



Contributions to the bryoflora of Ilgaz Mountains, Yenice Forests, Turkey

Serhat URSAVAŞ¹, Gökhan ABAY^{*2}

¹ Ankara University, Faculty of Sciences, Department of Biology, 06100, Ankara, Turkey

² Çankırı Karatekin University, Faculty of Forestry, Department of Forest Engineering, 18200, Çankırı, Turkey

Abstract

The results of a study on the bryophyte flora of Yenice Forests (Çankırı) were reported. The authors recorded 127 taxa (115 mosses and 12 liverworts) from the study area. *Encalypta alpina* Sm. was recorded for the second time in A2 grid square many years after Schiffner (1897). *Didymodon asperifolius* (Mitt.) H.A. Crum, Stere & L.E. Anderson and *Cynodontium strumiferum* (Hedw.) Lindb. were reported for the second time in Turkey. *Porella pinnata* L. was first cited from North Anatolia of Turkey. *Tortella inclinata* var. *densa* (Lorentz & Molendo) Limpr., among the bryophytes listed, is endemic for Europe and Macaronesia and *Schistidium trichodon* (Brid.) Poelt is also listed in the Red Data Book of European Bryophytes. The new record number for A2 square is 9.

Key words: A2 square, Mosses, Liverworts, Rare specie

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Ilgaz Dağları bryoflorasına katkılar, Yenice Ormanları, Türkiye

Özet

Yenice ormanları (Çankırı)'nın briyofit florası üzerine bir çalışmanın sonuçları rapor edilmiştir. Yazarlar, çalışma alanından 127 takson (115 karayosunu ve 12 ciğerotu) kayıt etmiştir. *Encalypta alpina* Sm. A2 karesinde Schiffner (1897)'den uzun yıllar sonra ikinci kez kayıt edilmiştir. *Didymodon asperifolius* (Mitt.) H.A. Crum, Stere & L.E. Anderson ve *Cynodontium strumiferum* (Hedw.) Lindb. Türkiye'den ikinci defa rapor edilmiştir. *Porella pinnata* L.'dan Türkiye'nin Kuzey Anadolu kesimi için ilk kez bahsedilmiştir. Listedeki briyofitlerden, *Tortella inclinata* var. *densa* (Lorentz & Molendo) Limpr. Avrupa ve Makaronezya için endemik türdür ve *Schistidium trichodon* (Brid.) Poelt, Avrupa Briyofitleri Kırmızı Veri Kitabında da yer almaktadır. A2 karesi için yeni kare kayıt sayısı 9'dur.

Anahtar kelimeler: A2 karesi, Karayosunları, Ciğerotları, Nadir türler

1. Introduction

Yenice forests chosen as the study area is in the Ilgaz Mountains range which are in the 122 important plant areas in Turkey (Avcı and Özhatay, 2005). Although the National park of Ilgaz Mountains range was explored on account of mosses (Abay and Çetin, 2003), the south parts of the mountain ranges were not studied up to now. Thus, the number of bryophyte records in the mountain ranges is far from being complete. So, we believed the necessity of studying the mosses and liverwort of the Yenice Forests located in the south parts of the Ilgaz mountains.

Up to now, many bryophyte studies were done in A2 grid square. These are: Robinson and Godfrey (1960), Henderson (1961–1963), Henderson and Prentice (1969), Çetin ve Yurdakulol (1985-1986-1988), Çetin (1988a-1988b), Özalp (1995), Gökler ve Özenoğlu (1999), Çetin and Uyar (1999), Uyar ve Çetin (2000), Keçeli and Çetin (2000), Uyar and Çetin (2001a-2001b), Çetin et al. (2002), Uyar (2003a-2003b), Abay and Çetin (2003), Uyar and Keçeli (2004),

* Corresponding author / Haberleşmeden sorumlu yazar: gokhanabay@karatekin.edu.tr

Keçeli (2004), Keçeli et al. (2004), Keçeli and Çetin (2005), Abay [2005] 2006, Keçeli and Çetin (2006), Uyar and Çetin (2006), Uyar et al. (2007), Abay (2008), Abay ve Ursavaş (2008) and Ursavaş ve Abay (2008).

We reached as many possible different vegetation types, habitats and microhabitats as for the bryophyte species' richness.

Most of the mosses are found in Büyük Hacet and Küçük Hacet Hills. These species belong to various habitats: open woodland, grasses, stony and rocky places.

1.1. The investigated area

As Öner (2001) declared ; the study area is in between the altitudes 790 m (Dede area) and 2546 m (Büyük Hacet Hill). And also Tülü (2174 m), Gökyar (2264 m), Çal (1582 m) Hills and Gökçay and Kubbe streams are important localities (Fig. 1). As Öner and Abay (2005a-2005b) said “Yenice Forests cover 11.585 ha of the total area, 7.144 ha of which has forest quality, and 4.441 ha of which lacks forests. 5.201 ha of the forest areas are productive high forests. The rest, 1.943 ha, forest areas are unproductive high forests” (Anonymous, 1996).

