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Updated Checklist of Turkish Bryophyte Vegetation

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Abstract

In this study, we present a current list of syntaxa belonging to the bryophyte vegetation of Türkiye. This checklist was compiled from the national and local literature, and includes all taxonomic units of bryophyte vegetation that have been newly described or reported for Türkiye to date. To date, 56 associations and 29 sub-associations belonging to 21 alliances, 14 orders, and 9 classes have been reported in Türkiye, bryosociologically. In addition, 26 phytosociological units were determined as unknown status. In the present study, taxonomical units were grouped according to their habitat type (aquatic, terrestrial, saxicolous, or epiphytic) and were given with their localities and synonyms.

Keywords: Bryophytes, Checklist, Phytosociology, Türkiye.

Güncellenen Türkiye Briyofit Vegetasyonu Kontrol Listesi

Öz

Bu çalışmada, Türkiye briyofit vegetasyonuna ait sintaksonların bir listesi sunulmuştur. Türkiye için yeni tanımlanan ve rapor edilen briyofit vegetasyonunun sintaksonomik birimlerinin güncel kontrol listesi, ulusal ve yerel literatürdeki verilerin derlenmesi sonucunda elde edilmiştir. Bugüne kadar Türkiye’de bryosociology olarak 21 alyans, 14 ordo ve 9 sınıfa ait 56 birlik ve 29 alt birlik rapor edilmiştir. Ayrıca, 26 fitosociology birim de durumu bilinmeyen olarak belirlenmiştir. Bu çalışmada, bryosociology birimler sucul, karasal veya epifitik habitatlara göre gruplandırılmış olup lokaliteleri ve sinonimleri ile birlikte verilmiştir.

Anahtar Kelimeler: Briyofitler, Kontrol Listesi, Fitosociology, Türkiye.

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1. Introduction

The flora of Türkiye has exceptionally rich and diverse due to different climate types (Terrestrial, Oceanic and Mediterranean), geological and geomorphological diversity, rich water resources (sea, lake and stream), great height differences (sea level - 5000 m) and a wide variety of habitat types (Özhataş vd., 2005). The most important reasons for Türkiye's geographical, climatic, habitat and ecosystem diversity is that it is located at the intersection of the Mediterranean, Euro-Siberian and Iran-Turanian phytogeographic regions (Akman, 1995). The effect of these three different phytogeographic regions led to the creation of favorable conditions for the Mediterranean elements in the south, the Euro-Siberian elements in the north, and the Irano-Turanian elements in the east (Davis, 1975). In our country, both floristic and sociological studies on bryophytes have increased rapidly in recent years. According to recent studies and final checklists approximately ± 1046 (± 196 liverworts, ± 846 mosses, ± 4 hornworts) bryophyte taxa have been reported in Türkiye (Erdağ and Kürschner, 2017, Batan et al., 2019; Ursavaş and Keçeli, 2019; Ursavaş and Işın, 2019; Erata and Batan, 2020; Kürschner and Frey 2020; Erata et al., 2021; Unan and Ören, 2021; Unan et al., 2021; Ursavaş et al., 2021; Kırmacı et al., 2021; Ellis et al., 2021a,b,c; Abay et al., 2022; Özenoğlu and Kırmacı, 2022).

However, bryofloristic studies and bryosociological studies do not progress at the same speed in Türkiye. While the studies regarding the bryophytes progress rapidly in terms of the floristic aspect it does not progress at the same speed in terms of vegetation. In the study of Walther and Leblebici (1969), which is the first biosociological study carried out in Türkiye, on moss vegetation in the Yamanlar Mountain-Karagöl Region in the north of İzmir, a total of 20 associations were determined. Walther's bryosociological studies in Türkiye continued with the investigation of *Liquidambar orientalis* Mill. forests in Southwest Anatolia (Marmaris-Koycegiz, Muğla) and the bryophyte vegetation of the Nif Mountains (İzmir) (Walther, 1975, 1979). After Walther's studies, no bryosociological studies were conducted in Türkiye until 1991. Since 1991, studies on bryophyte vegetation in Türkiye have started again and many studies have been carried out (Brullo et al., 1991; Kürschner et al., 1998, 2006, 2007, 2012; Kürschner, 1999; Kürschner and Parolly, 1999a,b; Kara, 2008; Ezer, 2008, 2017; Kürschner and Erdağ, 2008, 2009; Düzenli et al., 2009; Kara et al., 2011; Alataş and Batan, 2014, 2015; Alataş et al., 2015a, 2016, 2017; Alataş and Uyar, 2017; Can Gözcü et al.,

2018; Alataş et al., 2019a,b,c,d,e; 2021; 2022a,b,c,d; Kara and Taşpınar, 2022; Ezer et al., 2022a,b).

