Bryophytes records from Maçka District (Trabzon Province-Turkey)

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As a result of bryological collecting trips in the Maçka District (Trabzon Province) in Turkey, a total number of 235 bryophytes belonging to 108 genera (17 liverworts and 91 mosses) were determined from 20 different localities. Of these, 26 taxa belong to liverworts and 209 taxa belong to mosses.

Keywords: biodiversity, Black Sea coast, liverworts, mosses, Turkey

Maçka is one of the districts of Trabzon Province and it is located South of Trabzon in the eastern Black Sea Region. The study area is situated in the Euro-Siberian floristic region. It is surrounded by the Gümüşhane province in the south, Trabzon City in the north, the Tonya and Düzköy districts in the west, and the Yomra district and Gümüşhane province in the east (Fig. 1).

The eastern Black Sea region is dominated by alpine, subalpine and forest vegetation and shows close links with the same zones. The area is covered by mixed forests dominated by Alnus glutinosa (L.) Gaertner, Fagus orientalis Lipsky, Pinus orientalis (L.) Link, Castanea sativa Mill., Carpinus betulus L., Corylus avellana L., and alpine meadows (Papp 2004).

The climate in the research area has the characteristics of the eastern Black Sea climatic region. The annual average rainfall is 1429 mm and the average temperature is 6.4°C in the area (Akman 1999, Palabaş Üzun and Anışın 2006).

The bedrock in the Maçka region ranges in age from Liassic to Eocene. The oldest part observed in the region has basaltic, andesitic and acitic volcanic rocks at the base. Most of the bedrocks are of volcanic origin (Gülübrahimoğlu 1985).

There have been many bryofloristic studies carried out in the Trabzon Province up to the present (Gölder 1998, Papp 2004, Townsend 2005, Lara et al. 2010, Batan and Özdemir 2011, 2013, Batan et al. 2013, Kirmaci and Kürschner 2013, Kirmaci et al. 2013, Özdemir and Batan 2017, Erata et al. 2018, Erata and Batan 2019). However, there has not been any bryofloristic studies carried out in the Maçka District to date. Papp (2004), collected bryophyte samples from two localities of Altındere valley National Park in Maçka and Tortula bambbergeri was reported from the Akarsu valley in Maçka by Kirmaci et al. (2013). Therefore, this study provides a contribution to the bryophyte flora of Maçka and Turkey.

Material and methods

The bryophyte samples were collected from Maçka in Turkey. Material was collected from 20 localities (Table 1). The bryophyte samples were examined using light microscope and stereomicroscope. Identifications were made using relevant floras and keys (Crum and Anderson 1981, Ireland 1982, Nyholm 1986, 1989, 1993, 1998, Lewinsky 1993, Blom 1996, Smith 1996, 2004, Paton 1999, Pedrotti 2001, 2006, Greven 2003, Heyn and Herrnstadt 2004, Frey et al. 2006, Guerra et al. 2006, 2014, 2018, Brugués et al. 2007, Kürschner and Frey 2011, Brugués and Guerra 2015, Capparós et al. 2016).

For each taxon, localities and substrate were given in the floristic list. The taxa recorded as new from Maçka district are indicated with (#), new records for Trabzon with (+). Also new records for the A4 square, according to the grid system of Henderson (Henderson, 1961) are indicated with (*) in the bryofloristic list. Nomenclature of the species follows Ros et al. (2007) and Söderström et al. (2016) for liverworts and Ros et al. (2013), Pläšek et al. (2015), Lara et al. (2016) and Hodgetts et al. (2019) for mosses. The species list is arranged according to the system proposed by Goffinet et al. (2009). The new records for Trabzon and the A4 grid-square were determined by reviewing the related literature.
In the bryofloristic list the species are in taxonomic order followed by locality numbers and habitats.

**Results**

In this study, the collected bryoptytes were evaluated and they belong to 14 families, 17 genera and 26 taxa from Marchantiophyta, 32 families, 91 genera and 209 taxa from Bryophyta. Totally 265 specific and infraspecific taxa have been determined.

