



Rare and undercollected liverworts from Turkey – including new province records

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Abstract

26 new regional records of liverworts are presented. They include species, which are re-collected after a long collection gap, often of more than 100 years ago or represent up to now rarely collected taxa or new records for several provinces.

Key words: Bryophyte, flora, distribution, phytogeography, Turkey

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Türkiye’den yeni il kayıtlarını da içeren, nadir ve az toplanmış ciğerotları

Özet

Bu çalışmada il bazında 26 yeni ciğerotu sunulmuştur. Bunların bazıları iller için yeni kayıt, bazıları ise 100 yıllık bir zaman aralığından sonra tekrar toplanmış türleri içermektedir.

Anahtar kelimeler: Briyofit, flora, dağılım, fitocoğrafya, Türkiye

1. Introduction

Species knowledge and its distribution is of fundamental importance and urgently needed for the understanding of the dynamics and changes in ecosystems. This holds true for all organisms, including bryophytes. As bryophytes are found in a very broad array of ecosystems and landscapes they act as excellent monitoring tool to help us to understand sustainability of natural resources. Studying bryophytes therefore sheds light on distribution and ecology and is an important biological need for conservation of biodiversity and their rational use.

Since 2001, many new records and regional additions have been published which made it necessary to provide a new checklist for the Turkish bryophyte flora (Erdağ & Kürschner, 2017). However, species inventory and knowledge rarely comes to an end, especially in an ecological so highly divers country such as Turkey. Ongoing field studies therefore will reveal also in future new or rare species.

During several field excursions within the last years, carried out mainly in North, North-East (Karadeniz Dağları), and East Anatolia, the identification of our collections revealed several liverworts, which up to now are rarely collected in Turkey. Often it turned out that they represent first records for many provinces long the Black Sea coast. To the often neglected, less or none collected areas belong the Bayburt, Erzurum (e.g., Palandöken Dağları), Gümüşhane, Hâkkari, Kars and Van. But even well or best collected areas such as Artvin, Bolu, Düzce, Rize, or Trabzon areas present surprises when collecting liverworts. For a better understanding of the distributional patterns, migration processes in the past and presence, ecosystems, nature and the influence of sustainable livelihoods, 26 rare or rarely collected liverworts are presented in the following.

The treatment of families and genera strictly follows the most recent tentative system proposed by Frey & Stech (2009). Voucher specimens are kept at the herbarium of the Adnan Menderes University, Aydın (AYDN).

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2. Results and discussion

The records presented include species, which are re-collected for the first time after a long collection gap, often of more than 100 years ago or represent up to now rarely collected taxa or new province records. However, a wider distribution in Turkey can not be excluded, when carefully looked for these taxa in future.

Antheliaceae

Anthelia juratzkana (Limpr.) Trevis.

Second record for Turkey. Previously known only from a single locality from the Rize province [İkizdere, Başköy-Cermanin Yayla, (cf. Henderson & Muirhead, 1955)].

RIZE: İkizdere, Ovitdağı Geçidi, Aksu Göller area, 40°39'8.1''N 40°50'33.9''E, 3060 m, melting snow community, 15 September 2004 H. Kürschner & G. Parolly 04-955.

Cephaloziaceae

Fuscocephaloziopsis pleniceps (Austin) Váňa et L.Söderstr.

(Syn. *Cephalozia pleniceps* (Austin) Lindb.)

At present rarely collected in Turkey and known only from western Turkey (Uludağ, Walther, 1967) and the Artvin province (Abay et al., 2009).

First record for the Ağrı province.

AĞRI: Aras Güney Dağları, south of Yukarıkent Geçidi, between Kağızman and Ağrı, 8 km north of Cumaçay, 39°56'58"N, 43°15'48.7"E, 2072 m, in bog with *Sphagnum squarrosum*, 22 June 2014 M. Kırmacı & H. Kürschner 14-465.

Gymnomitriaceae

Gymnomitrium concinnatum (Lightf.) Corda

At present rarely collected in Turkey and known only from three localities in north-eastern Anatolia (Artvin and Rize provinces, cf. Henderson, 1963). This is the second record of the rare species for the Rize province.

RIZE: İkizdere, Çağrankaya Yayla, 40°49'38"N, 40°38'11.3"E, 2130 m, on rock in *Drosera* bog, 21 July 2012 M. Kırmacı & H. Kürschner 12-194.

Jungermanniaceae

Liochlaena lanceolata Nees.

(Syn. *Jungermannia leiantha* Grolle)

First record for the Düzce province.

DÜZCE: Yiğılca area, Saklıkent Şelalesi, 40°56'59.3"N 31°29'07.8"E, 400 m, on calcareous rock with tufa formation, 26 June 2015, A. Erdağ, M. Kırmacı & H. Kürschner 15-251.