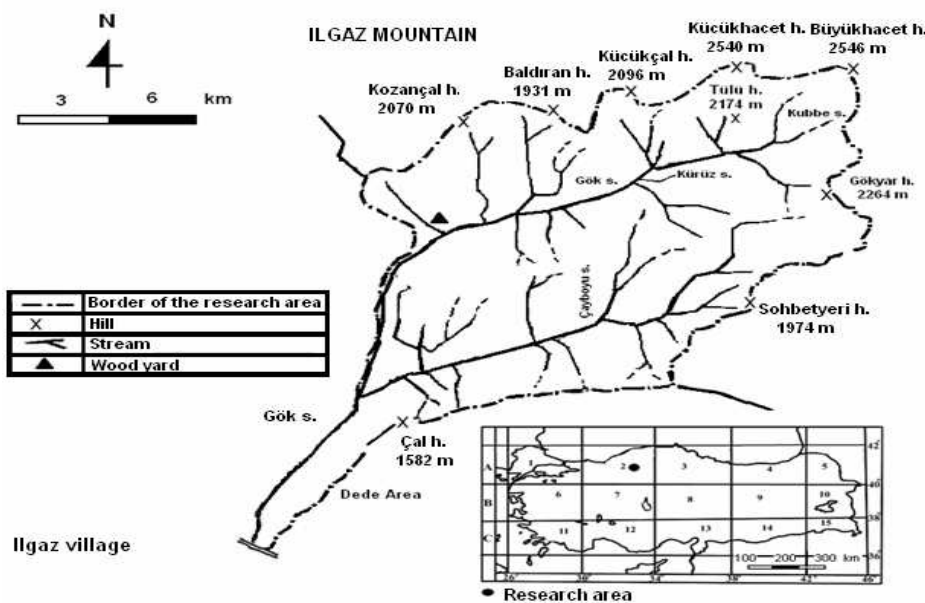


Figure 1. Geographic location of the study area in Turkey, grid system adopted by Henderson (1961)

Forest floor vascular plants in the study area are 170 taxa, the number of endemic species is 18, the ratio of endemism is 10.59% (Öner and Abay, 2005a).

The study area's climate rates were taken from Ilgaz meteorological station (885 m). As İmal (2007) said, the annual average temperature is 10.3 °C. The highest temperature is 41.4°C in July and the lowest is -20.6°C in February. The annual rain precipitation is 439,9 mm (Anonymous, 2005). When the annual temperature and rain rates of the mentioned meteorological observation station's last 25 years (1980-2005) were considered, the water balance was given in Fig. 2. The area is seen to have a climate like arid-dry sub humid, mesothermal, no or very less water surplus, close to oceanic climate type (İmal, 2007).

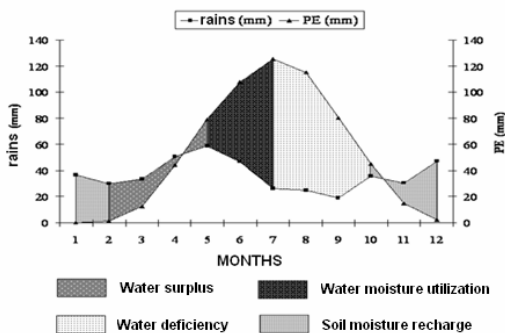


Figure 2. Graphic of the water balance according to Thornthwaite method (İmal, 2007)

2. Materials and methods

The study area has been visited in different times of the vegetation in between the years 2005-2006 in order to collect bryophyte samples. The stations, where the 1019 bryophytes were collected, were selected according to different plant communities, the geographical condition and the altitudes variation (Table 1).

The specimen identification was based on Lawton (1971), Crum (1973), Smith (1980-1990-2004), Nyholm (1981), Paton (1999), Cortini (2001-2006), Kürschner (2001), Greven (2003), Herrstadt and Heyn (2004). For the nomenclatures of the liverworts and mosses, we followed Grolle and Long (2000) and Hill et al. (2006). The specimens are preserved in the private collections of Serhat URSAVAŞ (Ankara, Turkey).

According to Henderson (1961)'s Turkey grid square system, the study area is located in A2. The new record bryophyte taxa were obtained from the following literatures: Schiffner (1897), Robinson and Godfrey (1960), Henderson (1961-1963), Henderson and Prentice (1969), Çetin and Yurdakulol (1985), Çetin and Yurdakulol (1988), Çetin (1988a, 1988b, 1989), Gökler and Öztürk (1991), Çetin and Uyar (1999), Özalp (1995), Uyar and Çetin (2000), Keçeli and Çetin (2000), Uyar and Çetin (2001a, 2001b), Çetin et al. (2002), Abay and Çetin (2003), Uyar (2003a-2003b), Uyar and Keçeli (2004), Abay [2005] 2006, Uyar and Çetin (2006), Uyar et al. (2007), Abay et al. (2007), Abay (2008), Abay ve Ursavaş (2008) and Ursavaş ve Abay (2008). The firstly recorded taxa from A2 were indicated by asteriks (*). The status of the taxa for Turkey was determined by reviewing the related literature (Uyar and Çetin, 2004; Kürschner and Erdağ, 2005).

