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The Bryophyte Flora of Kaplandede Mountain (Düzce, Turkey)

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Abstract: In this study, the bryoflora of the Kaplandede Mountain was investigated between March and October 2009. After the identification of 625 bryophyte specimens collected from the research area, total of 122 taxa (99 mosses, 22 liverworts, 1 hornwort) were found. Among them according to the grid-square system of Henderson (1961) three liverwort taxa and fifteen moss taxa are new records for A2 grid square. *Cephaloziella dentata* (Raddi) Steph. and *Campylopus flexuosus* (Hedw.) Brid. are recorded for the second time from Turkey. Two remarkable moss species, *Orthotrichum scanicum* Grönvall and *Tortula brevissima* Schiffn., were also collected from the study area.

Kokkuvõte: Kaplandede mäe (Düzce, Türgi) sammaltaimede floora

Artiklis käsitletakse Kaplandede mäe brüofloorat, mida uuriti 2009. aasta märtsist oktoobrini. Koguti 625 proovi, mille läbitöötamisel koostati nimekiri 122 sammaltaime taksonist, nende seas oli 99 lehtsambla, 22 helviksambla ja 1 kõdersambla takson. Henderson (1961) kaardivõrgustiku A2 ruudu kohta leiti kolm uut helviksambla ja viisteist uut lehtsambla taksonit. Helviksamblaliikidele *Cephaloziella dentata* (Raddi) Steph. ja *Campylopus flexuosus* (Hedw.) Brid. leiti teine leiukoht kogu Türgi teritooriumilt. Uurimisalalt koguti ka kaks tähelepanuväärset lehtsamblliiki: *Orthotrichum scanicum* Grönvall ja *Tortula brevissima* Schiffn.

INTRODUCTION

Turkey has many different habitats and ecosystems because of it's geographical location joining Europe and Asia. It has three phytogeographic regions: the Euro-Siberian which lies in the northern part, the Irano-Turanian which occupies the central and eastern part and the Mediterranean which forms the southern part of Turkey. These phytogeographical regions have given Turkey the richness of floristic diversity.

Although the vascular plants including vascular cryptogams have been thoroughly investigated in Turkey, the floristic and ecological studies about bryophytes of our country are still insufficient and maintain their status as initial researches. Moreover, the majority of floristic studies on bryophytes covers the western and northern Anatolia (e.g., Keçeli & Çetin, 2000; Özdemir, 2001; Erdağ, 2002; Özenoğlu & Gökler, 2002; Abay & Çetin, 2003; Uyar, 2003; Papp, 2004; Erdağ & Kürschner, 2005; Uyar & Çetin, 2006; 2001; Savaroğlu & Tokur, 2006; Özenoğlu Kiremit, 2007; Uyar et al., 2007; Ursavaş & Abay, 2009; Kırmacı & Erdağ, 2009). There are also quite a few published studies for the Mediterranean region of the southern Anatolia (e.g., Everest & Ellis, 1999, 2003; Kara et al., 2007, 2008; Ezer et al., 2008a, 2008b; Ezer et al., 2009a, 2009b; Düzenli et al., 2009). However, as it can be seen from the published studies, they still do not describe bryofloristic conditions for most parts of Turkey. Although the knowledge is not satisfactory enough to write a comprehensive flora (bryophyte flora of Turkey), it is sufficient to display a general view of the flora of our country. There are a few studies carried out on vascular plant flora in the research area (Sazak, 1997; Doğru Koca & Yıldırımlı, 2008), but no detalied study has yet been made on the bryophyte flora of Kaplandede Mountain. Therefore, the aim of the present study is to compile a list of bryophytes of Kaplandede Mountain and to make a contribution to the bryoflora of Turkey.

MATERIAL AND METHODS

Study Area

Kaplandede Mountain is situated in the western Black Sea region and in the Euro-Siberian Phytogeographical Region in Turkey (Fig. 1). It is located in the Düzce province. The highest point in the Kaplandede Mountain is Kaplandede Hill (1168 m). It is situated in the A2 square in Henderson grid system (Henderson, 1961) (Fig. 2).

The annual mean precipitation is 816.7 mm and the average annual temperature is 13 ^{0}C in

Düzce (Fig. 1). According to the measurements of Düzce Meteorology Station, the study area has a Sub-Mediterranean climate which belongs to the rainy Mediterranean climate type.