Nardia compressa (Hook.) Gray

Second record for Turkey. Previously known only from an older collection by H. v. Handel-Mazzetti 1907 from the Giresun province (cf. Schiffner, 1909).

First record for the Artvin province.

ARTVIN: Marsis Dağı, Yusufeli, Sarıgöl-Salikvan Yayla, above Zologara Yayla, 41°04'46.1"N 41°26'44"E, 2220 m, in flushes with *Sphagnum tenellum*, 25 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-110.

Lophoziaceae

Barbilophozia sudetica (Nees ex Huebener) L. Söderstr., De Roo & Hedde.

First record for the Gümüşhane province.

GÜMÜŞHANE: Zigana Dağları, 40°37'49.4"N, 39°25'46.8"E, 2410 m, subalpine meadows and flushes, 19 July 2012 M. Kırmacı & H. Kürschner 12-156.

Gymnocolea inflata (Huds.) Dumort. subsp. *acutiloba* (Schiffn.) R. M. Schust. & Damsh. ex L. Söderstr. & Váňa

(Syn. *Gymnocolea acutiloba* (Schiffn.) Müll.Frib.)

Known at present only from two records from Turkey [Giresun (Schiffner, 1909) and Aydin provinces (Özenoğlu & Gökler, 2002)].

First records for the Düzce and Gümüşhane provinces.

DÜZCE: Yedigöller Milli Parkı, way to Devrek, 40°59'06.4"N 31°44'40.9"E, 430 m, on serpentine rock, 26 June 2015 A. Erdağ, M. Kırmacı & H. Kürschner 15-264.

GÜMÜŞHANE: Torul, Kürtün, way from Çatalkaya to Kızılali Yayla, 40°49'02.8"N 39°03'27.08"E, 1800 m, on soil in *Fagus orientalis*-*Picea orientalis* forest, 27 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-135.

Leiocolea alpestris (Schleich. ex F. Weber) Isov.

Second record for Turkey. Previously known only from an older collection by H. v. Handel-Mazzetti 1907 from the Trabzon province (cf. Schiffner, 1909).

First records for the Gümüşhane and Rize provinces.

Gümüşhane: Zigana Dağları, 40°37'49.4"N, 39°25'46.8"E, 2410 m, subalpine meadow and flushes, 19 July 2012 M. Kırmacı & H. Kürschner 12-150.

Rize: İkizdere, Ovitdağı Geçidi, Dağbaşı Gölü, 40°37'29.3"N, 40°46'53.8"E, 2700 m, swampy meadows and flushes, 20 July 2012 M. Kırmacı & H. Kürschner 12-181.

Lophozia excisa (Dicks.) Konstant. & Vilnet(Syn. *Lophozia excisa* (Dicks.) Dumort.)

Although known from the mountains of western (İzmir province, Crundwell & Nyholm, 1979) and southern Turkey (Hatay province, Ezer et al., 2009), the new record represents the first finding for northern Turkey and the Trabzon province.

TRABZON: South of Tonya, between Şarlı Yayla and Yıldız Yayla, Kızılağac Obası, 40°43'44.5"N, 39°17'03.3"E, 2130 m, subalpine meadow, 18 July 2012 M. Kırmacı & H. Kürschner 12-129.

Mesoptychia badensis (Gottsche ex Rabenh.) L. Söderstr. & Váňa(Syn. *Leiocolea badensis* (Gottsche) Jørg.)

First record for the Bolu province.

BOLU: Köroğlu Dağları, summit area of Kartalkaya Dağı above Kartal Otel, 40°35'18.9"N 31°47'50.6"E, 2120 m, subalpine flushes, partly submerged, 29 June 2015 A. Erdağ, M. Kırmacı & H. Kürschner 15-313.

Mesoptychia turbinata (Raddi) L. Söderstr. et Váňa(Syn. *Leiocolea turbinata* (Raddi) H. Buch)

First record for the Erzurum province (e.g., Palandöken Dağları).

ERZURUM: Palandöken Dağları, Palandöken Geçidi, way to Küçük Palandöken, 39°49'10.12"N 41°19'14.6"E, 2930 m, alpine flushes, 22 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-8.

Neoorthocaulis attenuatus (Mart.) L. Söderstr., De Roo & Hedd.(Syn. *Barbilophozia attenuata* (Mart.) Loeske)

Second record for Turkey. Previously known only from a single locality from the Artvin province [Tiryal Dağ above Murgul (Henderson, 1961)].

First record for the Trabzon province.

