a.s.l. to 3,400 m a.s.l., Cima del Largo. FR: 3,429 m a.s.l., Bonneval-sur-Arc, Savoy. Red list status: V – decreasing (DE).

Tortula atrovirens (SM.) Lindb. (Pottiaceae), Schwärzlicher Drehzahn, Rib-leaf Moss
Recorded twice in TS/IT only, squares 3, Naturns village, wall, 560 – 580 m a.s.l. and 146, Schlanders village at begin Schlandrauntal, rock, 780 – 900 m a.s.l.
AT: a maximum elevation of **1,170 m a.s.l.**, with a further elevation limit of 975 – 1,027 m a.s.l., Hohe Tauern, Virgen, TE. IT: 650 m a.s.l., Klausen, TS. CH: 233 m a.s.l. to 940 m

a.s.l.; FR: 750 m a.s.l., La Cote-D'Aime, Savoy.
Red list status: 2 – severely endangered (AT),
VU – vulnerable (CH), 3 – endangered (DE).

Tortula canescens MONT. (Pottiaceae),

Grauer Drehzahn, Dog Screw-moss

Once in square 15 (TS/IT), Unterperfl,
ground, ca. **1,360 – 1,420 m a.s.l.**

AT: a maximum elevation of 1,000 m a.s.l.,
Thurner Berg at Lienz, TE. IT: 750 m a.s.l.,
Vellau, TS. Recently confirmed for the
Basilicata region of IT, ca. 374 m a.s.l., Matera
(Poponesi & Aleffi 2017). CH: 200 m a.s.l. to
900 m a.s.l.

Red list status: 0 – extinct (AT), CR –
threatened from extinction (CH), 2 – severely
endangered (DE).

Tortula hoppeana (SCHULTZ) OCHYRA;

Syn.: *Desmatodon latifolius* (HEDW.) BRID.

(Pottiaceae), Breitblättriges Bandzahnmoos,
no English name

According to recent nomenclatural changes,
the former *Desmatodon latifolius* has to be
changed to *Tortula hoppeana* (Ochyra 2004).
32 squares: 23, 50, 56-58, 60, 69, 72, 73,
77-79, 82, 91, 114, 115, 118-122, 128, 130,
162-165, 168, 170, 185, 193, 194, on ground
(often open soil) and rock, ca. 525 – 2,610 m
a.s.l. (TS/IT) and ca. 1,790 – 2,800 m a.s.l.
(TN/AT).

AT: an altitudinal range of ca. 1,500 – 3,300 m
a.s.l., with further altitudinal limits of 2,400
– 3,200 m a.s.l., Habicht, TN, and 3,150 m
a.s.l., Mullwitzaderl, Großvenediger, TE. IT:
up to **3,450 – 3,550 m a.s.l.**, Monte Aemilius,

Aosta, 2,500 m a.s.l., Monte Cavallazzo,
Trentino, and 3,300 m a.s.l., Schöntaufspitze,
TS. CH: 100 – 3,500 m a.s.l., Monte Rosa (IT,
partly CH). FR: 2,900 m a.s.l., Bessans, Savoy.
Red list status: V – decreasing (DE).

Tortula lanceolata ZANDER;

Syn.: *Pottia lanceolata* (HEDW.) C. MÜLL.

(Pottiaceae), Lanzettblättriges Pottmoos,

Lance-leaved Pottia

Once, square 193 (TS/IT), at Cloister Säben,
Tinnetal, ground/road bank, 525 – 570 m a.s.l.

AT: a maximum elevation of 1,100 m a.s.l.,
Umhausen, Ötztal. TN, with a further limit
of 1,040 m a.s.l., Steinach, TN. IT: 500 m
a.s.l., Schenna, TS. CH: 200 to **1,400 m a.s.l.**;
FR: 730 m a.s.l., La Cote-D'Aime, Savoy.

Red list status: VU – vulnerable (CH), V –
decreasing (DE).

