Arctoa (2013) **22**: *101-106*

CONTRIBUTION TO THE MOSS FLORA OF EASTERN BLACK SEA REGION (ARTVIN) IN TURKEY AND NEW RECORD TO THE SOUTHWEST ASIA

К ФЛОРЕ МХОВ ВОСТОЧНОГО ЧЕРНОМОРЬЯ (АРТВИН) В ТУРЦИИ И НОВАЯ НАХОДКА ДЛЯ ЮГО-ЗАПАДНОЙ АЗИИ

NEVZAT BATAN[1] & TURAN ÖZDEMİR[2]

НЕВЗАТ БАТАН[1], ТУРАН ЁЗДЕМИР[2]

Abstract

The moss specimens were collected from various localities in Eastern Black Sea region in Turkey (Artvin province; Hopa and Arhavi Districts), which is located in caucasian part of Turkey. A total of 146 moss taxa (belonging to 73 genera and 33 families) were recorded within the study area. Among of these, *Trematodon longicollis* Michaux was determined as new to Turkey. Also, this is the first record of the genus, as well as the family Bruchiaceae from the Southwest Asia.

Резюме

Представлена обработка коллекции мхов, собранной в ряде местонахождений в Восточном Черноморье Турции (провинция Артвин; районы Хопа и Архави), в кавказской части Турции. Список включает 146 таксонов мхов (из 73 родов, 33 семейств). Среди них *Trematodon longicollis* Michaux, новый вид для Турции, причем и род, и семейство Bruchiaceae к которому он относится – новость для бриофлоры Юго-Западной Азии.

KEYWORDS: mosses, Turkey, new record, Artvin, *Trematodon longicollis,* Bruchiaceae

INTRODUCTION

Although many bryophyte taxa have recently been recorded for Black Sea region of Turkey (Özdemir, 2008; Özdemir *et al.*, 2008; Özdemir & Uyar, 2008; Keçeli *et al*., 2008; Uyar *et al*., 2008; Abay *et al*., 2009; Lara *et al*., 2010; Kırmacı *et al*., 2012), bryofloristical knowledge of Turkey is still poor. Compared to other European countries, not many bryophyte flora studies have been conducted in Turkey. So the bryophyte flora of Turkey is still in need of more detailed investigation. This study aims to make contribution to the knowledge of moss flora of Turkey.

The investigated area is situated in Artvin province of north-east of Turkey (40°– 42° N, 38°– 42° E).The region is surrounded by Rize in the west, Georgia in the east and Murgul and Borçka district in the south (Fig. 1). In addition, the area is landed in the colchis province of the Euro-Siberian floristic region and in the A4 square which was adopted by Henderson (1961).

The research area (northern slope of the East Black Sea Mountain range) is covered with mixed forests. The dominant taxa in the main vegetation in the study area are: *Alnus glutinosa* (L.) Gaertn., *Corylus avellana* L., *Fagus orientalis* Lipsky, *Picea orientalis* (L.) Link., *Rhododendron ponticum* L., *R. luteum* Sweet, *Laurus nobilis* L., *Buxus sempervirens* L., *Ilex colchica* Pojark., *Daphne pontica* L., *Castanea sativa* Mill., *Carpinus betulus* L., *Tilia rubra* DC., *Pinus silvestris* L., *Acer cappadocicum* Gleditsch., *Salix* sp., and *Betula* sp. (Ansin, 1981). Hopa and Arhavi districts are subject to oceanic climate including those surroundings (Akman, 1999). The present study will contribute to the moss flora of Artvin province (Hopa and Arhavi districts), and Turkey.

MATERIALS & METHODS

The moss specimens were collected from Eastern Black Sea region (Artvin) on 27 June 2010, 8 April 2011 and 20 May 2011. After air-dried samples were examined in the laboratory their identifications were performed by consulting keys (Watson, 1981; Frey *et al*., 2006; Smith, 2004; Küsrschner, 2006, 2008; Noguchi & Iwatsuki, 1987; Kürschner & Frey, 2011). Nomenclature of species follows by (Hill *et al.*, 2006). The status of taxa was evaluated by reviewing the related literature for Turkey (Uyar & Çetin, 2004; Kürschner & Erdağ, 2005; Kürschner & Frey, 2011), Southwest Asia (Kürschner & Frey, 2011). Samples are kept in the herbarium in the Biology Department of Karadeniz Technical University, Trabzon, Turkey (KTUB).

The floristic list is given below. In the list, the new taxa for A4 grid square is indicated with asterisks (*)

[1] – Karadeniz Technical University, Maçka Vocational School, 61750, Trabzon, Turkey; e-mails: nevzatbatan@gmail.com; nbatan@ktu.edu.tr

[2] – Karadeniz Technical University, Faculty of Science, Biology Department, 61080, Trabzon, Turkey; e-mail: ozdemirturan@gmail.com