**Bryofloristic list**

**Liverworts (Marchantiophyta)**  
**Conocephalaceae** Müll. Frib. Ex Grolle  
*Conocephalum conicum* (L.) Dumort. – Loc.: 2, 7, 19; on wet rock.  
**Pelliaceae** H. Klinggr.  
# *Apopella endiviifolia* (Dicks.) Nebel & D.Quandt. – Loc.: 13; on wet soil.  
# *Pellia epiphylla* (L.) Corda. – Loc.: 7, 11, 19; on wet soil.  
**Jungermanniaceae** Rchb.  
# *Jungermannia sphaeroarpa* Hook. – Loc.: 15; on wet soil.  
**Pseudolepicoaceae** Fulford & J.Taylor  
# *Blepharostoma trichophyllum* (L.) Dumort. – Loc.: 11; on calcareous rock.  
**Calypogeiaaceae** Arnell  
# *Calypogeia fissa* (L.) Raddi. – Loc.: 11; on wet soil.  
**Lophocoleaceae** Vanden Berghen  
# *Chilocyphus pallescens* (Ehrh. ex Hoffm.) Dumort. – Loc.: 7; on wet soil.  
# *C. polyanthos* (L.) Corda. – Loc.: 19; on wet soil.  
**Lophoziaaceae** Cavers  
# *Tritomaria exsecta* Schmidel ex. Schrad.) Loeske. – Loc.: 11; on dead tree trunk.  
**Scapaniaceae** Mig.  
# *Barbilophozia barbata* (Schmidel ex Schreb.) Loeske. – Loc.: 3, 6, 14, 15, 18, 19; on rock, on soil.  
# *B. hatcheri* (A. Evans) Loeske. – Loc.: 7, 13, 19; on rock.  
# *Diplophyllum taxifolium* (Wahlenb) Dumort. – Loc.: 17; on wet soil.  
# *Scapania irrigua* (Ness) Ness. – Loc.: 6; on wet soil.  
# *S. nemorea* (L.) Grolle. – Loc.: 19; on wet soil.  
**Plagiociliaceae** Müll. Frib.  
# *Pedinophyllum interruptum* (Nees). – Loc.: 4, 7, 11; on wet soil, on wet rock.  
# *Plagiocilia asplenioides* (L. emend. Taylor) Dumort. – Loc.: 3, 4, 5, 6, 7, 8, 9, 10, 11;15, 17, 20; on soil, on rock, on dead tree trunk.  
*P. poreloides* (Torrey ex Nees) Lindenb. – Loc.: 3, 6, 7, 10, 11; on soil, on rock.  
**Porellaceae** Cavers  
*Porella platyphylla* (L.) Pfeiff. – Loc.: 2, 5, 7, 10; on rock.
Table 1. Details of study sites.