In the statements of specimens: The first number shows the locality no., the bold abbreviation shows the habitat, U and TK abbreviations show legit and determinavit (Serhat Ursavaş and Tamer Keçeli), and the last number shows the collection no.

Habitats in the study area: **s:** on soil, **r:** on rock, **src:** on soil in rock crevices, **t:** on bark of tree trunk and branch, **dt:** on dead trunk, **rsw:** on rock submerged in water.

3. Results

Hepatics

Marchantiaceae (Bisch.) Lindl.

1. *Marchantia polymorpha* L. — 28:s, TK 4101; 24:s, TK 4102; 24:dt, TK 4145.

Pelliaceae H. Klinggr.

2. *Pellia epiphylla* (L.) Corda — 25:s, TK 4108.

3. *P. endiviifolia* (Dicks.) Dumort. — 33:s, TK 4152.

Lophoziaceae Cavers

4. *Barbilophozia hatcheri* (A.Evans.) Loeske — 10:s, TK 4103; 33:s, TK 4111; 4:s, TK 4115; 42:s, TK 4121; 29:s, TK 4123; 44:s, TK 4129; 9:dt, TK 4136; 16:s, TK 4139; 55:s, TK 4140; 28:s, TK 4142.

Plagiochilaceae (Jörg.) Müll. Frib.

5. *Plagiochila porelloides* (Torrey ex Nees) Lindenb. — 10:s, TK 4104; 16:s, TK 4109; 50:r, TK 4133; 28:s, TK 4143; 35:s, TK 4148; 3:s, TK 4149; 40:r, TK 4150.

Geocalycaceae H. Klinggr.

6. *Lophocolea bidentata* (L.) Dumort. — 4: dt, TK 4112.

7. *L. minor* Nees — 28:s, TK 4116; 37:r, TK 4118, TK 4127; 28:s, TK 4128; 40:s, TK 4134; 29:s, TK 4135; 43:s, TK 4137; 38:s, TK 4141.

8. *Chiloscyphus pallescens* (Ehrh. ex Hoffm.) Dumort. — 25:s, TK 4107.

Radulaceae (Dumort.) Müll. Frib.

9. *Radula complanata* (L.) Dumort. — 27:r, TK 4120; 4:r, TK 4130.

10. *R. lindenberghiana* Gottsche ex C. Hartm. — 49:r, TK 4131.

Porellaceae Cavers

11. *Porella cordaeana* (Huebener) Moore — 27:r, TK 4114; 29:r, 4122; 20:r, TK 4124.

12. **P. pinnata* L. — 28:r, TK 4101.

Mosses

Polytrichaceae Schwägr.

13. *Atrichum undulatum* (Hedw.) P.Beauv. - 18:s,U1; 20:src,U2.

14. *Polytrichastrum formosum* (Hedw.) G.L.Smith. - 6:s,U3; 20:s,U4.

15. *Polytrichum juniperinum* Hedw. - 1:r,U5; 1:dt,U6; 3:s,U11; 18:s,U16; 20:r,U10; 20:r,U9; 26:s,U17; 31:s,U13; 32:s,U12; 34:s,U14; 35:r,U7; 35:s,U8; 37:s,U18; 39:s,U15.

Table 1. Site no., Altitude in meters above sea level (m), Localities and geographic coordinates, Trees and some shrubs.