Tortula leucostoma (R. BR.) HOOK. &

GREV.; Syn.: *Desmatodon leucostoma*

(R. BR.) BERGGGR. (Pottiaceae),

Weissmund-Bandzahnmoos, Alpine Pottia

32 squares: 5, 15, 17, 52-54, 58, 64, 67, 68,
70-76, 79, 81-84, 87, 89, 90, 104, 127, 129,
133, 134, 169, 185, on ground and on rock,
ca. 550 – 2,535 m a.s.l. (TS/IT) and ca. 1,770
– 2,880 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,900 m a.s.l.,
at Glatzberg near Kals, TE, with further alti-
tudinal limits of 2,530 m a.s.l., Wurmbachtal,
Pitztal, TN, 2,400 m a.s.l., Hinterbichl, TE,
2,270 m a.s.l., Kleiner Rappenkopf, TN. IT:
up to **3,450 m a.s.l.**, Monte Aemilius, Aosta,
and in a range of 1,600 – 3,000 m a.s.l.

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in Trentino. CH: 1,600 – 3,260 m a.s.l., Pitz Langard and Parpaner Weisshorn. FR: 2,950 m a.s.l., Bessans, Savoy.

Red list status: 4, NT – potentially endangered (AT, CH), 0 – extinct or missing (DE).

Tortula modica ZANDER;

Syn.: *Pottia intermedia* (TURN.) FUERNR.

(Pottiaceae), Mittleres Pottmoos,

Blunt-fruited Pottia

Recorded in five squares in TS/IT only, squares 6, at Tschars village, ground, 790 – 933 m a.s.l.; 7, at Castle Juval, ground, 980 – 1,300 m a.s.l.; 10, at Innerunterstell, ground, 1,400 – 1,460 m a.s.l.; 111, begin of Pfossental, ground/road bank, 1,380 – 1,450 m a.s.l.; 193, at Cloister Säben, Tinnetal, ground/road bank, 525 – 570 m a.s.l.

AT: a maximum elevation of 1,100 m a.s.l., with a further limit of 800 m a.s.l., between Pians and Landeck, TN. IT: **1,460 – 1,620 m a.s.l.**, Andraz at Buchenstein, Trentino, and 300 – 400 m a.s.l., Meran, TS. CH: 200 to 1,530 m a.s.l. For DE a highest altitude of 1,450 m a.s.l. (Bavaria). FR: 750 m a.s.l., La Cote-D’Aime, Savoy.

Red list status: r: 2 – regionally severely endangered (AT).

Tortula mucronifolia SCHWÄGR.

(Pottiaceae), Stachelblättriger Drehzahn,

no English name

In three squares in TS/IT only, squares 24, at Karthaus village, ground, ca. 1,250 – 1,280 m a.s.l.; 42, at Vernagt reservoir, rock, ca. 1,700 – 1,780 m a.s.l.; 43, at Vernagt reservoir, ground, ca. 1,700 – 1,780 m a.s.l.

AT: an altitudinal range of 500 – 2,860 m a.s.l. (Hochgölling, Styria), with further altitudinal limits of 2,635 m a.s.l., Roßkogel, TN, 2,500 – 2,600 m a.s.l., Matrei i.O., TE, and 1,500 – 1,900 m a.s.l., Musing, TE. IT: up to **3,700 – 3,800 m a.s.l.**, Grivola, Aosta, in a range of 1,500 – 3,500 m a.s.l. in Trentino, 1,700 m a.s.l., Stillferjochstraße, Trafoi, TS. CH: 405 – 3,547 m a.s.l.; FR: 2,800 m a.s.l., Bessans, Savoy.

Red list status: G – risk assumed (DE).