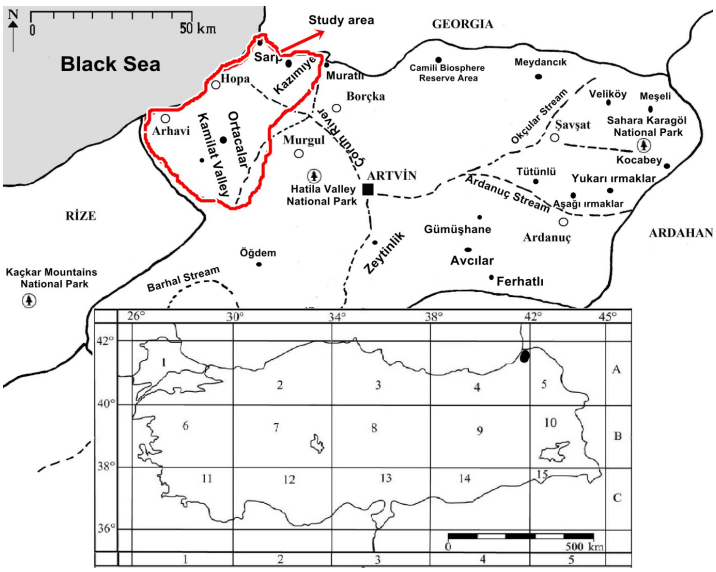

Fig. 1. Geographic location of the study area in Turkey and grid system adopted by Henderson (1961) for Flora of Turkey.

(Özdemir, 2009) and the new taxa for Turkey is indicated with asterisks (**). In the list of each taxon, the numbers of the sites where they have been found are given, followed by the description of the habitat occupied in the study area and collection number. Habitats in the study area: **S**: on soil; **WS**: on wet soil; **R**: on rock; **T**: on the bark of tree trunk and branch; **WR**: on wet rock submerged in the water.

MOSS SPECIES LIST

POLYTRICHACEAE SCHWÄGR.

Atrichum angustatum (Brid.) Bruch & Schimp. – 26, 28: **S**, BAT 2047, BAT 2016.
A. undulatum (Hedw.) P.Beauv. – 26, 27, 28, 31, 32: **S**, BAT 2119, BAT 2053, BAT 2115, BAT 2246, BAT 2132.
Pogonatum aloides (Hedw.) P.Beauv. – 25, 29, 30: **S**, BAT 2023, BAT 2285, BAT 2286.
P. urnigerum (Hedw.) P.Beauv. – 25, 29, 30: **S**, BAT 2023, BAT 2287, BAT 2286.
Polytrichastrum formosum (Hedw.) G.L.Sm. – 8, 9, 10: **S**, BAT 2149, BAT 2134, BAT 2203.
Polytrichum commune Hedw. – 36, 38: **S**, BAT 2244, BAT 2245.

TETRAPHIDACEAE SCHIMP.

Tetraphis pellucida Hedw. – 36, 38: **S**, BAT 2246, BAT 2247

DIPHYSCIACEAE M.FLEISCH.

Diphyscium foliosum (Hedw.) D.Mohr – 32, 37: **S**, BAT 2113, BAT 2002.

TIMMIACEAE SCHIMP.

Timmia austriaca Hedw. – 33: **S**, BAT 2099.

FUNARIACEAE SCHWÄGR.

Entosthodon obtusus (Hedw.)Lindb. – 11, 15: **S**, BAT 2265, BAT 2271.
Funaria hygrometrica Hedw. – 14: **S**, BAT 2269.

GRIMMIACEAE ARN.

Grimmia hartmanii Schimp. – 12: **S**, BAT 2270.
G. donniana Sm. – 3: **R**, BAT 2272.
Racomitrium aciculare (Hedw.) Brid – 34, 35: **S**, BAT 2287, BAT 2289.
R. affine (F. Weber & D. Mohr) Lindb. – 26: **S**, BAT 2060.
R. aquaticum (Brid. ex Schrad.) Brid. – 13: **S**, BAT 2179.
R. macounii subsp. *alpinum* (E. Lawton) Frisvoll. – 6: **S**, BAT 2138.
R. sudeticum (Funck) Bruch & Schimp – 31, 25: **S**, BAT 2116, BAT 2142.
Schistidium elegantulum H.H. Blom – 28: **R**, BAT 2058.
S. papillosum Culm. – 27, 28: **R**, BAT 2048, BAT 2049.
S. rivulare (Brid.) Podp. – 6: **R**, BAT 2133.
S. trichodon (Brid.) Poelt – 5: **R**, BAT 2147.

FISSIDENTACEAE SCHIMP.

Fissidens adianthoides Hedw. – 5, 34, 35: **WR**, BAT 2136, BAT 2222, BAT 2233, BAT 2229.
F. dubius P. Beauv. – 15, 26, 27, 28, 36: **WS**, BAT 2095, BAT 2046, BAT 2124, BAT 2150, BAT 2243.
F. osmundoides* Hedw. – 35: **WS, BAT 2207.
F. pusillus* (Wilson) Milde – 31: **WS, BAT 2110.
F. taxifolius Hedw. – 1, 2, 23, 24, 38, 39: **WS**, BAT 2062, BAT 2063, BAT 2066, BAT 2069, BAT 2171, BAT 2233.

DITRICHACEAE LIMPR.

29. *Ceratodon purpureus* (Hedw.) Brid. – 4, 16, 20, 21: **S**, BAT 2294, BAT 2295, BAT 2296, BAT 2297.

DICRANACEAE SCHIMP.

30. *Dicranum bonjeani* De Not – 37: **S**, BAT 2262.
31. *D. fuscescens* Sm. – 6: **S**, BAT 2134.
32. *D. polysetum* Sw. ex anon. – 5: **S**, BAT 2263.
33. *D. scoparium* Hedw. – 5: **S**, BAT 2264.

**BRUCHIACAE SCHIMP.

***Trematodon longicollis* Michaux – 25: **S**, BAT 2019, BAT 2023.

LEUCOBRYACEAE SCHIMP.

