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The bryophyte flora of the western part of the Küre Mountains (Bartın, Kastamonu), Turkey

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Abstract: This study presents the bryophyte flora of the western part of the Küre Mountains, situated in A2 square in the grid system adopted by Henderson, and entirely within the Euro-Siberian phytogeographic region. A total of 1545 bryophyte specimens were collected from the research area in 2008 and 2009. According to the results of this study, 272 taxa belonging to 146 genera and 60 families were recorded. Of these, 2 taxa are hornworts, 53 taxa are liverworts, and 217 taxa are mosses. Among them, 38 taxa are new records for A2 and 4 taxa [*Leiocolea badensis* (Gottsche) Jörg., *Cephaloziella rubella* (Ness) Warnst., *Diphyscium foliosum* (Hedw.) D.Mohr, and *Brachythecium tommasinii* (Sendtn. ex Boulay) Ignatov & Huttunen] are recorded for the second time in Turkey. In addition, *Seligeria trifaria* (Brid.) Lindb. and *Pseudotaxiphyllum elegans* (Brid.) Z.Iwats are new records for the moss flora of Turkey. At the same time, *Pseudotaxiphyllum* Z.Iwats. is a new genus record for Turkey.

Key words: Hornworts, liverworts, mosses, Küre Mountains, new national records

Introduction

Turkey contains a great variety of natural habitats, ranging from Mediterranean, Aegean, and Black Sea beaches to towering coastal and interior mountains, from deeply incised valleys to expansive steppes, and from fertile alluvial plains to arid, rocky hill slopes. Different community types and habitat mosaics occur, containing a rich mixture of plant and animal species, many of which are endemic (Kaya & Raynal, 2001). For the present study, the western part of the Küre Mountains in Turkey's western Black Sea region, a place of impressive beauty and magnificent wildlife, was selected as the research area (Figure 1). The study area is of particular importance because of the age and size of the forests, biodiversity, and variety of its endemic wildlife, and for this reason the World Wide Fund for Nature (WWF) has listed the area as 1 of 100 forest 'Hot Spots' in Europe (1 of 9 hot spots in Turkey) deserving priority conservation. Afterwards, in 2000, 37,000 ha of this area were declared as the Küre Mountains National Park. Moreover, the western part of the Küre Mountains, which is 1 of Turkey's 350 Key Biodiversity Areas (KBAs) and covering 521,368 ha, is located in Bartın-Kastamonu provinces in the western Black Sea region (Eken et al., 2006). High rainfall in the area

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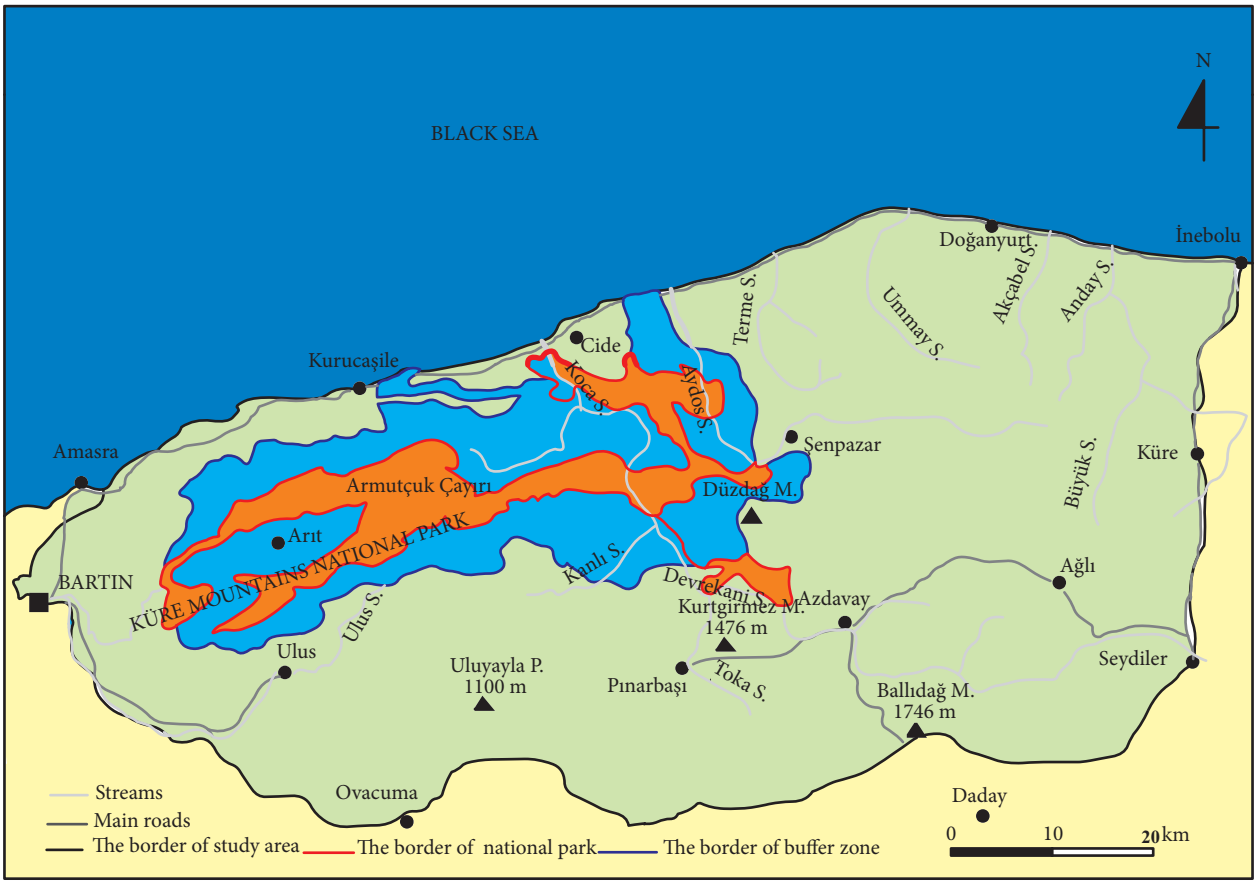

Figure 1. Map of the study area.

is one reason for the lush vegetation of this forested park, whose spectacular beauty is partly a result of the karst limestone structure, which has created countless caves, deep gorges, and waterfalls. The inaccessibility of much of this mountain range, with its karstic structure, great forests, and deep valleys, is one of the main reasons for the preservation of its wildlife. However, it is impossible to carry out protection and accomplish a special environmental protection plan in a scientific manner without having full knowledge about the flora and fauna of such a valuable area. According to the literature, although notable bryofloristic studies have been conducted in the western Black Sea region close to the research area and a new moss record for the bryophyte flora of Turkey in Küre National Park has been given, no detailed study on the bryophyte flora including all western parts of the Küre Mountains has yet been performed (Çetin & Yurdakulol, 1985, 1986, 1988; Özalp, 1995; Keçeli & Çetin, 2000; Uyar & Çetin, 2001; Çetin et al., 2002; Abay & Çetin, 2003; Uyar, 2003; Keçeli & Çetin, 2006; Uyar and Çetin, 2006; Uyar et al., 2007; Cangül & Ezer, 2010; Ören et al., 2010). Therefore, our main purpose in this study was to obtain information on the bryophyte flora of the western part of the Küre Mountains, which includes the Küre Mountains National Park and its buffer zone. It is hoped that this study will contribute to the exploration of the bryophyte flora of Turkey and be useful for future studies.

Materials and methods

This region is situated in the A2 square according to the grid system of Turkey adopted by Henderson (1961) (Figure 2).

In the study area, geological formations consist of the Çakraz formation of Paleozoic age, the Inaltı limestone formation of Jurassic-Cretaceous age in the national parks and its buffer zone, the Ulus

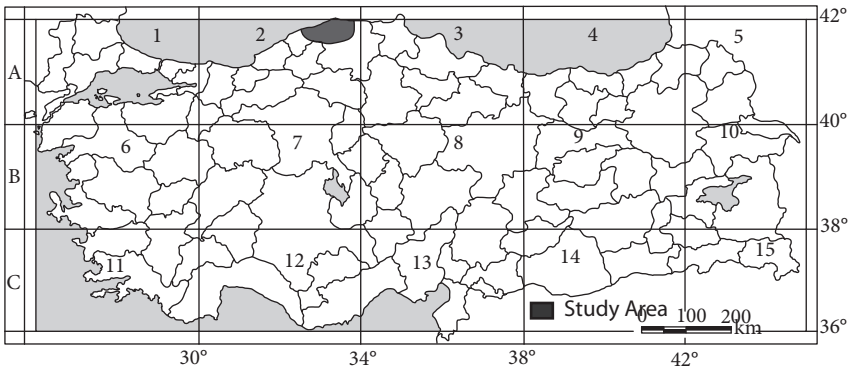

Figure 2. Grid system of Turkey adopted by Henderson (1961).

formation of upper Cretaceous age, Tertiary rocks, and Quaternary alluvia that formed in the bases of valleys (Kırmızıtaş, 2010). Common soil types in this region are brown forest soils and grey-brown podzolic soils (General Directorate of Rural Services, 1989, 1993). The region has the characteristic of an oceanic climate predominantly in the northern and western parts of the area, as well as Mediterranean climate types in the central and southern parts of the area (Akman, 1999). Hence, deciduous, evergreen, and coniferous are main forest vegetation formations in the western part of the Küre Mountains. Dominant deciduous species consist of *Fagus orientalis* Lipsky, *Carpinus betulus* L., *Castanea sativa* Miller, *Ostrya carpinifolia* Scop., *Sorbus aucuparia* L., *Coryllus avellana* L., *Quercus petraea* (Mattuschka) Liebl., *Q. robur* L., *Tilia argentea* Desf., *Populus tremula* L., *Cornus mas* L., *C. sanguinea* L., *Alnus glutinosa* L., *Acer campestre* L., *Ulmus glabra* Hudson, *Platanus orientalis* L., *Crataegus monogyna* Jacg., and *C. microphylla* C.Koch. Common evergreen species are represented by *Rhododendron ponticum* L., *Laurocerasus officinalis* Roemer, *Buxus sempervirens* L., *Arbutus andrachne* L., and *Laurus nobilis* L. The coniferous forests are dominated by *Abies nordmanniana* (Stev.) Spach, *Pinus nigra* J.F.Arnold subsp.*nigra Pinus sylvestris* L., and *Taxus baccata* L. (Atalay, 1994; Akman, 1995; Ketenoğlu & Güney, 1997).

Collections were made between April 2008 and October 2009 from 132 localities in different habitat types. In the floristic list for each taxon, the numbers of the sites where they here found are given according to the Table, followed by the description of the habitat occupied in the study area. All collected specimens are kept in the special collection of UYAR at Biology Department, Faculty of Sciences and Letters, Bülent Ecevit University. Specimens were identified by using relevant literature (Lewinsky, 1993; Zander, 1993; Smith, 1996, 2004; Paton, 1999; Pedrotti, 2001, 2006; Greven, 2003; Heyn & Herrnstadt, 2004; Frey et al., 2006; Guerra et al., 2006; Guerra & Cros, 2007; Casas et al., 2009).