| Locality no. | Date       | Altitude (m) | Locality                                           |
|--------------|------------|--------------|----------------------------------------------------|
| 1            | 18.05.2018 | 657          | Trabzon Province: Maçka, between Çatak and Çeşmeler 40°47'54.9"N, 39°32'18.1"E |
| 2            | 18.05.2018 | 602          | Trabzon Province: Maçka, Mulaga Valley, enter the Ocak village 40°47'52.7"N, 39°33'17.8"E |
| 3            | 18.05.2018 | 738          | Trabzon Province: Maçka, lower part of Sindiran village 40°47'54.02"N, 39°31'15.4"E |
| 4            | 23.05.2018 | 698          | Trabzon Province: Maçka, Mulaga Valley-3 Harmançık. 40°47'52.6"N, 39°31'51.9"E |
| 5            | 23.05.2018 | 1253         | Trabzon Province: Maçka, Mulaga Valley-4 40°48'01.3"N, 39°30'08.8"E |
| 6            | 23.05.2018 | 1141         | Trabzon Province: Maçka, Mulaga Valley-5 40°47'23.4"N, 39°29'59.6"E |
| 7            | 23.05.2018 | 1429         | Trabzon Province: Maçka, Mulaga Valley-6, Çamlık village 40°46'49.5"N, 39°27'29.1"E |
| 8            | 26.05.2018 | 1560–1587    | Trabzon Province: Maçka, Mulaga Valley-7, Yaylabaşı village 40°46'41.8"N, 39°24'23.9"E |
| 9            | 26.05.2018 | 1584         | Trabzon Province: Maçka, Mulaga Valley-8, lower part of Yaylabaşı village, 40°46'30.4"N, 39°25'20.1"E |
| 10           | 26.05.2018 | 1500–1529    | Trabzon Province: Maçka, Mulaga Valley-9, between Çamlık and Yaylabaşı village 40°46'41"N, 39°26'49.2"E |
| 11           | 26.05.2018 | 1886         | Trabzon Province: Maçka, Mulaga Valley, Çamlıkçılık village, Uçarsu located, 40°45'51.5"N, 39°28'01.9"E |
| 12           | 21.07.2018 | 2177         | Trabzon Province: Maçka, Eskala High Plateau-1 40°44'32.1"N, 39°20'51.8"E |
| 13           | 21.07.2018 | 228–2190    | Trabzon Province: Maçka, Eskala High Plateau-2 40°44'55.3"N, 39°20'51.3"E |
| 14           | 21.07.2018 | 2225         | Trabzon Province: Maçka, Eskala High Plateau-3 40°44'44.8"N, 39°20'29.2"E |
| 15           | 21.07.2018 | 2217         | Trabzon Province: Maçka, Eskala High Plateau-4 40°44'35.2"N, 39°20'30"E |
| 16           | 22.07.2018 | 2310         | Trabzon Province: Maçka, Eskala High Plateau-5 40°44'46.4"N, 39°20'10.8"E |
| 17           | 22.07.2018 | 2253         | Trabzon Province: Maçka, Eskala High Plateau, Ali Meydanı 40°44'21.6"N, 39°20'01.2"E |
| 18           | 22.07.2018 | 2302         | Trabzon Province: Maçka, Eskala High Plateau, Ksir Rock 40°44'28"N, 39°20'11.6"E |
| 19           | 31.07.2018 | 2051–2040    | Trabzon Province: Maçka, Eskala High Plateau, Gelincik Rock, 40°44'13.1"N, 39°21'54.3"E |
| 20           | 31.07.2018 | 2111–2050    | Trabzon Province: Maçka, Eskala High Plateau, Codana water 40°44'30"N, 39°21'34.9"E |

**Radulaceae** Müll. Frib.

*Radula complanata* (L.) Dumort. – Loc.: 6, 9, 10; on rock, on tree bark.

*Radula lindenbergiana* Gottsche ex C. Hartm. – Loc.: 3, 7, 19, 20; on rock, on tree bark.

**Frullaniaceae** Lorch

*Frullania dilatata* (L.) Dumort. – Loc.: 3, 7, 10, 19; on tree bark.

*F. tamarisci* (L.) Dumort. – Loc.: 3, 6; on rock.

**Lejeuneaceae** Casares-Gil

*Lejeunea cavifolia* (Ehrh.) Lindb. – Loc.: 7; on rock.

**Metzgeriaceae** H. Klinggr.

*Metzgeria pubescens* (Schrank) Raddi. – Loc.: 7; on soil.

*M. conjugata* Lindb. – Loc.: 4; on rock.

*M. furcata* (L.) Dumort. – Loc.: 10; on rock.

**Mosses (Bryophyta)**

**Sphagnaceae** Dumort.

*Sphagnum platyphyllum* (Lindb. ex Braithw.). – Loc.: 17; on wet soil in bog.

**Polytrichaceae** Schwägr.

*Artrichum undulatum* (Hedw.) P. Beauv. – Loc.: 11, 14; on wet soil.

*Pogonatum urnigerum* (Hedw.) P. Beauv. – Loc.: 5, 7, 9, 11; on soil, on rock.

*Polytrichum commune* Hedw. – Loc.: 10, 11, 13, 14, 17, 18, 19, 20; on soil among grass.

*P. juniperinum* Hedw. – Loc.: 10; on soil.

*P. piliferum* Hedw. – Loc.: 12, 13 16, 18; on soil.

**Encalyptaceae** Schimp.

*Encalypta ciliata* Hedw. – Loc.: 9; on rock.

*E. streptocarpa* Hedw. – Loc.: 1, 2, 3, 4, 6, 7, 20; on rock.

*E. vulgaris* Hedw. – Loc.: 4, 12, 13, 14; on rock.

**Funariaceae** Schwagr.

*Funaria hygrometrica* Hedw. – Loc.: 2; on rock.