Campylopus atrovirens De Not. – 6: **WR**, BAT 2142.
C. brevipilus Bruch & Schimp. – 5: **R**, BAT 2144,BAT 2147.
C. flexuosus (Hedw.) Brid. – 6, 7: **WR**, BAT 2131, BAT 2141.
C. fragilis Bruch & Schimp. – 19: **S**, BAT 2260.
C. introflexus* (Brid.) Bruch & Schimp.– 39: **S, BAT 2261.
C. subulatus Schimp. ex Milde – 27: **S**, BAT 2138.
Dicranodontium denudatum (Brid.) E. Britton – 5: **S**, BAT 2154, BAT 2162.

Table 1. List of collection localities in Turkey, Artvin Province

No	Locality	Latitude and	Longitude	Altitude, m	Date
1	Arhavi Dist., Near the highway, Güngören village	41° 20' 44" N-	41° 49' 36" E	40	20.VIII.2009
2	Arhavi Distr., Between Arhavi and Hopa near the highway	41° 21' 42" N-	41° 19' 36" E	46	20.VIII.2009
3	Arhavi Dist., Near city centrum	41° 20' 13" N-	41° 18' 18" E	27	20.VIII.2009
4	Arhavi Dist., Southern of city centrum	41° 19' 14" N-	41° 18' 10" E	45	20.VIII.2009
5	Arhavi Dist., Kamilat valley, near Meçuna waterfall	41° 16' 20" N-	41° 24' 25" E	487	20.IV.2011
6	Arhavi Dist., Midst of Kamilat valley	41° 16' 15" N-	41° 24' 07" E	454	20.IV.2011
7	Arhavi Dist., The lower part of Kamilat valley	41° 16' 23" N-	41° 23' 35" E	386	20.IV.2011
8	Arhavi Dist., Kamilat valley, Küçük village	41° 16' 16" N-	41° 23' 30" E	458	21.IV.2011
9	Arhavi Dist., Kamilat valley, Arýlý village	41° 16' 33" N-	41° 22' 32" E	287	21.IV.2011
10	Arhavi Dist., Kamilat valley, Çiftekemer köprü village	41° 16' 39" N-	41° 22' 25" E	278	21.IV.2011
11	Arhavi Dist., Ortacalar village	41° 16' 47" N-	41° 22' 36" E	455	21.IV.2011
12	Arhavi Dist., Dikyamaç village	41° 16' 50" N-	41° 22' 16" E	292	21.IV.2011
13	Arhavi Dist., Güneşli village	41° 18' 09" N-	41° 20' 16" E	353	22.IV.2011
14	Arhavi Dist., Konaklý village	41° 18' 57" N-	41° 19' 34" E	83	22.VIII.2009
15	Arhavi Dist., Çifteköprü	41° 16' 34" N-	41° 22' 47" E	318	22.IV.2011
16	Hopa Dist., Cankurtaran	41° 24' 38" N-	41° 31' 28" E	686	22.VIII.2009
17	Hopa Dist., Between Cankurtaran- Hopa near Upper Part	41° 23' 56" N-	41° 30' 23" E	391	22.VIII.2009
18	Hopa Dist., Between Cankurtaran- Hopa near Lower Part	41° 20' 20" N-	41° 28' 51" E	104	22.VIII.2009
19	Hopa Dist., City centrum near the Sarp district	41° 25' 19" N-	41° 26' 30" E	44	21.VIII.2009
20	Hopa Dist., City centrum near the Arhavi district	41° 23' 01" N-	41° 24' 21" E	35	21.VIII.2009
21	Hopa Dist., Between Kemalpaşa and Hopa	41° 28' 27" N-	41° 30' 21" E	15	23.VIII.2009
22	Hopa Dist., Kemalpaşa	41° 28' 50" N-	41° 31' 34" E	14	23.VIII.2009
23	Hopa Dist., Between Kemalpaşa and Sarp, near road	41° 30' 23" N-	41° 32' 08" E	21	23.VIII.2009
24	Hopa Dist., Near border gate in the Sarp	41° 31' 01" N-	41° 32' 43" E	20	23.VIII.2009
25	Hopa Dist., Sarp, Kazýmiye village	41° 30' 37" N-	41° 34' 08" E	284	23.IV.2011
26	Hopa Dist., Kemalpaşa, Köprücü village	41° 27' 47" N-	41° 34' 03" E	311	23.IV.2011
27	Hopa Dist., Kemalpaţa, Köprücü village, Altýnköprü Waterfall	41° 27' 54" N-	41° 34' 59" E	704	23.IV.2011
28	Hopa Dist., Kemalpaşa, The upper part Köprücü village	41° 28' 45" N-	41° 34' 59" E	584	23.IV.2011
29	Hopa Dist., Kemalpaşa, Osmaniye village	41° 28' 17" N-	41° 31' 48" E	90	25.IV.2011
30	Hopa Dist., Kemalpaşa, Karaosmaniye village	41° 27' 53" N-	41° 31' 12" E	253	25.IV.2011
31	Hopa Dist., Kemalpaşa, Liman village	41° 27' 59" N-	41° 29' 25" E	120	25.IV.2011
32	Hopa Dist., Kemalpaşa, Liman village	41° 27' 52" N-	41° 29' 30" E	150	25.IV.2011
33	Hopa Dist., Kemalpaţa, Esenkýyý village	41° 26' 27" N-	41° 27' 42" E	125	25.IV.2011
34	Hopa Dist., Koyuncular village	41° 23' 27" N-	41° 29' 57" E	166	24.IV.2011
35	Hopa Dist., Çavuşlu village	41° 23' 27" N-	41° 29' 26" E	203	24.IV.2011
36	Hopa Dist., Sugören village	41° 22' 50" N-	41° 24' 11" E	20	24.IV.2011
37	Hopa Dist., Sarp, Kayaköy village	41° 30' 14" N-	41° 33' 53" E	284	26.IV.2011
38	Hopa Dist., Sarp, Üçkardeş village	41° 30' 09" N-	41° 32' 33" E	252	26.IV.2011
39	Hopa Dist., Sarp, Üçkardeş village	41° 30' 06" N-	41° 32' 20" E	196	26.IV.2011