Tortula muralis HEDW. (Pottiaceae),

Mauer-Drehzahn, Wall Screw-moss

19 squares: 2, 3, 5, 9, 34, 42, 63, 96, 113, 143, 146, 171, 172, 183, 184, 193-195, 198, usually on walls and concrete but may be also on ground and on rock. Highest record in square 63 (TN/AT, TS/IT), Niederjoch near Similaunhütte, ground, 3,019 m a.s.l., lowest measures ca. 525 m a.s.l. (TS/IT) and ca. 1,590 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,850 m a.s.l., Musing, TE, with a further limit of 2,808 m a.s.l., Scharlthkopf, Nauders, TN. IT: 2,580 m a.s.l., Lago Miserin, Aosta, 1,460 – 1,620 m a.s.l., Andraz at Buchenstein, Trentino, 3,010 m a.s.l., Langtaufers, TS, and 3,300 m a.s.l., Schöntaufspitze, TS. CH: 200 to 2,625 – 2,850 m a.s.l., Isla Persa. FR: **3,550 m a.s.l.**, Val-D’Isere, Savoy.

Tortula obtusifolia (SCHWAEGR.)

MATH.; Syn.: *Tortula muralis* ssp. *obtusifolia*

(SCHWÄGR.) CULM. (Pottiaceae),

Stumpfbältriges Drehzahnmoos,

no English name

Recorded for five squares in TS/IT only. Squares 5, at Castle Juval, steppe heath, 550 – 790 m a.s.l.; 9, at Lint, dry ground, 1,155 – 1,465 m a.s.l.; 15, Unterperfl, dry ground, ca. 1,360 – 1,420 m a.s.l.; 143, at Schlanders vil- lage, dry ground, ca. 750 – 850 m a.s.l.; 144, above Schlanders village at Tappein Hof, dry ground, 1,397 – 1,450 m a.s.l. New to provin- ce Trentino-Alto Adige!

AT: a maximum elevation of 2,750 m a.s.l., between Johannishütte and Kapunitzköpf, TE, with further altitudinal limits of 1,400 m a.s.l., Vennatal, Brenner, TN, and 1,640 – 1,700 m a.s.l., Innervillgraten, TE. IT: up to 2,154 m a.s.l., Piccolo S. Bernardo, Aosta. CH: 275 m a.s.l. to **3,260 m a.s.l.**; FR: 2,850 m a.s.l., Bessans, Savoy.

Red list status: 4 – potentially endangered (AT), CR – threatened from extinction (CH), 3 – endangered (DE).

Tortula subulata HEDW. (Pottiaceae),

Pfriemen-Drehzahn, Awl-leaved Screw-moss
Abundant, 38 squares: 3, 4, 7, 9, 10, 13-16, 18, 20, 24, 25, 32, 33, 41, 42, 55, 84, 85, 94, 109, 111-113, 116, 138, 140, 141, 143, 145, 147, 149, 171-174, 184, on ground, occasion- ally on rock, track bank and wall, ca. 560 – 1,950 m a.s.l. (TS/IT) and ca. 1,450 – 2,130 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,450 m a.s.l., above Leutkircher Hütte, St. Anton, TN, with further altitudinal limits of 2,100 m a.s.l., Karwendelkirchle, TN, and 1,580 m a.s.l., Innervillgraten, TE. IT: up to 2,050 – 2,500 m a.s.l., Lauson valley, Gran Paradiso National Park, Aosta, 1,460 – 1,620 m a.s.l., Andraz at

Buchenstein, Trentino, 1,700 m a.s.l., Penegal near Bozen, TS. CH: 194 m a.s.l. to 2,440 m a.s.l.; FR: **2,700 m a.s.l.**, Val-D'Isere, Savoy. For DE a highest altitude of 2,210 m a.s.l. (Bavaria).

Red list status: V – decreasing (DE).

Trematodon ambiguus (HEDW.)

HORNSCH. (Bruchiaceae),

Gelbstieliges Lochzahnmoos,

Ambiguous Long-necked Moss

One record, square 104 (TN/AT), Gaislach- alm, ground, ca. 1,930 m a.s.l. (see Hofbauer et al. 2011).