**Grimmiaceae** Arn.

*Grimmia anodon* Bruch & Schimp. – Loc.: 12, 13, 14, 16, 19, 20; on calcareous rock.

*G. dissimulata* E.Maier. – Loc.: 17; on limestone rock.

*G. elatior* Bruch ex Bals.-Crv. & De Not. – Loc.: 6, 19; on acidic rock.

*G. funalis* (Schwaegr.) Bruch & Schimp. – Loc.: 3, 4, 6, 7, 19, 20; on siliceous rock.

*G. hartmannii* Schimp. – Loc.: 3, 6, 7, 9, 10, 14, 16, 19; on acidic rock.

*G. laevigata* (Brid.) Brid. – Loc.: 14, 17; on acidic rock.

*G. lissae* De Not. – Loc.: 2, 3, 7; on acidic rock.

*G. montana* Bruch & Schimp. – Loc.: 1, 4, 15, 17; on acidic rock.

*G. muehlenbeckii* Schimp. – Loc.: 6; on acidic rock.
#G. ovalis (Hedw.) Lindb. – Loc.: 1, 3, 7, 12, 13, 14, 18, 19; on basalt rock.

#G. pulvinata (Hedw.) Sm. – Loc.: 1; on basic rock.

Racomitrium canescens (Hedw.) Brid. – Loc.: 16; on rock.

#R. ericoides (Brid.) – Loc.: 11, 12, 13, 15, 16, 18; on rock.

#R. macounii Kindb. – Loc.: 17; on rock.

Schistidium apocarpum (Hedw.) Bruch & Schimp. – Loc.: 1, 2, 3, 4, 5, 6, 7; on rock.

#S. confertum (Funck) Bruch & Schimp. – Loc.: 1, 4, 6, 7, 9, 13; on rock.

#S. crasipilum H.H.Blom. – Loc.: 1, 6, 7, 9; on rock.

#S. elegantulum H.H.Blom. – Loc.: 1; on rock.

#S. faccidum (De Not.) Ochyra. – Loc.: 8; on rock.

#S. papillosus Culm. – Loc.: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14; on rock.

#S. platyphyllum (Hedw.) Roehl. – Loc.: 1, 3, 4, 6, 7; on soil.

#S. pruinatum (Wilson ex Schimp.) G.Roth. – Loc.: 1; on soil.

#S. rivulare (Brid.) Podp. – Loc.: 3, 11; on rock.

Fissidentaceae Schimp.

Fissidens dubius P. Beauv. – Loc.: 3, 11; on wet soil, on wet rock.

#F. taxifolius Hedw. – Loc.: 13, 19; on wet soil.

Ditrichaceae Limpr.

#Ceratodon purpureus (Hedw.) Brid.– Loc.: 12, 13, 14, 16, 18, 19; on soil, on rock.

Distichium cupulaceum (Hedw.) Bruch & Schimp. – Loc.: 20; on soil.

Distichium gracile (Hedw.) Bruch & Schimp. – Loc.: 2, 3, 7, 12, 14, 16, 18, 19; on rock.

Ditrichum gracile (Mitt.) Kuntze. – Loc.: 3, 4, 6, 7, 20; on soil.

Saelania glaucescens (Hedw.) Sm. – Loc.: 1; on basalt rock.

Rhabdoweisiaceae Limpr.

#Dichodontium palustre (Dicks.) M. Stech. – Loc.: 14; on soil.

D. pellucidum (Hedw.) Schimp. – Loc.: 3, 7, 11; on soil.

Hymenoloma compactum (Schwägr.) Ochyra. – Loc.: 17; on soil.

H. crispulum (Hedw.) Ochyra. – Loc.: 15, 16, 18, 19; on soil.

Dicranaceae Schimp.

#Dicranella heteromalla (Hedw.) Schimp. – Loc.: 14; on soil.

#Dicranum bonjeanii De Not. – Loc.: 14; on wet soil grassy slope.

#D. brevifolium (Lindb.) Lindb. – Loc.: 14, 15, 16, 17; on soil, on rock.

#D. polysetum Sw. ex anon. – Loc.: 6; on soil.

#D. scoparium Hedw. – Loc.: 3, 7, 8, 10, 11, 18, 19; on rock, on dead tree trunk.