Leucobryum glaucum (Hedw.) Ångstr. – 32: **S**, BAT 2106.
L. juniperoideum (Brid.) Müll. Hal. – 26, 27, 36: **S**, BAT 2148, BAT 2154, BAT 2162, BAT 2183.

Pottiaceae Schimp.
Anoectangium aestivum (Hedw.) Mitt. – 13: **S**, BAT 2182.
Barbula unguiculata Hedw. – 16: **S**, BAT 2254.
Bryoerythrophyllum recurvirostrum (Hedw.) P.C. Chen – 14: **S**, BAT 2134.
Didymodon acutus (Brid.) K. Saito – 17: **S**, BAT 2264.
Gymnostomum calcareum Nees & Hornsch. – 12, 25, 31: **S**, BAT 2002, BAT 2113, BAT 2226.
G. aeruginosum Sm. – 34: **S**, BAT 2232.
Pleurochaete squarrosa (Brid.) Lindb. – 24: **S**, BAT 2035, BAT 2088.
Tortella humilis (Hedw.) Jenn. – 34, 35: **S**, BAT 2136, BAT 2217, BAT 2233.
T. tortuosa (Hedw.) Limpr. – 13: **S**, BAT 2177.
Tortula subulata Hedw. – 23: **S**, BAT 2298
Weissia brachycarpa (Nees & Hornsch.) Jur. – 15: **S**, BAT 2249.
W. condensa (Voit) Lindb. – 15: **S**, BAT 2250.
W. controversa Hedw. – 15: **S**, BAT 2251.
W. squarrosa* (Nees & Hornsch.) Müll. Hal. – 15: **S, BAT 2243.

Orthotrichaceae Arn.
Orthotrichum diaphanum Schrad. ex Brid. – 19, 21: **T**, BAT 2277, BAT 2278.
O. speciosum Nees –15: **R**, BAT 2176.
Ulota crispa (Hedw.) Brid. – 10: **T**, BAT 2299.

Hedwigiaceae Schimp.
Hedwigia ciliata (Hedw.) P. Beauv. – 10, 30: **S**, BAT 2056, BAT 2300.

Bartramiaceae Schwägr.
Bartramia halleriana Hedw. – 29: **S**, BAT 2255.
B. pomiformis Hedw. – 30: **S**, BAT 2301
Philonotis arnellii Husn. – 16: **WS**, BAT 2302.
P. fontana (Hedw.) Brid. – 17: **WS**, BAT 2281.
P. marchia (Hedw.) Brid. – 18: **WS**, BAT 2282.
P. rigida Brid. – 5: **WS**, BAT 2283.
P. tomentella Molendo – 7: **WS**, BAT 2284.

BRYACEAE SCHWÄGR.
Bryum capillare Hedw. – 23, 24: **S**, BAT 2027, BAT 2045.
B. moravicum Podp. – 16: **S**, BAT 2256.
B. pseudotriquetrum (Hedw.) P.Gaertn. et al. – 16: **S**, BAT 2257.
B. torquescens Bruch. & Schimp. – 6, 28: **S**, BAT 2039, BAT 2133.
Rhodobryum roseum (Hedw.) Limpr. – 38: **S**, BAT 2289.

MIELICHHOFERIACEAE SCHIMP.
Epipterygium tozeri (Grev.) Lindb. – 27, 31, 32: **S**, BAT 2104, BAT 2127, BAT 2185.

MNIACEAE SCHWÄGR.
Mnium marginatum (Dicks.) P.Beauv. – 22: **S**, BAT 2276.
M. spinosum* (Voit) Schwägr. – 21: **S, BAT 2275.
M. stellare Hedw. – 24: **S**, BAT 2035.

CINCLIDIACEAE KINDB.
Rhizomnium punctatum (Hedw.) T.J.Kop. – 35: **S**, BAT 2303.

PLAGIOMNIACEAE T.J. KOP.
Plagiomnium affine (Blandow ex Funck) T.J.Kop. – 15, 26, 27: **S**, BAT 2159, BAT 2183, BAT 2212.
P. cuspidatum (Hedw.) T.J. Kop. – 5, 25: **S**, BAT 2014, BAT 2151.
P. ellipticum (Brid.) T.J.Kop. – 27: **S**, BAT 2090.
P. medium (Bruch & Hedw.) T.J. Kop. – 13, 26: **S**, BAT 2065, BAT 2199.
P. rostratum (Schrad.) T.J.Kop. – 13: **S**, BAT 2180, BAT 2188.
P. undulatum (Hedw.) T.J.Kop. – 5, 34, 35: **S**, BAT 2011, BAT 2129, BAT 2199

FONTINALACEAE SCHIMP.
Fontinalis antipyretica Hedw. subsp. *gracilis* (Lindb.) Kindb. – 5: **WR**, BAT 2269.

