

THE BRYOPHYTE FLORA OF ORDU PROVINCE (TURKEY)

БРИОФЛОРА ПРОВИНЦИИ ОРДУ, ТУРЦИЯ

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Abstract

To determine bryophyte diversity of Ordu region, investigation materials were collected from 310 different localities between 1 October 2013 and 1 October 2015 in the study area. The taxonomic survey of Ordu yielded one species of Anthocerotophyta, 51 taxa of 25 families of Marchantiophyta and 365 taxa of 43 families of Bryophyta. Among these taxa, *Thamnobryum coreanum* (Cardot) Nog. & Z. Iwats. appears to be new to bryophyte Flora of Turkey. All taxa are new records for the Ordu Province.

Резюме

Для выявления бриоразнообразия района Орду в Турции было проведено обследование 310 местонахождений в период с 1 октября 2013 г. по 1 октября 2015 г. При этом выявлены 1 вид Anthocerotophyta, 51 вид из 25 семейств Marchantiophyta и 365 видов из 43 семейств Bryophyta. Выявлен один новый для Турции вид, *Thamnobryum coreanum* (Cardot) Nog. & Z. Iwats. Остальные виды все являются новыми для района Орду.

KEYWORD: Ordu Province, Bryophyte, Flora, Turkey

INTRODUCTION

Turkey has three main floristic regions: Euro-Siberian, Mediterranean and Irano-Turanian. Diverse conditions in these regions provide a multitude of habitats which support a rich bryophyte flora. In this study bryophytes specimens were collected at Ordu province in the Black Sea Region of north-eastern Turkey (Fig. 1).

The province is situated within the Euxianian section of the Euro-Siberian floristic region which has an eastern Black Sea oceanic rainfall regime with no dry season. The mean annual maximum temperature in the region is 27,5 °C (in August), with mean minimum temperature equal to 3,9 °C (February). The mean precipitation per year is 1029,2 mm, the highest precipitations occur in October and December and the lowest in May and July (Akman, 1999).

Ordu has generally rough topography. There are also some plateaux at high altitudes, chiefly Çambaşı, Turnalık, Perşembe, Düzoba, Keyfalan, Topçam, Korgan, Sarıçiçek, Çukuralan and Cüre. At elevations of up to 1500 m, there are deciduous trees of *Alnus glutinosa* (L.) Gaertn., *Carpinus betulus* L., *Castanea sativa* Mill., *Fagus orientalis* Lipsky, *Quercus* sp. and shrubs such as *Rhododendron ponticum* L., *R. luteum* Sweet., *Laurus nobilis* L. and *Corylus* sp. prevail. *Corylus* sp. are important crop plants as well. At 1500-1900 m the forest consists of *Picea orientalis* (L.) Link. together with *Pinus sylvestris* (L.). Above 1900 m alpine meadows are dominant (Atalay, 1994).

In recent years, a surprising number of bryophyte taxa new to Turkey have been collected during detailed bryological field surveys in a diverse range of geographical locations (Batan & Özdemir, 2013a, b, c; Uyar & Ören, 2013; Batan *et al.*, 2013a, b; Can *et al.*, 2013; Ezer *et al.*, 2013; Kırmacı *et al.*, 2013; Kırmacı & Kürschner, 2013; Tonguç-Yayıntaş, 2013a, b; Kürschner, 2013; Tonguç-Yayıntaş, 2014; Abay & Keçeli, 2014; Batan & Özdemir, 2014a,b; Özdemir & Batan, 2014; Ezer *et al.*, 2014a,b; Kara *et al.*, 2014; Batan *et al.*, 2014a,b; Ursavaş & Çetin, 2014; Kırmacı *et al.*, 2014; Kırmacı & Erdağ, 2014; Ören *et al.*, 2015; Özdemir & Batan, 2016; Özenoğlu Kıremi & Keçeli, 2009).

The aim of the present study is to compile a list of bryophytes of Ordu province to make a contribution to the bryoflora of Turkey. This study can be used as a guide for future bryological studies in Turkey.

MATERIAL AND METHODS

The bryophyte specimens were collected by the authors during field work in Ordu Province (Turkey) from 1 October 2013 to 1 October 2015. Materials were collected from 310 localities (Table 1). Identifications were determined using keys (Savicz-Ljubitzkaja & Smirnova, 1970; Lawton, 1971; Agnew & Vondráček, 1975; Watson, 1981; Crum & Anderson, 1981; Ireland, 1982; Nyholm, 1986, 1989, 1993, 1998; Hedenäs, 1992; Paton, 1999; Smith, 1996, 2004; Frey *et al.*, 1995; Noguchi & Iwatsuki, 1987; Noguchi & Iwatsuki, 1988; Noguchi & Iwatsuki, 1989; Noguchi *et al.*, 1991; Noguchi *et al.*, 1994; Sharp *et al.*, 1994; Allen, 1994, 2002; Lin & He,

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Fig. 1. Map of the study area.

1999; Heyn & Herrnstadt, 2004; Pedrotti, 2001, 2006; Li *et al.*, 2007; Casas *et al.*, 2009; Zhang & He, 2011).

Latest status of the taxa for Turkey and Southwest Asia have been assessed using the related literatures (Uyar & Çetin, 2004; Kürschner & Erdağ, 2005; Kürschner & Frey, 2011; Hill *et al.*, 2006; Goffinet & Shaw, 2009; Ros *et al.*, 2013).

For each taxon, only one collector number was given to avoid repetition in the floristic list but the same plants collected from different localities were indicated. Selected vouchers have been deposited in the Herbarium of the Biology Department, Faculty of Science, Karadeniz Technical University, Turkey (KTUB).

RESULTS

As a result of the study, 1 hornwort taxa, 51 liverwort taxa (belonging to 25 families and 32 genera) and 365 moss taxa (belonging to 43 families and 128 genera) have been determined. In the list the species is followed by locality numbers (according to Table 1) and habitat.

ANTHOCEROTOPHYTA

Phaeoceros laevis (L.) Prosk. — 8, 14, 29, 71, 264, 276, 301 — On wet soil.

MARCHANTIOPHYTA

Apometzgeria pubescens (Schrank) Kuwah. — 5, 8, 28, 39 — On dry limestone blocks in the wooded area and on stones.
Barbilophozia barbata (Schmid. ex Schreb.) Loeske — 94, 225, 231 — On dry rock walls and on rock ledges.
Bazzania trilobata (L.) Gray — 291 — On the stones and tree trunks in forest.
Blepharostoma trichophyllum (L.) Dumort. — 4, 5, 28, 39 — On limestone cliffs and rock crevices.
Calypogeia fissa (L.) Raddi — 61, 186, 233 — On acidic soil, peat (*Sphagnum* sp.) and soft rock.
Cephalozia bicuspidata (L.) Dumort. — 4, 5 — On rotting tree stumps, moist soils and moist the rocks.
Cephaloziella divaricata (Sm.) Schiffn. — 4, 5 — On moist, sandy, gravelly soil and acidic the rocks.
Chiloscyphus pallescens (Ehrh. ex Hoffm.) Dumort. — 15, 39, 181, 186, 234 — On the rocks at the side of a stream, it was observed in humid and aquatic areas.
Conocephalum conicum (L.) Dumort. — 6, 8, 9, 10, 12, 13, 14, 19, 28, 30, 34, 36, 39, 49, 50, 54, 58, 61, 62, 71, 115,

118, 129, 130, 132, 134, 137, 146, 155, 155, 158, 181, 185, 186, 187, 191, 222, 226, 227, 231, 259, 260, 266, 271, 274 — In damp, shady areas, like waterfall, on rocks.