Site No.	Altitude (m)	Localities and geographic coordinate	Trees and some shrubs
1	1916	Kubbe stream, N 41° 01' 81.6"-E 033° 45' 52.9"	PS, ANB, JCA
2	1264	Seed stand, N 41° 00' 75.5"-E 033° 43' 11.4"	PS, ANB
3	1609	Saray seki, N 41° 00' 23.38"-E 033° 42' 24.7"	PS, ANB
4	1512	Kadın çayırı, N 41° 00' 73.1"-E 033° 43' 31.2"	PS, ANB
5	1551	Belen gediği, N 41° 01' 80.0"-E 033° 46' 78.1"	PS, ANB
6	1878	Kumlu burun hill, N 41° 02' 76.6"-E 33° 50' 95.54"	PS, ANB, JCA
7	1903	Tülü hill, N 41° 01' 67.6"-E 033° 49' 63.3"	PS, ANB, JCA
8	1882	Mıcık stream, N 41° 02' 74.1"-E 027° 50' 19.8"	PS, ANB
9	1811	Sırıklı burun, N 41° 01' 22.2"-E 033° 48' 91.4"	PS, ANB
10	1665	Karanlık hill, N 41° 00' 72.6"-E 033° 49' 57.2"	PS, ANB, JCA
11	1352	Çukur sırtı, N 41° 09' 40.7"-E 033° 45' 93.2"	PN, JCA
12	1452	Tepelce hill, N 41° 00' 55.8"-E 033° 46' 17.9"	PN, CA, QI, PT, UG
13	1525	Kızılyalak stream, N 41° 00' 14.4"-E 033° 46' 04.3"	ANB, CA
14	1796	Yukarı göl hill, N 41° 00' 19.2"-E 033° 46' 80.1"	ANB, SA, PS, AP
15	815	Seki başı, N 41° 00' 09.9"-E 033° 45' 26.5"	PS, ANB
16	1899	Taş pınar hill, N 41° 00' 58.0"-E 033° 48' 16.2"	PS, ANB
17	1830	Küçük çal hill, N 41° 01' 60.7"-E 033° 48' 52.4"	PS, ANB, JCA
18	1668	Arpa mount, N 41° 09' 95.2"-E 033° 49' 03.0"	PS, ANB, JCA
19	1667	Evregın hill, N 41° 08' 89.0"-E 033° 48' 24.1"	PS, ANB
20	1746	Karanlık mountain, N 41° 00' 63.7"-E 033° 49' 46.4"	PS, ANB, JCA
21	1650	Kürüz stream, N 41° 00' 37.4"-E 033° 48' 03.2"	PS
22	1556	Arap mountain, N 41° 00' 12.0"-E 033° 48' 71.7"	PS, SA
23	1673	Evregın hill, N 41° 09' 33.1"-E 033° 48' 50.6"	PS, ANB
24	1861	Dikenli pınarın hill, N 40° 07' 43.8"-E 033° 48' 39.4"	PS, ANB, JCA
25	1819	Gökyar hill, N 41° 09' 59.0" - E 033° 49' 86.1"	PS, ANB
26	1825	Arpa mountain, N 41° 09' 78.8"-E 033° 49' 44.5"	PS, ANB
27	1934	Karabatak hill, N 41° 00' 34.5"-E 033° 50' 37.5"	PS, ANB
28	1690	Kürüz stream, N 41° 00' 12.2"-E 033° 49' 54.7"	PS, ANB
29	1446	Çomar rural, N 41° 09' 98.9"-E 033° 47' 18.9"	PS, ANB, JCA
30	1446	Ulun kuş, N 41° 00' 88.1"-E 033° 48' 42.0"	PS, ANB
31	1685	Beygöynüğü, N 40° 13' 02.6"-E 033° 46' 75.2"	PS, ANB, PT
32	2301	Çifte kaş hill, N 41° 02' 49.3"-E 033° 50' 79.6"	PS, ANB, JCA
33	2543	Küçük Hacet, N 40° 03' 37.7"-E 033° 48' 28.5"	SP, RP, O
34	2098	Taşlık sırtı hill, N 41° 03' 03.1"-E 033° 50' 92.3"	PS, ANB, JCA
35	2500	Büyük Hacet, N 41° 03' 57.5"-E 033° 51' 35.2"	O, G
36	1597	Çal pınar, N 40° 97' 01.3"-E 033° 48' 65.0"	PN, JCA, QI
37	1803	Dikenli, N 40° 98' 38.6" - E 033° 48' 75.8"	PS, PN, JCA
38	1663	Sırtın hill, N 40° 99' 13.6"-E 033° 47' 35.8"	JCA, QI, PT
39	1689	Domuzdeperdi, N 40° 90' 55.2"-E 033° 46' 39.4"	PS, ANB, JCA
40	1264	Mantarlık hill, N 40° 96' 07.7"-E 033° 39' 65.7"	PN
41	1596	Yanıklı hill, N 40° 96' 69.5"-E 033° 44' 72.3"	PN, PS, PT
42	1375	Beyderesinin kaş, N 40° 94' 32.7"-E 033° 47' 60.7"	PN, QI, PT, SA, CA
43	1664	Sugundu hill, N 40° 93' 82.6"-E 033° 47' 64.2"	PN, PT
44	1555	Çal hill, N 40° 91' 61.2"-E 033° 39' 34.9"	PN, JCA

PS = *Pinus sylvestris* L., PN = *Pinus nigra* Arnold subsp. *pallasiana* (Lamb.) Holmboe, ANB = *Abies nordmanniana* (Steven) Spach subsp. *bornmulleriana* (Mattf.) Coode & Cullen, JCA = *Juniperus communis* L. subsp. *alpina* (Sm.) Celak, SA = *Salix alba* L. CA = *Corylus avellana* L., QI = *Quercus infectoria* Olive., PT = *Populus tremula* L., UG = *Ulmus glabra* Hudson, SP = Stony place, RP = Rocky place, O = Openness, G = Grass

Timmiaceae Schimp.

16. *Timmia austriaca* Hedw. - 24:r,U374; 35:r,U372; 35:s,U373.

Encalyptaceae Schimp.

17. *Encalypta streptocarpa* Hedw. - 12:r,U20; 24:r,U21.

18. *E. alpina* Sm. - 35:s,U19.

Grimmiaceae Arn.

19. *Grimmia donniana* Sm. - 34:r,U80; 35:r,U81.

20. **G. funalis* (Schwäger.) Bruch & Schimp. - 42:r,U40.