Lithologically, the Kaplandede mountain essentially contains paleozoic schist and limestone. Düzce plain is formed of Quaternary deposits derived from the surrounding hills (Ünsal & Çelik, 2008).

Deciduous and coniferous forests are the main vegetation formations in Kaplandede mountain. Dominant deciduous species in Kaplandede mountain have been formed by *Fagus orientalis* Lipsky, *Carpinus betulus* L., *Castanea sativa* Miller., *Coryllus avellana* L., *Quercus petraea* (Mattuschka) Liebl., *Quercus cerris* L., *Tilia argentea* Desf., *Populus tremula* L., *Acer trautvetteri* Medw., *Cornus mas* L., *C. sanguinea* L. and *Alnus glutinosa* L. The coniferous forests consist of *Abies nordmanniana* (Stev) Spach. ssp. *bornmülleriana* (Mattf) Coode et Cullen., *Picea orientalis* (L) Link, *Cedrus deodora* Lound, *Taxus baccata* L. and *Cupressus sempervirens* L. (Sazak, 1997; Doğru Koca & Yıldırımlı, 2008).

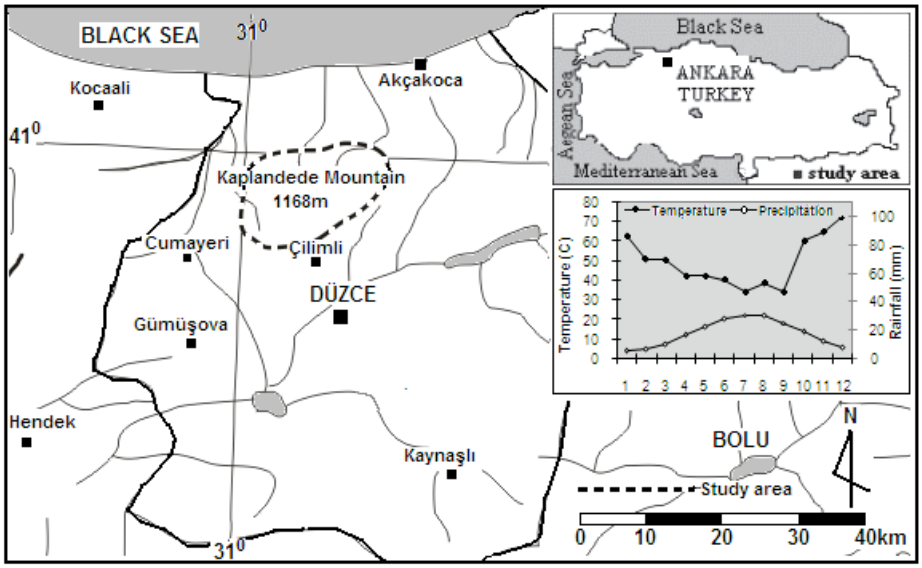

Fig. 1. Topographical map of the study area and a climatic diagram of Düzce.

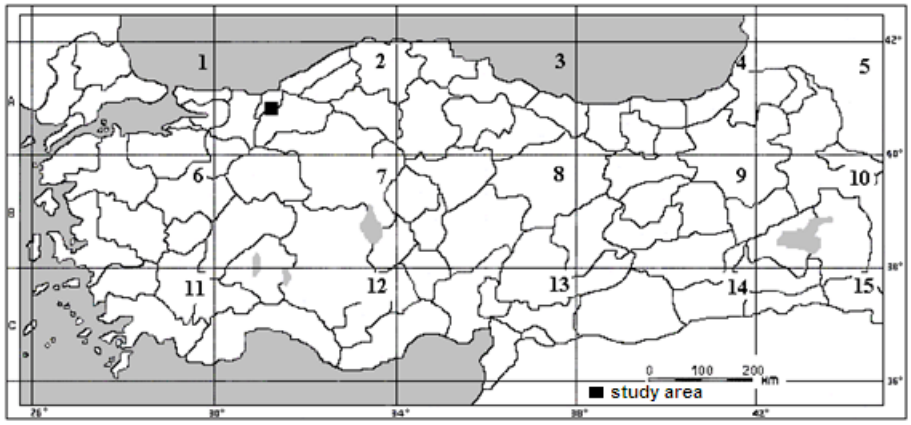

Fig. 2. Grid system of Turkey adopted by Henderson (1961).