AT: a maximum elevation of 1,900 m a.s.l., Innervillgraten, TE, with a further limit of 1,800 m a.s.l., Zeinisjoch, St. Anton, TN. IT: in a range of 1,000 – 2,000 m a.s.l. in Trentino, 1,900 m a.s.l., Seiseralm, TS and **2,200 m a.s.l.**, at the Bildstockjoch near Kurzras in Schnalstal, TS. CH: 400 to 2,100 m a.s.l.

Red list status: 2 – severely endangered (AT, DE), VU – vulnerable (CH), AR – at risk (FR).

Trichocolea tomentella (EHRH.)

DUMORT. (Trichocoleaceae), Filziges

Haarkelchmoos, Handsome Woollywort

One record, square 195 (TS/IT), Villnoder, ground, 690 – 700 m a.s.l.

AT: a maximum elevation of 1,100 m a.s.l., e.g. Hoher Lahner, TN, with a further limit of ca. 1,000 m a.s.l., Tulfes, TN. IT: 1,600 m a.s.l., Windtal at Prettau, TS. CH: 200 m a.s.l. to **2,600 m a.s.l.** For DE a highest altitude of 1,700 m a.s.l. (Bavaria) is recorded. FR: 1,570 m a.s.l., Peisey-Nancroix, Savoy.

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Red list status: NT – near threatened (IT), 3 – endangered (DE).

Tritomaria exsecta (SCHMIDEL) LOESKE (Lophoziaceae), Kleines Ungleichlappenmoos, Cut Notchwort

Seven squares: 22, 91, 103, 136, 137, 160, 171, on ground, track bank and rotten wood, ca. 1,425 – 2,300 m a.s.l. (TS/IT) and ca. 1,790 – 2,160 m a.s.l. (TN/AT).

AT: a maximum elevation of 3,000 m a.s.l., near Düsseldorf Hütte, TN, with further altitudinal limits of 2,500 m a.s.l., Lienz, TE, 1,700 m a.s.l., Roßkaiser, TN, and 1,650 m a.s.l., Haggen, Sellrain, TN. IT: up to 2,000 – 2,245 m a.s.l., Seyvaz valley, Aosta, in a range of 500 – 2,000 m a.s.l. in Trentino, 2,600 m a.s.l., near St. Martin in Passeier, TS. CH: 260 m a.s.l. to 2,826 – 2,850 m a.s.l.; FR: 1,580 m a.s.l., Peisey-Nancroix, Savoy. For the Alps, a highest altitude of **3,050 m a.s.l.** is given, without precise location.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Tritomaria exectiformis (BREIDL.)

LOESKE (Lophoziaceae), Großzelliges

Ungleichlappenmoos, Large Cut Notchwort

Four squares with records: 25 (TS/IT), at Karthaus village, ground, 1,485 m a.s.l.; 43 (TS/IT) at Vernagt reservoir, ground, ca. 1,700 – 1,780 m a.s.l.; 83 (TN/AT), Mutsbichl, ground, ca. 2,130 – 2,250 m a.s.l.; 150 (TS/IT), lower Schlandrauntal, ground, 1,483 – 1,740 m a.s.l.

AT: an altitudinal range of ca. 400 – 2,700 m a.s.l., with further altitudinal limits of ca.

2,400 m a.s.l., Ködnitztal, TE, 2,000 m a.s.l., Silvretta, TN, and 1,500 m a.s.l., at Trenkwald and Plangeross, Pitztal, TN. IT: up to 1,830 – 2,100 m a.s.l., near Tribola Glacier, Gran Paradiso National Park, Aosta, and in a range of 500 – 2,500 m a.s.l. in Trentino. CH: 480 m a.s.l. to **2,740 m a.s.l.**; FR: 1,989 m a.s.l., Bessans, Savoy.

Red list status: NT – near threatened (IT, CH), V – decreasing (DE).

Tritomaria polita (NEES) JÖRG.;

Syn.: *Saccobasis polita* (NEES) H. BUCH

(Lophoziaceae), Höfliches Ungleichlappenmoos, Polite Notchwort

Recorded in two squares in TN/AT only, squares 82, above Vent village towards Rofen, flush, ca. 1,940 – 2,100 m a.s.l. and 89, Venteral at Koner Rinne, wet ground, ca. 1,840 – 1,860 m a.s.l.