The first checklist for bryophyte vegetation in Türkiye was given in 1999 and the second checklist in 2018. (Kürschner and Parolly, 1999b; Alataş, 2018). In recent years, the rapidly increase in bryosociological studies in our country and the determining of newly described and new recorded syntaxonomic units have revealed the necessity of renewing the bryophyte vegetation list. In this context, the present study aims to review and bring together all bryosociological studies in Türkiye in order to update the current understanding of Türkiye's bryophyte vegetation.

This current checklist has been prepared by compiling the results of bryophyte vegetation studies carried out according to the Braun-Blanquet (1964) methodology in Türkiye between 1969-2022.

2. Materials and Methods

Syntaxonomic scheme of Turkish bryophyte vegetation

The following syntaxonomic scheme applies exclusively to the bryophyte vegetation of Türkiye. All syntaxonomic units were revised according to the International Code of Phytosociological Nomenclature (Weber et al., 2000) and ordered according to Von Hübschmann (1986), Dierssen (2001), Marstaller (2006), and Mucina et al., (2016). The headings of the syntaxa and syntaxonomic categories are presented in abbreviated form, i.e., All.: Alliance, Ass.: Association, Subass.: Subassociation, and Syn: Synonym.

3. Results

Checklist

Aquatic and semi-aquatic communities

Class: *Platyhypnidio-Fontinalietea antipyretica* Philippi 1956

Order: *Hygrohypnetalia* Krajina 1933

All.: *Racomitrium acicularis* von Krusenstjerna 1945

Ass. *Madothecetum cordaeanae* Philippi 1956

(Syn: *Lunularia cruciata-Porella cordaeana* ass. Walther 1969)

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

Order: *Leptodictyetalia riparii* Philippi 1956

All.: *Platyhypnidion rusciformis* Philippi 1956

Ass. *Oxyrrhynchietum rusciformis* Gams ex v. Hübschmann 1953

(Syn: *Platyhypnidietum riparioides* Gams 1927)

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

All.: *Brachythecion rivularis* Hertel 1974

Ass. *Brachythecio rivularis-Hygrohypnetum luridi* Philippi 1965

(Syn: *Brachythecietum rivularis* Herzog ex Walther 1969)

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

All.: *Fissidenton rivularis* Marstaller 1987

Ass. *Fissidenti rivularis-Rhynchostegiellum jacquini* Walther 1969

(Syn: *Fissidentetum rivularis* v. Hübsemann 1971)

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

Ass. *Fegatellum conicae* Smarda ex Ježek & Vondráček 1962

(Syn: *Conocephalum conicum-Mniobryum delicatulum* ass. Walther 1969)

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

Associations of uncertain syntaxonomic rank and position:

- *Barbula sinuosa-Bryum alpinum* ass. Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

- *Pellia endiviifolia-Hygroamblystegium tenax* ass. Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

- *Philonotetum caespitosae* ass. Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

Class: *Montio-Cardaminetea* Br.-Bl. & Tx. ex Klika & Hadač 1944

Order: *Montio-Cardaminetalia* Pawlowski 1928

All.: *Cardamino-Montion* Br.-Bl. 1925

- *Palustriella commutata-Cratoneuron filicinum* community Kürschner, Kırmacı & Erdağ 2015

[The high mountains of Turkey (Kürschner et al., 2015)]

- *Bryum schleicheri* community Kürschner, Kırmacı & Erdağ 2015

[The high mountains of Turkey (Kürschner et al., 2015)]

- *Palustriella falcata* community Kürschner, Kırmacı & Erdağ 2015

[The high mountains of Turkey (Kürschner et al., 2015)]