Abbreviations: AA: *Arbutus andrachne*, AG: *Alnus glutinosa*, AN: *Abies nordmannia*, AP: *Acer platanoides*, Asp: *Acer* sp., AU: *Arbutus unedo*, BS: *Buxus sempervirens*, CA: *Corylus avellana*, CB: *Carpinus betulus*, CC: *Corylus colurna*, CCG: *Cotinus coggyria*, CM: *Cornus mas*, CMN: *Crataegus monogyna*, CO: *Carpinus orientalis*, CS: *Castanea sativa*, CSN: *Cornus sanguinea*, Csp: *Crataegus* sp., EA: *Erica arborea*, FO: *Fagus orientalis*, Fsp: *Fraxinus* sp., IC: *Ilex colchica*, JC: *Juniperus communis*, JS: *Juniperus sabina*, Jsp: *Juniperus* sp., LN: *Laurus nobilis*, LO: *Laurocerasus officinalis*, MA: *Morus alba*, MG: *Mespilus germanica*, OC: *Ostrya carpinifolia*, PB: *Pinus brutia*, PC: *Pyracantha coccinea*, PL: *Phillyrea latifolia*, PN: *Pinus nigra* subsp. *nigra.* PO: *Platanus orientalis*, PS: *Pinus sylvestris*, PSC: *Paliurus spina-christi*, Psp: *Populus* sp., PT: *Pistacia terebinthus*, PTR: *Populus tremula*, Qsp: *Quercus* sp., RC: *Rosa canina*, RL: *Rhododendron luteum*, RP: *Rhododendron ponticum*, SA: *Salix alba*, SJ: *Spartium junceum*, SN: *Sambucus nigra*, Ssp: *Salix* sp., ST: *Sorbus torminalis*, TB: *Taxus baccata*, Tsp: *Tilia* sp., UG: *Ulmus glabra.*

Table. Details of study sites.

Loc. no.	Altitude (a.s.l.)	Localities	The list of forest trees
1	967 m	Bartın, Arıt, 41°44′10.7″N, 32°44′42.4″E	AN, FO, CB, BS, TB, CC, RP
2	37 m	Bartın, 41°37′26.0″N, 32°21′30.0″E	PS, Tsp, Fsp
3	25 m	Bartın, Arıt, 41°39′17.4″N, 32°29′16.9″E	LN, MA, CMN, RC, PSC, PT, PL, CSN
4	57 m	Bartın, Arıt, 41°39′05.8″ N, 32°28′49.0″E	PO, AG, Psp, Fsp
5	688 m	Bartın, Arıt, 41°40′13.4″N, 32°38′42.6″E	AN, BS, CMN
6	750 m	Bartın, Arıt, 41°39′57.7″N, 32°38′02.3″E	AN, FO, BS
7	890 m	Bartın, Arıt, 41°39′39.4″N, 32°38′05.7″E	AN, FO, RP
8	930 m	Bartın, Arıt, 41°39′36.4″N, 32°38′04.7″E	CB, OC, RP
9	860 m	Bartın, Arıt, 41°44′07.1″N, 32°39′30.5″E	AN, FO, SA
10	843 m	Bartın, Arıt, 41°43′34.6″N, 32°38′03.1″E	AN, FO, CB, LO, BS, TB
11	860 m	Bartın, Arıt, 41°43′16.4″N, 32°37′22.3″E	FO, CB, AN, BS, Qsp, RP
12	865 m	Bartın, Arıt, 41°43′04.7″N, 32°36′57.1″E	FO, CB, PTR, Qsp, RP
13	550 m	Bartın, Arıt, 41°39′05.1″N, 32°31′06.8″E	FO, CB, PTR, Qsp, RP, Asp
14	650 m	Bartın, Arıt, 41°38′55.3″N, 32°31′11.8″E	FO, RP
15	350 m	Bartın, Ulus, 41°36′08.5″N, 32°32′27.9″E	PN, Qsp, CCG, CMN
16	510 m	Bartın, Ulus, 41°36′07.4″N, 32°32′23.9″E	Bare field
17	305 m	Bartın, Ulus, 41°36′18.6″N, 32°32′05.8″E	FO, CB, LN, LO
18	1200 m	Kastamonu, Azdavay, 41°29′48.4″N, 33°24′37.2″E	PS, PN, JC
19	635 m	Kastamonu, Azdavay, 41°39′49.9″N, 33°12′40.7″E	Bare field
20	528 m	Kastamonu, Azdavay, 41°39′47.9″N, 33°12′27.5″E	CB, CO, AG, UG, TB, BS
21	1145 m	Kastamonu, Azdavay, 41°39′21.7″N, 33°14′07.9″E	AN, CC, JS
22	1066 m	Kastamonu, Azdavay, 41°39′03.8″N, 33°15′06.3″E	Qsp, OC, PC, CMN, Jsp
23	975 m	Kastamonu, Azdavay, 41°37′35.5″N, 33°14′06.5″E	AN, CB, CMN
24	1100 m	Kastamonu, Azdavay, 41°35′33.5″N, 33°13′16.5″E	PN, AN, Qsp, CC
25	1160 m	Kastamonu, Azdavay, 41°34′24.6″N, 33°12′44.6″E	AN, PS
26	1315 m	Kastamonu, Azdavay, 41°36′24.7″N, 33°12′01.1″E	AN, Jsp, BS
27	1225 m	Kastamonu, Azdavay, 41°35′05.1″N, 33°12′17.6″E	PN, PS
28	850 m	Kastamonu, Azdavay, 41°36′52.0″N, 33°14′59.3″E	AG, SA, CA, CMN
29	314 m	Bartın, Amasra, 41°42′44.7″N, 32°25′56.2″E	CB, FO, CS, RP
30	212 m	Bartın, Amasra, 41°40′25.8″N, 32°23′32.6″E	Qsp, OC, CB, Jsp, PL, LN
31	140 m	Bartın, Amasra, 41°38′45.8″N, 32°26′27.8″E	PN, SA, Psp, CB, Ssp
32	360 m	Bartın, Amasra, 41°39′48.3″N, 32°29′06.6″E	Qsp, Jsp, CCG, CO, CM, SJ
33	540 m	Bartın, Amasra, 41°39′41.7″N, 32°29′25.4″E	Qsp, OC, CMN, LN, CO, FO, CA, Jsp, PL
34	640 m	Bartın, Amasra, 41°39′44.9″N, 32°29′27.6″E	Tsp, Qsp, OC, LN, BS
35	640 m	Bartın, Amasra, 41°43′48.8″N, 32°34′11.9″E	AG, PTR, CS, UG
36	463 m	Bartın, Amasra, 41°43′14.2″N, 32°33′48.2″E	CB, CS, FO, AG, RP
37	550 m	Bartın, Amasra, 41°43′08.3″N, 32°33′58.2″E	CB, CS, FO, AG, RP
38	550 m	Bartın, Amasra, 41°43′01.7″N, 32°34′24.8″E	FO, CB, IC, LO, AP
39	199 m	Bartın, Kurucaşile, 41°45′17.0″N, 32°35′59.0″E	CB, MG, AG, RP, PS
40	366 m	Bartın, Kurucaşile, 41°45′48.0″N, 32°37′29.7″E	FO, CB, AG, CS
41	65 m	Bartın, Kurucaşile, 41°50′08.7″N, 32°42′32.1″E	PB, PN
42	19 m	Bartın, Kurucaşile, 41°49′39.7″N, 32°44′59.0″E	CB, CSN, BS,OC, AU, Asp

43	118 m	Bartın, Kurucaşile, 41°48′31″N, 32°44′13″E	PO, AG, CB, PS, FO, CS
44	469 m	Kastamonu, Cide, 41°47′24″N, 32°46′40″E	AN, CB, BS, CS, RP
45	941 m	Kastamonu, Cide, 41°45′58″N, 32°47′07″E	Bare field
46	949 m	Kastamonu, Cide, 41°45′55″N, 32°47′44″E	AN
47	1023 m	Kastamonu, Cide, 41°46′19″N, 32°47′32″E	CB, FO, BS, LO, AP, CA
48	1020 m	Kastamonu, Cide, 41°46′25″N, 32°47′09″E	CB, FO, AN, LO, IC, RP, AP
49	1085 m	Kastamonu, Cide, 41°46′26″N, 32°46′18″E	CB, FO, BS, LO, IC, AP, AN, UG
50	180 m	Bartın, Ulus, 41°36′40″N, 32°38′17″E	CB, FO, AG, Psp, BS, PO, PL
51	350 m	Bartın, Ulus, 41°37′50″N, 32°38′14″E	CA, CB, PL, CMN, BS
52	1056 m	Bartın, Ulus, 41°38′17″N, 32°36′56″E	CB, FO, AN, LO, BS, CA, TB
53	1080 m	Bartın, Ulus, 41°38′09″N, 32°36′57″E	CB, BS
54	821 m	Bartın, Ulus, 41°37′52″N, 32°37′17″E	CB, Qsp
55	320 m	Bartın, Ulus, 41°40′08″N, 32°45′49″E	PO
56	640 m	Bartın, Ulus, 41°38′50″N, 32°47′56″E	Qsp
57	851 m	Bartın, Ulus, 41°38′25″N, 32°48′58″E	AN, FO
58	950 m	Bartın, Ulus, 41°38′54″N, 32°49′33″E	AN, FO, Qsp
59	320 m	Bartın, Ulus, 41°37′26″N, 32°43′16″E	PN, Qsp, UG
60	962 m	Karabük, Eflani, 41°31′54″N, 32°50′11″E	AN, PS
61	950 m	Karabük, Eflani, 41°33′09″N, 32°49′53″E	AN, PS
62	960 m	Bartın, Ulus, 41°32′23″N, 32°46′42″E	AN, PS, CA, BS, FO
63	980 m	Bartın, Ulus, 41°31′16″N, 32°47′28″E	AN, PS
64	620 m	Kastamonu, Pınarbaşı, 41°38′05″N, 33°08′36″E	CB, BS, PN, CM
65	720 m	Kastamonu, Pınarbaşı, 41°38′08″N, 33°09′16″E	PN, PS, CB, PC
66	730 m	Kastamonu, Pınarbaşı, 41°44′22″N, 32°59′32″E	AN, FO
67	1075 m	Kastamonu, Pınarbaşı, 41°42′39″N, 32°58′05″E	FO, CB, Qsp, Psp
68	960 m	Kastamonu, Pınarbaşı, 41°42′51″N, 32°56′58″E	AN, FO
69	710 m	Kastamonu, Pınarbaşı, 41°37′44″N, 32°57′12″E	AN, AG, PTR, PN
70	1100 m	Kastamonu, Pınarbaşı, 41°43′32″N, 33°08′08″E	PN, PS, AN, CB, TB, Qsp
71	1200 m	Kastamonu, Azdavay, 41°43′33″N, 33°12′20″E	AN, PS, PN, FO
72	1090 m	Kastamonu, Azdavay, 41°43′02″N, 33°13′45″E	FO, PS, Qsp
73	850 m	Kastamonu, Azdavay, 41°40′38″N, 33°23′07″E	AN, PS, CB, SA, Psp
74	610 m	Kastamonu, Şenpazar, 41°45′34″N, 33°11′14″E	FO, CB, BS, LO
75	610 m	Kastamonu, Şenpazar, 41°45′52″N, 33°10′08″E	AN, PS, Qsp, FO, CB
76	685 m	Kastamonu, Şenpazar, 41°49′25″N, 33°13′39″E	PN
77	810 m	Kastamonu, Şenpazar, 41°49′46″N, 33°13′35″E	PN, PS, FO, EA, AN
78	555 m	Kastamonu, Şenpazar, 41°48′26″N, 33°13′06″E	FO, RL, EA, PN
79	850 m	Kastamonu, Şenpazar, 41°47′05″N, 33°14′01″E	AN, FO, CB
80	510 m	Kastamonu, Şenpazar, 41°48′08″N, 33°14′03″E	Qsp, PTR, PS
81	875 m	Kastamonu, Azdavay, 41°41′56″N, 33°22′16″E	PS, AN, CB, Asp, CMN, PC, SN
82	850 m	Kastamonu, Azdavay, 41°43′48″N, 33°20′58″E	Qsp, CB, CM, CA, CMN, FO
83	985 m	Kastamonu, Azdavay, 41°44′48″N, 33°19′58″N	AN, FO, CB, AG, CA
84	1175 m	Kastamonu, Azdavay, 41°45′39″N, 33°18′48″E	AN, FO, CB, AG, CA
85	890 m	Kastamonu, Azdavay, 41°46′57″N, 33°20′15″E	Qsp, PN
86	75 m	Kastamonu, Ağlı, 41°41′55″N, 33°27′58″E	PS, PN, AN
87	1086 m	Kastamonu, Ağlı, 41°39′20″N, 33°35′05″E	PS, CMN, PC