Table 1. Details of the study sites. SN: Site number

S.N.	Date	Localities	Altitude (m)	Latitude-Longitude
1	11.07.2009	Akçakoca forest cutting area	505	N41°00'165" E31°09'330"
2	11.07.2009	Akçakoca output of forest cutting area	458–464	N41°00'354" E31°09'487"
3	30.04.2009	Around Asya water tank	398	N40°55'445" E31°04'074"
4	30.04.2009 17.03.2009 16.03.2009	Bıçkıbaşı	389–498	N40°55'423" E31°04'169"
5	17.03.2009 30.04.2009	Bıçkıbaşı-Düverdüzü	433–485	N40°55'595" E31°04'437"
6	15.06.2009	Çilimli	226	N40°54'154" E31°02'304"
7	31.04.2009 16.03.2009	Çilimli-Hızardere	235–311	N40°55'146" E31°03'321"
8	15.11.2009	Çilimli-Kaplandede	431–487	N40°54'491" E31°02'492"
9	15.06.2009 31.04.2009	Çilimli-Karaçörtlen village	260–403	N40°54'319" E31°01'522"
10	15.06.2009	Kaplandede	359–380	N40°54'306" E31°01'582"
11	30.04.2009 17.03.2009	Düverdüzü	500–532	N40°56'257" E31°05'370"
12	11.07.2009 14.11.2009 15.11.2009	Düverdüzü-Konuralp	516–723	N40°57'273" E31°06'259"
13	30.04.2009 16.03.2009	Hızardere-Bıçkıbaşı	370	N40°55'388" E31°03'560"
14	17.03.2009 30.04.2009	Hızardere	359–375	N40°55'275" E31°03'453"
15	10.07.2009	Kaplanşarkı-Akçakoca	100–1028	N40°58'523" E31°07'508"
16	11.07.2009	Kaplanşarkı	1035–1049	N40°58'493" E31°07'271"
17	11.07.2009 10.07.2009	Kaplandede-Akçakoca	784–1009	N40°58'597" E31°07'432"
18	08.07.2009	Kaplandede	1006–1117	N40°56'599" E31°03'534"
19	10.07.2009 08.07.2009	Summit of Kaplandede	1153–1158	N40°57'010" E31°04'002"
20	08.07.2009 10.07.2009	Kaplandede-Kaplanşarkı	927–1081	N40°57'272" E31°05'472"
21	16.06.2009	Karaçörtlen	462	N40°55'071" E31°00'266"
22	16.06.2009	Karaçörtlen-Kırkharman	436–487	N40°55'142" E31°00'198"
23	16.06.2009	Kırkharman	397–471	N40°56'291" E31°00'254"
24	16.06.2009	Kırkharman-Kurukavak	372–468	N40°56'544" E31°00'244"
25	16.06.2009	Kurukavak	445–483	N40°38'114" E31°01'144"
26	08.07.2009	Kurukavak-Karaçörtlen	438	N40°58'166" E31°01'144"

Table 2. The bryofloristic list. *: new record for A2 grid square, SN: site number, S: on soil, R: on rock, LT: on living tree, r: on root, t: on trunk, DT: on dead tree, CN: collector number, C.C.: Celal Cangül