#D. spadiceum J.E.Zetterst. – Loc.: 13, 15, 16, 18, 19, 20; on rock.

#Diceranum tauricum Sapjegin. – Loc.: 17; on rock.

#Kiaeria starkei (F. Weber & D. Mohr) I. Hagen. – Loc.: 19; on soil.

Leucobryaceae Schimp.

#Campylopus fragilis (Brid.) Bruch & Schimp. – Loc.: 20; on wet soil.

#C. pyriformis (Schultz) Brid. – Loc.: 15, 16; on soil.

Pottiaceae Schimp.

#Anoectangium aestival (Hedw.) Mitt. – Loc.: 3, 7, 9, 11, 12, 20; on acidic rock.

#Barbula unguiculata Hedw. – Loc.: 1; on soil.

+Cinclidotus fontinaloides (Hedw.) P.Beaup. – Loc.: 4; on wet soil.

*C. riparius (Host ex Brid.) Arn. – Loc.: 2; on wet soil.

#Dalytrichia mucronata (Brid.) Broth. – Loc.: 18; on soil.

*Bryocenophyllum ferruginascens (Stirt.) Giacom. – Loc.: 7, 11; on wet soil, on wet rock.

#B. recurvirostrum (Hedw.) P.C. Chen. – Loc.: 7, 9, 11; on rock.

Didymodon ferrugineus (Schimp. ex Besch.) M.O.Hill. – Loc.: 2, 3, 4; on soil, on rock.

#Didymodon fallax (Hedw.) R.H. Zander. – Loc.: 4; on soil.

#D. glaucus Ryan. – Loc.: 2, 4; on soil, on rock.

#D. nicholsonii Culm. – Loc.: 15, 18; on soil.

D. rigidulus Hedw. – Loc.: 2, 3, 4, 11; on rock.

D. tophaceus (Brud.) Lisa. – Loc.: 2, 4; on wet rock.

#D. vinealis (Brid.) R.H.Zander. – Loc.: 2, 6, 18; on rock.

#Gymnostomum aeruginosum Sm. – Loc.: 19, 20; on wet soil.

Oxystegus tenuirostris (Hook. & Taylor) A.J.E.Sm. – Loc.: 2; on rock.

#Syntrichia montana Nees. – Loc.: 7, 9, 10, 17; on soil.

*S. papilloisima (Copp.) Loecke. – Loc.: 19; on rock.

#S. ruralis var. ruraliformis (Besch.) Delogne. – Loc.: 6, 8, 12, 15, 16, 17, 18, 19; on rock.

#S. ruralis (Hedw.) F. Weber & D. Mohr var. ruralis. – Loc.: 2, 3, 7, 12, 14, 16, 18, 19; on rock.

#Tortula fragilis (Hook. & Wilson) Limpr. – Loc.: 8; on rock.

T. squarrosa (Brid.) Limpr. – Loc.: 1, 2, 3, 4, 6, 9; on soil, on rock.

T. tortuosa (Hedw.) Limpr. – Loc.: 1, 2, 3, 4, 6, 7, 11, 12, 13, 14, 18, 19, 20; on soil, on rock.

#T. inermis (Brid.) Mont. – Loc.: 1, 15; on rock.

*T. marginata (Bruch & Schimp.) Spruce. – Loc.: 7, 11; on rock.

#T. mucronifolia Schwägr. – Loc.: 7; on rock.

T. muralis Hedw.– Loc.: 1; on soil.

#T. subulata Hedw. – Loc.: 6, 8, 9, 10; on soil.

*W. brahyacarpa (Nees & Hornsch.) Jur. – Loc.: 2; on soil.

W. controversa Hedw. – Loc.: 20; on soil.

#W. rutilans (Hedw.) Lindb. – Loc.: 3; on soil.

Bryaceae Schwagr.

#Bryum argenteum Hedw. – Loc.: 12; on soil.

#B. dichotomum Hedw. – Loc.: 7; on soil.

*B. elegans P. Beauv. – Loc.: 1, 9; on soil.

#B. gemmiparum De Not. – Loc.: 4; on wet soil.

#B. subapiculatum Hampe. – Loc.: 14; on wet soil.

#Imbribrainum alpinum (Huds. ex With.) N. Pedersen. – Loc.: 19; on soil.