CLIMACIACEAE KINDB.
Climacium dendroides (Hedw.) F. Weber & D. Mohr. – 26, 27, 28: **S**, BAT 2065, BAT 2075, BAT 2100.

AMBLYSTEGIACEAE KINDB.
Amblystegium serpens (Hedw.) Schimp. – 6, 15: **WS**, BAT 2032, BAT 2253.
Campyliadelphus chrysophyllus (Brid.) R.S. Chopra – 25: **S**, BAT 2022.
Campylium protensum (Brid.) Kindb.– 15: **S**, BAT 2247.
Cratoneuron filicinum (Hedw.) Spruce – 8: **WS**, BAT 2261.
Hygroamblystegium varium (Hedw.) Mönk. – 24: **WS**, BAT 2034.
Hygrohypnum duriusculum* (De Not.) D. W. Jamieson – 27: **WR, BAT 2079.
H. eugyrium (Schimp.) Broth. – 13, 10: **WR**, BAT 2081, BAT 2107.
H. luridum (Hedw.) Jenn. – 15, 26, 32: **WR**, BAT 2123, BAT 2144, BAT 2230.
Palustriella commutata (Hedw.) Ochyra – 5: **WS**, BAT 2280.
Sanionia uncinata (Hedw.) Loeske – 17: **S**, BAT 2292.

LESKEACEAE SCHIMP.
Pseudoleskeella nervosa (Brid.) Nyholm – 16: **T**, BAT 2286.

THUIDIACEAE SCHIMP.
Abietinella abietina (Hedw.) M.Fleisch. – 7: **S**, BAT 2136.
Thuidium assimile (Mitt.) A.Jaeger – 6: **S**, BAT 2148.
T. delicatulum (Hedw.) Schimp. – 28: **S**, BAT 2068.
T. recognitum (Hedw.) Lindb. – 5, 6, 13: **S**, BAT 2143, BAT 2159, BAT 2234.
T. tamariscinum (Hedw.) Schimp. – 26, 5, 6, 34, 35: **S**, BAT 2042, BAT 2129, BAT 2134, BAT 2154, BAT 2200.

BRACHYTHECIACEAE SCHIMP.
Brachythecium albicans (Hedw.) Schimp. – 25: **S**, BAT 2012.
B. glareosum (Bruch ex Spruce) Schimp. – 13: **S**, BAT 2184.
B. mildeanum (Schimp.) Schimp. – 25, 26: **S**, BAT 2022, BAT 2045.
B. rivulare Schimp. – 6: **S**, BAT 2132.
B. rutabulum (Hedw.) Schimp. – 5, 6, 7, 13, 24, 26, 27: **S**, BAT 2078, BAT 2080, BAT 2077, BAT 2088, BAT 2085, BAT 2137, BAT 2155, BAT 2176.
B. salebrosum (Hoffm. ex F.Weber & D.Mohr) Schimp. – 29: **S**, BAT 2038.
Brachytheciastrum velutinum (Hedw.) Ignatov & Huttunen – 27: **S**, BAT 2072.
Eurhynchium angustirete (Broth.) T.J.Kop. – 8, 9: **S**, BAT 2266, BAT 2267.
E. striatum (Hedw.) Schimp. – 5, 35: **S**, BAT 2159, BAT 2162, BAT 2199.
Homalothecium aureum* (Spruce) H. Rob. – 28: **S, BAT 2054.
H. lutescens (Hedw.) H.Rob. – 28: **S**, BAT 2059.
H. sericeum (Hedw.) Schimp. – 21, 23, 36: **S**, BAT 2271, BAT 2272, BAT 2273.
Oxyrrhynchium hians (Hedw.) Loeske – 24: **S**, BAT 2221.
O. speciosum (Brid.) Warnst. – 13: **S**, BAT 2176.
Palamocladium euchloron (Müll.Hal.) Wijk & Margad. – 5, 15, 23, 24, 31: **S**, BAT 2118, BAT 2126, BAT 2136, BAT 2182, BAT 2188, BAT 2234.
Platyhypnidium riparioides (Hedw.) Dixon – 8, 15, 26, 27, 32: **WS**, BAT 2061, BAT 2078, BAT 2128, BAT 2216, BAT 2235.
Pseudoscleropodium purum (Hedw.) M.Fleisch. – 16: S, BAT 2304.
Rhynchostegiella tenella (Dicks.) Limpr. – 36: **S**, BAT 2290.
Scuiro-hypnum plumosum (Hedw.) Ignatov & Huttunen – 24: **S**, BAT 2032.

HYPNACEAE SCHIMP.
Calliergonella cuspidata (Hedw.) Loeske. – 14, 20: **WS**, BAT 2258, BAT 2259.
Hypnum cupressiforme var. *cupressiforme* Hedw. – 31: **S**, BAT 2102.
H. cupressiforme var. *lacunosum* Brid. – 25: **S**, BAT 2005.
H. cupressiforme var. *resupinatum* (Taylor) Schimp. – 24: **S**, BAT 2027.
H. jutlandicum Holmen & Warncke – 26: **S**, BAT 2044.

HYLOCOMIACEAE (BROTH.) M.FLEISCH.
Ctenidium molluscum (Hedw.) Mitt. – 2, 3, 4: **S**, BAT 2309, BAT 2310, BAT 2311.
Hylocomium splendens (Hedw.) Schimp. – 6, 7, 8: **S**, BAT 2305, BAT 2306, BAT 2307.
Pleurozium schreberi (Willd. ex Brid.) Mitt. – 5: **S**, BAT 2308.
Rhytidiadelphus triquetrus (Hedw.) Warnst. – 18: **S**, BAT 2291.