Families	Bryophyta Taxa	SN	Substratum S	R	LT r	LT t	DT	CN
HORNWORT AND LIVERWORTS								
Anthocerotaceae Dumort.	*Anthoceros punctatus* L.	9	+					C.C. 127c
Lophoziaceae Cavers	*Barbilophozia hatcheri* (A. Evans) Loeske	18		+				C.C. 172e
Calypogeiaceae (Müll. Frib.) Arnell	*Calypoegia fissa* (L.) Raddi	17, 18, 6	+					C.C. 232e
Cephaloziaceae Mig.	*Cephalozia bicuspidata* (L.) Dumort.	17, 12	+					C.C. 233d
Cephaloziellaceae Douin	**Cephaloziella baumgartneri* Schiffn.	18		+				C.C. 201c
	**Cephaloziella dentata* (Raddi) Steph.	17, 12, 18	+					C.C. 235e
	**Cephaloziella divaricata* (Sm.) Schiffn.	17	+					C.C. 215b
Conocephalaceae Müll. Frib. Ex Grolle	*Conocepholum conicum* (L.) Dumort.	8, 23, 25	+					C.C. 254a
	Diplophyllum albicans (L.) Dumort.	20, 12	+					C.C. 176a
Fossombroniaceae Hazslinszky	*Fossombronia pusilla* (L.) Nees	4	+					C.C. 27e
Frullaniaceae Lorch	*Frullania dilatata* (L.) Dumort.	20, 9, 2, 8, 25, 14, 13, 18, 12				+		C.C. 213d
	Frullania tamarisci (L.) Dumort.	2		+				C.C. 243d
Jungermanniaceae Rchb.	**Jungermannia obovata* Nees	25			+			C.C. 168e
Lejeuneaceae Casares-Gil	*Lejeunea cavifolia* (Ehrh.) Lindb.	18, 1				+		C.C. 26d
Geocalycaceae H. Klinggr.	*Lophocolea bidentata* (L.) Dumort.	25, 17	+					C.C. 165c
	Lophocolea heterophylla (Schrad.) Dumort.	10, 19, 18, 17	+					C.C. 111b
Lunulariaceae H. Klinggr.	*Lunularia cruciata* (L.) Lindb.	4, 21	+					C.C. 24a
Metzgeriaceae H. Klinggr.	*Metzgeria furcata* (L.) Dumort.	18				+		C.C. 206b
Pelliaceae H. Klinggr.	*Pellia epiphylla* (L.) Corda	25, 8		+				C.C. 155b
Plagiochilaceae (Jörg.) Müll. Frib.	*Plagiochila porelloides* (Torrey ex Nees) Lindb.	4, 9, 18, 2	+					C.C. 30b
Porellaceae Cavers	*Porella cordaeana* (Huebener) Moore	18, 17				+		C.C. 211a
	Porella platyphylla (L.) Pfeiff.	18, 17, 15, 11, 9, 12				+		C.C. 196a
Radulaceae (Dumort.) Müll. Frib.	*Radula complanata* (L.) Dumort	4, 11, 7, 6, 10, 9, 23, 25, 18, 17				+		C.C. 207c

Table 2 (continued)

Families	Bryophyta Taxa	SN	Substratum S	R	LT r	LT t	DT	CN
MOSSES								
Polytrichaceae Schwägr.	*Atrichum angustatum* (Brid.) Bruch & Schimp	18	+					C.C. 192c
	Atrichum tenellum (Röhl.) Bruch & Schimp	17, 8	+					C.C. 231b
	Atrichum undulatum (Hedw.) P.Beauv.	4, 9, 19, 18, 12, 17	+					C.C. 24b
	Pogonatum aloides (Hedw.) P. Beauv.	4, 23, 20, 17, 18	+					C.C. 31a
	Pogonatum urnigerum (Hedw.) P. Beauv.	6	+					C.C. 62
	Polytrichastrum formosum (Hedw.) G.L.Sm.	19, 4, 10, 18, 12, 20, 17	+					C.C. 175a
Encalyptaceae Schimp.	*Encalypta vulgaris* Hedw.	23		+				C.C. 138c
Funariaceae Schwägr.	*Funaria hygrometrica* Hedw.	18	+					C.C. 187a
Grimmiaceae Arn.	*Grimmia pulvinata* (Hedw.) Sm.	4, 11, 6, 9, 7		+				C.C. 33b
	Schistidium apocarpum (Hedw.) Bruch &Schimp.	11, 21, 23, 25, 17		+				C.C. 51b
Fissidentaceae Schimp.	*Fissidens bryoides* Hedw.	12	+					C.C. 248e
	Fissidens viridulus (Sw. ex anon.) Wahlenb.	4, 25, 17	+					C.C. 235c
Ditrichaceae Limpr.	**Pleuridium acuminatum* Lindb.	4,6, 23, 18, 17	+					C.C. 31c
	**Pleuridium subulatum* (Hedw.) Rabenh.	18		+				C.C. 188b
Dicranaceae Schimp.	*Dicranella heteromalla* (Hedw.) Schimp.	25, 20, 18	+					C.C. 149b
	**Dicranella rufescens* (Dicks.) Schimp.	6, 12	+					C.C. 246b
	**Dicranella subulata* (Hedw.) Schimp	17	+					C.C. 223b
	Dicranella varia (Hedw.) Schimp	17	+					C.C. 240c
	Dicranum majus Sm.	18					+	C.C. 211e
	Dicranum scoparium Hedw.	18		+				C.C. 172c
	Dicranum tauricum Sapjegin	19, 17				+		C.C. 209a
Leucobryaceae Schimp.	**Campylopus flexuosus* (Hedw.) Brid.	18	+					C.C. 194b
	**Campylopus subulatus* Schimp. ex Milde	23		+				C.C. 142c
Pottiaceae Schimp.	*Gymnostomum calcareum* Nees & Hornsch.	4		+				C.C. 20
	Pleurochaete squarrosa (Brid.) Lindb.	14	+					C.C. 6
	Tortella inclinata (R.Hedw.) Limpr.	10	+					C.C. 111c
	Tortella nitida (Lindb.) Broth.	17		+				C.C. 220f
	Tortella tortuosa (Hew.) Limpr.	6, 9	+					C.C. 64b
	Trichostomum brachydontium Bruch	25	+					C.C. 147c
	Weissia controversa Hedw.	14, 4, 6, 9, 21, 17	+					C.C. 6a