#I. mildeanum (Jur.) J.R. Spence. – Loc.: 7; on soil.

#Psychotum angaroticum (Bruch & Schimp.) J.R. Spence. – Loc.: 13; on soil.

#P. capillare (Hedw.) Holyoak & N. Pedersen. – Loc.: 1, 3, 6, 7, 11, 12, 14; on soil, on rock.

#P. creberrimum (Taylor) J.R. Spence &H.P. Ramsay. – Loc.: 9, 19; on wet soil.
#P. imbricatulum (Müll. Hal.) Holyoak & N. Pedersen. – Loc.: 1, 6, 12, 13, 16, 19; on soil, on rock.
#P. moravicum (Podp.) Ros & Mazimpaka. – Loc.: 8, 10, 11, 14; on soil, on tree bark.
#P. pseudotrigonum (Hedw.) J.R. Spence & H.P. Ramsay var. pseudotrigonum. – Loc.: 3, 12, 13, 14, 15, 16; near stream, on wet soil.
#Rhodobryum ontariense (Kindb) Kindb. – Loc.: 5, on soil.
#Pohlia wahlenbergii (F.Weber & D.Mohr) A.L.Andrews. – Loc.: 7; on wet soil.

Mniaceae Schwagr.
#Mniium marginatum (Dicks. exWith.) P. Beauv. – Loc.: 4, 7, 11; on wet soil.
M. spinosum (Voit) Schwägr. – Loc.: 15, 19; on wet soil.
#M. spinulosum Bruch & Schimp. – Loc.: 17; on wet soil.
#M. stellare Hedw. – Loc.: 13; on soil.
M. thomsonii Schimp. – Loc.: 3, 17; on soil.
Plagiomnium ellipticum (Hedw) T.J.Kop. – Loc.: 3; on wet soil.
#P. rostratum (Schrad.) T.J.Kop. – Loc.: 6; on wet soil.
#P. undulatum (Hedw) T.J.Kop. – Loc.: 4, 7, 11; on soil, on rock.
#Pohlia cruda (Hedw.) Lindb. – Loc.: 11, 12, 19; on wet soil.
#P. melatoodon (Brid.) A.J. Shaw. – Loc.: 19; on wet soil.
#P. nutans (Hedw) Lindb. – Loc.: 12; on wet soil.
#Rhizomnium punctatum (Bruch & Schimp) T.J.Kop. – Loc.: 11, 13, 19; on wet soil.

Entodontaceae Kindb.
#Entodon concinnus (De Not.) Paris. – Loc.: 1, 2, 3, 4, 5, 6, 8, 11, 17; on soil, on rock.
E. schleicheri (Schimp) Demet. – Loc.: 4, 5; on soil, on rock.

Pterigynandraceae Schimp.
#Heterocladium dimorphum (Brid.) Schimp. – Loc.: 17; on rock.
Pterigynandrum filiforme Hedw. – Loc.: 5, 10, 11, 13, 16, 17, 19; on rock, on tree bark.

Bartramiacae Schwägr.
Bartramia belleriana Hedw. – Loc.: 7, 9, 11, 19; on wet rock.
B. ithyphylla Brid. – Loc.: 9, 12, 17, 19, 20; on rock, on wet rock.
#Philonotis fontana (Hedw.) Brid. – Loc.: 13, 16, 19; on soil, near stream.

Orthotrichaceae Arn.
#Leuwenkja rupestris (Schleich. Ex Schwägr.) F.Lara, Garilleti & Goffinet. – Loc.: 12, 13, 14, 16, 19; on rock, on tree bark.
L. speciosa (Nees) F.Lara, Garilleti & Goffinet. – Loc.: 3, 4, 9; on tree bark.
#Orthotrichum cupulatum Bruch – Loc.: 20; on rock.
O. pallens Bruch ex Brid. – Loc.: 2; on rock.
O. pumilum Sw. ex Anon. – Loc.: 1, 6; on tree bark.
O. tenellum Bruch ex Brid. – Loc.: 3; on tree bark.
#Ulota crispula Bruch – Loc.: 9; on tree bark.

Hedwigiacae Schimp.
#Hedwigia ciliata (Hedw.) P.Beauv. var. ciliata. – Loc.: 2, 3, 5, 6, 10, 12, 14, 16, 18, 19; on soil, on rock.
#H. ciliata var. leucophaea Bruch & Schimp. – Loc.: 2, 7, 14; on rock.