21. *G. montana* Bruch & Schimp. - 35:r,U72; 36:r,U73.

22. *G. ovalis* (Hedw.) Lindb. - 4:r,U78; 18:r,U79; 36:r,U77.
 23. *G. pulvinata* (Hedw.) Sm. - 1:r,U49; 3:r,U50; 36:r,U48; 41:r,U51; 42:r,U52; 44:r,U47.
 24. *G. trichophylla* Grev. - 33:r,U74; 36:r,U76; 38:r,U75.
 25. *Racomitrium canescens* (Hedw.) Brid. - 20:s,U44; 21:s,U45; 22:s,U46; 34:s,U43; 35:s,U41; 41:s,U51.
 26. *Schistidium apocarpum* (Hedw.) Bruch & Schimp.- 1:r,U56; 3:r,U63; 5:r,U66; 11:r,U57; 12:r,U61; 20:r,U65; 21:r,U53; 23:r,U67; 24:r,U64; 29:r,U59; 31:r,U58; 32:r,U56; 35:r,U55; 41:r,U62; 42:r,U60.
 27. *S. atrofusum* (Schimp.) Limpr. - 32:r,U70.
 28. *S. confertum* (Funck) Bruch & Schimp. - 1:r,U68; 1:s,U69.
 29. *S. trichodon* (Brid.) Poelt - 41:r,U71.

Ditrichaceae Limpr.

30. *Ceratodon purpureus* (Hedw.) Brid. - 1:s,U225; 3:s,U226; 5:r,U37; 15:s,U35; 19:s,U36; 35:s,U34.
 31. *Distichium capillaceum* (Hedw.) Bruch & Schimp. - 21:r,U48; 24:r,U488; 33:r,U25; 35:s,U26.
 32. *D. inclinatum* (Hedw.) Bruch & Schimp. - 33:src,U24; 35:s,U23.
 33. *Ditrichum flexicaule* (Schwägr.) Hampe - 12:r,U28; 33:r,U27; 35:r,U30; 35:s,U29; 44:src,U31.
 34. *Trichodon cylindricus* (Hedw.) Schimp. - 29:s,U32; 30:s,U33.

Rhabdoweisiaceae Limpr.

35. *Cynodontium strumiferum* (Hedw.) Lindb. - 39:s,U133.
 36. *Dicranoweisia cirrata* (Hedw.) Lindb. - 18:r,U99.
 37. *D. crispula* (Hedw.) Milde - 5:r,U102; 10:r,U104; 21:r,U100; 24:r,U103; 26:r,U101; 30:r,U105.

Dicranaceae Schimp.

38. *Dicranella heteromalla* (Hedw.) Schimp. - 12:s,U38; 8:s,U39.
 39. *Dicranum scoparium* Hedw. - 1:s,U117; 1:t,U127; 2:t,U126; 3:t,U125; 11:t,U131; 12:s,U130; 12:r,U132; 21:s,U128; 31:s,U122; 32:s,U129; 34:t,U121; 37:s,U118; 38:s,U119; 38:t,U120; 39:s,U124; 40:s,U123.
 40. *D. tauricum* Sapjegin - 1:t,U106; 2:t,U112; 3:t,U111; 8:t,U110; 20:t,U108; 34:t,U107; 37:t,U114; 38:t,U115; 39:t,U113.

Pottiaceae Schimp.

41. **Tortella fragilis* (Hook. & Wilson) Limpr. - 32:s,U185; 33:s,U184.
 42. *T. inclinata* var. *densa* (Lorentz & Molendo) Limpr. - 1:s,U490; 34:s,U183.
 43. *T. inclinata* var. *inclinata* (R.Hedw.) Limpr. - 2:s,U190; 20:s,U189.
 44. *T. tortuosa* (Hedw.) Limpr. - 1:r,U200; 1:s,U201; 2:r,U220; 3:r,U215; 5:r,U222; 8:r,U214; 9:r,U199; 11:r,U197; 11:s,U198; 12:t,U208; 12:r,U207; 12:s,U206; 13:r,U213; 14:r,U219; 16:r,U216; 17:s,U221; 18:r,U217; 24:s,U211; 24:r,U212; 26:r,U218; 31:s,U191; 31:s,U192; 32:r,U193; 32:r,U194; 33:s,U202; 33:r,U203; 34:r,U204; 34:s,U205; 35:s,U209; 35:r,U210; 44:r,U194; 44:s,U196.
 45. *Weissia brachycarpa* (Nees & Hornsch.) Jur. - 1:r,U188.
 46. *W. controversa* Hedw. - 1:r,U187; 32:s,U186.
 47. *Barbula convoluta* Hedw. - 5:s,U227.
 48. *Didymodon asperifolius* (Mitt.) H.A.Crum, Steere & L.E.Anderson - 2:s,U228.
 49. *D. fallax* (Hedw.) R.H.Zander - 2:t,U230; 4:t,U231; 25:s,U232.
 50. *D. ferrugineus* (Schimp. ex Besch.) M.O.Hill - 35:r,U229.
 51. *Syntrichia montana* Nees - 44:r,U134.
 52. *S. norvegica* F.Weber - 1:s,U157; 2:s,U162; 8:s,U165; 23:s,U163; 24:s,U156; 31:r,U167; 32:s,U160; 33:r,U155; 34:r,U164; 35:r,U166; 36:s,U159; 39:s,U158; 41:s,U161.
 53. *S. ruralis* (Hedw.) F.Weber & D.Mohr - 1:r,U166; 1:s,U171; 3:r,U173; 4:r,U182; 5:s,U181; 11:r,U174; 13:r,U180; 17:r,U177; 18:r,U176; 21:r,U175; 32:r,U179; 35:r,U172; 42:s,U178; 44:s,U168.
 54. **Tortula leucostoma* (R.Br.) Hook. & Grev. - 35:s,U224.
 55. **T. marginata* (Bruch & Schimp.) Spruce - 35:s,U223.
 56. *T. muralis* Hedw. - 34:r,U137; 35:s,U135; 42:r,U138; 43:s,U136.
 57. *T. schimperii* M.J.Cano, O.Werner & J.Guerra - 1:s,U157; 5:s,U139; 6:s,U140; 20:src,U144; 34:s,U141; 43:s,U142.
 58. *T. subulata* Hedw. - 1:s,U150; 3:s,U145; 15:s,U152; 23:s,U146; 28:s,U154; 31:s,U149; 32:s,U153; 37:s,U147; 41:s,U148; 43:s,U151.