Diplophyllum albicans (L.) Dumort. — 4, 5, 12, 13, 14, 18, 20, 30, 36, 71, 113, 137, 158, 191 — On soil, stone and rock, in peat bogs, rarely in tree body.

D. taxifolium (Wahlenb.) Dumort. — 4, 5, 14, 18, 20, 113, 137, 158, 191 — On acidic soils and soils high in iron content in forest areas.

Frullania dilatata (L.) Dumort. — 2, 24, 27, 31, 32, 49, 194, 223, 270 — On wood (*Picea orientalis*) and the bushes, on rocky areas close to the beach.

F. jackii Gottsche — 74 — On rock and tree body (*Fagus orientalis*).

F. tamarisci (L.) Dumort. — 4, 24, 31, 32, 27, 49, 65, 132, 155, 184, 189, 194, 255, 247, 270 — Low altitude, on tree and stone.

Fossombronia pusilla (L.) Nees — 4, 5 — On acidic soil and moist soil.

Gymnocolea inflata (Huds.) Dumort. — 4 — On swamps and on moist acidic soils.

Jubula hutchinsiae ssp. *javanica* (Steph.) Verd. — 4, 5, 135 — On rocks in forest areas and rivers edge.

Jungermannia atrovirens Dumort. — 71 — On moist soil and lime stone on wet fields.

J. gracillima Sm. — 118 — On moist soil and on soft rock.

J. hyalina Lyell. — 4, 183 — On rocks, in river side, damp and wet areas.

Leiocolea badensis (Gott. ex Rabenh.) Schiffn. — 128 — On wet rock, riverside.

L. turbinata (Raddi) H.Buch. — 4, 5, 10, 12 — On wet soil.

Lejeunea cavifolia (Ehrh.) Lindb. — 4, 5, 10, 30, 39 — On moist areas, on rock and tree body (*Fagus orientalis*).

Lophocolea bidentata (L.) Dumort. — 71, 129, 253 — In wooded area, on the other plants and rocks.

L. heterophylla (Schrader) Dumort. — 229 — On tree trunk (*Picea orientalis*) and rotting on the stump.

Lophozia ventricosa (Dicks.) Dumort. — 4, 5, 10, 30, 39, 32, 31 — On the ground on damp walls and on soil in wetlands.

Lunularia cruciata (L.) Dumort. ex Lindb. — 29, 50, 54, 57 — Wet, shaded and moist areas, on a stone wall.

Marchantia paleacea Bertol. — 29, 39 — On stones in wet areas.

M. polymorpha L. — 29, 39, 58, 132, 133, 154, 225, 232, 234 — Riverside, in edge of the stream on walls stone and siliceous rocks.

- Marsupella emarginata* (Ehrh.) Dumort. — 14 — On wet and damp acidic rocks.
- Metzgeria conjugata* Lindb. — 3, 9, 10, 13, 23, 32, 50, 62, 65, 66, 90, 118, 135, 137, 146, 147, 158, 181, 186, 226, 227, 266 — On tree body (*Fagus orientalis*), on calcareous and siliceous rocks.
- M. furcata* (L.) Dumort. — 3, 9, 13, 23, 23, 32, 62, 65, 74, 90, 113, 137, 158, 186, 194, 227 — On trees, shrubs, rocks and wall.
- Pedinophyllum interruptum* (Nees) Kaal. — 181, 186 — On calcareous rocks or on moist soil.
- Pellia endiviifolia* (Dicks.) Dumort. — 8, 9, 18, 34, 61, 127, 225, 233 — On wet soil.
- P. epiphylla* (L.) Corda. — 6, 8, 14, 36, 58, 61, 62, 71, 113, 115, 147, 188, 232, 243, 259, 260 — On wet soil.
- Plagiochila asplenioides* (L. emend. Taylor) Dumort. — 5, 9, 15, 18, 20, 23, 29, 49, 58, 90, 118, 120, 132, 135, 146, 158, 191, 229, 234, 237, 253, 261, 266, 274, 226, 227, 235, 463 — In forest areas on calcareous and acidic soils.
- P. porelloides* (Torrey ex Nees) Lindenb. — 4, 12, 18, 23, 24, 25, 58, 64, 65, 90, 93, 118, 119, 120, 132, 133, 136, 138, 139, 146, 152, 153, 194, 214, 215, 222, 223, 226, 227, 230, 231, 235, 236, 239, 257, 261, 264, 266, 237, 274 — In wooded areas, on stones and soils in creek edge.
- Porella cordaeana* (Huebener) Moore — 226, 264 — On tree body, on rock, in creek edge.
- P. pinnata* L. — 128 — In wooded areas, on rock, in creek edge.
- P. platyphylla* (L.) Pfeiff. — 27, 62, 94, 120, 147, 190, 264 — Cliffs and on the old walls.
- Radula complanata* (L.) Dumort. — 3, 14, 32, 25, 39, 49, 58, 71, 130, 146, 147, 181, 185, 243, 270 — High mountains, on trees and bushes and on rocks at creek edge.
- R. lindenbergiana* Gottsche ex C. Hartm. — 3, 12, 14, 25, 32, 39, 58, 71, 78, 146, 158, 181, 185, 189, 226, 243, 270 — High mountains, on trees and bushes and on rocks at creek edge.
- Reboulia hemisphaerica* (L.) Raddi — 4, 5, 10, 12, 29, 39 — On calcareous soils in the rocky areas.
- Scapania aequiloba* (Schwägr.) Dumort. — 181, 225 — On the basic rocks.