Climaciaceae Kindb.
#Climacium dendroides (Hedw.) F. Weber & D. Mohr. – Loc.: 15, 17, 19, 20; on wet soil.

Amblystegiaceae Kindb.
#Campyladenophas cryphyllus (Brid.) R.S.Chopra. – Loc.: 2, 14; on wet soil, on wet rock.
#Campylium protonem (Brid.) Kindb. – Loc.: 14, 15, 19; on wet soil.
Campylum phyllophyllum calcareum (Mitt) Hedenäs. – Loc.: 19; on wet soil
#Cratoneuron filicinum (Hedw.) Spruce. – Loc.: 7, 15, 19, 20; on wet soil, on wet rock.
#Hygrohypnum luridum (Hedw.) Jenn. – Loc.: 7; on wet soil.
#H. ochraceum (Turner ex Wilson) Loeske. – Loc.: 3; on wet soil.
#Palustriella falcata (Brid) Hednäs. – Loc.: 13, 16, 19, 20; on wet soil.
#Sanionia uncinita (Hedw.) Loeske. – Loc.: 11, 15, 17; on dead tree trunk.

Pseudoleskeaceae Schimp.
#Lescuraea mutabilis (Brid.) Lindb. ex I. Hagen. – Loc.: 16, 17; on wet soil.
#L. incurvata (Hedw) E. Lawton. – Loc.: 17, 19; on rock.
#L. plicata (Schleich. ex F. Weber & D. Mohr) Broth. – Loc.: 17; on soil.
#L. radicosa (Mitt) Mönk. – Loc.: 15, 20; on rock.

Leskeaceae Schimp.
#Pseudoleskea catenulata (Brid) ex Schrad) Kindb. – Loc.: 6; on rock.
Pseudoleskea nervosa (Brid) Nyholm. – Loc.: 5, 14; on rock.

Thuidiacae Schimp.
Abietinella abietina (Hedw) M.Fleisch. var. abietina. – Loc.: 2, 5, 12, 14, 15, 17, 18; on rock.
#A. abietina var. hystricosa (Mitt) Sakurai. – Loc.: 6, 8, 11, 16, 19; on soil.
#Thuidium assimile (Mitt) A.Jaeger. – Loc.: 1, 2, 3, 4, 5, 6, 7; on wet soil.
#T. recognitum (Hedw) Lindb. – Loc.: 1; on wet soil.
#T. tamariscinum (Hedw) Schimp. – Loc.: 4; on wet soil.

Brachytheciaceae Schimp.
Brachythecastrum velutinum (Hedw) Ignatov & Huttunen. – Loc.: 8, 14; on dead tree trunk, on soil.
#Brachythecium albicans (Hedw) Schimp. – Loc.: 4, 11, 12, 18, 20; on soil.
#B. campestr (Müll.Hal) Schimp. – Loc.: 4; on wet soil.
B. glareosum (Bruch ex Spruce) Schimp. – Loc.: 2; on soil.
#B. laetum (Brid) Schimp. – Loc.: 4; on soil.
#B. rivulare Schimp. – Loc.: 2, 3, 7, 13, 14, 15, 16, 17; on wet soil, near stream.
B. rutabulum (Hedw) Schimp. – Loc.: 1, 4, 9, 11; on wet soil, near stream.
#B. salebrosum (Hoffm. ex F. Weber & D. Mohr) Schimp. – Loc.: 4; on soil.
#Cirriphyllum piliferum (Hedw) Grout. – Loc.: 2, 3, 7; on soil, on rock.
Eurhynchium angustirete (Broth) T.J.Kop. – Loc.: 9, 11; on soil.
The genera richest in species: Hypnum (11 taxa), Schisandra (8 taxa), Lophocolea (8 taxa), and Anomodon (8 taxa) represent 35.06% of the total moss taxa. These nine families give 73.21% of the total moss taxa (excluding liverworts). The dominant Bryophyta families in the study area were Pottiaceae (31 taxa), Brachytheciaceae (27 taxa), Grimmiaaceae (23 taxa), Hypnaceae (16 taxa), Bryaceae (14 taxa), Mniumaceae (12 taxa), Dicranaceae (9 taxa), Amblystegiaceae (9 taxa), and Orthotrichaceae (7 taxa). These nine families give 73.21% of the total moss taxa in this study and the other families constitute 26.79%. The Pottiaceae is the most species-rich moss family in the study area with 31 taxa in 12 genera.