Saxicolous communities

Class: *Racomitrietea heterostichi* Neumayr 1971

Order: *Grimmietalia commutatae* Smarda & Vanek in Smarda 1947

All.: *Grimmion commutatae* von Krusenstjerna 1945

Ass. *Grimmion commutato-campestris* von Krusenstjerna 1945

[Yamanlar Mountain / İzmir (*Grimmia laevigata-Grimmia ovalis* ass. Walther and Leblebici, 1969); Beşparmak Mountain / Muğla (Kürschner and Parolly, 1999b); Phrygian Highlands / Afyonkarahisar-Kütahya-Eskişehir-Sakarya River (Kürschner and Erdağ, 2009)]

Subass. - *orthotrichetosum bistratosae* Kürschner & Erdağ 2009

Subass. - *anacolietosum menziesii* Kürschner & Erdağ 2009

[Phrygian Highlands / Afyonkarahisar-Kütahya-Eskişehir-Sakarya River; Kula area / Manisa (Kürschner and Erdağ, 2009)]

Class: *Schistidietea apocarpi* Ježek & Vondráček 1962

Order: *Schistidietalia apocarpi* Ježek & Vondráček 1962

All.: *Grimmion tergestinae* Šmarda 1947

Ass. *Orthotricho anomali-Grimmiatum pulvinatae* Stodiek 1937

(Syn.: *Tortuletum muralis* (Muraletum) Waldh.1944, *Grimmio pulvinate-Tortuletum muralis* v. Hübsemann 1950)

[Yamanlar Mountain / İzmir (*Grimmia pulvinata-Tortula muralis* ass. and *Tortula intermedia - Tortula calcicolens* ass. Walther & Leblebici, 1969)]

Associations of uncertain syntaxonomic rank and position:

- *Tortula inermis-Barbula cylindrica* ass. Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

- *Trichostomum crispulum-Distichium capillaceum* ass. Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

Class: *Neckeretea complanatae* Marstaller 1986

Order: *Neckeretalia complanatae* Ježek & Vondráček 1962

All.: *Plasteurhynchion meridionalis* Guerra & Varo 1981

Ass. *Antitrichietum breidleriana* Walther 1969

Subass. - *tortuletosum hirsutae* Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

Subass. - *orthotrichetosum rupestris* Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

Ass. *Homalothecio sericei-Neckeradelphetum menziesii* (Varo, Guerra & Gil 1977) Guerra & Varo 1981

(Syn. *Neckeretum menziesii* Varo, Guerra & Gil 1977, nom. illeg., art. 31 ICPN, Weber et al., 2000)

[Yamanlar Mountain-Spil Mountain / İzmir-Manisa; Aydın Mountain / Aydın; Yılanlı Mountain / Muğla (Kürschner and Erdağ, 2008)]

Terricolous communities

Class: *Psoretea decipientis* Mattick ex Follmann 1974

Order: *Barbuletalia unguiculatae* von Hübschmann 1960

All.: *Grimaldion fragrantis* Smarda & Hadač in Hadač & Šmarda 1944

Ass. *Riccio sorocarpace-Pseudocrossidietum hornschuchiani* Frey, Herrnstadt & Kürschner 1990

[Dilek Peninsula National Park, Aydın Dağları / Aydın (Kürschner et al., 2007)]

All.: *Tortellion flavovirentis* Guerra ex Guerra & Puche 1984

Ass. *Tortello flavovirentis-Bryetum dunensis* Guerra et Puche 1984

[Manavgat Area / Antalya (Brullo et al., 1991)]

All.: *Mannion androgynae* Ros & Guerra 1987

Ass. *Riccio nigrellae-Oxymitretum paleaceae* Ros & Guerra 1987

[Beşparmak Mountain / Muğla (Kürschner and Parolly, 1999b); Dilek Peninsula National Park, Aydın Dağları / Aydın (Kürschner et al., 2007)]

Order: *Funarietalia hygrometricae* von Hübschmann 1957

All.: *Phascion cuspidati* Waldheim ex v. Krusenstjerna 1945

Ass. *Riccio sorocarpace-Funarietum fascicularis* Lecointe 1978

[Dilek Peninsula National Park, Aydın Dağları / Aydın (Kürschner et al., 2007)]