- S. aspera* Bernet et M. Bernet. — 50, 266 — On the limestone.
- S. nemorea* (L.) Grolle — 50, 266 — In the forest or on rocky slopes and on rotting logs.
- S. paludosa* (Müll. Frib.) Müll. Frib. — 233 — On alkaline soil on high altitude mountains.
- S. subalpina* (Nees) Dumort. — 231, 233 — Rivers and lakes edge in the damp rock crevices, on sandy soil.
- S. undulata* (L.) Dumort. — 233 — Rivers and lakes edge in the damp rock crevices, on rocks.
- Southbya tophacea* (Spruce) Spruce — 4, 186 — On moist soil.
- Targionia hypophylla* L. — 58 — On calcareous rock, gravelly soils and rocks on the cracks.
- BRYOPHYTA**
- Abietinella abietina* var. *abietina* (Hedw.) M. Fleisch. — Cosmopolitan — On soil and rock.
- A. abietina* var. *hystricosa* (Mitt.) Sakurai — 8, 12, 20, 24, 40, 44, 83, 88, 131, 135, 138, 158, 177, 226, 231, 247, 303 — On the soil and rock.
- Alleniella besseri* (Lobarz.) S. Olsson, Enroth & D. Quandt. — 152, 215 — On tree body (*Castanea sativa*).
- A. complanata* (Hedw.) S. Olsson, Enroth & D. Quandt. — 7, 9, 18, 25, 29, 39, 42, 43, 49, 50, 53, 54, 55, 67, 68, 69, 70, 72, 73, 75, 111, 120, 130, 139, 140, 141, 142, 143, 144, 145, 146, 158, 185, 186, 187, 189, 190, 191, 207, 215, 228, 229, 231, 234, 249, 272, 295, 301, 305, 307 — On tree body (*Fagus orientalis*) and soil.
- Amphidium mougeotii* (Bruch & Schimp.) Schimp. — 31, 32 — Among cracks on wet rock in the water.
- Amblystegium serpens* (Hedw.) Schimp. — 34, 39, 42, 43, 49, 50, 53, 67, 74, 76, 93, 112, 130, 137, 139, 140, 141, 142, 143, 146, 153, 155, 183, 190, 224, 227, 265, 270, 271, 277, 279, 282, 291, 292, 293, 294, 299, 301 — On tree body (*Fagus orientalis*), soil and rock.
- Anomodon attenuatus* (Hedw.) Huebener — Cosmopolitan — On tree body (*Fagus orientalis*), soil and rock.
- A. longifolius* (Schleich. ex Brid.) Hartm. — 132, 185 — In forest, on rock.
- A. rugelii* (Müll. Hal.) Keissl. — 26, 28, 36, 223, 227, 230, 254. — On tree body (*Fagus orientalis*).
- A. viticulosus* (Hedw.) Hook. & Taylor — Cosmopolitan — On rock, on soil and on tree body (*Fagus orientalis*, *Carpinus betulus*, *Alnus glutinos*).
- Antitrichia californica* Sull. — 174, 175, 176, 177 — On rock in open area.
- A. curtipendula* (Hedw.) Brid. — 169, 170 — On rock in open area.
- Atrichum angustatum* (Brid.) Bruch & Schimp. — 5, 17, 168 — On soil.
- A. crispulum* Besch. — 27, 37, 38 — On soil.
- A. undulatum* (Hedw.) P. Beauv. — Cosmopolitan — On soil.
- Aulacomnium androgynum* (Hedw.) Schwägr. — 62, 63 — On soil.
- Barbula convoluta* Hedw. — 49, 131, 247, 284, 303, 309 — On rock and wet soil.
- B. unguiculata* Hedw. — 20, 21, 22, 30, 62, 138, 146, 155, 184, 185, 186, 188, 229, 232, 235, 240, 241, 242 — On rock and wet soil.
- Bartramia halleriana* Hedw. — 215, 266, 274 — On wet rocks on the slopes.
- B. pomiformis* Hedw. — 8, 14, 22, 130, 297, 301 — On wet rock.
- Blandia acuta* (Hedw.) Bruch & Schimp. — 240, 241, 242 — In water, on rock.
- Brachythecium albicans* (Hedw.) Schimp. — 6, 8, 17, 20, 21, 22, 27, 32, 37, 38, 39, 42, 43, 62, 115, 117, 132, 154, 156, 188, 194, 195, 196, 197, 199, 200, 201, 202, 203, 205, 206, 224, 227, 232, 247, 254, 262, 269, 270, 297, 300 — In water, on rock.
- B. capillaceum* (F. Weber & D. Mohr) Giacom. — 181, 213 — On soil and rock.
- B. erythrorhizon* Schimp. — 236, 247, 248 — On rock.
- B. glareosum* (Bruch ex Spruce) Schimp. — 35, 94, 132, 133, 227, 232, 235, 236, 238, 240, 242, 243, 247, 254, 259, 271, 294, 300 — On stones, on grounded rock and soil.
- B. laetum* (Brid.) Schimp. — 167, 171, 172 — In open area, on grounded rock.
- B. mildeanum* (Schimp.) Schimp. ex Milde — 5, 32, 62, 71, 138, 147, 149, 151, 207, 208, 227, 263, 264 — On rock and soil.
- B. piligerum* Cardot — 236, 266 — On tree body (*Carpinus betulus*, *Alnus glutinos*), on grounded rock.
- B. rivulare* Schimp. — Cosmopolitan — On tree body (*Fagus orientalis*, *Carpinus betulus*, *Junglas* sp., *Alnus glutinos*), on stone, on soil.