Orthotrichaceae Arn.

59. **Orthotrichum stramineum* Hornsch. Ex Brid. - 32:t,U369.
 60. *O. rupestre* Schleich. ex Schwägr. - 4:r,U366; 18:r,U365; 20:r,U364; 36:r,U363.
 61. *O. affine* Schrad. ex Brid. - 2:t,U361; 11:t,U359; 38:t,U362; 42:t,U360.

62. *O. lyellii* Hook. & Taylor – 40:t,U358.
 63. *O. striatum* Hedw. - 1:t,U367; 32:t,U368.

Bartramiaceae Schwägr.

64. *Bartramia ithyphylla* Brid. - 20:s,U370; 34:s,U371.
 65. *Philonotis marchica* (Hedw.) Brid. – 1:s,U375.
 66. *P. fontana* (Hedw.) Brid. - 1:s,U378; 6:s,U379; 7:s,U377; 12:s,U380; 13:s,U382; 14:s,U376; 16:s,U383; 27:s,U381.

Bryaceae Schwägr.

67. *Bryum caespiticium* Hedw. - 32:src,U98.
 68. *B. capillare* Hedw. – 1:s,U86; 35:r,U83; 36:r,U84; 37:s,U85; 43:s,U82.
 69. *B. pallescens* Schleich. Ex Schwägr. – 4:s,U95.
 70. *B. pseudotriquetrum* (Hedw.) P.Gaertn. et al. - 18:s,U87.

Mielichhoferiaceae Schimp.

71. *Pohlia cruda* (Hedw.) Lindb. – 5:src,U93; 25:s,U90; 29:s,U91; 30:s,U92; 35:s,U89; 43:s,U88.
 72. *P. elongata* Hedw. - 20:src,U94.
 73. *P. wahlenbergii* var. *calcarea* (Warnst.) E.F.Warb. - 16:s,U96.
 74. *P. wahlenbergii* var. *wahlenbergii* (F.Weber & D.Mohr) A.L.Andrews – 18:s,U97.

Mniaceae Schwägr.

75. *Mnium thomsonii* Schimp. - 20:s,U238.
 76. *M. lycopodioides* Schwägr. - 35:src,U239.
 77. *M. marginatum* (Dicks.) P.Beauv. - 1:r,U245; 4:s,U241; 7:s,U242; 8:dt,U243.
 78. *M. stellare* Hedw. - 1:s,U264; 3:s,U263; 4:s,U262; 5:s,U259; 13:s,U265; 19:s,U266; 20:s,U261; 24:s,U268; 31:s,U260; 35:s,U266.
 79. *Rhizomnium punctatum* (Hedw.) T.J.Kop. - 1:s,U269; 4:t,U277; 6:s,U274; 7:dt,U271; 10:s,U273; 14:s,U272; 16:s,U274; 20:s,U270; 27:s,U275.

Plagiomniaceae T.J.Kop.

80. *Plagiomnium cuspidatum* (Hedw.) T.J.Kop. - 41:r,U273.
 81. *P. affine* (Blandow ex Funck) T.J.Kop. - 1:s,U254; 2:s,U258; 3:s,U253; 3:dt,U252; 13:s,U257; 16:s,U257; 18:s,U251; 27:s,U256.
 82. *P. elatum* (Bruch & Schimp.) T.J.Kop. – 4:s,U245; 13:s,U247; 20:s,U245; 20:dt,U246; 30:s,U250; 39:s,U249.
 83. *P. undulatum* (Hedw.) T.J.Kop. – 4:s,U235; 14:s,U234; 20:s,U233.