Ass. *Epipterygio tozeri-Riccietum frostii* Kürschner & Parolly 1999

[Beşparmak Mountain / Muğla (Kürschner and Parolly, 1999)]

Class: *Pleurochaeto squarrosae-Abietinelletea abietinae* Marstaller 2002

Order: *Pleurochaeto squarrosae-Abietinelletea abietinae* Marstaller 2002

All.: *Homalothecio aurei-Pleurochaetion squarrosae* (Ros et Guerra 1987) Marst. 1993

Ass. *Pleurochaeto squarrosae-Tortuletum ruralis* Brullo, Lo Giudice et Privitera 1991

[Karabiga Area/ Çanakkale (Brullo et al., 1991)]

Subass. - *campylietosum chrysophylli* Brullo, Lo Giudice & Privitera 1991 ex Marstaller 2006

(Syn: *Pleurochaeto squarrosae-Tortuletum ruralis* Brullo, Lo Giudice et Privitera 1991

(subass. of -*Campylium chrysophyllum* nom. inval. (Art. 3h) Brullo, Lo Giudice & Privitera 1991)

Subass.- *rhynchostegietosum megapolitani* Brullo, Lo Giudice & Privitera 1991 ex Marstaller 2006

(Syn: *Pleurochaeto squarrosae-Tortuletum ruralis* Brullo, Lo Giudice & Privitera 1991 subass. of -

Rhynchostegium megapolitanum nom. inval. (Art. 3h) Brullo, Lo Giudice & Privitera 1991)

Ass. *Homalothecio aurei-Pleurochaetium squarrosae* Ros & Guerra 1987

Subass. - *bartramietosum strictae* Kürschner & Parolly 1999

[Beşparmak Mountain / Muğla (Kürschner and Parolly, 1999b)]

Associations and communities of uncertain taxonomic rank and position:

- *Anthoceros punctatus-Oxyrhynchium hians* community Walther & Leblebici 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

- *Fissidens viridulus-Rhynchostegiella curviseta* community Walther & Leblebici 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

- *Metzgeria furcata-Fabronia pusilla* ass. Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

- *Targionia hypophylla-Funaria calcarea* ass. Walther 1969

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969)]

Epiphytic communities

Class: *Cladonio digitatae-Lepidozieta reptantis* Ježek & Vondráček 1962

Order: *Cladonio digitatae - Lepidozieta reptantis* Ježek & Vondráček 1962

Alliance: *Tetrarhizidion pellucidae* von Krusenstjerna 1945

Ass.: *Leucobryo-Tetrarhizidion pellucidae* Barkm. 1958

[Kamilet Valley / Artvin (Alataş et al., 2019)]

Order: *Lophocoleetalia heterophyllae* Barkman 1958

All.: *Nowellion curvifoliae* Philippi 1965

Ass. *Dicranetum taurici* Neumayr ex von Hübschmann 1978

(Syn.: *Tetrarhido pellucidae-Orthodicranetum stricti* Hébrard 1973)

[Abant Mountains / Bolu (Alataş and Uyar, 2017)]

Order: *Brachythecietalia rutabulo-salebrosi* Marstaller 1987

All.: *Bryo capillaris-Brachythecion rutabuli* Lecointe 1975

Ass. *Plagiothecium neglecti* Ricek 1968

(Syn.: *Plagiothecio nemoralis-Brachythecium velutini* Vadam 1990)

[Göbü village / Zonguldak (Alataş et al., 2015a)]

Order: *Dicranetalia scoparii* Barkman 1958

All.: *Dicrano scoparii-Hypnion filiformis* Barkman 1958

Ass. *Dicrano scoparii-Hypnetum filiformis* Barkman 1958

[Örümcek forests / Gümüşhane (Alataş and Batan, 2015)]

Subass. -*sanionietosum uncinatae* Grgic 1983

[Örümcek forests / Gümüşhane (Alataş and Batan, 2015)]