AT: a maximum elevation of **3,470 m a.s.l.**, Hinterer Seelenkogel, TN, with further altitudinal limits of 2,600 m a.s.l., Glungezer summit, TN, and 2,540 m a.s.l., Ködnitzhaus, Kals, TE. IT: up to 2,746 – 2,770 m a.s.l., at Lago Trebecchi, Gran Paradiso National Park, Aosta, and 2,000 m a.s.l., Kirchbergtal, Ulten, TS. CH: 1,399 m a.s.l. to 2,840 m a.s.l.; FR: 2,700 m a.s.l., Bessans, Savoy.

Red list status: NT – near threatened (IT), R – extremely rare (DE).

Tritomaria quinquedentata (HUDS.) H.

BUCH.; Syn.: *Trilophozia quinquedentata*

(HUDS.) BAKALIN (Lophoziaceae),

Fünzfähniges Ungleichlappenmoos,

Lyon's Notchwort

17 squares: 13, 20, 24, 26, 33, 57, 65, 71, 99, 107, 111, 114, 116, 136, 157, 159, 167, on ground, soil and rock. Highest record in square 65 (TN/AT, TS/IT), Niederjochferner near discovery place, soil, ca. 3,200 m a.s.l., not lower than 856 m a.s.l. (TS/IT) and 1,525 m a.s.l. (TN/AT).

AT: a maximum elevation of **3,400 m a.s.l.**, Hinterer Spiegelkogel, TN with further altitudinal limits of 2,600 m a.s.l., Messelingkogel at Matrei i.O., TE, 2,600 m a.s.l., Zischgeles at Praxmar, TN, and 2,530 m a.s.l., Kirchdachscharte, TN. IT: 1,900 m a.s.l., near Pian de la Pesse, Aosta, and 2,000 m a.s.l., Jaufen, Brenner, TS. CH: 270 m a.s.l. to 2,992 m a.s.l.; FR: 2,600 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: NT – near threatened (IT), V – decreasing (DE).

Tritomaria scitula (TAYLOR) JÖRG.

(Lophoziaceae), Hübsches Ungleichlappenmoos, Mountain Notchwort

Twice, square 63, (TN/AT, TS/IT) slope behind Similaunhütte 3,050 m a.s.l.; square 100 (TN/AT), Ventertal at Freistabl, ground, ca. 1,550 – 1,560 m a.s.l.

AT: a maximum elevation of 3,400 m a.s.l., Hinterer Spiegelkogel, Ötztaler Alps, TN, with further altitudinal limits of ca. 2,700 m a.s.l., Ködnitztal, TE, and 2,600 m a.s.l., Glungezer, TN. IT: up to 2,580 – 2,680 m a.s.l., Lauson valley, Gran Paradiso National Park, Aosta, documented from an altitudinal range of 2,400 – 2,700 m a.s.l. in Piedmont, and in a range of 2,000 – **3,500 m a.s.l.** in Trentino. CH: 900 m a.s.l. to 3,010 m a.s.l.; FR: 2,800 m a.s.l., Bonneval-sur-Arc, Savoy.

Red list status: NT – near threatened (IT), 0 – extinct or missing (DE), AR – at risk (FR).

Ulota crispa (HEDW.) BRID.

(Orthotrichaceae), Gewöhnliches Krausblattmoos, Crisped Pincushion

One record, square 14 (TS/IT), at Altratheis, bark, ca. 880 – 900 m a.s.l.

AT: a maximum elevation of 1,600 m a.s.l., near Hall i.T., TN, with a further limit of 975 – 1,500 m a.s.l., Matrei i.O., TE. IT: **2,100 m a.s.l.**, Faloria, Ampezzo, Trentino. CH: 194 – 1,516 m a.s.l.; FR: 1,762 m, Saint-Martin-de-Belleville, Savoy.