PLAGIOTHECIACEAE (BROTH.) M.FLEISCH.
Herzogiella seligeri (Brid.) Z.Iwats. – 8, 9: **S**, BAT 2312, BAT 2313.
Plagiothecium cavifolium (Brid.) Z.Iwats. – 26, 27, 28, 34: **S**, BAT 2047, BAT 2062, BAT 2092, BAT 2226.

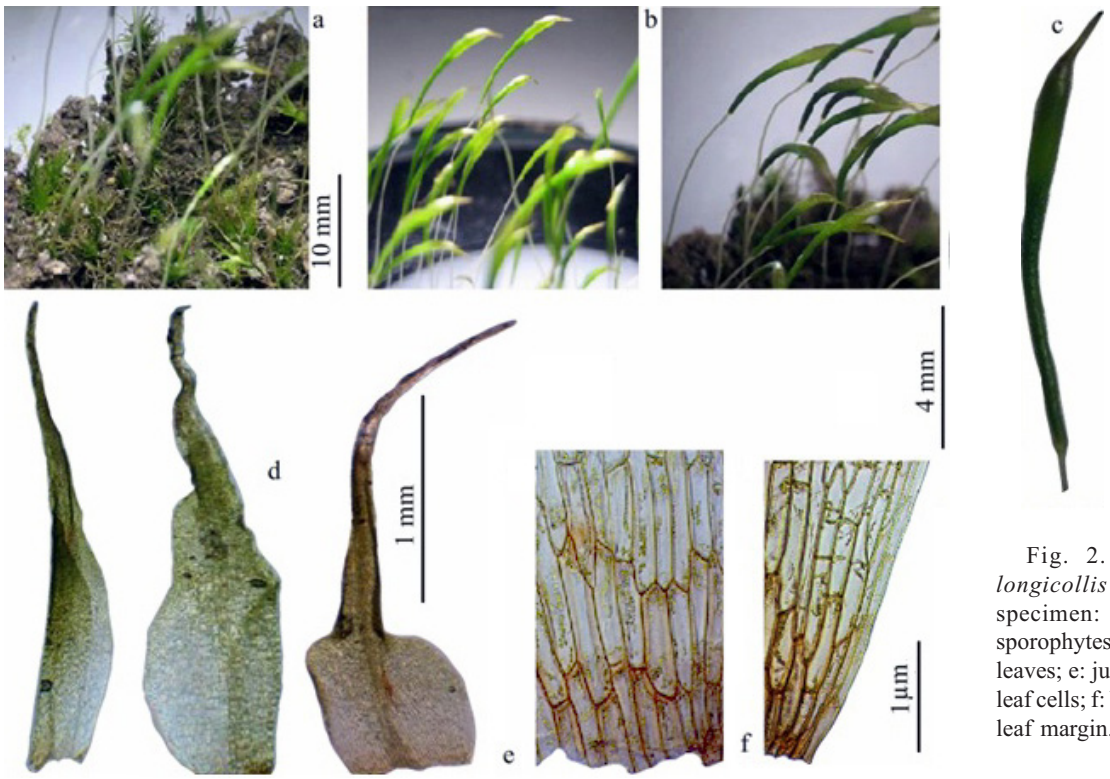

Fig. 2. *Trematodon longicollis* from Turkey specimen: a: habitus; b: sporophytes; c: capsule; d: leaves; e: juxtaxostal basal leaf cells; f: basal cells near leaf margin.

P. laetum Schimp. – 27, 28: **S**, BAT 2050, BAT 2090.
P. latebricola Schimp. – 5, 15, 25: **S**, BAT 2009, BAT 2015, BAT 2151, BAT 2218.
P. nemorale (Mitt.) A. Jaeger. – 26: **S**, BAT 2140.
P. platyphyllum Mönk. – 6: **S**, BAT 2314.
P. succulentum (Wilson) Lindb. – 25, 28, 31, 32: **S**, BAT 2001, BAT 2008, BAT 2087, BAT 212.

LEUCODONTACEAE SCHIMP.

Antitrichia curtipendula (Hedw.) Brid. – 5, 18: **T**, BAT 2315, BAT 2316.
Leucodon sciuroides (Hedw.) Schwägr. – 16, 17, 18: **T**, BAT 2317, BAT 2318, BAT 2319.

NECKERACEAE SCHIMP.

Neckera complanata (Hedw.) Huebener – 25, 27, 28, 31: **R**, BAT 2007, BAT 2082, BAT 2051, BAT 2118.
N. crispa Hedw. – 34, 35: **T**, BAT 2173, BAT 2199, BAT 2234.
Thamnobryum alopecurum (Hedw.) Gangulee – 13, 15, 28, 31: **S**, BAT 2074, BAT 2089, BAT 2114, BAT 2115, BAT 2234.

LEMBOPHYLLACEAE BROTH.

Isothecium alopecuroides (Lam. ex Dubois) Isov. – 6, 13, 15: **S**, BAT 2134, BAT 2189, BAT 2245.

ANOMODONTACEAE KINDB.

Anomodon attenuatus (Hedw.) Huebener – 13, 25, 29, 30: **R**, BAT 2013, BAT 2041, BAT 2094, BAT 2082, BAT 2188, BAT 2189.
A. rugelii (Müll. Hal.) Keissl. – 27, 35: **R**, BAT 2099, BAT 2196.
A. viticulosus (Hedw.) Hook. & Taylor – 5, 26: **R**, BAT 2040, BAT 2165.