- Class:** *Neckeretea complanatae* Marstaller 1986
Order: *Neckeretalia complanatae* Ježek & Vondráček 1962
All.: *Neckerion complanatae* Smarda & Hadac ex Klíka 1948 nom. cons.
Ass. *Alleniello besseri* - *Palamocladietum euchloronis* Ezer, Alataş, Erata & Batan 2022
 [Fırtına Valley / Rize (Alataş et al., 2022d)]
Ass. *Exsertotheco crispa* - *Alleniellum besseri* Alataş, Ezer, Batan & Erata 2022
 [Fırtına Valley / Rize (Alataş et al., 2022d)]
Subass. - *leucodontetosum sciuroidis* Batan, Ezer, Erata & Alataş 2022
 [Fırtına Valley / Rize (Alataş et al., 2022d)]
Ass. *Frullanio tamarisci-Neckeretum pumilae* Alataş, Ezer, Batan & Erata 2022
 [Kümbet Plateau / Giresun (Alataş et al., 2022c)]
Subass. - *isothecietosum alopecuroidis* Alataş, Ezer, Batan & Erata 2022
 [Kümbet Plateau / Giresun (Alataş et al., 2022c)]
Ass. *Anomodonto attenuati* - *Neckeretum crispae* Pläm. 1982
 [Kamilet Valley / Artvin (Alataş et al., 2019)]
Subass. - *leucodontetosum sciuroidis* Grgić 1972
 [Kamilet Valley / Artvin (Alataş et al., 2019)]
Ass. *Alleniella besseri-Leucodontetum immersi* Ezer, Alataş & Batan 2021
 [Altındere Valley Maçka-Trabzon (Alataş et al., 2021)]
Ass. *Frullanio tamarisci* - *Exsertothecetum crispae* Pilous 1961 em. Gillet 1986
 [Kamilet Valley / Artvin (Alataş et al., 2019)]
Ass. *Brachythecietum populei* Hagel ex Phil. 1972
 [Çifteköprü ve Karagöl Tabiat Parkı / Borçka-Artvin (Alataş et al. 2019d); Altındere Valley Maçka-Trabzon (Alataş et al., 2021)]
Subass. - *hypnetosum filiformis* Ezer, Alataş & Batan 2019
 [Çifteköprü ve Karagöl Tabiat Parkı / Borçka-Artvin (Alataş et al., 2019d)]
Subass. - *isothecietosum alopecuroidis* Lauer 2002
 [Altındere Valley Maçka-Trabzon (Alataş et al., 2021)]
Ass. *Plagiomnio undulati-Raduletum lindbergianae* Alataş, Ezer, Batan & Erata 2021
 [Altındere Valley Maçka-Trabzon (Alataş et al., 2021)]
Subass. - *leucodontetosum sciuroidis* Alataş, Ezer, Batan & Erata 2021
Ass. *Pterigynandretum filiformis* Hiltzer 1925
 [Abant Mountains / Bolu (Alataş and Uyar, 2017); Samanlı Mountains / Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018); Akyazı District / Sakarya (Alataş et al., 2019a)]
Subass. - *leucodontetosum sciuroidis* Grgić 1983
 [Akyazı District / Sakarya (Alataş et al., 2019a)]
Ass. *Homalothecio sericei-Neckeretum besseri* Ježek & Vondráček 1962
 [Altındere Valley Maçka-Trabzon (Alataş et al., 2021)]
Ass. *Homalothecio sericei-Porelletum platyphyllae* Storm. ex Duda 1951
 [Abant Mountains / Bolu (Alataş and Uyar, 2017); North Amanos Mountains / Hatay (Kara, 2008); Samanlı Mountains / Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018)]
Subass. - *leucodontetosum sciuroidis* Marstaller 1992
 [Abant Mountains / Bolu (Alataş and Uyar, 2017); North Amanos Mountains / Hatay (Kara, 2008); Samanlı Mountains / Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018)]
Ass. *Anomodontetum attenuati* (Barkman 1958) Peciar 1965
 [Amanos Mountains / Hatay (Kara et al. 2011); South Amanos Mountains / Hatay (Ezer, 2008)]
Subass. - *homalietosum trichomanoidis* Peciar 1965
 [South Amanos Mountains / Hatay (Ezer, 2008)]
Ass. *Anomodonto viticulosi-Leucodontetum sciuroidis* Wiśniewski 1930
 (Syn.: *Anomodonto longifolii-Isothecietum myuri* Lipmaa 1935 p.p, *Neckeretum complanatae* Waldh. 1944, *Neckero-Anomodonteum viticulosi* Szafran 1955, *Neckeretum crispae* PHIL. 1965, *Neckero complanatae-Eurhynchietum striatuli* Cor. Ped. 1988)
 [North Amanos Mountains / Hatay (Düzenli et al., 2009); South Amanos Mountains / Hatay (Ezer, 2008); Beldibi and Babadağ Forests / Devrek-Zonguldak (Alataş et al., 2019c); Akyazı District / Sakarya (Alataş et al., 2019a)]
Subass. - *palamocladietosum euchloronis* Kürschner & Düzenli 2009
 [North Amanos Mountains / Hatay (Düzenli et al., 2009); South Amanos Mountains / Hatay (Ezer, 2008)]
Ass. *Mnietum cuspidati* Felf. 1941
 [Altındere Valley Maçka-Trabzon (Alataş et al., 2021)]
Ass. *Neckeretum crispae* (Kaiser 1926) Herzog & Höffler 1944
 (Syn.: *Anomodonto viticulosi-Leucodontetum sciuroidis* Wiśniewski 1930)
 [Beldibi and Babadağ Forests / Devrek-Zonguldak (Alataş et al., 2019c); South Amanos Mountains / Hatay (Ezer, 2008)]
Ass. *Neckero-Anomodontetum viticulosi* (Wiśniewski 1929) Philippi 1965
 [Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018)]
Subass. - *anomodontetosum viticulosi* Marstaller 1980
Ass. *Palamocladio euchloronis-Leucodontetum immersi* Kürschner, Kirmaci & Parolly 2012