Red list status: 3 – endangered (DE).

Warnstorfia exannulata (SCHIMP.)

LOESKE (Calliergonaceae), Ringloses Moorsichelmoos, Ringless Hook-moss

Abundant, 50 squares: 23, 31, 46, 48, 50-53, 58, 60, 61, 63, 67, 68, 70-74, 76-79, 81, 82, 84, 87, 89, 90, 104, 107, 118, 124, 127, 136, 138, 150-152, 154, 157-159, 161, 163, 166, 167, 182, 198, 199, wet ground/place, rock, river, river bank, boggy place, spring, flush, peat bog, ca. 1,380 – 2,875 m a.s.l. (TS/IT) and 1,770 – 2,880 m a.s.l. (TN/AT).

AT: a maximum elevation of 2,650 m a.s.l., with further limits of 2,600 m a.s.l., Timmelsjoch, TN and Rendel at St. Anton, TN, 2,560 m a.s.l., Innervillgraten, TE, and 2,500 m a.s.l., above Riffsee, Pitztal, TN. IT: up to **3,400 – 3,500 m a.s.l.** (should be checked!), Grivola, Aosta, 2,650 – 2,700 m a.s.l., Colle del Nivolet, Gran Paradiso National Park, Piedmont, 2,600 m a.s.l., Wormser Joch, TS. CH: 270 – 2,700 m a.s.l., Piz Umbrail. FR:

5 Results

2,520 m a.s.l., Bonneval-sur-Arc, Savoy. Records above 2900 m a.s.l. should be checked. Red list status: r: 3 – locally endangered (AT), V – decreasing (DE).

Warnstorfia fluitans (HEDW.) LOESKE
(Calliergonaceae), Flutendes Moorsichelmoos,
Floating Hook-moss
13 squares: 30, 36, 43, 49, 50, 70, 81, 82, 154,
161, 170, 171, 198, wet ground, flush, bog,
peat bog, river bank, river, ca. 1,640 – 2,220 m
a.s.l. (TS/IT) and ca. 1,900 – 2,800 m a.s.l.
(TN/AT).

AT: a maximum elevation of 2,560 m a.s.l.,
Peischlerpass, TE, with further altitudinal lim-
its of 2,200 m a.s.l., Schwarzenstein, Ziller-
taler Alps, TN, and 1,800 m a.s.l., Senderstales,
TN. IT: up to **3,400 m a.s.l.** (should be
checked!), Grivola, Aosta, 2,200 m a.s.l., 2,100
– 2,200 m a.s.l., Pordoijoch, Buchenstein,
Trentino, and Rittner Horn, TS. CH: 240 –
2,620 m a.s.l.; FR: 2,400 m a.s.l., Montvalezan,
Savoy. For DE a highest altitude of 1,800 m
a.s.l. (Bavaria).

Red list status: 3 – endangered (AT), NT –
potentially endangered (CH), V – decreasing
(DE).

Warnstorfia sarmentosa (WAHLENB.)
HEDENÄS; Syn.: *Calliergon sarmentosum*
(WAHLENB.) KINDB. (Calliergonaceae),
Stumpfbältriges Moorsichelmoos,
Twiggy Spear-moss
22 squares: 22, 31, 51-53, 61, 70, 71, 73, 79,
82, 84, 88, 89, 104, 107, 159-161, 163, 198,
199, wet ground/place, flush, bog, peat bog,

ca. 1,980 – 2,680 m a.s.l. (TS/IT) and ca.
1,780 – 2,630 m a.s.l. (TN/AT).

AT: an altitudinal range of ca. 600 – **2,860 m
a.s.l.**, with further altitudinal limits of
2,550 m a.s.l., below Fotscherferner, TN,
2,200 – 2,500 m a.s.l., Zetttersfeld, Neualpl,
TE, and 2,300 m a.s.l., Gaisbergtal, TN. IT:
up to 2,800 m a.s.l., Grivola, Aosta, in a range
of 1,000 – 2,800 m a.s.l. in Trentino, 2,400 m
a.s.l., Schneeberg, Passeier, TS. CH: 800 –
2,590 m a.s.l.; FR: 2,520 m a.s.l., Bonneval-
sur-Arc, Savoy.