88	1020 m	Kastamonu, Seydiler, 41°38′52″N, 33°39′34″E	Psp, CMN, Ssp
89	1053 m	Kastamonu, Seydiler, 41°37′30″N, 33°43′02″E	Bare field
90	1265 m	Kastamonu, Ağlı, 41°40′31″N, 33°32′19″E	PS, Qsp
91	1185 m	Kastamonu, Ağlı, 41°39′37″N, 33°31′50″E	PS, Qsp, AN
92	1175 m	Kastamonu, Ağlı, 41°42′37″N, 33°31′29″E	FO, Qsp
93	907 m	Kastamonu, Ağlı, 41°43′31″N, 33°30′26″E	PN, Qsp, Csp, PC
94	1130 m	Kastamonu, Ağlı, 41°44′1″N, 33°32′14″E	PN, CB, Asp, Qsp, CM, CA
95	1193 m	Kastamonu, Ağlı, 41°44′15″N, 33°32′31″E	PN, FO, CB
96	1356 m	Kastamonu, Ağlı, 41°41′7″N, 33°31′32″E	AN, CMN
97	1160 m	Kastamonu, Ağlı, 41°42′5″N, 33°38′27″E	PS, PC
98	1173 m	Kastamonu, Küre, 41°45′52″N, 33°41′10″E	CB, Qsp, Asp, PS, PTR, CA
99	990 m	Kastamonu, Küre, 41°49′4″N, 33°42′18″E	AN, PS, Qsp
100	1010 m	Kastamonu, Küre, 41°45′50″N, 33°36′13″E	AN, PS, AG, CB
101	1350 m	Kastamonu, Küre, 41°48′46″N, 33°32′3″E	AN
102	922 m	Kastamonu, Küre, 41°51′09″N, 33°32′03″E	AN, PS, FO
103	877 m	Kastamonu, Küre, 41°52′25″N, 33°34′23″E	Qsp
104	605 m	Kastamonu, Küre, 41°52′19″N, 33°38′38″E	Qsp, FO, CB, PS, AN
105	512 m	Kastamonu, Küre, 41°50′54″N, 33°39′16″E	Qsp, CB, CA
106	820 m	Kastamonu, İnebolu, 41°53′09″N, 33°42′04″E	PN, PS, AN, FO, CB
107	547m	Kastamonu, İnebolu, 41°56′17″N, 33°40′06″E	Qsp, EA, FO, CB, PN
108	560 m	Kastamonu, İnebolu, 41°57′37″N, 33°39′42″E	AN, Psp, PN
109	36 m	Kastamonu, İnebolu, 41°57′54″N, 33°36′44″E	PO, AG
110	30 m	Kastamonu, İnebolu, 41°59′07″N, 33°37′55″E	PN, LN
111	5 m	Kastamonu, Doğanyurt, 41°59′13″N, 33°27′18″E	PO, AG, Psp, PN, CS
112	450 m	Kastamonu, Doğanyurt, 41°57′02″N, 33°26′29″E	FO, CS, PN
113	778 m	Kastamonu, Doğanyurt, 41°56′28″N, 33°25′59″E	FO, CB, CS, PS, AN
114	840 m	Kastamonu, Doğanyurt, 41°55′31″N, 33°25′51″E	AG, FO, CB, CS, Asp, SN
115	911 m	Kastamonu, Doğanyurt, 41°55′13″N, 033°24′03″E	AN, CB
116	450 m	Kastamonu, Doğanyurt, 41°57′40″N, 33°21′03″E	Qsp, OC, PL, AU
117	118 m	Kastamonu, Doğanyurt, 41°56′28″N, 33°25′59″E	Qsp, PTR, PN, OC, LN, CS, AU, CA, EA
118	78 m	Kastamonu, Cide, 41°51′49″N, 32°53′16″E	CS, LN, SJ
119	70 m	Kastamonu, Cide, 41°58′01″N, 33°14′19″E	AG, PO, PN
120	380 m	Kastamonu, Cide, 41°56′57″N, 33°16′36″E	PN, FO, CB, CS
121	310 m	Kastamonu, Cide, 41°56′26″N, 33°16′02″E	FO, CB, PO, CS, AG
122	343 m	Kastamonu, Cide, 41°56′50″N, 33°14′49″E	CS, Psp, EA, Qsp
123	535 m	Kastamonu, Cide, 41°52′43″N, 33°02′59″E	FO, CB, CS, PTR
124	885 m	Kastamonu, Cide, 41°50′00″N, 33°04′40″E	FO, CB
125	687 m	Kastamonu, Cide, 41°47′39″N, 33°06′51″E	FO, CB, AN, BS
126	480 m	Kastamonu, Cide, 41°46′50″N, 33°05′49″E	OC, BS, FO, CB
127	138 m	Kastamonu, Cide, 41°48′09″N, 33°03′56″E	AN
128	35 m	Kastamonu, Cide, 41°49′21″N, 33°01′04″E	PO, AG
129	130 m	Kastamonu, Cide, 41°50′22″N, 32°56′01″E	CB, CS
130	300 m	Kastamonu, Cide, 41°50′05″N, 32°54′30″E	OC, Qsp, CS, CA, AA
131	370 m	Kastamonu, Cide, 41°49′43″N, 32°53′27″E	CB, Qsp, PN
132	90 m	Kastamonu, Cide, 41°49′15″N, 32°44′27″E	Psp, Ssp, PO, AG

The floristic list is arranged according to the system proposed by Goffinet and Shaw (2009). In addition, the new records for A2 grid-square and Turkey were determined by reviewing the related literature (Uyar & Çetin, 2004; Kürschner & Erdağ, 2005; Özenoğlu Kiremit & Keçeli, 2009; Ursavaş & Abay, 2009; Cangül & Ezer, 2010).

New records for the A2 grid square are marked with an asterisk (*), the taxa recorded from Turkey for the second time with 2 asterisks (**), and new records for Turkish bryophyte flora with 3 asterisks (***). For each taxon, only one collector number was given to avoid repetition in the floristic list but the same plants collected from different localities were indicated (Loc. 1, 2, 3). The recorded specific and subspecific taxa are listed alphabetically under the families in the floristic list.

Floristic List

Anthocerotophyta

Anthocerotaceae (Gray) Dumort. corr. Trevis. emend. Hässel

1. ***Anthoceros punctatus*** L. - Loc: 35, 107; on soil, *Ören* 565/09.

Notothyladaceae (Milde) Müll.Frib. ex Prosk.

2.** ***Phaeoceros laevis (L.) Prosk. - Loc: 17; on damp soil, *Ören* 245/08.

Marchantiophyta

Blasiaceae H.Klinggr.

3.** ***Blasia pusilla L. - Loc: 35, 39: on damp soil, *Ören* 556/08.

Lunulariaceae H.Klinggr.

4. ***Lunularia cruciata*** (L.) Dumort. ex Lindb. - Loc: 17, 35, 38, 43, 78, 103, 106, 117, 118, 119, 121, 132; on wet soil, wet rocks and soil stream bank, *Ören* 2/09.

Marchantiaceae (Bisch.) Lindb.

5. ***Marchantia polymorpha*** L. - Loc: 1, 4, 43, 62, 115; on wet soil at stream bank and rocks near stream bed, *Ören* 1/09.

Aytoniaceae Cavers

6. ***Reboulia hemisphaerica*** (L.) Raddi - Loc: 39, 62; on damp soil, *Ören* 202/08.

Conocephalaceae Müll.Frib. ex Grolle

7. ***Conocephalum conicum*** (L.) Dumort. - Loc: 1, 4, 9, 17, 35, 39, 43, 74, 105, 107, 109, 111, 114, 115, 119, 121, 125; on soil and rocks near stream bed, *Ören* 14/08.

Corsiniaceae Engl.

8. ***Corsinia coriandrina*** (Spreng.) Lindb. - Loc: 17; on damp soil, *Ören* 252/08.

Ricciaceae Rchb.

9.** ***Riccia crozalsii Levier - Loc: 17; on damp soil, *Ören* 213/08.

Targioniaceae Dumort.

10. ***Targionia hypophylla*** L. - Loc: 17; on damp soil, *Ören* 257/08.

Pelliaceae H.Klinggr.

11. ***Pellia endiviifolia*** (Dicks.) Dumort. - Loc: 4, 6, 9, 13, 25, 32, 45, 58, 74, 81, 84, 99, 107, 114, 119, 121, 125; on wet soil and wet rocks, *TK* 3516.

Fossombroniaceae Hazsl.

12. ***Fossombronia angulosa*** (Dicks.) Raddi - Loc: 17, 43; on damp soil, *Ören* 256/08.

13.** ***Fossombronia caespitiformis De Not. ex Rabenh. subsp. ***multispira*** (Schiffn.) J.R.Bray and D.C.Cargill - Loc: 78; on soil, *Ören* 76/09.

Metzgeriaceae H.Klinggr.

14. ***Apometzgeria pubescens*** (Schrank) Kuwah. - Loc: 21, 23, 104; on rocks, *TK* 3691.

15. ***Metzgeria conjugata*** Lindb. - Loc: 1, 17, 43, 78, 79, 107, 125; on rocks, tree roots and soil near stream bed, *Ören* 513/09.