[Pazar, Çayeli / Rize; Borçka / Artvin; Ayancık / Sinop; Dernekpazarı, Of / Trabzon (Kürschner et al., 2012)]

Subass. *-neckeretosum crispae* Kürschner, Kirmaci & Parolly 2012

[Fırtına Valley, Pazar / Rize; Borçka / Artvin (Kürschner et al., 2012)]

Ass. *Pseudoleskeello nervosae-Leucodontetum immersi* Kürschner, Kirmaci & Parolly 2012

[Kaçkar Mountains / Rize; Borçka / Artvin; Ayancık / Sinop; Dernekpazarı, Of / Trabzon (Kürschner et al., 2012)]

Class: *Frullanio dilatatae-Leucodontetia sciuroidis* Mohan 1978

Order: *Orthotrichetalia* Hadač in Klika & Hadač 1944

All.: *Ulotion crispae* Barkman 1958

Ass. *Ulotetum crispae* Ochn. 1928

[Kamilet Valley / Artvin (Alataş et al., 2019); Kümbet Plateau / Giresun (Alataş et al., 2022c)]

Subass. *-isothecietosum alopecuroidis* Marst. 1985

[Kamilet Valley / Artvin (Alataş et al., 2019)]

Subass. *-sanionietosum uncinatae* Schlüss. 2001

[Kümbet Plateau / Giresun (Alataş et al., 2022c)]

Ass. *Leskeello nervosae-Pterigynandretum filiformis* Phil. 1983

[Hıdırnebi Plateau / Trabzon (Alataş et al., 2022b)]

Subass. *-lewinskyetosum rupestris* Ezer, Alataş, Batan & Erata 2022

[Hıdırnebi Plateau / Trabzon (Alataş et al., 2022b)]

Ass. *Pseudoleskeello nervosae-Raduletum lindbergianae* Alataş, Ezer, Batan & Erata 2022

[Hıdırnebi Plateau / Trabzon (Alataş et al., 2022b)]

Subass. *-isothecietosum alopecuroidis* Batan, Ezer, Erata & Alataş 2022

[Hıdırnebi Plateau / Trabzon (Alataş et al., 2022b)]

Ass. *Lewinskyetum affinis* Alataş & Uyar 2017

[Abant Mountains / Bolu (Alataş and Uyar, 2017); Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018); Akyazı District / Sakarya (Alataş et al., 2019a)]

Ass. *Orthotrichetum lyellii* Allorge ex Lecointe 1975

(Syn.: *Tortulo-Orthotrichetum lyellii* Walther 1979 nom. inval.)