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The genera richest in species: Hypnum (11 taxa), Schistidium (9 taxa), Brachythecium (7 taxa), Dicranum (6 taxa), Didymodon (6 taxa), Psychotum (6 taxa), Bryum (5 taxa), Mnium (5 taxa), Syntrichia (4 taxa), Pohlia (4 taxa), Orthotrichum (4 taxa) and Lescurea (4 taxa). Other genera are represented by 3 or fewer taxa in the area.

**Discussion**

As a result of the study, 26 liverwort taxa (belonging to 14 families and 17 genera), 209 moss taxa (belonging to 32 families and 91 genera) and a total of 235 bryophyte taxa (belonging to 46 families and 108 genera) were determined. The dominant Bryophyta families in the study area were Pottiaceae (31 taxa), Brachytheciaceae (27 taxa), Grimmiaaceae (23 taxa), Hypnaceae (16 taxa), Bryaceae (14 taxa), Mniumaceae (12 taxa), Dicranaceae (9 taxa), Amblystegiaceae (9 taxa), Orthotrichaceae (7 taxa) and Hylocomiaceae (7 taxa). These nine families give 73.21% of the total moss taxa in this study and the other families constitute 26.79%. The Pottiaceae is the most species-rich moss family in the study area with 31 taxa in 12 genera.

The genera richest in species: Hypnum (11 taxa), Schistidium (9 taxa), Brachythecium (7 taxa), Dicranum (6 taxa), Didymodon (6 taxa), Psychotum (6 taxa), Bryum (5 taxa), Mnium (5 taxa), Syntrichia (4 taxa), Pohlia (4 taxa), Orthotrichum (4 taxa) and Lescurea (4 taxa). Other genera are represented by 3 or fewer taxa in the area.
The dominant liverwort families are Scapaniaceae (5 taxa), Plagiochilaceae (3), Metzgeriaceae (3). These three families give 44% of the total liverwort taxa in this study and the other families constitute 56%.

The liverwort genera richest in species: Metzgeria (3 taxa), Pellia (2 taxa), Chiloscyphus (2 taxa), Barbilophozia (2 taxa), Scapania (2 taxa), Plagiochila (2 taxa) and Frullania (2 taxa).

Other genera are represented by one taxon in the area.

Polytrichum commune, Encalypta streptocarpa, Grimmia anodon, G. hartmannii, Schistidium papillosum, Ceratodon purpureus, Dicranum scoparium, Syntrichia ruralis var. ruraliformis, Syntrichia ruralis var. rustica, Tortella tortuosa, Entodon concinnus, Hedwigia ciliata var. ciliata, Abietinella abietina var. abietina, Homalothecium lutescens, H. philippinum, H. sericeum, Hypnum cupressiforme var. cupressiforme, H. cupressiforme var. resupinatum, H. cupressiforme var. lacunosum, H ylocomium splendens, Rhytidium rugosum, Leucodon sciuroides and Isothecium alopecuroides are the most common moss species found in the area. Additionally, Barbi lophozia barbata, Plagiochila asplenioides, P. porelloides, Radula lindenbergiana and Frullania dilatata are the most common liverwort species found in the area.

Cinclidotus fontinaloides, Rhynchoscoygiella teneriffae, Herzog iella seligeri, Hypnum cupressiforme var. subjulaceum, Lecurana plicata and Isopterygiopsis muelleriana taxa were reported for the first time from Trabzon province. Also, Cinclidotus riparius, Syntrichia papillosum taxa are new for the square A4 according to the Henderson (1961) grid system. One hundred and eighty-eight taxa are new records for Maçka District.

Due to the suitable habitat conditions, high rainfall, acidic bedrock and mixed forests vegetation the bryophyte flora of Maçka is rich. Thus, hygrophyte, xerophyte and mesophyte taxa were observed in the study area. Bryophytes taxa were collected on soils, rocks and trunks of trees in the study area.

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