16. ***Metzgeria furcata*** (L.) Dumort. - Loc: 1, 5, 6, 9, 13, 14, 20, 26, 32, 37, 38, 40, 46, 52, 60, 78, 83, 96, 101, 106, 111, 115; on tree bark and rocks, *Ören* 261/08.

Aneuraceae H.Klinggr.

17. ***Aneura pinguis*** (L.) Dumort. - Loc: 110; on soil, *Ören* 667/09.

18.** ***Riccardia chamedryfolia (With.) Grolle - Loc: 107, 132; on damp soil, *Ören* 424/09.

Porellaceae Cavers

19. ***Porella arboris-vitae*** (With.) Grolle - Loc: 5, 17, 34; on rocks, *TK* 3526.

20. ***Porella cordaeana*** (Huebener) Moore - Loc: 9, 21, 23, 101; on rocks, *Ören* 249/08.

21. ***Porella platyphylla*** (L.) Pfeiff. - Loc: 2, 13, 15, 19, 20, 34, 39, 50, 55, 79, 80, 81, 82, 103, 107, 116, 125, 129, 130; on tree bark and rocks, *Ören* 511/09.

22. ***Radula complanata*** (L.) Dumort. - Loc: 1, 2, 5, 13, 14, 15, 20, 23, 24, 26, 31, 41, 44, 50, 57, 65, 78, 97, 117, 130; on bark and rocks, *Ören* 72/09.

23. ***Radula lindenbergiana*** Gottsche ex C.Hartm. - Loc: 37, 108, 116; on soil and rotten logs, *TK* 3937.

Frullaniaceae Lorch

24. ***Frullania dilatata*** (L.) Dumort. - Loc: 2, 5, 13, 15, 20, 21, 22, 29, 32, 37, 38, 41, 50, 68, 70, 75, 79, 108, 116, 130; on bark, *Ören* 204/08.

25.** ***Frullania fragilifolia (Taylor) Gottsche & al. - Loc: 9; on tree bark, *TK* 3552.

26. ***Frullania tamarisci*** (L.) Dumort. - Loc: 9, 10, 15, 17, 23, 30, 39, 44, 74, 75, 125; on rocks, *Ören* 434/08.

Jubulaceae H.Klinggr.

27. ***Jubula hutchinsiae*** (Hook.) Dumort. subsp. ***javanica*** (Steph.) Verd. - Loc: 17, 114; on rocks and tree trunks near stream bed, *TK* 3610.

Lejeuneaceae Cavers

28. ***Cololejeunea rossettiana*** (C.Massal.) Schiffn. - Loc: 1, 5, 9, 13, 20, 21, 23, 26, 38, 44, 48, 62, 64, 108, 123; on tree branch, rocks and other bryophytes, *Ören* 452/08.

29. ***Lejeunea cavifolia*** (Ehrh.) Lindb. - Loc: 5, 13, 14, 17, 30, 37, 44, 108, 116, 117, 122, 126, 127; on tree trunks, rocks and soil, *Ören* 508/09.

Ptilidiaceae H.Klinggr.

30. ***Ptilidium pulcherrimum*** (Weber) Vain. - Loc: 21, 60; on rotten logs, *TK* 3678.

Lophocoleaceae Vanden Berghen

31. ***Chiloscyphus polyanthos*** (L.) Corda - Loc: 46, 80; on damp soil and rotten logs, *TK* 3920.

32. ***Lophocolea bidentata*** (L.) Dumort. - Loc: 5, 6, 15, 39, 44, 56, 60, 73, 75, 77, 80, 102, 108, 120, 127; on soil and rotten logs, *Ören* 434/09.

33. ***Lophocolea heterophylla*** (Schrad.) Dumort. - Loc: 5, 6, 7, 9, 11, 13, 16, 17, 21, 23, 27, 41, 46, 48, 58, 66, 83, 112, 123; on tree trunks and soil, *Ören* 453/08.

34. ***Lophocolea minor*** Nees - Loc: 5, 15, 16, 20, 21, 39, 56, 73, 78, 80, 81, 100, 113, 116, 117; on tree, soil and rocks, *Ören* 507/09.

Plagiochilaceae Müll.Frib. & Herzog

35. ***Pedinophyllum interruptum*** (Nees) Kaal. - Loc: 1, 11, 38, 39, 44, 62, 74, 75, 80, 114, 121; on rocks and damp soil, *Ören* 203/08.

36. ***Plagiochila asplenioides*** (L. emend. Taylor) Dumort - Loc: 74; on soil covered rocks near waterfall, *Ören* 625/09.

37. ***Plagiochila porelloides*** (Torrey ex Nees) Lindenb. - Loc: 1, 9, 14, 17, 20, 21, 38, 39, 47, 61, 78, 79, 106, 108, 121; on rocks and soil, *Ören* 69/09.

Cephaloziaceae Mig.

38. ***Cephalozia bicuspidata*** (L.) Dumort. - Loc: 29, 37, 125; on soil, *Ören* 292/08.

39.** ***Nowellia curvifolia (Dicks.) Mitt - Loc: 27, 66, 113; on rotten logs, *Ören* 484/09.

Cephaloziellaceae Douin

40. ***Cephaloziella divaricata*** (Sm.) Schiffn. - Loc: 12, 23, 101, 105; on soil and rotten logs, *TK* 3950.

41.** ***Cephaloziella hampeana (Nees) Schiffn. - Loc: 14; on soil, *TK* 3944.

****42.** ***Cephaloziella rubella*** (Nees) Warnst. - Loc: 23, 25; on rotten logs, *Ören* 572/08.

43.** ***Cephaloziella turneri (Hook.) Müll.Frib. - Loc: 37, 58, 107; on soil and rocks, *TK* 3931.

Scapaniaceae Mig.

44. ***Barbilophozia barbata*** (Schmidel ex Schreb.) Loeske - Loc: 20, 21, 22, 23, 98; on rocks, *Ören* 564/08.

45. ***Diplophyllum albicans*** (L.) Dumort. - Loc: 29, 37, 107, 114; on damp soil, *Ören* 432/08.

46.** ***Gymnocolea inflata (Huds.) Dumort. - Loc: 51; on soil, *TK* 3646.

47. ***Lophozia ventricosa*** (Dicks.) Dumort. - Loc: 39; on soil, *TK* 3844.

48. ***Scapania aequiloba*** (Schwägr.) Dumort - Loc: 11, 20, 47, 75, 100, 125; on rocks, *Ören* 265/09.

49. ***Scapania aspera*** Bernet & M.Bernet - Loc: 20, 55, 64, 98, 104, 126; on rocks, *Ören* 270/09.

50. ***Scapania irrigua*** (Nees) Nees - Loc: 22; on rocks, *Quercus* forest, *Ören* 260/08.

51. ***Scapania nemorea*** (L.) Grolle; - Loc: 29, 39; on soil, *TK* 3829.

Arnelliaceae Nakai

52. ***Southbya tophacea*** (Spruce) Spruce - Loc: 31, 39, 121, 126; on soil and rocks near stream bed, *Ören* 256/09.

Calypogeiaceae Arnell

53. ***Calypogeia fissa*** (L.) Raddi - Loc: 7, 13, 14, 17, 29, 36, 37, 39, 40, 44, 55, 106, 107, 112, 114, 122, 125; on damp soil, *Ören* 15/08.

Mesoptychiaceae Inoue & Steere

****54.** ***Leiocolea badensis*** (Gottsche) Jörg. - Loc: 1; on rocks, *TK* 3503.

55. ***Leiocolea turbinata*** (Raddi) H.Buch - Loc: 4, 50, 132; on soil and concrete near stream bed, *TK* 3632.

Bryophyta

Polytrichaceae Schwägr.

56. ***Atrichum angustatum*** (Brid.) Bruch & Schimp. - Loc: 12, 17, 29, 35, 39, 40, 43, 101; on soil, *Ören* 188/08.

57. ***Atrichum undulatum*** (Hedw.) P.Beauv. - Loc: 1, 9, 17, 36, 39, 45, 47, 68, 71; on soil, *Ören* 53/08.

58. ***Pogonatum aloides*** (Hedw.) P.Beauv. - Loc: 10, 13, 17, 47, 68, 114; on soil, *Ören* 263/08.

59. ***Pogonatum urnigerum*** (Hedw.) P.Beauv. - Loc: 39, 77, 100, 101, 107; on soil, *Ören* 617/09.

60. ***Polytrichastrum formosum*** (Hedw.) G.L.Sm. - Loc: 10, 12, 29, 91, 92; on soil, *Ören* 164/08.

61. ***Polytrichum juniperinum*** Hedw. - Loc: 9, 12, 13, 91, 97; on soil, *Ören* 300/08.

62. ***Polytrichum piliferum*** Hedw. - Loc: 69; on soil, *Ören* 499/09.

Buxbaumiaceae Schimp.

63. ***Buxbaumia viridis*** (Moug. ex Lam. & DC.) Brid. ex Moug. & Nestl. - Loc: 61, 68, 86; on decaying wood, *Ören* 39/09.

Diphysciaceae M.Fleisch.

****64.** ***Diphyscium foliosum*** (Hedw.) D.Mohr - Loc: 29, 39; on soil in mixed forest, *Ören* 97/08.

Timmiaceae Schimp.

65. ***Timmia austriaca*** Hedw. - Loc: 23, 62; on rocks, *Ören* 571/09.

Encalyptaceae Schimp.

66. ***Encalypta ciliata*** Hedw. - Loc: 69; on soil, *Ören* 499/09.

67. ***Encalypta streptocarpa*** Hedw. - Loc: 1, 21, 23, 42, 52, 54, 64, 74, 81, 89, 121, 124; on rocks, *Ören* 483/08.

68. ***Encalypta vulgaris*** Hedw. - Loc: 19; on rocks, *Ören* 509/08.

Funariaceae Schwägr.

69.** ***Entosthodon fascicularis (Hedw.) Müll.Hal. - Loc: 17, 73; on soil, *Ören* 40/09.

70. ***Funaria hygrometrica*** Hedw. - Loc: 13, 16, 43, 55, 74, 124; on soil, *Ören* 310/08.

71.** ***Physcomitrium pyriforme (Hedw.) Brid. - Loc: 9; bare field, on soil, *Ören* 3/08.

Grimmiaceae Arn.

72. ***Grimmia anodon*** Bruch & Schimp. - Loc: 89; on rocks, *Ören* 238/09.

73. ***Grimmia dissimulata*** E.Maier - Loc: 3; on rocks, *Ören* 488/08.

74. ***Grimmia ovalis*** (Hedw.) Lindb. - Loc: 44, 55, 130; on rocks, *Ören* 234/09.

75. ***Grimmia pulvinata*** (Hedw.) Sm. - Loc: 3, 13, 16, 21, 22, 23, 24, 26, 32, 81, 88, 94, 97, 112, 126, 130; on rocks, *Ören* 147/08.

76. ***Racomitrium canescens*** (Hedw.) Brid. - Loc: 76, 99; on stone and rocks, *Ören* 492/09.

77.** ***Racomitrium elongatum Ehrh. ex Frisvoll - Loc: 21, 23, 77, 78, 85, 90; on soil, *Ören* 502/08.