[Nif Mountain / İzmir (Walther, 1979); Abant Mountains / Bolu (Alataş and Uyar, 2017); North Amanos Mountains / Hatay (Kara, 2008); Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018); Akyazı District / Sakarya (Alataş et al., 2019a)]

Ass. *Orthotrichetum pallentis* Ochsner 1928

[Boraboy and Destek forests / Amasya (Alataş et al., 2017); Akyazı District / Sakarya (Alataş et al., 2019a)]

Subass. *-Isothecietosum alopecuroidis* Alataş, Ezer, Uyar & Ören 2018

[Akyazı District / Sakarya (Alataş et al., 2019a)]

Ass. *Orthotrichetum striati* (Gams 1927) Marstaller 1985

(Syn.: *Orthotrichetum speciosi* Barkman 1958)

[Quercus vulcanica forests / Isparta-Konya (Kürschner et al., 2006); Abant Mountains / Bolu (Alataş and Uyar, 2017); North Amanos Mountains / Hatay (Kara, 2008); South Amanos Mountains / Hatay (Ezer, 2008); Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018); Boraboy and Destek forests / Amasya (Alataş et al., 2017); Akyazı District / Sakarya (Alataş et al., 2019a)]

Ass. *Pylaisietum polyanthae* Felföldy 1941

[Göbü village / Zonguldak (Alataş et al., 2015a); Fener area / Zonguldak (Alataş and Batan, 2014); Çifteköprü ve Karagöl Tabiat Parkı / Borçka-Artvin (Alataş et al., 2019b)]

Subass. *-lophocoleetosum heterophyllae* Kara, Ezer & Alataş 2015

[Göbü village / Zonguldak (Alataş et al., 2015a)]

Ass. *Orthotricho straminei-Pterigynandretum filiformis* Gillet 1986

[Beldibi and Babadağ Forests / Devrek-Zonguldak (Alataş et al., 2019c); Abant Mountains / Bolu (Alataş and Uyar, 2017); Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018)]

All.: *Syntrichion laevipilae* Ochsner 1928

Ass. *Syntrichietum laevipilae* Ochsner 1928

(Syn.: *Uloto phyllanthae-Tortuletum laevipilae* Barkman 1958)

[Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018)]

Subass. *-orthotrichetosum lyellii* Duv. & Lecointe 1975

[Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018)]

Ass. *Syntrichietum papillosae* Jaeggli 1934

(Syn.: *Orthotrichetum fallcis* v. Krusenstjerna 1945, *Syntrichietum laevipilae* Ochsner 1928, *Fabronietum pusillae* Ochsner 1936)

[Fener area / Zonguldak (Alataş and Batan, 2014)]

Ass. *Orthotrichetum pumili* (Jäggli 1934) von Hübschmann 1986

[Göreme National Park / Nevşehir (Kara and Taşpınar, 2022); Fırat University / Elazığ (Alataş et al., 2022a)]

All.: *Fabronion pusillae* (Barkman 1958) Gil & Guerra 1981

Ass. *Cryphaetum arborae* Barkman 1958

[Bucak Sweetgum Forest Nature Park and Karacaören Dams / Burdur (Alataş et al., 2016)]

Subass. *-orthotrichetosum diaphani* Lecointe 1975

Ass. *Orthotricho franzoniani-Antitrichietum breidlerianae* Walther 1969

(Syn.: *Orthotricho lyellii-Antitrichietum californicae* All. ex Varo et al. 1977)

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969); Nif Mountain / İzmir (Walther,

1979); Yılanlı Mountain / Muğla (Kürschner, 1999)]

Ass. *Scorpiurio sendtneri-Zygodontetum vulgaris* Walther 1975

[Marmaris-Köyceğiz / Muğla (Walther, 1975; Kürschner et al., 1998); South Amanos Mountains / Hatay (Ezer, 2008)]

Ass. *Brachythecio olympici-Dicranoweisietum cirrate* Walther 1969

(Syn.: *Dicranoweisio cirratae-Brachythecietum olympici* Walther 1979, nom. invers. Illegit., cf. Barkman et al., 1986, CPN Art. 29)