NEW NATIONAL RECORD

Trematodon longicollis Michaux Fig. 2

Plants in turf, stems 8-10 mm long. Leaves 1-2 mm long, gradually tapered to narrow awns from short, ovate-oblong bases. Costa percurent. Basal leaf cells rectangular. Seta 30-35 mm long, yellow- green. Capsule inclined, curved, neck 2-3 times longer than urn, urn cylindrical. Calyptra cucullate, 2-3 mm long.

T. longicollis differs from other species of the genus in very capsules, and its apophysis are longer and slender than in other species, and this is a very remarkable distinguishing character.

Specimen examined: TURKEY (Artvin), Hopa-Sarp district, in the vicinity of Kazımiye village (41°30'37"N – 41°34'08"E), 284 m a.s.l. (leg & det Batan), near stream bank, 20.IV.2011, BAT 2019, BAT 2023.

Ecology: The specimens were collected from soil and accompanying species were *Pogonatum aloides* and *P. urnigerum*. The dominant taxa in the main vegetation from collection locality are: *Rhododendron ponticum*, *R. luteum*, *Corylus avellana*, *Alnus glotinosa*, *Ilex colchica*, *Castanea sativa*, *Carpinus betulus*, *Rubus canescens*.

Distribution: The species is known from Central and South America, Asia (Russian Far East, China, Japan, Papua New Guinea, Philippines, Malaysia), Europe, Central Africa and Pacific Islands. Until now, the species was unknown from Turkey and Southwest Asia (Noguchi & Iwatsuki, 1987; Frahm, 1993; Zhi-Hua & Sinikka, 1994; Suleiman & Edwards, 2002; Uyar & Cetin, 2004; Kürschner & Erdağ, 2005; Frey *et al*., 2006; Banu-Fattah & Sarker, 2007; Lüth & Frahm, 2008; Kürschner &

Frey, 2011; Müller, 2012). It is the first report of the genus *Trematodon* and the family Bruchiaceae not only in Turkey, but in the whole Southwest Asia.

DISCUSSION

At the end of the study, 146 taxa (species, subspecies and varieties) belonging to 73 genera and 33 families were identified. Of these, the family Bruchiaceae Schimp. and its the species *Trematodon longicollis* Michaux belonging to the genera *Trematodon* Michaux new to Moss Flora of Turkey, similarly these taxa (*Bruchiaceae*, *Trematodon* and *T. longicollis*) are reported for the first time from Southwest Asia (Uyar & Çetin, 2004; Kürschner & Erdađ, 2005; Kürschner & Frey, 2011). Furthermore, according to the grid system of Henderson, nine taxa also are new for A4 square (Henderson, 1961; Özdemir, 2009).

Dominated families of the study area are *Brachytheciaceae* (20 taxa) (13,7% of all taxa), *Pottiaceae* (14 taxa) (9,6% of all taxa), *Grimmiaceae* (11 taxa) (7,5% of all taxa), *Amblystegiaceae* (10 taxa) (6,8% of all taxa), *Leucobryaceae* (9 taxa) (6,2% of all taxa), *Bartramiaceae* and *Plagiotheciaceae* (7 taxa) (4,8% of all taxa), *Polytrichaceae*, and *Plagiomniaceae* (6 taxa) (4,1% of all taxa), *Fissidentaceae*, *Bryaceae*, *Thuidiaceae* and *Hypnaceae* (5 taxa) (3,4% of all taxa) and other families (36 taxa) (24,6% of all taxa) (Tab. 2).

The genera with the highest number of taxa are *Plagiothecium* and *Brachythecium* with seven taxa; *Plagiomnium* and *Campylopus* with six taxa; *Fissidens* and *Racomitrium* with five taxa; *Bryum*, *Dicranum*, *Homalothecium*, *Hypnum*, *Philonotis*, *Schistidium*, *Thuidium* and *Weissia* with four taxa; *Anomodon*, *Mnium* and *Hygrohypnum* are represented with tree taxa. Nine taxa (*Trematodon longicollis*, *Campylopus inroflexus*, *Entosthodon obtusus*, *Fissidens osmundoides*, *F. pusillus*, *Weissia squarrosa*, *Mnium spinosum*, *Hygrohypnum duriusculum*, and *Homalothecium aureum* are new records for A4 square of Turkey depending on the square grid system adopted by Henderson (1961). Consequently, it has been reached to 397 taxa in the A4 square with nine new records.

ACKNOWLEDGEMENTS

We are grateful to Prof. Dr. Yu JİA for revisions and helpful comments on an earlier draft of this manuscript. This study was supported by Research Fund of Karadeniz Technical University (Project Code No: 2008.111.04.8).

LITERATURE CITED

ABAY, G., G. UYAR, T. KEÇELI & B. ÇETIN 2009. *Sphagnum centrale* and other remarkable bryophyte records from the Kaçkar Mountains (Northern Turkey). – *Cryptogamie, Bryol.* **3**: *399-407*.

AKMAN, Y 1999. *Climate and bioclimate.* – Kariyer Matbaacılık, Ankara. *346 pp*.

ANSIN, R 1981. Main Vegetation types inner and coastal part of east Black sea region. – *J. Foresty Fac. K.T.U.* **4**(1): *14-25*.

BANU-FATTAH, K & S.K. SARKER 2007. Bryophyte Flora of Greater Mymensingh District of Bangladesh – Class: Bryopsida. – *Bang. J. Plant Tax*. **14**: *47-66*.