78. ***Schistidium atrofuscum*** (Schimp.) Limpr. - Loc: 26, 86; on rocks, *Ören* 237/09.

79. ***Schistidium confertum*** (Funck) Brunch & Schimp. - Loc: 26, 51, 73; on rocks, *Ören* 294/09.

80. ***Schistidium crassipilum*** H.H.Blom - Loc: 26, 53, 79, 98; on rocks, *Ören* 32/09.

Seligeriaceae Schimp.

81. ***Seligeria acutifolia*** Lindb. - Loc: 62, 64; on rocks, *Ören* 406/09.

82. ***Seligeria pusilla*** (Hedw.) Bruch & Schimp. - Loc: 38, 114; on rocks, *Ören* 241/09.

83. ***Seligeria recurvata*** (Hedw.) Bruch & Schimp. - Loc: 57, 80; on rocks, *Ören* 495/09.

******84.** ***Seligeria trifaria*** (Brid.) Lindb. - Loc: 1; on vertical limestone rock, *Ören* 196/08.

Fissidentaceae Schimp.

85. ***Fissidens bryoides*** Hedw. - Loc: 36; on soil, *Ören* 561/08.

86.** ***Fissidens crassipes Wilson ex Brunch & Schimp. - Loc: 4, 50; on rocks in stream bed, *Ören* 353/09.

87. ***Fissidens dubius*** P.Beauv. - Loc: 1, 5, 11, 20, 49, 64, 74, 78, 86, 121, 125; on rocks in woodlands, *Ören* 417/08.

88. ***Fissidens exilis*** Hedw. - Loc: 66, 73; on soil, *Ören* 564/09.

89. ***Fissidens taxifolius*** Hedw. - Loc: 4, 7, 13, 15, 27, 29, 32, 40, 41, 44, 50, 57, 67, 75, 81, 83, 97, 100, 103, 105, 108; on soil, *Ören* 6/08.

90. ***Fissidens viridulus*** (Sw. ex anon.) Wahlenb. - Loc: 4, 13, 17, 36, 39, 66, 79, 113; on soil, *Ören* 508/08.

Ditrichaceae Limpr.

91. ***Ceratodon purpureus*** (Hedw.) Brid. - Loc: 9, 10, 12, 13, 17, 39, 90; on soil, *Ören* 157/08.

92. ***Ditrichum flexicaule*** (Schwägr.) Hampe - Loc: 55, 86, 96; on rocks and soil, *Ören* 442/09.

93. ***Ditrichum gracile*** (Mitt.) Kuntze - Loc: 55, 92; on soil, *Ören* 233/09.

94. ***Ditrichum pallidum*** (Hedw.) Hampe - Loc: 9, 13, 37, 127; on soil, *Ören* 160/08.

95. ***Pleuridium acuminatum*** Lindb. - Loc: 33, 77; on soil, *Ören* 616/09.

96. ***Pleuridium subulatum*** (Hedw.) Rabenh. - Loc: 73; on soil, meadow near forest, *Ören* 500/09.

Rhabdoweisiaceae Limpr.

97. ***Dichodontium pellucidum*** (Hedw.) Schimp. - Loc: 125; on soil near stream bed, *Ören* 661/09.

Dicranaceae Schimp.

98. ***Dicranella heteromalla*** (Hedw.) Schimp. - Loc: 10, 29; on soil, *Ören* 80/08.

99. ***Dicranella howei*** Renauld & Cardot - Loc: 9, 13; on soil, *Ören* 82/08.

100. ***Dicranella varia*** (Hedw.) Schimp. - Loc: 84, 107; on damp soil, *Ören* 184/09.

101. ***Dicranum polysetum*** Sw. ex anon. - Loc: 99; on soil, *Ören* 572/09.

102. ***Dicranum scoparium*** Hedw. - Loc: 1, 10, 15, 18, 22, 23, 26, 27, 46, 52, 56, 73, 86, 101, 125; on rocks, soil and tree trunks, *Ören* 190/08.

103. ***Dicranum tauricum*** Sapjegin - Loc: 25, 26, 60, 81, 83, 84; on tree trunks, *Ören* 169/08.

Leucobryaceae Schimp.

104. ***Dicranodontium denudatum*** (Brid.) E.Britton - Loc: 9; on rotten logs, *Ören* 320/08.

105. ***Leucobryum juniperoideum*** (Brid.) Müll. Hal. - Loc: 39; on damp soil, *Ören* 68/08.

Pottiaceae Schimp.

106.** ***Aloina aloides (Koch ex Schultz) Kindb. - Loc: 56; on soil, *Ören* 27/09.

107. ***Barbula convoluta*** Hedw. - Loc: 1, 74; on soil, *Ören* 641/09.

108. ***Barbula unguiculata*** Hedw. - Loc: 16, 32, 36, 53, 55, 79; on soil, *Ören* 365/08.

109. ***Bryoerythrophyllum recurvirostrum*** (Hedw.) P.C.Chen - Loc: 28, 81, 86; on rocks, *Ören* 229/09.

110.** ***Cinclidotus aquaticus (Hedw.) Bruch & Schimp. - Loc: 55; on submerged rocks, *Ören* 19/09.

111.** ***Cinclidotus fontinaloides (Hedw.) P.Beauv. - Loc: 55, 64, 128; on submerged rocks and tree roots, *Ören* 213/09.

112. ***Cinclidotus riparius*** (Host ex Brid.) Arn. - Loc: 20, 55, 128; on submerged rocks and tree roots, *Ören* 148/09.

113. ***Dialytrichia mucronata*** (Brid.) Broth. - Loc: 50; on tree root near stream bed, *Ören* 627/09.

114. ***Didymodon acutus*** (Brid.) K.Saito - Loc: 15, 16, 79, 88, 132; on soil, *Ören* 387/08.

115. ***Didymodon fallax*** (Hedw.) R.H.Zander - Loc: 13; on damp soil, *Ören* 78/08.

116. ***Didymodon insulanus*** (De Not.) M.O.Hill - Loc: 9, 39, 125; on soil and rocks near stream bed, *Ören* 278/09.

117. *Didymodon luridus* Hornsch. - Loc: 4, 15, 41, 55, 131, 132; on soil and soil covering rocks, *Ören* 368/08.

118. *Didymodon sinuosus* (Mitt.) Delogne - Loc: 33; on rocks, *Ören* 285/08.

119. *Ephemerum minutissimum Lindb. - Loc: 61; on soil in meadow, *Ören* 21/09.

120. *Eucladium verticillatum* (With.) Brunch & Schimp. - Loc: 4, 41, 74, 121, 126; on calcareous rocks, *Ören* 328/08.

121. *Gymnostomum calcareum* Nees & Hornsch. - Loc: 1, 32, 110, 126; on calcareous rocks, *Ören* 369/08.

122. *Leptobarbula berica (De Not.) Schimp. - Loc: 26; on rocks, *Ören* 187/08.

123. *Phascum cuspidatum* Hedw. - Loc: 25, 73; on soil, *Ören* 18/09.

124. *Pleurochaete squarrosa* (Brid.) Lindb. - Loc: 15, 34, 51, 76, 120; on soil and rocks, *Ören* 14/09.

125. *Protobryum bryoides (Dicks.) J.Guerra & M.J.Cano - Loc: 73; on soil, *Ören* 651/09.

126. *Pterygoneurum ovatum (Hedw.) Dixon - Loc: 89; on soil in open land, *Ören* 570/09.

127. *Syntrichia calcicola* J.J.Amann - Loc: 24, 39, 93; on rocks, *Ören* 60/08.

128. *Syntrichia ruralis* (Hedw.) F.Weber & D.Mohr. - Loc: 21, 24, 25, 26, 27, 52, 64, 81, 88; on rocks and tree trunks, *Ören* 141/08.

129. *Syntrichia virescens* (De Not.) Ochyra - Loc: 20, 23, 86, 88; on tree trunks, *Ören* 181/08.

130. *Tortella humilis (Hedw.) Jenn.- Loc: 23, 86; on rocks, *Ören* 181/09.

131. *Tortella inclinata* (R.Hedw.) Limpr. var. ***densa*** (Lorentz & Molendo) Limpr. (*T. densa* (Lorentz & Molendo) Crundw. & Nyholm) - Loc: 39; on rocks, *Ören* 333/08.

132. *Tortella tortuosa* (Hedw.) Limpr. - Loc: 1, 21, 74, 124; on rocks, *Ören* 102/08.

133. *Tortula brevissima* Schiffn. - Loc: 50; on concrete wall, *Ören* 328/09.

134. *Tortula caucasica Lindb. ex Broth. - Loc: 51; on soil, *Ören* 23/09.

135. *Tortula inermis* (Brid.) Mont - Loc: 51, 55; on rocks, *Ören* 31/09.

136. *Tortula lanceola* R.H.Zander - Loc: 55; on rocks, *Ören* 307/09.

137. *Tortula muralis* Hedw. - Loc: 1, 13, 16, 17, 32, 33, 50, 55, 130; on rocks, *Ören* 100/08.

138. *Tortula schimperi* M.J.Cano et al. - Loc: 13, 70, 71, 73, 79, 81, 87; on soil, *Ören* 610/09.

139. *Tortula subulata* Hedw. - Loc: 49, 69, 73, 85, 90; on soil, *Ören* 590/09.

140. *Trichostomum brachydontium* Bruch - Loc: 11, 17, 71, 121; on rocks and soil, *Ören* 352/09.

141. *Trichostomum crispulum* Bruch - Loc: 3, 15, 41, 42, 79, 104; on rocks and soil, *Ören* 334/08.

142. *Weissia brachycarpa* (Nees & Hornsch.) Jur. - Loc: 15, 17, 36, 85, 94, 122; on soil, *Ören* 122/08.

143. *Weissia condensa (Voit) Lindb. - Loc: 22, 51; on soil and rock crevices, *Ören* 322/09.

144. *Weissia controversa* Hedw. - Loc: 64, 78, 124; on soil, *Ören* 64/09.

Bryaceae Schwägr.

145. *Bryum alpinum* Huds. ex With. - Loc: 13, 15, 51, 132; on soil, *Ören* 265/08.

146. *Bryum argenteum* Hedw. - Loc: 51, 55, 73, 79, 81; on soil and rocks, *Ören* 121/09.

147. *Bryum caespiticium* Hedw. - Loc: 13, 16, 17, 42, 71, 124; on soil and rocks, *Ören* 373/08.

148. *Bryum capillare* Hedw. - Loc: 13, 16, 17, 26, 29, 73, 77, 96, 130; on rocks, soil, and tree root, *Ören* 51/08.

149. *Bryum creberrimum* Taylor - Loc: 12; on soil, *Ören* 393/08.

150. *Bryum donianum* Grev. - Loc: 55; water leakage, on calcareous rocks, *Ören* 367/09.

151. *Bryum moravicum* Podp. - Loc: 2, 21, 23, 82, 88; on tree roots, soil and rocks, *Ören* 191/08.

152. *Bryum pseudotriquetrum* (Hedw.) P.Gaertn. et al. - Loc: 5, 51, 71, 125; on damp soil by small spring, *Ören* 95/08.