- B. rutabulum* (Hedw.) Schimp. — Cosmopolitan — Near water, on stone, soil and tree body (*Fagus orientalis*, *Carpinus betulis*, *Alnus glutinosa*).
- B. salebrosum* (Hoffm. ex F. Weber & D. Mohr) Schimp. — 24, 52, 113, 124, 125, 134, 138, 153, 171, 172, 173, 174, 176, 177, 183, 228, 238, 243, 247, 265, 283, 301 — On stone, soil and rock.
- B. starkei* (Brid.) Schimp. — 18, 112 — On old tree body.
- B. trachypodium* (Brid.) Schimp. — 134, 214, 216 — On tree body.
- B. turgidum* (Hartm.) Kindb. — 26, 28, 36, 76, 214, 299, 301 — On rock.
- B. velutinum* (Hedw.) Schimp. — 146, 223, 237, 244 — On rock.
- Bryoerythrophyllum recurvirostrum* (Hedw.) P. C. Chen. — 3, 13 — On calcareous rocks.
- Bryum apiculatum* Schwägr. — 49 — On soil.
- B. caespitium* Hedw. — 244 — On soil.
- B. dichotomum* Hedw. — 139, 140, 142, 143, 144, 228 — On soil.
- B. elegans* Nees — 52 — On soil, in open area.
- B. gemmiparum* De Not. — 29, 30, 167, 171, 172 — On wetland soils.
- B. intermedium* (Brid.) Blandow — 118, 267 — On soil.
- B. mamillatum* Lindb. — 14 — On soil.
- B. radiculosum* Brid. — 57, 229, 301 — On grounded rock.
- B. schleicheri* DC. — 8, 40, 41, 44, 45, 46, 47, 77, 80, 81, 84, 87, 88, 89, 90, 91, 92, 129, 134, 154, 156, 167, 168, 169, 225, 232, 234, 251, 252, 253, 299, 301, 304, 308 — On soil and grounded rock.
- B. subapiculatum* Hampe — 118 — On soil.
- Calliergonella cuspidata* (Hedw.) Loeske — Cosmopolitan — In wetland, on soil.
- C. lindbergii* (Mitt.) Hedenäs — 32 — In wetland, on soil.
- Campyliadelphus chrysophyllus* (Brid.) Kanda — 94, 299, 301 — Near stream, on soil.
- C. elodes* (Lindb.) Kanda — 42, 43 — On wet and moist soil, on wet grounded rock.
- Campylium protensum* (Brid.) Kindb. — 265 — On wet rock2.
- Campylophyllum calcareum* (Crundw. & Nyholm) Hedenäs — 15, 16 — On calcareous rocks.
- Campylopus atrovirens* De Not. — 14, 64, 277, 282, 291 — On wet rock.
- C. brevipilus* Bruch & Schimp. — 169, 170 — Wetlands, on grounded rocks.
- C. flexuosus* (Hedw.) Brid. — 170 — Wetlands, on grounded rocks.
- C. fragilis* (Brid.) Bruch & Schimp. — 9, 10, 20, 21, 22, 32, 215, 217, 220 — Wetlands, on grounded rocks.
- C. pyriformis* (Schultz) Brid. — 4, 6, 9, 20, 21, 32, 146, 191 — In wetlands, between rocks.
- C. subulatus* Schimp. ex Milde — 171, 173 — In wetlands, on grounded rocks.
- Ceratodon purpureus* (Hedw.) Brid. — 23 — In wetlands, on grounded rocks.
- Cinclidotus riparius* (Host ex Brid.) Arn. — 213 — On stones in the creek.
- Cirriphyllum crassinervium* (Taylor) Loeske & M. Fleisch. — 30, 110, 226, 267, 277, 278, 279, 280, 281, 282, 286, 288, 291, 292 — On tree roots and the body (*Carpinus betulus*).
- C. piliferum* (Hedw.) Grout. — 30, 42, 43 — On tree roots and the body (*Fagus orientalis*).
- Climacium dendroides* (Hedw.) F. Weber & D. Mohr — 8, 15, 16, 32, 35, 94, 128, 129, 134, 154, 225, 250 — Near the stream, on rock and soil.
- Cratoneuron filicinum* var. *atrovirens* (Brid.) Ochyra — 232, 246, 260, 261, 263 — In water, on wet rocks.
- C. filicinum* var. *filicinum* (Hedw.) Spruce — 30, 51, 52, 66, 75, 76, 93, 115, 130, 138, 155, 187, 190, 213, 226, 227, 232, 246, 260, 261, 263, 264, 270, 273 — On wet rocks.
- Ctenidium molluscum* (Hedw.) Mitt. — Cosmopolitan — On rock and soil.
- Cryphaea heteromalla* (Hedw.) D. Mohr — 54, 55, 68, 72, 73 — On tree body (*Fagus orientalis*).
- Cynodontium jenneri* (Schimp.) Stirton — 23 — On acidic rocks.
- C. polycarpon* (Hedw.) Schimp. — 33 — On acidic rocks.
- Dendrocryphaea lamyana* (Mont.) P. Rao. — 65, 67 — Near creek, on rock.
- Dialytrichia mucronata* (Brid.) Broth. — 185, 187, 194, 195, 197, 200, 202, 203, 204, 205 — On soil and rock.
- Dichodontium palustre* (Dicks.) M. Stech. — 233 — In wetland, on soil.
- D. pellucidum* (Hedw.) Schimp. — 13, 17, 26, 28, 36, 49, 50, 53, 62, 64, 118, 135, 146, 147, 149, 151, 155, 181, 191, 213, 226, 227, 229, 240, 241, 242, 259, 266, 288, 293, 298, 304 — Wetland, on soil.
- Dicranella heteromalla* (Hedw.) Schimp. — 135, 181, 225, 228, 237 — On soil.
- D. howei* Renauld & Cardot — 171, 173 — On rock.
- D. schreberiana* (Hedw.) Hilf. ex H.A. Crum & L.E. Anderson — 146 — On grounded rock.
- D. subulata* (Hedw.) Schimp. — 71, 132 — On grounded rock.
- D. varia* (Hedw.) Schimp. — 171, 173 — On moist soil.
- Dicranodontium denudatum* (Brid.) E. Britton — 14, 27, 37, 38, 64 — On tree body (*Fagus orientalis*).
- D. uncinatum* (Harv.) A. Jaeger — 23, 27, 37, 38 — On tree body (*Fagus orientalis*).
- Dicranum bonjeanii* De Not. — 129 — In forest, on soil.
- D. fuscescens* Sm. — 5, 23, 63, 128, 129, 134, 225, 275, 276 — In forest, on soil.
- D. majus* Turner — 5, 10, 14, 15, 16, 20, 21, 22, 23, 31, 32, 64, 129, 269, 270 — In forest, on soil.
- D. scoparium* Hedw. — Cosmopolitan — In forest, on soil.
- Didymodon acutus* (Brid.) K. Saito — 93, 112, 133, 135, 185, 187, 194, 195, 197, 200, 202, 203, 206, 230 — On rock.
- D. cordatus* Jur. — 260, 273 — On soil.
- D. ferrugineus* (Schimp. ex Besch.) M.O. Hill — 29, 52, 118 — On calcareous rocks.
- D. icmadophilus* (Schimp. ex Müll. Hal.) K. Saito — 235 — On calcareous rocks.
- D. insulanus* (De Not.) M.O. Hill — 132, 232 — On calcareous rocks.
- D. luridus* Hornsch. — 30, 207, 208 — On calcareous rocks.
- D. nicholsonii* Culm. — 30, 34 — On calcareous rocks.
- D. rigidulus* Hedw. — 4, 5, 14, 19, 27, 32, 34, 37, 38, 39, 42, 43, 49, 54, 63, 66, 68, 69, 70, 72, 73, 110, 115, 132, 147, 149, 151, 187, 188, 213, 214, 216, 229, 230, 232, 247, 270, 276, 283, 286, 291, 295, 299, 302, 306 — On calcareous rocks, on soil.
- D. fallax* (Hedw.) R.H. Zander — 8, 30, 34, 41, 54, 55, 67, 68, 72, 73, 146, 154, 156, 186, 240, 241, 242, 292, 298, 302, 306 — On calcareous rocks and soil.
- D. spadiceus* (Mitt.) Limpr. — 213 — On soil.