TRABZON: North of Soğanlı Geçidi, between Dumlu köyü and Karaçam/Çaykara, 40°39'23.2"N 40°14'06.6"E, 1950 m, on rock and soil, 28 June 2016 M. Kırmacı & H. Kürschner 16-175.

Schistochilopsis incisa (Schrad.) Konstant.(Syn. *Lophozia incisa* (Schrad.) Dumort.)

First record for the Gümüşhane province.

GÜMÜŞHANE: Zigana Dağları, 40°37'49.4"N, 39°25'46.8"E, 2410 m, subalpine meadows and flushes. 19 July 2012 M. Kırmacı & H. Kürschner 12-156.

Tritomaria quinquedentata (Huds.) H. Buch

Well known from north-eastern Anatolia (Rize province), but rarely collected in the north-western Karadeniz Dağları.

First record for the Düzce province.

DÜZCE: Yedigöller Milli Parkı, way to Devrek, 40°59'06.4"E, 31°44'40.9"E, 430 m, on serpentine rock, 26 June 2015 A. Erdağ, M. Kırmacı & H. Kürschner 15-263.

Marchantiaceae***Marchantia polymorpha*** L. subsp. *montivagans* Bischl. et Boissel.-Dub.[*M. alpestris* (Nees) Burgeff]

M. polymorpha is present in Turkey with three subspecies: subsp. *montivagans*, *polymorpha*, and subsp. *ruderalis* (Erdağ & Kürschner, 2017). Except in subsp. *polymorpha*, the presence and distribution of the other two subspecies is only imperfectly known. The here presented locality data are the first records for the Erzurum, Rize and Van provinces.

ERZURUM: Erzurum Tekman road, Palandöken Dağları Geçidi, 39°51'38.2"N 41°20'24"E, 2550 m, on rock in subalpine flushes, 22 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-24.

RIZE: İkizdere, Çimil Yayla, between Başköy and Çirmaniman Yaylası, Kalçarak Yayla, 40°43'31.5"N, 40°47'55.7"E, 2260 m, flushes, 23 July 2012 M. Kırmacı & H. Kürschner 12-244.

RIZE: İkizdere, Ovitdağı Geçidi, Dağbaşı Gölü, 40°36'59"N 40°46'22.8"E, 2800 m, flushes, 14 September 2004 H. Kürschner & G. Parolly 04-934.

VAN: Çatak-Bahçesaray, 37°59'21.2"N, 42°53'09.7"E, 2700 m, flushes, 18 June 2014 M. Kırmacı & H. Kürschner 14-381.

Ricciaceae***Riccia bifurca*** Hoffm.

Previously known from central (Erciyes Dağı, Bornmüller, 1931) and southern Turkey (Antalya province, Özçelik et al., 2016).

First record for the Rize province and north-east Anatolia.

RIZE: İkizdere, Ovitdağı Geçidi, Dağbaşı Gölü, 40°37'29.3"N, 40°46'53.8"E, 2700 m, peaty lake shore, 20 July 2012 M. Kırmacı & H. Kürschner 12-175.

Riccia glauca L.

Widely distributed in Turkey. The two collections presented, however, are the first one from the Erzurum and Kars provinces and north-east Anatolia.

ERZURUM: Çoruh valley, 12 km northeast of İspir, close to Öztoprak, 500-700 m, sandy-pepply banks and muddy pools along the Çoruh river, 27 August 1999 M. Döring, G. Parolly & D. Tolimir (7406), det. H. Kürschner.

KARS: North of Horasan, between Karaorgan and Sarıkamış, Handere Geçidi West of Sarıkamış, 40°16'22.7"N 42°29'21.1"E, 2320 m, boggy meadow, 29 June 2016 M. Kırmacı & H. Kürschner 16-180.

Riccia sorocarpa Bisch.

A widely distributed taxon in Turkey with a Mediterranean distribution pattern. The first record for the east Anatolian Hakkari province.

HAKKARI: Karadağ area, Nebirnov Yayla, 37°49'19.9"N, 43°40'36.2"E, 2920 m, flushes, 17 June 2014 M. Kırmacı & H. Kürschner 14-374.

Scapaniaceae

Scapania compacta (Roth) Dumort.

Widely distributed in western and south-western Turkey. First records for the Bayburt and Rize provinces and north-eastern Turkey.

BAYBURT: Soğanlı Geçidi, Dunlu köyü-Çaykara, 40°31'22.9"N 40°13'55.6"E, 2350 m, subalpine flushes, 28 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-167.

RIZE: İkizdere, Ovitdağı Geçidi, Kızıldağ, 40°36'59''N 40°46'22.8''E, 2800 m, in flushes, 13 September 2004 H. Kürschner & G. Parolly 04-933.