153. *Rhodobryum roseum* (Hedw.) - Loc: 21, 26, 73, 81, 100, 101; on rocks and soil, *Ören* 40/08.

Mniaceae Schwägr.

154. *Epipterygium tozeri* (Grev.) Lindb. - Loc: 17, on damp soil, *Ören* 19/08.

155. *Mnium hornum* Hedw. - Loc: 11; on rock crevices, *Ören* 345/08.

156. *Mnium marginatum* (Dicks.) P.Beauv. - Loc: 9, 26; on wet soil and rocks, *Ören* 136/08.

157. *Mnium spinosum* (Voit) Schwägr. - Loc: 86; on damp soil, *Ören* 197/09.

158. *Mnium stellare* Hedw. - Loc: 17, 23, 43, 64, 74, 92, 96; on soil and rocks, *Ören* 409/08.

159. *Mnium thomsonii* Schimp. - Loc: 1, 125; on rocks, *Ören* 138/08.

160. *Plagiomnium affine* (Blandow ex Funck) T.J.Kop. - Loc: 23, 30, 31, 46, 86; on soil in woodland, *Ören* 325/08.

161. *Plagiomnium elatum* (Bruch & Schimp.) T.J.Kop. - Loc: 132; on soil near stream bed, *Ören* 470/09.

162. *Plagiomnium ellipticum* (Brid.) T.J.Kop. - Loc: 34, 127; on soil and soil covered rocks, *Ören* 449/09.

163. *Plagiomnium rostratum* (Schrad.) T.J.Kop. - Loc: 5, 9, 17, 44, 55, 74, 75, 80; on soil and rocks near stream bed, *Ören* 57/09.

164. *Plagiomnium undulatum* (Hedw.) T.J.Kop. - Loc: 36, 60, 73, 81, 115, 118, 125; on wet soil near stream bed, *Ören* 601/09.

165. *Pohlia nutans* (Hedw.) Lindb. - Loc: 120; open field, on wet soil, *Ören* 409/09.

166. *Pohlia wahlenbergii* (F.Weber & D.Mohr) A.L.Andrews - Loc: 9, 16, 35, 80; on damp soil, *Ören* 272/08.

167. *Pohlia wahlenbergii* (F.Weber & D.Mohr) A.L.Andrews var. ***calcarea*** (Warnst.) E.F.Warb. - Loc: 39, 40, 106; on damp soil, *Ören* 347/08.

168. *Rhizomnium magnifolium (Horik.) T.J.Kop. - Loc: 10; on rocks near stream bed, *Ören* 54/08.

169. *Rhizomnium punctatum* (Hedw.) T.J.Kop. - Loc: 17, 37, 40, 48, 49, 61, 74, 78; on damp soil and soil covered rocks, *Ören* 573/09.

Bartramiaceae Schwägr.

170. *Bartramia halleriana* Hedw. - Loc: 92; on damp soil, *Ören* 190/09.

171. *Bartramia pomiformis* Hedw. - Loc: 64; on rocks, *Ören* 626/09.

172. *Philonotis arnellii* Husn. - Loc: 39, 77, 103; on soil, *Ören* 81/08.

173. *Philonotis calcarea* (Bruch & Schimp.) Schimp. - Loc: 32, 76, 107; on damp soil and soil near stream bed, *Ören* 403/09.

174. *Plagiopus oederianus* (Sw.) H.A.Crum & L.E.Anderson - Loc: 11, 20, 47, 59, 62, 64, 104, 125; on rocks and soil, *Ören* 121/08.

Orthotrichaceae Arn.

175. *Nyholmiella obtusifolia (Brid.) Holmen & Warncke - Loc: 24, 88; on tree trunks, *Ören* 204/09.

176. *Orthotrichum affine* Schrad. ex Brid. - Loc: 9, 15, 25, 88; on tree trunks, *Ören* 304/08.

177. *Orthotrichum anomalum* Hedw.- Loc: 13, 19, 20, 21, 44; on rocks, *Ören* 467/08.

178. *Orthotrichum cupulatum* Hoffm. ex Brid. var. ***cupulatum*** - Loc: 1, 4, 20, 22, 55, 64, 65, 86; on rocks, *Ören* 505/08.

179. *Orthotrichum cupulatum* Hoffm. ex Brid. var. ***riparium*** Huebener - Loc: 20, 55, 64; on rocks riverside, *Ören* 589/09.

180. *Orthotrichum diaphanum* Schrad. ex Brid. - Loc: 112, 128, 130; on tree trunks, *Ören* 161/09.

181. *Orthotrichum lyellii* Hook. & Taylor - Loc: 9, 24, 36, 39, 127, 130; on tree trunks, *Ören* 133/08.

182. *Orthotrichum pallens* Bruch ex Brid. - Loc: 38, 122, 130; on tree trunks, *Ören* 200/09.

183. *Orthotrichum pumilum Sw. ex anon. - Loc: 23, 66, 131; on tree trunks, *Ören* 142/08.

184. *Orthotrichum rupestre* Schleich. ex Schwägr. - Loc: 64, 76; on rocks, *Ören* 663/09.

185. *Orthotrichum speciosum* Nees - Loc: 13, 64, 65, 68, 81; on tree trunks, *Ören* 551/09.

186. *Orthotrichum stramineum Hornsch. ex Brid. - Loc: 1; on tree trunks, *Ören* 38/08.

187. *Orthotrichum striatum* Hedw. - Loc: 8, 68, 85; on tree trunks, *Ören* 544/08.

188. ***Ulota crispa*** (Hedw.) Brid. - Loc: 9, 10, 13, 15, 39; on tree trunks, *Ören* 464/08.

189. ***Zygodon rupestris*** Schimp. ex Lorentz - Loc: 109; on tree trunks, *Ören* 386/09.

Aulacomniaceae Schimp.

190. ***Aulacomnium androgynum*** (Hedw.) Schwägr. - Loc: 69, 91, 99; on soil and rotten logs, *Ören* 112/09.

Fontinalaceae Schimp.

191. ***Fontinalis antipyretica*** Hedw. subsp. ***antipyretica*** - Loc: 55, 62, 64, 66, 88; attached to submerged rocks in stream, *Ören* 390/09.

192.** ***Fontinalis antipyretica Hedw. subsp. ***gracilis*** (Lindb.) Kindb. - Loc: 20, 128; attached to submerged tree root and rocks in stream, *Ören* 168/09.

Amblystegiaceae Kindb.

193. ***Amblystegium confervoides*** (Brid.) Schimp. - Loc: 23, 123; on rocks, *Ören* 452/09.

194. ***Amblystegium serpens*** (Hedw.) Schimp. - Loc: 109; on tree trunks nearby riverside, *Ören* 223/09.

195. ***Amblystegium subtile*** (Hedw.) Schimp. - Loc: 1, 17, 25, 50, 93, 95; on tree trunks and damp soil, *Ören* 349/08.

196. ***Campyliadelphus chrysophyllus*** (Brid.) R.S.Chopra. - Loc: 13, 15, 30, 42, 87; on soil and rocks, *Ören* 410/08.

197. ***Cratoneuron filicinum*** (Hedw.) Spruce - Loc: 4, 11, 25, 35, 55, 73, 74, 76, 79, 100, 125, 126, 132; on wet soil and rocks, *Ören* 41/09.

198. ***Drepanocladus aduncus*** (Hedw.) Warnst. - Loc: 9, 45; on submerged soil, *Ören* 5/08.

199. ***Hygrohypnum luridum*** (Hedw.) Jenn. - Loc: 4, 44, 50, 57, 121, 125, 126, 132; on rocks near stream bed, *Ören* 89/08.

200. ***Leptodictyum riparium*** (Hedw.) Warnst. - Loc: 40, 88, 127; on rocks near stream bed, *Ören* 353/08.

201. ***Palustriella commutata*** (Hedw.) Ochyra - Loc: 5, 71, 74, 84; on calcareous rocks or soil, *Ören* 304/09.

202. ***Sanionia uncinata*** (Hedw.) Loeske - Loc: 46, 61, 63; on soil, *Ören* 296/09.

Leskeaceae Schimp.

203.** ***Lescuraea mutabilis (Brid.) Lindb. ex I.Hagen - Loc: 48; on tree trunks, *Ören* 573/08.

204. ***Leskea polycarpa*** Hedw. - Loc: 28, 128; on tree trunks near stream bed, *Ören* 172/09.

205. ***Pseudoleskea incurvata*** (Hedw.) Loeske - Loc: 49, 53; on rocks, *Ören* 73/08.

206. ***Pseudoleskeella catenulata*** (Brid. ex Schrad.) Kindb. - Loc: 26, 96; on rocks, *Ören* 163/08.

207. ***Pseudoleskeella nervosa*** (Brid.) Nyholm - Loc: 96; on rocks, *Ören* 456/09.

Thuidiaceae Schimp.

208. ***Abietinella abietina*** (Hedw.) M.Fleisch. - Loc: 18, 22, 81, 85, 86, 87, 103; on soil, *Ören* 166/08.

209. ***Thuidium assimile*** (Mitt.) A.Jaeger - Loc: 44, 102, 108; on soil, *Ören* 529/08.

210. ***Thuidium delicatulum*** (Hedw.) Schimp. - Loc: 65, 73; on soil, *Ören* 619/09.

211. ***Thuidium tamariscinum*** (Hedw.) Schimp. - Loc: 59; on soil, *Ören* 43/09.

Brachytheciaceae Schimp.

212. ***Brachytheciastrum velutinum*** (Hedw.) Ignatov & Huttunen - Loc: 1, 9, 10, 21, 25, 43, 50, 56, 66, 83, 101, 107; on soil, tree trunks and stone, *Ören* 191/08.

213. ***Brachythecium albicans*** (Hedw.) Schimp. - Loc: 10, 26; on soil, *Ören* 371/08.

214. ***Brachythecium glareosum*** (Bruch ex Spruce) Schimp. - Loc: 101; on soil, *Ören* 360/09.

215. ***Brachythecium mildeanum*** (Schimp.) Schimp. - Loc: 15, 39; on soil, *Ören* 83/08.

216. ***Brachythecium rivulare*** Schimp. - Loc: 4, 17, 84; on wet soil and rocks near stream bed, *Ören* 656/09.

217. ***Brachythecium rutabulum*** (Hedw.) Schimp. - Loc: 9, 31, 32, 50, 64, 75, 107, 115, 121, 126; on rotten logs, rocks and soil, *Ören* 588/09.

218. ***Brachythecium salebrosum*** (Hoffm. ex F.Weber & D.Mohr) Schimp. - Loc: 9, 15, 34; on rocks, rotten logs and soil in forest, *Ören* 308/08.

****219.** ***Brachythecium tommasinii*** (Sendtn. ex Boulay) Ignatov & Huttunen - Loc: 1; on rocks, *Ören* 231/08.

220. *Cirriphyllum crassinervium* (Taylor) Loeske & M.Fleisch. - Loc: 1, 62, 64; on rocks, *Ören* 630/09.

221. *Eurhynchium angustirete (Broth.) T.J.Kop. - Loc: 66; on soil, *Ören* 532/09.