- D. tomaculosus* (Blockeel) M. F. V. Corley — 30 — On soil.
D. tophaceus (Brid.) Lisa — 12, 30, 32, 274 — On soil.
D. vinealis (Brid.) R.H. Zander — 29, 66, 225, 232 — On soil.
Ditrichum flexicaule (Schwägr.) Hampe — 232, 233, 240, 241, 242 — On calcareous rocks.
Drepanocladus aduncus (Hedw.) Warnst. — 24, 94, 136 — In water, on rock and stones.
Encalypta streptocarpa Hedw. — 30, 118, 213, 218, 226, 294, 300, 304, 308 — On rock and soil.
E. vulgaris Hedw. — 76, 213, 218, 293 — On rock and soil.
Entodon concinnus (De Not.) Paris — 213, 227 — On calcareous soil and rock.
E. schleicheri (Schimp.) Demet. — 35, 213, 237, 257, 258, 268 — On calcareous soil and rock.
Epipterygium tozeri (Grev.) Lindb. — 76, 207, 208 — On soil.
Euxcladium verticillatum (With.) Bruch & Schimp. — 30, 115, 117 — On calcareous rocks, on wet soil.
Eurhynchium angustirete (Broth.) T.J. Kop. — 171, 173 — In forest, on soil.
E. pulchellum var. *diversifolium* (Schimp.) Ochyra & Zarnowiec — Cosmopolitan — On calcareous soil and rock.
E. pulchellum var. *pulchellum* (Hedw.) Ignatov & Huttunen — 3, 23, 39, 137, 237, 297, 300, 302, 305, 311 — Under forest, on soil.
E. striatum (Schreb. ex Hedw.) Schimp. — Cosmopolitan — On stone, on soil and grounded rock.
Exsertotheca crispa (Hedw.) S. Olsson, Enroth & D. Quandt. — 146, 147, 149, 151, 184, 186, 231, 271 — On tree body (*Fagus orientalis*), on rock.
Fissidens adianthoides Hedw. — Cosmopolitan — On wet and moist rock.
F. dubius P. Beauv. — 49, 62, 158 — On moist soil.
F. gracilifolius Brugg.-Nann. & Nyholm — 171, 173 — On soil.
F. monguillonii Ther. — 113, 124 — On soil.
F. taxifolius Hedw. — Cosmopolitan — In forest, on moist soil.
F. viridulus (Sw. ex anon.) Wahlenb. — 153 — On soil.
Fontinalis antipyretica Hedw. — 31, 32, 94, 225 — Near stream, in water, on grounded rock.
Funaria hygrometrica Hedw. — 119, 121, 123, 126 — On soil.
Grimmia crinita Brid. — 223 — On rock.
G. decipiens (Schultz) Lindb. — 49, 65 — On rock.
G. dissimulata E. Maier — 138 — On rock.
G. donniana Sm. ex Spruce — 10 — On rock.
G. elongata Kaulf. — 134, 254 — On rock.
G. hartmannii Schimp. — 111, 115, 120, 134, 227, 231, 259, 269 — On rock.
G. laevigata (Brid.) Brid. — 50, 52, 53, 128, 228, 230, 244 — On rock.
G. lisae De Not. — 51, 52, 63, 129, 133, 137, 139, 141, 143, 144, 145, 147, 149, 151, 223, 225, 237, 262, 266, 296, 304, 307 — On rock.
G. montana Bruch & Schimp. — 128, 138 — On rock.
G. ovalis (Hedw.) Lindb. — 51, 94, 129, 136, 139, 140, 141, 142, 143, 144, 214, 216, 225, 233, 240, 241, 242, 244, 257, 258, 260, 262, 268, 273, 284, 287, 297, 300, 302, 304, 307, 311 — On rock.
G. pulvinata (Hedw.) Sm. — 51, 129, 132, 225, 243, 244, 246, 262, 265, 269, 274, 279, 283, 294, 300 — On rock.
G. tergestina Tømm. ex Bruch & Schimp. — Cosmopolitan — On rock.
Habrodon perpusillus (De Not.) Lindb. — 31, 32 — On tree body (*Fagus orientalis*).
Hedwigia ciliata var. *ciliata* (Hedw.) P. Beauv. — Cosmopolitan — On rock.
H. ciliata var. *leucophaea* Bruch & Schimp. — 226 — On rock.
H. stellata Hedenäs — 10, 34, 152 — On rock.
Herzogiella seligeri (Brid.) Z. Iwats. — 111, 114, 116, 227 — On old tree body.
H. striatella (Brid.) Z. Iwats. — 171, 173 — On tree body (*Fagus orientalis*).
Heterocladium dimorphum (Brid.) Schimp. — 113, 120, 122, 124, 125, 133, 223, 290 — On acidic rocks.
H. heteropterum (Brid.) Schimp. — 50, 53, 226, 236 — On acidic rocks.
Homalothecium aureum (Spruce) H. Rob. — 76, 231, 235 — On rock.
H. lutescens (Hedw.) H. Rob. — Cosmopolitan — On soil, rock and tree body.
H. philippeanum (Spruce) Schimp. — 115 — On tree body (*Carpinus betulus*).
H. sericeum (Hedw.) Schimp. — Cosmopolitan — On soil, rock and tree body (*Fagus orientalis*, *Carpinus betulus*, *Alnus glutinosa*, *Quercus* sp.).
Homomallium incurvatum (Schrader ex Brid.) Loeske — 94 — On grounded rock.
Hookeria lucens (Hedw.) Sm. — 14, 16 — On rock.
Homalia trichomonoides (Hedw.) Bruch et al. — 226 — On soil.
Hygroamblystegium fluviatile (Hedw.) Loeske — 52, 65, 134, 234, 254 — Near the stream, on moist soil.
H. tenax (Hedw.) Jenn. — 15, 16, 34, 51, 64, 71, 113, 122, 123, 124, 146, 254, 255, 256, 259, 272, 274, 282 — Near stream, on moist soil, stone and rock.
H. varium var. *humile* (P. Beauv.) Vanderp. & Hedenäs — 50, 53, 293, 299, 301 — Near stream, on moist soil, stone and rock.
H. varium var. *varium* (Hedw.) Mönk. — 57, 118, 129, 158, 181, 183, 191 — Near stream, on moist soil, stone and rock.
Hymenoloma crispulum (Hedw.) Ochyra — 33, 207 — On rock.
Hygrohypnum eugyrium (Schimp.) Broth. — 15, 16, 31, 32, 64, 118, 181, 215, 217, 220, 249, 250 — Near stream, on moist soil, stone and rock.
H. luridum (Hedw.) Jenn. — 7, 8, 19, 23, 30, 32, 35, 62, 64, 66, 75, 115, 117, 118, 130, 146, 147, 149, 151, 154, 156, 190, 226 — Near the stream, on moist soil, stone and rock.
Hylocomium splendens (Hedw.) Schimp. — 5, 15, 16, 222, 225, 249, 250, 270 — On moist soil, stone and rock.
Hylocomium armoricum (Brid.) Wijk & Margad. — 23, 49, 71, 261, 266 — Near the stream, on moist soil, stone and rock.
Hymenostylium recurvirostrum (Hedw.) Dixon — 7 — On grounded rock.
Hypnum andoi A.J.E. Sm. — 12, 17, 24, 34, 49, 51, 52, 62, 63, 64, 65, 113, 122, 124, 132, 133, 146, 147, 149, 151, 153, 158, 183, 213, 222, 223, 225, 226, 228, 231, 235, 238, 240, 255, 256, 265, 266, 272, 297, 300, 303, 304 — On soil, rock and tree body (*Quercus* sp., *Acer* sp., *Platanus* sp.).
H. bambergeri Schimp. — 5 — On tree body (*Quercus* sp., *Acer* sp.).
H. calcicolum Ando — 26, 28, 36 — On rock and tree body.
H. cupressiforme var. *cupressiforme* Hedw. — Cosmopolitan — On soil, rock and tree body üzerinde (*Quercus* sp., *Acer* sp., *Platanus* sp.).
H. cupressiforme var. *lacunosum* Brid. — 10, 12, 24, 31, 61, 71, 132, 158, 214, 238, 240 — On soil, rock and tree body.