Red list status: r: 1 – regionally threatened from
extinction (AT), 2 – severely endangered (DE).

Weissia brachycarpa (NEES &
HORNSCH.) JUR. (Pottiaceae),
Kleinmündiges Perlmoos,
Small-mouthed Beardless-moss
Recorded in three squares in TS/IT only,
squares 7, at Castle Juval, ground, 780 – 820 m
a.s.l.; 24, at Karthaus village, ground, 1,160
– 1,320 m a.s.l.; 55, at Raffenerhof, ground,
ca. 1,866 – 1,930 m a.s.l.

AT: a maximum elevation of 1,500 m a.s.l.,
Höttinger Alm, TN, with further altitudinal
limits of ca. 1,250 m a.s.l., Jerzens, TN, and
900 m a.s.l., Klauswald, Matrei i.O., TE. IT:
180 m a.s.l., Arco, Trentino. CH: 265 – **2,648 m
a.s.l.**; FR: 1,213 m a.s.l., Villarodin-Bourget,
Savoy.

Red list status: V – decreasing (DE).

Weissia condensa (VOIT) LINDB.;
Syn.: *Hymenostomum tortile* (SCHWAEGR.)
LIMPR. (Pottiaceae), Dichtes Perlmoos,
Curly Beardless-moss

Recorded twice in TS/IT only, squares 121, Pfossental above Eishof, ground, 2,180 – 2,350 m a.s.l. and 145, at Schlanders village at begin of Schlandrauntal, ground, ca. 805 – 940 m a.s.l.

AT: a maximum elevation of 1,320 m a.s.l., Matrei i.O., TE. IT: 2,100 m a.s.l., Piccolo S. Bernardo, Aosta, 180 m a.s.l., Arco, Trentino. CH: 205 – **2,340 m a.s.l.**; FR: 390 m a.s.l., Saint-Paul, Savoy.

Red list status: 3 – endangered (AT, DE), VU – vulnerable (CH).

Weissia controversa HEDW. (Pottiaceae),

Zartgrünes Perlmoos, Green-tufted

Beardless-moss

21 squares: 3, 4, 9, 10, 15, 52, 57, 71, 80, 83, 104, 107, 116, 127, 129, 130, 134, 135, 142, 147, 149, on ground and rock, ca. 560 – 2,400 m a.s.l. (TS/IT) and ca. 1,780 – 2,630 m a.s.l. (TN/AT).

AT: a maximum elevation of **2,700 m a.s.l.**, Zirmeggenkar near Obergurgl, TN, with further altitudinal limits of 2,300 m a.s.l., at Kals and Matrei i.O., TE, 2,080 – 2,180 m a.s.l., TN, Kratzer, and 2,080 m a.s.l., Kalser Törl, TE. IT: 1,660 – 1,720 m a.s.l., Corte, Buchenstein, Trentino, 1,400 – 1,600 m a.s.l., Sambock, Bruneck, TS. CH: 200 – 2,600 m a.s.l.; FR: 1,900 m a.s.l., Peisey-Nancroix, Savoy.

Red list status: V – decreasing (DE).

Weissia rutilans (HEDW.) LINDB.

(Pottiaceae), Rötliches Perlmoos,

Pointed-leaved Stubble-moss

Once, square 177 (TS/IT), at Castle Tarantsberg, ground, 555 m a.s.l.

AT: a maximum elevation of **1,250 m a.s.l.** with a further record of 700 m a.s.l., Lienz, TE. For IT no altitudinal limits revealed so far. CH: 420 – 710 m a.s.l.

Red list status: 2 – severely endangered (AT), CR – threatened from extinction (CH), G – risk assumed (DE).