Table 2 (continued)

Families	Bryophyta Taxa	SN	Substratum S	R	LT r	t	DT	CN
	Barbula unguiculata Hedw.	5, 14, 11, 4, 7, 9, 22, 25, 21	+					C.C. 35a
	Didymodon acutus (Brid.) K. Saito	25, 5	+					C.C. 157b
	Didymodon fallax (Hedw.) R. H. Zander	18, 17	+					C.C. 187b
	Didymodon rigidulus Hedw.	11, 14, 10, 24, 25		+				C.C. 48
	Didymodon vinealis (Brid.) R. H. Zander	18, 25, 20, 17	+					C.C. 180b
	**Microbryum davallianum* (Sm.) R.H.Zander	6, 14	+					C.C. 61d
	Pseudocrossidium revolutum (Brid.) R.H.Zander	6	+					C.C. 95a
	**Tortula brevissima* Schiffn.	14	+					C.C. 6c
	**Tortula marginata* (Bruch & Schimp.) Spruce	10, 24, 20	+					C.C. 115c
	Tortula muralis Hedw.	25, 4		+				C.C. 159a
Orthotrichaceae Arn.	**Orthotrichum scanicum* Grönvall	6			+			C.C. 98b
	**Orthotrichum tenellum* Bruch ex Brid.	14				+		C.C. 11c
	Orthotrichum rupestre Schleich. ex Schwagr.	9					+	C.C. 16
	Orthotrichum lyellii Hook. & Taylor	14, 4, 11, 7, 6, 9, 19, 20, 17, 2, 12				+		C.C. 4
	Orthotrichum striatum Hedw.	4, 14, 24, 20, 17				+		C.C. 21b
	Ulota bruchii Hornsch. ex Brid.	17				+		C.C. 218b
Bartramiaceae Schwägr.	*Philonotis arnellii* Husn.	4, 10, 25, 18	+					C.C. 24c
Bryaceae Schwägr.	*Bryum argenteum* Hedw.	4, 11, 9, 25, 18		+				C.C. 33a
	Bryum caespiticum Hedw.	5, 11	+					C.C. 43b
	Bryum capillare Hedw.	13, 4, 11, 9, 22, 25, 18, 17		+				C.C. 14b
	**Bryum dichotomum* Hedw.	18		+				C.C. 188a
	Bryum pallens Sw.	6	+					C.C. 95b
	Bryum pallescens Schleich. ex Schwägr.	9			+			C.C. 124c
Mielichhoferiaceae Schimp.	*Pohlia elongata* Hedw.	20, 18	+					C.C. 176c
	**Pohlia annotina* (Hedw.) Lindb.	25	+					C.C. 162
	**Pohlia bulbifera* (Warnst.) Warnst.	9, 11, 6, 21	+					C.C. 121b
Mniaceae Schwägr.	*Mnium marginatum* (Dicks.) P.Beauv.	25	+					C.C. 169c
	Mnium stellare Hedw.	4, 9, 25, 1	+					C.C. 29b
Cinclidiaceae Kindb.	*Rhizomnium punctatum* (Hedw.) T.J.Kop.	8	+					C.C. 254c

Table 2 (continued)