- H. cupressiforme* var. *resupinatum* (Taylor) Schimp. — 25, 27, 35, 37, 38, 61, 139, 140, 142, 143, 144, 146 — On tree body, stone, rock and soil.
- H. imponens* Hedw. — 132, 133, 189, 223, 235, 251, 252, 253, 262, 265, 270, 274, 289, 303, 304, 306, 307, 308, 310, 311 — On stone and rock.
- H. jutlandicum* Holmen & E. Warncke — Cosmopolitan — On stone.
- H. pallescens* var. *protuberans* (Brid.) Austin — 5 — On tree body (*Quercus* sp., *Acer* sp., *Platanus* sp.).
- H. revolutum* (Mitt.) Lindb. — 10, 24, 223, 269 — On tree body.
- H. vaucheri* Lesq. — 1, 2, 94, 134, 255, 256, 272 — On stone.
- Isopterygiopsis muelleriana* (Schimp.) Iwats. — 35 — On grounded rock.
- I. pulchella* (Hedw.) Z. Iwats. — 23 — On grounded rock.
- Isothecium alopecuroides* (Lam. ex Dubois) Isov. — Cosmopolitan — On tree roots and body (*Fagus orientalis*).
- I. holtii* Kindb. — 274 — On tree body.
- I. myosuroides* Brid. — 71, 113, 122, 124, 125, 265, 270, 274 — On tree roots and body (*Fagus orientalis*).
- Imbribrum alpinum* (Huds. ex With.) N. Pedersen — 49, 52, 58 — On soil.
- I. mildeanum* (Jur.) J.R. Spence — 30, 57, 94, 194, 196, 198, 199, 201, 202, 203, 204, 205, 206 — On soil.
- Kindbergia praelonga* (Hedw.) Ochyra — 5, 7, 15, 22, 68, 142, 216, 282, 306 — On soil.
- Leptodictyum riparium* (Hedw.) Wanrst. — 13, 71, 265, 271 — Near stream, on wet soil.
- Leptodon smithii* (Hedw.) F. Weber & D. Mohr. — 231 — Under forest (*Fagus orientalis*), on tree roots.
- Lescuraea saxicola* (Schimp.) Milde — 15, 16 — On rock.
- Leskea polycarpa* Ehrh. ex Hedw. — 238 — On rock.
- Leucobryum glaucum* (Hedw.) Angstr. — 4, 10, 11, 26, 27, 28, 31, 36, 37, 38, 63, 64, 71, 113, 122, 124, 125, 146, 147, 149, 151, 181 — Under forest canopy (*Fagus orientalis*, *Castanea sativa*), on soil.
- L. juniperoideum* (Brid.) Müll. Hal. — 32 — Under forest canopy (*Fagus orientalis*, *Castanea sativa*), on soil.
- Leucodon sciuroides* (Hedw.) Schwägr. — Cosmopolitan — On tree body (*Fagus orientalis*, *Alnus glutinosa*, *Castanea sativa*, *Quercus* sp., *Junglas* sp.).
- Mnium hornum* Hedw. — 35, 118, 135, 139, 140, 141, 142, 143, 145, 225, 226, 227 — On soil.
- M. lycopodioides* Schwägr. — 10, 215, 217, 220, 226 — On soil.
- M. marginatum* (Dicks. ex With.) P. Beauv. — 15, 16, 188, 225, 226, 231, 249, 250, 297, 300 — On soil.
- M. spinosum* (Voit) Schwägr. — 49 — On soil.
- M. spinulosum* Bruch & Schimp. — 227 — On soil.
- M. stellare* Hedw. — 30, 58, 94, 215, 217, 220, 225, 226, 228, 237, 254, 257, 258, 261, 268, 269, 270, 274, 286, 287, 288, 294, 297, 300, 306, 308, 311 — On soil.
- M. thomsonii* Schimp. — 227, 266 — On soil.
- Neckera pennata* Hedw. — 226, 231 — On tree body (*Fagus orientalis*), on rock.
- Nyholmia obtusifolia* (Brid.) Holmen & Warncke — 127 — On rock.
- Oncophorus virens* (Hedw.) Brid. — 238, 259 — On soil.
- Orthotrichum affine* Schrad. ex Brid. — 94, 152 — On calcareous rocks, on tree body (*Pinus* sp.).
- O. alpestre* Hornsch. ex B. S. G. — 13 — On calcareous rocks.
- O. anomalum* Hedw. — 59, 60, 129, 130, 133, 139, 140, 141, 143, 144, 145, 152, 223, 225, 239 — On calcareous rocks.
- O. consimile* Mitt. — 138 — On calcareous rocks.
- O. cupulatum* Hoffm. ex Brid. — 54, 55, 68, 70, 72, 73 — On calcareous rocks.
- O. diaphanum* Brid. — 174, 176 — On tree body (*Quercus* sp.).
- O. lyellii* Hook. & Taylor — 258, 260, 273 — On tree body (*Abies* sp.).
- O. pallens* Bruch ex Brid. — 80, 94, 110, 118, 129, 239, 251, 252, 253, 258, 260, 270, 273, 302, 304, 305, 309 — On tree body (*Platanus* sp.) and on rock.
- O. pulchellum* Brunton in J. E. Smith — 127, 138, 222, 235, 237, 247, 254 — On calcareous rocks.
- O. pumilum* Sw. ex anon. — 139, 140, 141, 142, 143, 144, 145 — On calcareous rocks.
- O. rogeri* Brid. — 54, 68, 73 — On calcareous rocks.
- O. rupestre* Schleich. ex Schwägr. — 17, 94, 113, 122, 125, 129, 134, 228, 236 — On calcareous rocks and on tree body.
- O. speciosum* Nees — 35, 134, 146, 228 — On tree body (*Quercus* sp.) and on rock.
- Oxyrrhynchium hians* (Hedw.) Loeske — 24, 26, 28, 32, 35, 36, 155 — In forest, on soil.
- O. pumilum* (Wilson) Loeske — 166, 167, 168, 176, 177 — On stone and soil.
- O. schleicheri* (R. Hedw.) Röhl. — 7, 26, 28, 29, 32, 35, 36 — Near stream, on soil.
- Oxystegus tenuirostris* (Hook. & Taylor) A.J.E. Sm. — 118, 120, 207, 208 — Near road, under forest, on tree body (*Quercus* sp.).
- Palamocladium euchloron* (Bruch ex Müll. Hal.) Wijk & Margad. — 30 — On tree body (*Fagus orientalis*).
- Palustriella commutata* (Hedw.) Ochyra — 34 — Near stream, on wet soil.
- P. falcata* (Brid.) Hedenäs — 129, 188 — Near stream, on wet soil.
- P. caespitosa* Jur. — 129, 181 — Near stream, on wet soil.
- P. calcarea* (Bruch & Schimp.) Schimp. — 15, 16, 233, 249, 250 — Near stream, on wet soil.
- Philonotis capillaris* Lindb. — 207, 208, 229 — Near stream, on wet soil.
- P. fontana* (Hedw.) Brid. — 79, 80, 112, 128, 129, 132, 133, 134, 215, 217, 220, 225, 229, 233, 245, 251, 252, 253, 259, 267, 302, 303, 304, 306, 307, 308, 310, 311 — Near stream, on wet soil.
- P. rigida* Brid. — 19, 184, 194, 196, 198, 199, 201, 202, 203, 204, 205, 276 — Near stream, on wet soil.
- P. tomentella* Molendo — 17, 229, 289 — Near stream, on wet soil.
- Physcomitrium pyriforme* (Hedw.) Hampe — 166, 167, 168, 174, 176, 177 — On soil.
- Plagiomnium affine* (Blandow ex Funck) T.J. Kop. — 1, 2, 5, 10, 14, 17, 33, 52, 65, 112, 134, 158, 215, 289, 293, 296, 299, 301, 307 — Near stream, on wet soil.
- P. cuspidatum* (Hedw.) T.J. Kop. — 26, 28, 35, 36, 52, 54, 55, 68, 69, 70, 72, 73, 75, 127, 128, 189, 190, 301 — On moist soil.
- P. elatum* (Bruch & Schimp.) T.J. Kop. — 5, 17, 26, 28, 36, 128, 147, 149, 151, 266, 286, 289, 299, 301, 302, 303, 305, 309, 311 — Under *Corylus* sp., on moist soil.
- P. ellipticum* (Brid.) T. J. Kop. — 26, 28, 36 — Near stream, on wet soil.
- P. medium* (Bruch & Schimp.) T.J. Kop. — 4, 15, 16, 65, 93,