222. *Eurhynchium striatum* (Hedw.) Schimp. - Loc: 1, 15, 34, 44, 75, 80, 125, 126; on soil, tree roots and rocks, *Ören* 221/09.

223. *Homalothecium lutescens* (Hedw.) H.Rob. - Loc: 17, 20, 23, 50, 55, 65, 73, 74, 81, 82, 97, 98, 123, 126; on rocks, soil and tree trunks, *Ören* 582/09.

224. *Homalothecium philippeanum* (Spruce) Schimp. - Loc: 14, 123; on rocks, *Ören* 535/08.

225. *Homalothecium sericeum* (Hedw.) Schimp. - Loc: 1, 3, 15, 21, 22, 56, 66, 82, 93, 96, 115, 116; on rocks and tree trunks, *Ören* 538/08.

226. *Kindbergia praelonga* (Hedw.) Ochyra - Loc: 16, 17, 29, 39, 63, 131; on damp soil and rocks, *Ören* 159/09.

227. *Oxyrrhynchium hians* (Hedw.) Loeske - Loc: 6, 9, 15, 29, 31, 37, 42, 75, 106, 124, 129; on rocks, soil and rotten logs, *Ören* 335/08.

228. *Oxyrrhynchium pumilum* (Wilson) Loeske. - Loc: 1, 14, 15, 16, 17, 34, 44, 64, 117, 120, 131; on rocks, soil and sticks, *Ören* 351/08.

229. *Oxyrrhynchium schleicheri* (R.Hedw.) Röll - Loc: 9, 17; on damp soil, *Ören* 20/08.

230. *Oxyrrhynchium speciosum* (Brid.) Warnst. - Loc: 39, 64, 74, 81; on sticks and soil, *Ören* 653/09.

231. *Palamocladium euchloron* (Müll.Hal.) Wijk & Margad. - Loc: 34; on rocks, *Ören* 569/08.

232. *Plasteurhynchium striatulum* (Spruce) M.Fleisch. - Loc: 4, 21; on rocks, *Ören* 474/08.

233. *Platyhypnidium riparioides* (Hedw.) Dixon - Loc: 4, 13, 28, 32, 35, 39, 55, 57, 74; on rocks and tree roots in stream bed, *Ören* 137/08.

234. *Pseudoscleropodium purum* (Hedw.) M.Fleisch. - Loc: 5, 15, 18, 30, 46, 51, 65, 72, 80, 86, 120; on soil, *Ören* 301/08.

235. *Rhynchostegiella teneriffae* (Mont.) Dirkse & Bouman - Loc: 17; on sticks in water sources, *Ören* 266/08.

236. *Rhynchostegium confertum* (Dicks.) Schimp. - Loc: 4; on moist rocks, *Ören* 11/08.

237. *Rhynchostegium murale* (Hedw.) Schimp. - Loc: 11; on rocks, *Ören* 195/08.

238. *Scleropodium touretii* (Brid.) L.F.Koch - Loc: 17, 102, 111; on damp soil and tree roots, *Ören* 357/09.

239. *Scorpiurium circinatum* (Bruch) M.Fleisch. & Loeske - Loc: 3, 33, 34, 131; on rocks, *Ören* 287/08.

240. *Scorpiurium deflexifolium (Solms) M.Fleisch. & Loeske - Loc: 128; on tree root, *Ören* 274/09.

Hypnaceae Schimp.

241. *Calliergonella cuspidata* (Hedw.) Loeske. - Loc: 4, 5, 13, 15, 32, 40, 50, 60, 65, 76, 79, 80, 81, 108, 121, 125; on wet soil nearby water sources, *Ören* 306/08.

242. *Campylophyllum calcareum* (Crundw. & Nyholm) Hedenäs - Loc: 4, 15, 34; on soil and rocks, *Ören* 363/08.

243. *Herzogiella seligeri* (Brid.) Z.Iwats. - Loc: 6, 9, 23, 44, 66, 68; on rotten logs, *Ören* 491/08.

244. *Homomallium incurvatum* (Schrad. ex Brid.) Loeske - Loc: 14, 81; on rocks, *Ören* 501/08.

245. *Hypnum andoi* A.J.E.Sm. - Loc: 9, 100; on tree trunks, *Ören* 132/08.

246. *Hypnum cupressiforme* Hedw. var. ***cupressiforme*** - Loc: 1, 3, 20, 21, 23, 27, 50, 78, 119, 126; on rocks, tree trunks and soil, *Ören* 60/09.

247. *Hypnum cupressiforme* Hedw. var. ***lacunosum*** Brid. - Loc: 1, 15, 24, 50, 72, 85, 120; on rocks, tree trunks and soil, *Ören* 587/09.

248. *Hypnum cupressiforme* Hedw. var. ***resupinatum*** (Taylor) Schimp. - Loc: 66; on tree trunks, *Ören* 631/09.

249. *Hypnum jutlandicum* Holmen & Warncke - Loc: 1, 75; on tree root, *Ören* 37/08.

250. *Pseudotaxiphyllum elegans (Brid.) Z.Iwats. - Loc: 14; on sandy soil in deciduous forest, *Ören* 426/08.

251. *Taxiphyllum wissgrillii* (Garov.) Wijk & Margad. - Loc: 9; on rocks, *Ören* 462/08.

Pterigynandraceae Schimp.

252. *Pterigynandrum filiforme* Hedw. - Loc: 1, 9, 37, 72, 78, 91, 92, 95; on tree trunks and rocks, *Ören* 182/09.

Hylocomiaceae (Broth.) M.Fleisch.

253. *Ctenidium molluscum* (Hedw.) Mitt. - Loc: 13, 14, 16, 21, 26, 34, 41, 42, 51, 52, 55, 75, 86, 104, 114, 121; on soil and rocks, *Ören* 143/08.

254. *Hylocomium splendens* (Hedw.) Schimp. - Loc: 23, 73, 86; on soil, *Ören* 6/09.

255. *Pleurozium schreberi* (Willd. ex Brid.) Mitt. - Loc: 23, 46, 73, 81, 86; on soil, *Ören* 108/08.

256. *Rhytidiadelphus triquetrus* (Hedw.) Warnst. - Loc: 20, 23, 64, 73, 86, 97; on soil, *Ören* 28/08.

Plagiotheciaceae (Broth.) M.Fleisch.

257. *Plagiothecium cavifolium* (Brid.) Z.Iwats. (*P. roeseanum* Schimp.) - Loc: 125; on damp soil, *Ören* 127/09.

258. *Plagiothecium denticulatum* (Hedw.) Schimp. - Loc: 9, 61, 63, 66, 83; on tree bases, *Ören* 94/08.

259. *Plagiothecium laetum* Schimp. - Loc: 123; on tree root, *Ören* 346/09.

260. *Plagiothecium latebricola* Schimp. - Loc: 9; on soil, *Ören* 92/08.

261. *Plagiothecium succulentum* (Wilson) Lindb. - Loc: 8, 9, 14, 17, 114; on tree roots and soil, *Ören* 382/08.

Leucodontaceae Schimp.

262. *Antitrichia curtipendula* (Hedw.) Brid. - Loc: 9, 19, 23, 66, 92; on tree trunks and rocks, *Ören* 168/08.

263. *Leucodon sciuroides* (Hedw.) Schwägr. - Loc: 15, 19, 20, 24, 38, 52, 56, 66, 69, 81, 85, 88, 107; on tree trunks and rocks, *Ören* 489/09.

Neckeraceae Schimp.

264. *Homalia trichomanoides (Hedw.) Brid. - Loc: 48; on tree trunks, *Ören* 540/08.

265. *Neckera besseri* (Lobarz.) Jur. - Loc: 13, 53, 108, 123; on rocks and tree roots near stream bed, *Ören* 513/08.

266. *Neckera complanata* (Hedw.) Huebener - Loc: 15, 23, 30, 32, 42, 43, 50, 53, 55, 64, 98, 129, 130; on tree trunks and rocks, *Ören* 124/08.

267. *Neckera crispa* Hedw. - Loc: 6, 11, 20, 34, 55, 74, 104, 125; on rocks and tree trunks, *Ören* 55/08.

268. *Neckera menziesii* Drumm. (*Metaneckera menziesii* (Drumm.) Steere) - Loc: 19, 23; on rocks and tree bases, *Ören* 47/08.

269. *Thamnobryum alopecurum* (Hedw.) Gangulee - Loc: 13, 17, 21, 44, 48, 79, 80, 119, 125; on rocks in stream bed, *Ören* 492/08.

Lembophyllaceae Broth.

270. *Isothecium alopecuroides* (Lam. ex Dubois) Isov - Loc: 1, 5, 6, 8, 15, 20, 29, 48, 52, 54, 56, 65, 66, 79, 81, 91, 123; on tree bases and rocks, *Ören* 315/09.

Anomodontaceae Kindb.

271. *Anomodon attenuatus* (Hedw.) Huebener - Loc: 10, 50, 54, 79, 82, 83, 125, 131; on rocks and tree trunks *Ören* 45/09.

272. *Anomodon viticulosus* (Hedw.) Hook. & Taylor - Loc: 4, 9, 13, 20, 21, 32, 42, 53, 55, 62, 64, 93, 108, 130, 131; on rocks and tree trunks, *Ören* 234/08.

New national records

Seligeria trifaria - **Specimen examined:** Turkey, Bartın province, Arıt District, Örenbaşı hill, (41°44′10″N, 32°44′42″E) in *Abies nordmannia*, *Fagus orientalis*, *Carpinus betulus*, *Buxus sempervirens*, *Taxus baccata*, *Corylus colurna*, and *Rhododendron ponticum*, mixed forest, 967 m. a.s.l., 19.04.2008, *Ören* 196/08.

The specimens were collected from the entrance of a small cave on shaded, damp, and vertical limestone rocks near a forest road, associated with *Leiocolea badensis*, *Barbula convoluta*, and *Brachythecium tommasinii.* Green to blackish green plants are often so encrusted with algae that they are hard to detect. This mountain temperate species grows in shoots 2-4 mm tall and differs from other species of *Seligeria* in having narrow, pointed trifarious leaves that are less than 1 mm long, appressed, and arranged in 3 distinct rows. At the same time this species is similar to *Seligeria patula* and *S. tristichoides* with its trifarious leaves, but it differs from the others having larger spore size and smooth subula. Furthermore, leaves are imbricate, especially in sterile stems, rapidly narrowed to smooth subula filled by costa. Cells are narrowly rectangular in basal part of leaves but shorter above cells. Upper vegetative leaves with long stout subula are similar to perichaetial leaves. Capsules are ovoid, wide-mouthed, when moist setae

are straight and stout, 1.7-2.0 mm long, capsule neck with imperfect stomata, columella not elongate after dehiscence, spores 24-29 µm and coarsely papillose (Figure 3). This very rare species has been recorded from S, C, and W Europe, extending north to Germany and the Caucasus (Smith, 2004). Apparently this new record fills its remarkable distributional gap between Europe and Caucasus.