FRAHM, J.P 1993. Taxonomic results the Bryotrop Expedition to Zaire and Rwanda. – *Tropical Bryol*. **8**: *153-169*.

FREY, W., J.P. FRAHM, E. FISCHER & W. LOBIN 2006. The liwerworts, Mosses and Ferns of Europe. English edition revised and edited by T.L. Blockeel. – *Harley Books, Colchester*, *512 pp.*

HENDERSON, D.M. 1961. Contribution to bryophyte flora of Turkey IV. – Notes Royal Bot. Gar. Edinb. **23**: *263-278*.

HILL, M.O., N. BELL, M.A. BRUGGEMAN-NANNENGA, M. BRUGUÉS, M.J. CANO, J. ENROTH, K.L. FLATBERG, J.-P. FRAHM, M.T. GALLEGO, R. GARILLETI, J. GUERRA, L. HEDENÄS, D.T. HOLYOAK, J. HYVÖNEN, M.S. IGNATOV, F. LARA, V. MAZIMPAKA, J. MUÑOZ & L. SÖDERSTRÖM 2006. An annotated checklist of the mosses of Europe and Macaronesia. – *J. Bryol.* **28**: *198-267*.

KEÇELI, T., G. ABAY, G. UYAR & B. ÇETIN 2008. New national and regional bryophyte records, 19: *Scapania paludosa* (Müll. Frib.) Müll. Frib. – *J. Bryol.* **30**: *234*.

KIRMACI, M., H. KÜRSCHNER & A. ERDAĞ 2012. New and noteworthy records to the bryophyte flora of Turkey and Southwest Asia. – *Crypt. Bryol.* **33**: *267-270*.

KÜRSCHNER, H & A. ERDAĞ 2005. Bryophytes of Turkey: an annotated reference list of the species with synonyms from the recent literature and an annotated list of turkish bryological literature. – *Turk. J. Bot.* **29**: *95-154*.

KÜRSCHNER, H 2006. A key to pleurocarpous mosses (Bryophytina p.p.) of the Near and Middle East. Towards a bryophyte flora of the Near and Middle East 5. – *Nova Hedwigia* **83**(3-4): *353-386*.

KÜRSCHNER, H 2008. A key to acrocarpous mosses (Bryophytina p.p.) of the Near and Middle East. towards a bryophyte flora of the Near and Middle East. 7. – *Nova Hedwigia* **86**(1-2): *43-103*.

KÜRSCHNER, H & W. FREY 2011. Liverworts, Mosses and Hornworts of Southwest Asia (Marchantiophyta, Bryophyta, Anthocerotophyta). – *Nova Hedwigia.* **139**: *1-240*.

LARA, F., V. MAZIMPAKA, R. MEDINA, R. CAPARRÓS & R. GARILETTI 2010. Norteastern Turkey, an unnoticed but very important area for the Orthotrichaceae (Bryophyta). – *Nova Hedwigia* **138**: *165-180*.

LÜTH, M & J.P. FRAHM 2008. New and interesting records of bryophytes from Crete. – *Herzogia* **21**: *247-250*.

MÜLLER, F. 2012. Additions to the moss flora Of Taveuni Island (Fiji, South Pacific). – *Polish Bot. J*. **57**: *197-203*.

NOGUCHI, A & Z. IWATSUKI 1987. *Illustrated moss flora of Japan*, Part 1. – *Hat. Bot. Lab., Nichinan, Japan*. *242 pp*.

ÖZDEMIR, T 2008. *Rhytidiadelphus loreus* (Hedw.) Warnst., new to moss flora of Turkey and South-West Asia. – *Cryptogamie Bryol.* **29**(2): *207-208*.

ÖZDEMIR, T., B. KOZ & N. BATAN 2008. *Didymodon asperifolius* (Pottiaceae, Bryopsida), new to the moss flora of Turkey and southwestern Asia. – *Cryptogamie Bryol.* **29**(3): *311-312*.

ÖZDEMIR, T & G. UYAR 2008. *Campylopus flexuosus* (Hedw.) Brid. (Dicranaceae, Bryopsida) a new record in Turkey. – *Crypt. Bryol.* **29**(4): *401-404*.

ÖZDEMIR, T 2009. A revised checklist of mosses of A4 Square of Turkey. – *Inter. J. Bot.* **5**(1): *1-35*.

SMITH, A.J.E 2004. The moss flora of Britain and Ireland. 2d ed. – *Cambridge Univ. Press*. *1012 pp*.

SULEIMAN, M. & S.R. EDWARDS 2002. Mosses of Mt. Trus Madi, Sabah, Malaysia. – *Tropical Bryol.* **21**: *57-64*.

UYAR, G & B. ÇETIN 2004. A new check-list of the mosses of Turkey. – *J. Bryol.* **26**: *203-220*.

UYAR, G., G. ABAY, B. ÇETIN & T. KEÇELI 2008. *Dicranum flexicaule* Brid. (Dicranaceae, Bryopsida), new to the moss flora of southwest Asia. – *Cryptogamie Bryol.* **29**(1): *103-106*.

WATSON, E.V 1981. *British Mosses and Liverworts*. – *Cambridge University Press*. *519 pp*.

ZHI-HUA, L & S. PIIPPO 1994. Preliminary list of bryophytes of Heishiding Nature Reserve, Guangdong Province, China. – *Tropical Bryol*. **9**: *35-41*.