Families	Bryophyta Taxa	SN	Substratum S	R	LT r	LT t	DT	CN
Plagiomniaceae T.J.Kop.	*Plagiomnium undulatum* (Hedw.) T.J. Kop.	4, 23, 25	+					C.C. 27b
Amblystegiaceae Kindb.	*Amblystegium serpens* (Hedw.) Schimp.	4	+					C.C. 19
	Campyliadelphus crysophyllus (Brid.) R. S. Chopra	25	+					C.C. 148d
	Campyliadelphus elodes (Lindb.) Kanda	7				+		C.C. 90a
	Hygroamblystegium varium (Hedw.) Mönk.	5	+					C.C. 71a
	Sanionia ucinata (Hedw.) Loeske	10	+					C.C. 115ı
Leskeaceae Schimp.	*Pseudoleskea patens* (Lindb.) Kindb.	22			+			C.C. 135b
Brachytheciaceae Schimp.	*Pseudoscleropodium purum* (Hedw.) M.Fleisch.	10, 21	+					C.C. 112a
	Plasteurhynchium meridionale (Schimp.) M. Fleisch.	9, 22	+					C.C. 125a
	Plasteurhynchium striatulum (Spruce) M.Fleisch.	7	+					C.C. 3a
	Platyhypnidium riparioides (Hedw.) Dixon	25, 6, 13, 8	+					C.C. 168b
	Rhynchostegium murale (Hedw.) Schimp.	25	+					C.C. 169a
	**Rhynchostegium rotundifolium* (Scop. ex Brid.) Schimp.	22				+		C.C. 133b
	Cirriphyllum piliferum (Hedw.) Grout	5		+				C.C. 38
	Oxyrrhynchium speciosum (Brid.) Warnst.	3, 9	+					C.C. 74b
	Kindbergia praelonga (Hedw.) Ochyra	10, 9, 22, 25	+					C.C. 115a
	Sciuro-hypnum plumosum (Hedw.) Ignatov & Huttunen	25, 23, 11, 14	+					C.C. 154c
	Sciuro-hypnum populeum (Hedw.) Ignatov & Huttunen	9, 5, 13					+	C.C. 118b
	Brachythecium albicans (Hedw.) Schimp.	5, 23, 17	+					C.C. 71b
	Brachythecium glareosum (Bruch ex Spruce) Schimp.	14, 25, 19, 20, 18, 15, 17, 1	+					C.C. 80b
	Brachythecium rutabulum (Hedw.) Schimp.	21, 5, 7, 13, 11, 22, 26, 17	+					C.C. 129b
	Scleropodium touretii (Brid.) L.F.Koch	4, 5, 3, 4, 10, 18	+					C.C. 29a
	Eurhynchiastrum pulchellum (Hedw.) Ignatov & Huttunen	14, 5, 11	+					C.C. 7
	Brachytheciastrum velutinum (Hedw.) Ignatov & Huttunen	4, 5, 11, 22, 23, 19, 18, 20, 16			+			C.C. 25
	Homalothecium lutescens (Hedw.) H. Rob.	25, 17		+				C.C. 148a

Table 2 (continued)

Families	Bryophyta Taxa	SN	Substratum S	R	LT r	LT t	DT	CN
	Homalothecium sericeum (Hedw.) Schimp	14, 11, 24, 8		+				C.C. 5b
Hypnaceae Schimp.	*Ctenidium molluscum* (Hedw.) Mitt.	26, 17		+				C.C. 170a
	Hypnum cupressiforme Hedw.var. *cupressiforme*	6, 14, 4, 5, 11, 13, 7, 9, 10, 21, 22, 24, 23, 25, 18			+			C.C. 2b
	Hypnum cupressiforme Hedw. var. *filiforme* Brid.	25				+		C.C. 163b
	Hypnum cupressiforme var. *resupinatum* (Taylor) Schimp.	11					+	C.C. 46
	Hypnum imponens Hedw.	10		+				C.C. 113a
Pterigynandraceae Schimp.	*Pterigynandrum filiforme* Hedw.	18, 9, 19, 17, 15, 12				+		C.C. 172d
Plagiotheciaceae (Broth.) M.Fleisch.	*Plagiothecium cavifolium* (Brid.) Z.Iwats.	4, 9, 10	+					C.C. 27a
	Plagiothecium curvifolium Schlieph. ex Limpr.	23, 25, 8	+					C.C. 137d
Leucodontaceae Schimp.	*Leucodon sciuroides* (Hedw.) Schwagr.	11, 14, 7, 9, 22, 12				+		C.C. 69
Neckeraceae Schimp.	*Neckera comlanata* (Hedw.) Huebener	9, 10			+			C.C. 125e
	Thamnobryum alopecurum (Hedw.) Nieuwl. ex Gangulee	9, 23	+					C.C. 125b
Lembophyllaceae Broth.	*Isothecium alopecuroides* (Lam. ex Dubois) Isov	4, 10, 9, 18, 19	+					C.C. 30a
	Isothecium myosuroides Brid.	15, 17, 12	+					C.C. 49a
Anomodontaceae Kindb.	*Anomodon viticulosus* (Hedw.) Hook. & Taylor	9, 21			+			C.C. 122b