- 134, 138, 186, 239, 243, 249, 250, 269, 270 — Near stream, on wet soil.
- P. rostratum* (Schrad.) T.J. Kop. — Cosmopolitan — On soil.
- P. undulatum* (Hedw.) T.J. Kop. — Cosmopolitan — On soil.
- Plagiothecium cavifolium* (Brid.) Z. Iwats. — 23, 26, 27, 28, 32, 36, 37, 38, 50, 53, 62, 65, 112, 113, 118, 122, 125, 135, 137, 146, 181, 183, 215, 217, 220, 224, 227, 228, 297, 300, 301, 307, 311 — On soil.
- P. curvifolium* Schlieph. ex Limpr. — 27, 37, 38, 66, 132, 135, 146, 266, 290 — On soil.
- P. denticulatum* (Hedw.) Schimp. — 15, 16, 226, 249, 250 — On soil.
- P. laetum* Schimp. — 293, 294, 300 — On soil.
- P. latebricola* Schimp. — 115 — On soil.
- P. nemorale* (Mitt.) A. Jaeger — 3, 9, 14, 15, 16, 20, 21, 23, 26, 28, 35, 36, 52, 58, 64, 65, 134, 146, 155, 158, 183, 184, 266, 287, 288, 290 — On soil.
- P. platyphyllum* Mönk. — 9, 17, 20, 21, 22, 26, 28, 31, 32, 34, 35, 36, 52, 63, 65, 67, 71, 118, 146, 226 — On soil and tree body.
- P. succulentum* (Wilson) Lindb. — 5, 26, 28, 31, 32, 35, 36, 50, 53, 58, 61, 63, 64, 65, 71, 137, 146, 155, 181, 215, 222, 227, 266 — On soil.
- P. undulatum* (Hedw.) Schimp. — 166, 168, 174, 176, 177 — On soil.
- Plasteurhynchium meridionale* (Schimp.) M. Fleisch. — 10, 59, 60, 174, 176, 194, 196, 199, 201, 202, 203, 204, 205 — On wet soil.
- P. striatulum* (Spruce) M. Fleisch. — 8, 18, 35, 39, 42, 43, 112, 154, 155, 156, 176, 181, 199, 205, 212, 254, 262, 269, 288, 298, 302 — Near the stream, on wet soil.
- Pseudoamblystegium subtile* (Hedw.) Vanderp. & Hedenäs — 30, 35, 62, 128, 139, 140, 141, 143, 144, 145, 181, 239 — On soil.
- Platygium repens* (Brid.) Schimp. — 1, 2, 14, 17, 24, 33, 49, 50, 53, 54, 64, 68, 69, 70, 71, 72, 73, 76, 115, 130, 158, 181, 183, 186, 190, 228, 255, 256, 272, 286, 289, 290, 297, 300, 305, 307, 309, 310, 311 — On tree body (*Fagus orientalis*).
- Plathypnidium ripariodes* Hedw. — 15, 16, 20, 21, 22, 29, 54, 55, 58, 64, 68, 69, 70, 72, 73, 76, 132, 135, 137, 213, 228, 249, 250, 260, 261, 263, 264, 266, 273, 297, 300, 302, 305, 308, 311 — On wet soil and rock.
- Pleurozium schreberi* (Willd. ex Brid.) Mitt. — Cosmopolitan — On soil.
- Pogonatum aloides* (Hedw.) P. Beauv. — 166, 167, 168, 172, 177, 180 — On soil.
- P. nanum* (Hedw.) Beauv. — 181 — On soil.
- P. urnigerum* (Hedw.) P. Beauv. — 9, 13, 14, 112, 286, 289 — On soil.
- Pohlia cruda* (Hedw.) Lindb. — 225 — On soil.
- P. elongata* Hedw. — 79, 96, 228, 251, 252, 253, 302, 303, 305, 306, 307, 311 — On soil.
- P. melanodon* (Brid.) A.J. Shaw. — 115 — On soil.
- P. nutans* (Hedw.) Lindb. — 225, 274 — On soil.
- P. wahlenbergii* (F. Weber & D. Mohr) A.L. Andrews — 13, 227, 288, 270 — On soil.
- Polytrichum commune* Hedw. — 4, 5, 6, 10, 13, 15, 16, 17, 18, 20, 21, 22, 23, 31, 32, 33, 62, 64, 67, 71, 112, 118, 133, 207, 208, 224, 229, 233, 249, 250, 259 — On soil.
- P. formosum* Hedw. — 10, 13, 24, 31, 32, 63, 64, 67, 129, 132, 134, 223, 225, 232, 233, 237, 262, 266, 290, 293, 294, 301 — On soil.
- P. juniperinum* Hedw. — 14 — On soil.
- P. longisetum* Sw. ex Brid. — 9, 289 — On soil.
- P. piliferum* Hedw. — 94, 129, 133, 225, 238, 240 — On soil.
- P. strictum* Menzies ex Brid. — 166, 167, 168, 177, 180 — On soil.
- Pottiopsis caespitosa* (Bruch ex Brid.) Blockeel & A.J.E. Sm. — 32 — On wet rock.
- Pseudocrossidium hornschurchianum* (Schultz) R.H. Zander — 112, 239, 277, 279, 282, 291, 292 — On soil.
- Pseudoleskea incurvata* (Hedw.) Loeske — 139, 140, 141, 143, 144, 145 — On soil.
- Pseudoleskeella nervosa* (Brid.) Nyholm — 62, 119, 121, 123, 126, 127, 128, 129, 131, 138, 181, 223, 232 — On tree body (*Platanus* sp.).
- Pseudoscleropodium purum* (Hedw.) M. Fleisch. — 6, 9, 10, 20, 21, 22, 29, 30, 57, 59, 60, 71, 118, 120, 213, 218, 237, 269, 270, 293, 301 — On wet soil and rock.
- Pseudotaxiphyllum elegans* (Brid.) Z. Iwats. — 75, 93, 190, 227 — On soil.
- Pterigynandrum filiforme* Hedw. — 14, 27, 37, 38, 75, 80, 94, 132, 133, 134, 190, 225, 227, 230, 238, 240, 243, 251, 252, 253, 258, 260, 262, 265, 267, 269, 270, 273, 275, 276, 303, 304, 305, 307, 309 — On tree body (*Fagus orientalis*).
- Ptychostomum archangelicum* (Bruch & Schimp.) J.R. Spence — 112, 119, 121, 123, 126, 128, 129, 225, 227, 265 — On grounded rock.
- P. boreale* (F. Weber & D. Mohr) Ochrya & Bednarek-Ochrya — 94, 225 — On grounded rock.
- P. capillare* (Hedw.) Holyoak & N. Pedersen — Cosmopolitan — On grounded rock.
- P. compactum* Hornsch. — 129, 247 — On grounded rock.
- P. moravicum* (Podp.) Ros & Mazimpaka — 26, 28, 36, 62, 94, 169, 170, 254, 293, 294, 300 — On grounded rock.
- P. pseudotriquetrum* (Hedw.) J.R. Spence & H.P. Ramsay — 13, 129, 213, 225 — On grounded rock.
- P. rubens* (Mitt.) Holyoak & N. Pedersen — 15, 16, 187, 249, 250 — On grounded rock.
- P. torquescens* (Bruch & Schimp.) Ros & Mazimpaka — 51, 57 — On grounded rock.
- P. zieri* (Hedw.) Holyoak & N. Pedersen — 229, 240, 241, 242 — On grounded rock.
- Pylaisia polyantha* (Hedw.) Schimp. — 7, 33, 49, 50, 53, 61, 71, 118, 139, 140, 141, 142, 143, 144, 145, 189, 225 — On tree body (*Platanus* sp.).
- Racomitrium aciculare* (Hedw.) Brid. — 31, 50, 53, 66, 191, 225, 233 — On rock.
- R. affine* (F. Weber & D. Mohr) Lindb. — 194, 195, 196, 198, 199, 201, 202, 203, 204, 205, 206, 230 — On rock.
- R. aquaticum* (Brid. ex Schrad.) Brid. — 14, 20, 21, 22, 31, 63, 64, 225, 233 — On rock.
- R. canescens* (Hedw.) Brid. — 94, 132, 225, 233 — On rock.
- R. ellipticum* (Turner) Bruch & Schimp. — 34, 234 — On rock.
- R. elongatum* Ehrh. ex Frisvoll — 173, 177, 179, 180 — On rock.
- R. ericoides* (Brid.) Brid. — 167, 172, 173, 177, 178, 179 — On rock.
- R. heterostichum* (Hedw.) Brid. — 32, 51, 52, 64, 225 — On rock.
- R. lanuginosum* (Hedw.) Brid. — 13, 15, 16, 249, 250, 290 — On rock.
- R. macounii* subsp. *alpinum* (E. Lawton) Frisvoll — 194, 197, 198, 202, 204 — On rock.