Pseudotaxiphyllum elegans - **Specimen examined:** Turkey, Bartın province, Arıt District, Kayadibi Kavlak village, Keçikuzu region (41°38′55″N, 32°31′11″E) on sandy soil in deciduous forest; especially dominant with *Fagus orientalis* and under the forest cover with *Rhododendron ponticum*, 650 m. a.s.l., 22.04.2008, *Ören* 426/08.

This disjunct circumpolar species forms glossy green patches. The plants grow up to 3 cm long. The stems are flattened and shoots prostrate, all pointing in the same direction. The ovate leaves are over 1 mm long, mostly gradually tapering to a fine point. Leaf margins are denticulate toward the apex. The nerve is very short and double, or absent. Cells are linear almost homogeneous in all leaf parts; mid-leaf cells are approximately 80-120 µm long. However, alar cells are hardly differentiated, neither inflated nor decurrent. The plant has vegetative axillary propagules that are easily detached filiform branchlets in leaf axils. Specimens are sterile (Figure 4).

Pseudotaxiphyllum elegans is similar to most *Plagiothecium* species with complanate leaves, whereas it differs by its leaf base that is not decurrent down stem and its vegetative propagules from all *Plagiothecium* species. Moreover, *Taxiphyllum wissgrillii* could be confused with *Pseudotaxiphyllum elegans.* However, *Taxiphyllum wissgrillii* differs in the less tapering leaves, more glossy shoots, not having axillary propagules, and its calcareous habitat (Atherton et al., 2010).

Until now, this plant was known only from Europe and the Caucasus; this new record in Turkey fills its considerable distributional gap (Smith, 2004).

Figure 3. *Seligeria trifaria.* a- plant with sporophyte, b- sterile plant, c- leaves, d- leaf tip, e- basal cells, f- leaf shoulder, g- base of the sporophyte with stomata, h- spores.

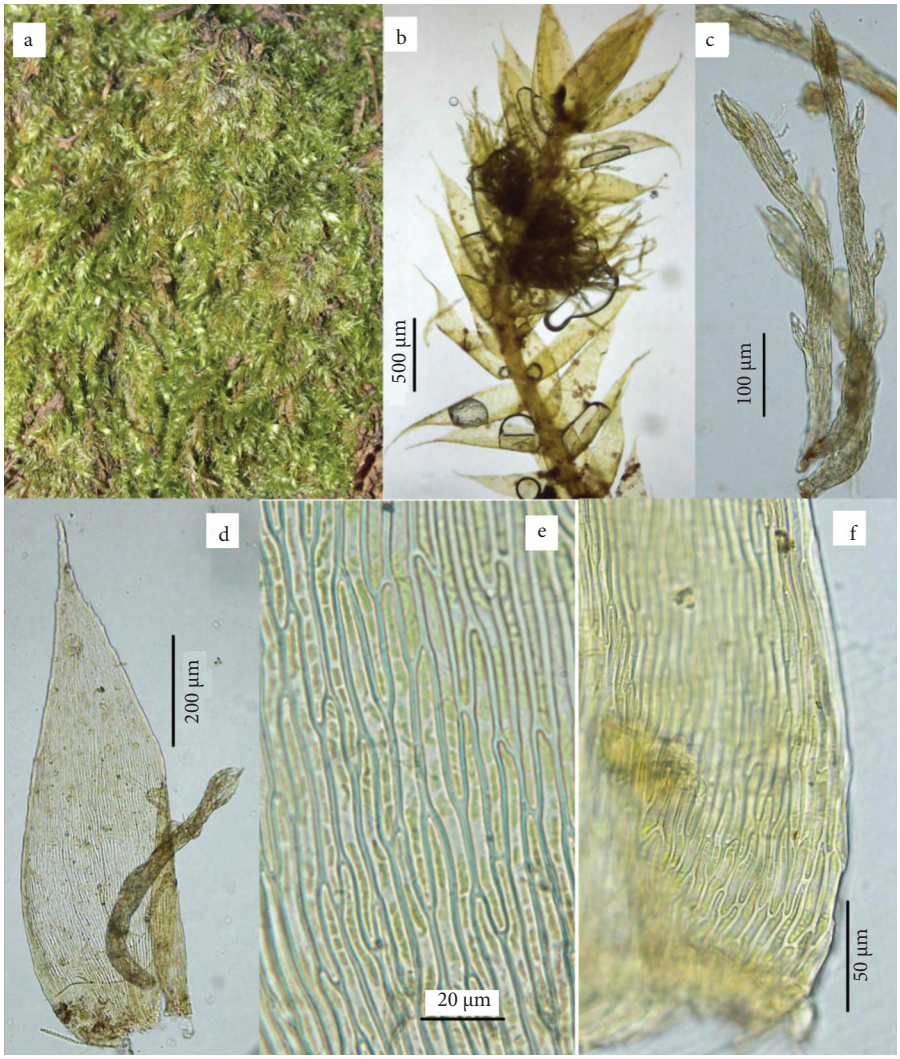

Figure 4. *Pseudotaxiphyllum elegans*. a- Habit, b- shoot with propagules, c- propagules, d- leaves, e- middle-leaf cells, f- leaf base.

Results and discussion

In this study, 272 specific and infraspecific taxa (2 hornworts, 53 liverworts, and 217 mosses) belonging to 146 genera and 60 families were identified from 1545 bryophyte specimens collected in the western part of the Küre Mountains in 2008 and 2009. Among them, according to the grid-square system of Henderson (1961) 1 hornwort, 11 liverwort taxa, and 26 moss taxa are new records for A2 grid-square (Uyar & Çetin, 2001, 2006; Uyar, 2003; Uyar et al., 2007; Ursavaş & Abay, 2009; Cangül & Ezer, 2010). Two new moss taxa (*Seligeria trifaria* and *Pseudotaxiphyllum elegans*) are also reported as new records for Turkey. Moreover, *Pseudotaxiphyllum* is a new genus record for the moss flora of Turkey. In addition, there were some interesting taxa collected from the study area. For example, second localities of *Leiocolea badensis*, *Cephaloziella rubella*, *Diphyscium foliosum*, and *Brachythecium tommasinii* in Turkey were discovered in this study. Namely, *Leicolia badensis* and *Cephaloziella rubella* have been recorded from Turkey without details of localities (Özenoğlu Kiremit & Keçeli, 2009). The first report of *Diphyscium foliosum* was given from Trabzon Province (Handel-Mazzetti, 1909) and *Brachythecium tommasinii* for the first time was recorded in Karabük Province from Yenice forests (Özalp, 1995).

The richness of families in terms of species in the research area for mosses is as follows: Pottiaceae (39 taxa) and Brachytheciaceae (29 taxa), Mniaceae (16 taxa), Orthotrichaceae (16 taxa), Hypnaceae (11 taxa), Amblystegiaceae (10 taxa), Grimmiaceae (9 taxa), and Bryaceae (9 taxa); and for liverworts is Scapaniaceae (8 taxa), Lophocoleaceae (4 taxa), Metzgeriaceae (3 taxa), Porellaceae (3 taxa), Plagiochilaceae (3 taxa), Frullaniaceae (3 taxa), and Cephaloziellaceae (3 taxa). These predominant 15 families make up 61% of the total taxa in the study area. The remaining 45 families constitute 39% of the total taxa. The most species-rich genera are as follows: *Orthotrichum* (12 taxa), *Bryum* (8 taxa), *Brachythecium* (7 taxa), *Tortula* (7 taxa), *Fissidens* (6 taxa), *Plagiothecium* (5 taxa), *Hypnum* (5 taxa), *Plagiomnium* (5 taxa), *Mnium* (5 taxa), and *Didymodon* (5 taxa). Other genera are represented by 4 or fewer taxa in the area.

As a result of our efforts to determine the ecological habitats of bryophytes, the following bryophyte species were found to be abundant on rocks near stream beds: *Hygrohypnum luridum*, *Thamnobryum alopecurum*, *Cratoneuron filicinum*, and *Conocephalum conicum*. Moreover, *Palustriella commutata* and *Plagiomnium undulatum* are widespread on wet soil near stream banks. *Fontinalis antipyretica*, *Cinclidotus fontinaloides*, *C. riparius*, *C. aquaticus*, and *Platyhypnidium riparioides* are common on submerged rocks and on the roots of trees next to rivers. In addition, the predominant epiphytic bryophytes of the area are *Radula complanata*, *Frullania dilatata*, *Metzgeria furcata*, *Lophocolea heterophylla*, *Leucodon sciuroides*, *Pterigynandrum filiforme*, *Neckera complanata*, *Orthotrichum affine*, *O. lyellii*, *O. speciosum*, and *Ulota crispa*. At the same time, while *Hypnum cupressiforme*, *Homalothecium lutescens*, *H. sericeum*, *Anomodon viticulosus*, *Ctenidium molluscum*, *Fissidens dubius*, *Isothecium alopecuroides*, *Plagiochila porelloides*, and *Neckera crispa* are widespread taxa as saxicolous species, *Pseudoscleropodium purum*, *Tortula schimperi*, *T. subulata*, *Fissidens taxifolius*, *Lophocolea bidentata*, *Pogonatum aloides*, *Polytrichastrum formosum*, *Rhytidiadelphus triquetrus*, *Calypogeia fissa*, and *Dicranum scoparium* are common taxa as terricolous species. Furthermore, *Tortula muralis*, *Grimmia pulvinata*, *Bryum capillare*, *Orthotrichum anomalum*, *Syntrichia ruralis*, *Bryum argenteum*, *Syntrichia ruralis*, and *Tortella tortuosa* can be found on rocks. *Ceratodon purpureus*, *Bryum caespiticium*, *Funaria hygrometrica*, *Bryum alpinum*, *Didymodon acutus*, and *D. fallax* are the most common taxa on soils in wide open areas.

The majority of bryophyte species that were found in this area have been cited for many European countries. Because of this they were classified as Least Concern (LC) for threat status in Europe; however, *Jubula hutchinsiae* subsp. *javanica* and *Buxbaumia viridis* have been classified as vulnerable (VU) and also *Tortula brevissima* has been classified as rare (R) in Europe by the European Committee for Conservation of Bryophytes (ECCB, 1995).

If it is necessary to make a comment considering the status of these taxa in Turkey, among them, *J. hutchinsiae* subsp. *javanica* is not rare in the Black Sea region in Turkey, because to date it has been recorded from A2, A3, and A4 grid-squares, which are in this region (Handel-Mazzetti, 1909; Papp, 2004; Keçeli & Çetin, 2006; Abay et al., 2009). Moreover, it was collected from 2 localities in the study area.

In addition, in our opinion *T. brevissima* is rare for Turkey also, because, to date, it has been recorded only from A2 and C11 grid-squares (Kürschner & Parolly, 1998; Cangül & Ezer, 2010; Kırmacı & Erdağ, 2010). We think *B. viridis* ought to be classified as vulnerable (VU) for Turkey as in Europe, because it has been collected from only a few localities in A2 grid-square in Turkey since 1967 (Walther, 1967; Abay & Çetin, 2003; Uyar et al., 2007).

Consequently, in our opinion, these rare and vulnerable species must be given priority for monitoring and managed carefully in an effort to promote genetic conservation as indicated by Işık (2011).

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