RIZE: İkizdere, Ovitdağı Geçidi, Dağbaşı Gölü, 40°37'29.3"N, 40°46'53.8"E, 2700 m, swampy meadows and flushes, 20 July 2012 M. Kırmacı & H. Kürschner 12-176.

Scapania curta (Mart.) Dumort.

Second record for Turkey. Previously known only from an older collection by K. Krause 1926 from the Trabzon province (cf. Reimers, 1927).

First record for the Rize province.

RIZE: İkizdere, Ovitdağı Geçidi, Aksu Yayla-Aksu Göller area, 40°38'39.9''N 40°50'28.3''E, 2800 m, in flushes, 15 September 2004 H. Kürschner & G. Parolly 04-945.

RIZE: İkizdere, Ovitdağı Geçidi, Aksu Göller area, 40°39'08.1''N 40°50'33.9''E. 3060 m, on peat near lake shore, 15 September 2004 H. Kürschner & G. Parolly 04-962.

Scapania subalpina (Nees ex Lindenb.) Dumort.

First records for the Düzce, Bayburt and Artvin provinces.

DÜZCE: Yığılca-Yedigöller Milli Parkı, crossing Mengen/Bolu road, 40°58'44"N 31°44'20.5"E, 450 m, on soil in *Fagus orientalis* forest, 26 June 2015 A. Erdağ, M. Kırmacı & H. Kürschner 15-253 !

DÜZCE: Yedigöller Milli Parkı, way to Devrek, 40°59'06.4"N 31°44'40.9"E, 430 m, on serpentine rock, 26 June 2015 A. Erdağ, M. Kırmacı & H. Kürschner 15-261.

BAYBURT: Soğanlı Geçidi, Dunlu köyü-Çaykara, 40°31'22.9"N 40°13'55.6"E, 2350 m, in subalpine flushes, 28 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-163.

ARTVIN: Marsis Dağı, Yusufeli, Sarıgöl-Salıkvana Yayla, above Zologara Yayla, 41°04'46.1"N 41°26'44"E, 2220 m, in flushes with *Sphagnum*, 25 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-107.

Scapania undulata (L.) Dumort.

Widely distributed along the Black Sea coast (Karadeniz Dağları).

First record for the Gümüşhane province.

GÜMÜŞHANE: Torul district, Kürtün, between Kızılıyalı Yayla and Çatalkaya, 40°47'39.9"N 39°04'20.6"E, 1660 m, on rock, partly submerged, 27 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-157.

Scapania verrucosa Heeg

Widely distributed along the Black Sea coast (Karadeniz Dağları).

First record for the Düzce province.

DÜZCE: Yedigöller Milli Parkı, way to Devrek, 40°59'06.4"N 31°44'40.9"E, 430 m, on serpentine rock, 26 June 2015 A. Erdağ, M. Kırmacı & H. Kürschner 15-262.

Solenostomataceae

Solenostoma handelii (Schiffn.) Müll.Frib.

(Syn. *Jungermannia handelii* (Schiffn.) Amak.)

Previously known only from two older collections from Ordu and Trabzon provinces by H. v. Handel-Mazzetti 1907 (cf. Schiffner, 1909). For a long time thought to be an endemic of Turkey. Known also from Japan (Furuki & Mizutani, 1994) and meanwhile by collections of Crete and Spain (Frey et al., 2006). Probably a Tertiary relict species of the former widely distributed broad-leaved, deciduous *Fagus* forests of the Northern Hemisphere and along the Black Sea coast.

First record for the Rize province.

RIZE: Kaçkar Dağları, Anzer Yayla, Lapazeli Yatak Yayla, Öküz Yatağı, 40°31'55"N, 40°30'18.8"E, 2620 m, flushes, 22 July 2012 M. Kırmacı & H. Kürschner 12-222b.

Solenostoma obovatum (Nees) R.M.Schust.

(Syn. *Jungermannia obovata* Nees)

First record for the Bayburt province.

BAYBURT: Soğanlı Geçidi, Dunlu köyü-Çaykara, 40°31'22.9"N 40°13'55.6"E, 2350 m, in subalpine flushes, 28 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-169.

Solenostoma sphaerocarpum (Hook.) Steph.

(Syn. *Jungermannia sphaerocarpa* Hook.)

Widely distributed in the mountains of Inner, West and North-East Anatolia.

First record for the Bayburt province.

BAYBURT: Soğanlı Geçidi, Dunlu köyü-Çaykara, 40°31'22.9"N 40°13'55.6"E, 2350 m, subalpine flushes, 28 June 2016 A. Erdağ, M. Kırmacı & H. Kürschner 16-164..

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