Amblystegiaceae Kindb.

84. *Amblystegium serpens* (Hedw.) Schimp. - 3:r,U245; 11:r,U260.
 85. *Campyliadelphus chrysophyllus* (Brid.) R.S.Chopra – 2:r,U464; 12:r,U463; 21:s,U462.
 86. *Cratoneuron filicinum* (Hedw.) Spruce – 1:t,U298; 14:r,U297; 20:r,U293; 23:s,U294; 24:r,U292; 29:s,U295; 42:r,U296.
 87. *Drepanocladus aduncus* (Hedw.) Warnst. – 1:s,U470; 8:rsw,U471.
 88. *Hygroamblystegium tenax* (Hedw.) Jenn. – 19:r,U461.
 89. *Palustriella commutata* (Hedw.) Ochyra - 1:s,U286; 4:s,U290; 12:r,U288; 13:r,U284; 13:t,U285; 14:r,U287; 18:s,U289; 25:s,U291.
 90. *P. falcata* (Brid.) Hedenäs -13:s,U306.
 91. *Sanionia uncinata* (Hedw.) Loeske - 1:r,U311; 4:s,U314; 4:s,U314; 5:s,U316; 14:s,U319; 18:s,U307; 18:dt,U308; 19:s,U315; 22:s,U317; 23:dt,U309; 23:s,U310; 24:s,U312; 27:s,U313; 34:s,U318.

Leskeaceae Schimp.

92. *Lescuraea saxicola* (Schimp.) Molendo – 6:r,U385; 23:s,U384.
 93. *Pseudoleskea incurvata* (Hedw.) Loeske - 26:r,U394; 32:s,U395.
 94. *P. patens* (Lindb.) Kindb. - 33:r,U391.
 95. *P. saviana* (De Not.) Latzel – 34:r,U392; 34:t,U393.
 96. *Pseudoleskeella catenulata* (Brid. ex Schrad.) Kindb. - 12:r,U387; 18:r,U386; 31:r,U389; 34:r,U388.
 97. *P. nervosa* (Brid.) Nyholm – 34:r,U390.
 98. **Ptychodium plicatum* (Schleich. Ex F.Weber & D.Mohr) Schimp. – 33:s,U405.

Thuidiaceae Schimp.

99. *Abietinella abietina* var. *abietina* (Hedw.) M.Fleisch. – 9:s,U283; 13:s,U284; 14:s,U282; 31:s,U281; 35:s,U486.

100. *A. abietina* var. *hystricosa* (Mitt.) Sakurai - 35:s,U278; 36:r,U280; 40:r,U279.

Brachytheciaceae Schimp.

101. *Pseudoscleropodium purum* (Hedw.) M.Fleisch. - 2:s,U420; 3:s,U422; 29:s,U421.

102. *Rhynchostegium murale* (Hedw.) Schimp. - 5:t,U454.

103. *Kindbergia praelonga* (Hedw.) Ochyra - 1:r,U445; 31:s,U446

104. *Sciuro-hypnum plumosum* (Hedw.) - 3:r,U456.

105. *Brachythecium albicans* (Hedw.) Schimp. - 18:r,U442; 23:s,U443.

106. *B. glareosum* (Bruch ex Spruce) Schimp. - 2:r,U474; 3:s,U475; 11:s,U476; 12:s,U477; 17:s,U478; 19:r,U479; 24:r,U480; 29:s,U481; 41:dt,U482.

107. *B. mildeanum* (Schimp.) Schimp. - 19:s,U408.

108. *B. rivulare* Schimp. - 12:r,U416; 14:s,U417; 16:s,U419; 18:s,U414; 20:s,U418; 23:s,U410; 23:r,U411; 24:r,U412; 24:s,U413; 25:r,U415; 27:s,U409.

109. *Eurhynchiastrum pulchellum* (Hedw.) var. *diversifolium* (Schimp.) Ochyra & Zarnowiec - 5:s,U451; 9:s,U452; 18:r,U453; 21:s,U450; 22:s,U449; 41:s,U448.

110. *E. pulchellum* (Hedw.) Ignatov & Huttunen var. *pulchellum* - 23:s,U447.

111. *Brachytheciastrum velutinum* (Hedw.) Ignatov & Huttunen - 5:dt,U406; 41:r,U407.

112. *Homalothecium lutescens* (Hedw.) H.Rob. - 3:r,U431; 3:t,U432; 12:r,U441; 13:r,U440; 18:r,U437; 23:r,U439; 24:r,U438; 31:r,U436; 33:r,U428; 35:r,U429; 35:s,U430; 36:src,U435; 43:r,U433; 44:r,U434.

113. *H. sericeum* (Hedw.) Schimp. - 1:dt,U; 426, 3:r,U427; 4:r,U424; 32:r,U423; 33:s,U425.

Hypnaceae Schimp.

114. *Campylophyllum calcareum* (Crundw. & Nyholm) Hedenäs - 7:s,U465.

115. *Ctenidium molluscum* (Hedw.) Mitt. - 12:r,U323.