[Yamanlar Mountain / İzmir (Walther and Leblebici, 1969); Nif Mountain / İzmir (Walther, 1979); Yılanlı Mountain, Akyaka Area, Kiran Mountain / Muğla; Honaz Mountain / Denizli (Kürschner, 1999)]

Ass. *Pterigynandro filiformis-Orthotrichetum speciosi* Guerra 1982

[Abant Mountains / Bolu (Alataş and Uyar, 2017); North Amanos Mountains / Hatay (Kara, 2008); Sakarya-Kocaeli-Yalova-Bursa (Can Gözcü et al., 2018)]

Ass. *Leptodonto smithii-Leucodontetum sciurooides* Privitera & Puglisi 1997

(Syn.: *Leptodontetum smithii* Jaggli 1933 nom. inval.)

[Bucak Sweetgum Forest Nature Park and Karacaören Dams / Burdur (ALATAŞ et al. 2016); North Amanos Mountains / Hatay (Kara, 2008); South Amanos Mountains / Hatay (Ezer, 2008)]

Subass. *-cinclidotetosum mucronati* Kürchner, Tonguç & Yayıntaş 1998

Associations and communities of uncertain syntaxonomic rank and position:

- *Rhynchostegiella* var. *litorea- Scorpiurium circinatum* ass. Walther 1975

(Syn.: *Scorpiurietum circinati* Giacomini 1951)

[Marmaris-Köyceğiz / Muğla (Walther, 1975)]

- *Tortulo-Brachythecietum condensatae* ass. Walther 1979

[Nif Mountain / İzmir (Walther, 1979)]

- *Neckera complanata-Palamocladium euchloron*

[South Amanos Mountains / Hatay (Ezer, 2008)]

- *Hypnum cupressiforme - Anomodon viticulosus* Ezer 2017

[Kadıncık Valley / Mersin (Ezer, 2017)]

- *Palamocladium euchloron - Alleniella complanata* Ezer 2017

[Kadıncık Valley / Mersin (Ezer, 2017)]

- *Porella platyphylla - Homalothecium sericeum* Ezer 2017

[Kadıncık Valley / Mersin (Ezer, 2017)]

- *Leucodon sciurooides - Anomodon viticulosus* Ezer 2017

[Kadıncık Valley / Mersin (Ezer, 2017)]

- *Leptodon smithii - Zygodon rupestris* Ezer 2017

[Kadıncık Valley / Mersin (Ezer, 2017)]

- *Isothecium alopecurooides - Hypnum andoi* Ezer, Alataş, Batan, Erata 2022

[Kümbet Plateau / Giresun (Ezer et al., 2022a)]

- *Neckera pumila - Frullania tamarisci* Ezer, Alataş, Batan, Erata 2022

[Kümbet Plateau / Giresun (Ezer et al., 2022a)]

- *Neckera pumila - Hypnum andoi* Ezer, Alataş, Batan, Erata 2022

[Kümbet Plateau / Giresun (Ezer et al., 2022a)]

- *Exsertotheca crispa - Isothecium alopecurooides* Ezer, Alataş, Batan, Erata 2022

[Fırtına Valley / Rize (Ezer et al., 2022b)]

- *Alleniella complanata-Exsertotheca crispa* Ezer, Alataş, Batan, Erata 2022

[Fırtına Valley / Rize (Ezer et al., 2022b)]

- *Alleniella besseri-Leucodon sciurooides* Ezer, Alataş, Batan, Erata 2022

[Fırtına Valley / Rize (Ezer et al., 2022b)]

In Türkiye, 41 associations and 19 sub-associations belonging to 19 alliances, 12 orders and eight bryosociological classes were reported by Alataş (2018). After this study, new and new record briyo-sociological units were added in the Turkish bryophyte vegetation with the phytosociological studies carried out in Türkiye.

In conclusion, the present study containing the updated checklist of Turkish bryophyte vegetation noted that it included 56 associations and 29 sub-associations belonging to 21 alliances, 14 orders, and eight bryosociological classes. It also includes 26 phytosociological units which have unknown status.

Note: We attribute this study to the 100th anniversary of the founding of the Republic of Türkiye.

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