Methods

Bryological investigations were carried out in the period from March to October 2009. Materials were collected from 26 localities (Table 1). All specimens are deposited in the herbarium of the Niğde University and special collections of EZER & KARA (Niğde). The specimens collected from Kapandede mountain were identified by using relevant literature (Smith, 2004; Pedrotti, 2001, 2006; Muñoz, 1999; Zander, 1993; Heyn & Herrnstadt, 2004; Casas et al., 2009; Guerra & Cros, 2006, 2007).

Latest status of the taxa for Turkey have been assessed using the related literature (Uyar & Çetin, 2004; Kürschner & Erdağ, 2005; Özenoğlu Kiremit & Keçeli, 2009). Arrangement of taxa in the list follows the system which is proposed by Ros et al., (2007) and Hill et al., (2006). For each taxon, only one collector number (i.e., C.C.102) was given to avoid repetition in the floristic list (Table 2).

RESULTS AND DISCUSSION

As a result of the study, 99 moss taxa belonging to 26 families and 57 genera, 22 liverwort taxa belonging to 16 families and 17 genera, and one hornwort species have been found in the Kaplandede Mountain. Among them, according to the grid-square system of Henderson (1961) three liverwort taxa and fifteen moss taxa have new records for A2 grid square. The most species-rich families in the study area are *Brachytheciaceae* (with 19 species), *Pottiaceae* (with 17 species) and *Dicraneceae* (with 7 spe-

cies), which form up to 35.2% of the bryophyte species identified in this study.

The most species-rich genera recorded were *Bryum* (9), *Orthotrichum* (5), *Dicranella* (4), *Didymodon* (4) and *Hypnum* (4). Other genera were represented with three or less taxa.

The proportion of pleurocarpous mosses, especially meso-hygrophytic *Brachytheciaceae* family members in the Black Sea region is higher than that in the Mediterranean and Aegean regions since pleurocarpous taxa need much more humidity than acrocarpous taxa. *Brachytheciaceae* with 19 species in 13 genera (Table 2) is the most species-rich pleurocarpous family in the study area as well as in other areas in the Black Sea region of Turkey, such as Yenice forests (26 taxa; Uyar et al., 2007), Akçakoca Mountains (28 taxa; Uyar, 2003) and Western Black Sea region (31 taxa; Uyar & Çetin, 2006). The second richest family *Pottiaceae* includes acrocarpous mosses.

The bryoflora of the study area includes taxa with different ecological demands since the area is semi-arid in southern parts, but relatively humid in northern and western parts due to topographical features and some climatic differences in the region. The study area has both the characteristics of oceanic as well as rainy Mediterranean climate (Akman, 1990).

Hypnum cupressiforme, Pterigynandrum filiforme, Radula complanata, Frullania dilatata and *Orthotrichum lyellii* are the most common species found in the study area. For *Campylopus flexuosus* and *Cephaloziella dentata* second localities in Turkey were discovered during the present study.

All the hornwort and liverwort species of the Kaplandede Mountain have been cited for many European countries. They were evaluated for threat status in Europe and classified as Least Concern (LC), but a moss species *Orthotrichum scanicum*, collected from a single locality (S.N. 6) in Kaplandede Mountain, has been classified as vulnerable (VU) by the European Committee for Conservation of Bryophytes (ECCB, 1995). A second moss species *Tortula brevissima* is classified as rare (R) in Europe (ECCB, 1995). It is very rare in Turkey (Kürschner & Parolly, 1998) and was collected from a single locality (S.N. 14) in the study area.

Results of the present study provide important contributions to the bryoflora of Turkey.

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