116. *Hypnum cupressiforme* var. *cupressiforme* Hedw. - 12:s,U344; 28:s,U345; 29:dt,U343; 34:s,U346; 35:r,U339; 35:s,U340; 40:s,U341; 40:t,U342.

117. *H. cupressiforme* var. *lacunosum* Brid. - 29:r,U321; 40:s,U322; 44:r,U320.

118. *H. imponens* Hedw. - 2:r,U457; 3:r,U472; 12:r,U473; 12:r,U492.

119. *H. revolutum* (Mitt.) Lindb. - 33:src,U347; 35:r,U491.

Pterigynandraceae Schimp.

120. *Heterocladium dimorphum* (Brid.) Schimp. - 1:t,U303; 2:r,U302; 8:s,U305; 28:s,U304; 29:r,U300; 29:s,U301.

121. *H. heteropterum* (Brid.) Schimp. - 11:r,U299.

122. *Pterigynandrum filiforme* Hedw. - 2:r,U396; 2:t,U397; 4:t,U403; 9:r,U399; 18:t,U403; 20:t,U404; 34:t,U398; 40:t,U401; 43:t,U400.

Hylocomiaceae (Broth.) M.Fleisch.

123. *Hylocomium splendens* (Hedw.) Schimp. - 2:s,U348; 3:s,U355; 19:s,U354; 20:s,U349; 24:s,U356; 28:s,U351; 28:r,U352; 29:s,U350.

124. *Rhytidiadelphus squarrosus* (Hedw.) Warnst. - 1:dt,U334; 1:s,U337; 7:s,U333; 12:s,U335; 16:s,U336; 35:s,U338.

125. *R. triquetrus* (Hedw.) Warnst. - 1:s,U327; 2:s,U326; 3:s,U328; 4:s,U330; 5:s,U331; 10:s,U324; 19:s,U329; 20:s,U325; 29:s,U332.

Plagiotheciaceae (Broth.) M.Fleisch.

126. *Herzogiella seligeri* (Brid.) Z.Iwats. - 2:t,U444; 8:t,U357; 18:t,U458.

Leucodontaceae Schimp.

127. *Leucodon sciuroides* (Hedw.) Schwägr. - 4:r,U454.

4. Conclusions

A total of 127 taxa belonging to 67 genera and 30 families were determined by evaluating 1019 bryophytes collected from Ilgaz-Yenice (Çankırı) Forests between 2005-2006 in different times of vegetation. From the 115 moss taxa recorded in the study area, 48 ones were from Büyük Hacet and Küçük Hacet Hills.

Encalypta alpina was recorded for the second time in A2 grid square, in Büyük Hacet Hill of Ilgaz Mountains range, many years after Schiffner determined it in 1897. Firstly this species was reported in Paphlagonia region, Ilgaz Mountains of Turkey, from 2300 a.s.l. (Schiffner, 1897) and had not been recorded in A2 square in Turkey so far.

Didymodon asperifolius was cited for the second time in Turkey in the present study. This species was known from only one locality in Eastern Black Sea Region of Turkey, Artvin Province, Hatila Valey National Park, from 1300 a.s.l, on acidic rock by stream in woods (Özdemir, Koz and Batan, 2008; Özdemir, 2009). In this study, it was collected

in *Pinus sylvestris* seed stand in Yenice Forests, from 1264 a.s.l, on soil. This record contributes to its known range in the North Anatolian parts of Turkey.

Cynodontium strumiferum is not abundant in our country, only its locality from Turkey is also in the A2 square, Gerede-Aktaş-Bolu Forests, 1350 a.s.l., on rock (Çetin and Yurdakulol, 1985).

Porella pinnata was cited from C12 (Çetin, 1989) and C11 (Özenoğlu Kiremit, 2006) grid squares that are in the Mediterranean region. Within this study, the species was recorded for the first time in northwest Anatolian Region.

Porella pinnata, *Grimmia funalis*, *Tortella fragilis*, *Didymodon asperifolius*, *Tortula leucostoma*, *T. marginata*, *Orthotrichum stramineum*, *Ptychodium plicatum* and *Heterocladium dimorphum* were new records for A2 according to Henderson (1961)'s Turkey grid square system.

We also recorded one taxa, *Tortella inclinata* var. *densa* (NT), which is included in the Red Data Book of European Bryophytes (ECCB, 1995). The species is endemic for Europe and Macaronesia. It was found on soil and in the high level of our study area. *Schistidium trichodon* occurred in Yanıklı Hill is also known as threatened mosses in Europe and categorized by “K” which means insufficiently known. These mentioned species almost extend their distribution range from northwest to northeast parts of Turkey.

Although the Ilgaz Mountain National Park is limited with small area, we can offer to enlarge the park area to the south because of Yenice Forests' endemic seeded plants and some aforementioned interesting bryophyte taxa. If it is not possible to add Yenice Forests to the national park area perhaps it can be stated as conservation land because the most important summits of Yenice Forests' like Büyük Hacet and Küçük Hacet Hills are not even in the national park.

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