- R. sudeticum* (Funck) Bruch & Schimp. — 32, 64, 132, 233, 236 — On rock.
- Rhabdoweisia crenulata* (Mitt.) H. Jameson — 7, 13, 17, 49, 54, 55, 68, 72, 73, 113, 122, 124, 186, 226 — On rock.
- Rhizomnium magnifolium* (Horik.) T.J. Kop. — 23 — On soil.
- R. pseudopunctatum* (Bruch & Schimp.) T.J. Kop. — 15, 16, 226, 249, 250 — On soil.
- R. punctatum* (Hedw.) T.J. Kop. — 14, 20, 21, 22, 52, 62, 63, 65, 113, 118, 122, 125, 129, 134, 183, 225, 234, 237, 286, 287, 288 — On soil.
- Rhodobryum roseum* (Hedw.) Limpr. — 15, 16, 17, 23, 24, 31, 32, 40, 41, 44, 45, 46, 47, 64, 77, 78, 80, 81, 83, 84, 86, 88, 89, 90, 91, 92, 128, 130, 135, 167, 168, 179, 214, 215, 216, 217, 220, 231, 249, 250, 251, 252, 253, 293, 294, 300, 304, 308 — On soil.
- Rhynchostegiella litorea* (De Not.) Limpr. — 25 — On soil.
- R. confertum* (Dicks.) Schimp. — 30, 49, 67, 225 — On soil.
- R. megapolitanum* (Blandow ex F. Weber & D. Mohr) Schimp. — 232 — Near stream, on wet soil.
- R. murale* (Hedw.) Schimp. — 15, 16, 24, 287, 288 — On soil.
- R. riparioides* (Hedw.) Cardot — 54, 55, 67, 68, 69, 70, 72, 73 — Near stream, on wet soil.
- R. rotundifolium* (Scop. ex Brid.) Schimp. — 26, 28, 36, 215, 226 — Near stream, on wet soil.
- R. tenella* (Dicks.) Limpr. — 1, 2, 12, 17, 146 — On soil.
- Rhytidiadelphus squarrosus* (Hedw.) Warnst. — 62, 94, 181 — On grounded rock.
- R. subpinnatus* (Lindb.) T.J. Kop. — 128, 229 — On grounded rock.
- R. triquetrus* (Hedw.) Warnst. — 15, 16, 62, 128, 225, 237, 249, 250 — On soil.
- Rhytidium rugosum* (Ehrh. ex Hedw.) Kindb. — 24, 129, 236, 275 — On soil.
- Sanionia uncinata* (Hedw.) Loeske — 245 — On grounded rock.
- Schistidium agassizii* Sull. & Lesq. — 138 — On rock.
- S. apocarpum* (Hedw.) Bruch & Schimp. — Cosmopolitan — On rock.
- S. brunnescens* Limpr. subsp. *brunnescens* — 225 — On rock.
- S. papillosum* Culm. — 26, 28, 36 — On rock.
- S. rivulare* (Brid.) Podp. — 138 — On rock.
- S. strictum* (Turner) Loeske ex Martensson — 3, 13, 15, 16, 32, 33, 110, 132, 139, 140, 142, 143, 144, 249, 250, 289 — On rock.
- S. trichodon* (Brid.) Poelt. — 167, 168, 172, 178, 179 — On rock.
- Sciuro-hypnum flotowianum* (Sendtn.) Ignatov & Huttunen — 226 — On stone.
- S. glaciale* (Schimp.) Ignatov & Huttunen — 7, 19 — On soil and rock.
- S. plumosum* (Hedw.) Ignatov & Huttunen — 9, 20, 21, 22, 58, 62, 63, 65, 67, 112, 132, 133, 134, 153, 171, 172, 173, 174, 176, 177, 181, 183, 186, 214, 216, 226, 229, 232, 254, 275, 276, 278, 280, 281, 289, 291, 292 — On soil and rock.
- S. populeum* (Hedw.) Ignatov & Huttunen — Cosmopolitan — On soil and rock.
- S. reflexum* (Starke) Ignatov & Huttunen — 14, 67, 207, 208, 246, 247 — On soil and rock.
- Scleropodium tourettii* (Brid.) L. F. Koch. — 29 — On soil and rock.
- Scorpidium revolvens* (Sw. ex anon.) Rubers — 15, 16, 233 — On soil.
- Scorpiurium circinatum* (Bruch) M. Fleisch. & Loeske — 8, 9, 15, 16, 17, 18, 31, 34, 153, 154 — On soil.
- Sphagnum auriculatum* Schimp. — 4, 14, 170, 171 — Near the road, in water.
- S. palustre* L. — 4, 14, 15, 168, 170, 171, 172 — In wetlands.
- S. squarrosum* Crome — 167, 170 — In water.
- S. subsecundum* Nees — 16 — Near stream, on wet soil.
- S. teres* (Schimp.) Angstr. — 14, 168, 170 — Near stream, on wet soil.
- Syntrichia laevipila* Brid. — 265 — On soil.
- S. montana* Nees — 94, 128, 129, 132, 133, 134, 136, 138, 139, 140, 141, 143, 145, 189, 223, 228, 232, 238, 240, 241, 242, 243, 244, 247, 248, 250, 253, 264, 275, 278, 281 — On soil.
- S. norvegica* F. Weber — 131 — On grounded rock.
- S. papillosissima* (Coppey) Loeske — 235 — On soil.
- S. princeps* (De Not.) Mitt. — 129, 139, 141, 143, 144, 145 — On soil.
- S. ruralis* var. *ruraliformis* (Besch.) Delogne — 127, 139, 140, 141, 142, 143, 232, 233, 244, 255, 256, 258, 260, 270, 273, 278, 280, 281, 291, 292 — On soil.
- Tetraphis pellucida* Hedw. — 14, 62, 64, 71, 262 — On soil.
- Thamnobryum alopecurum* (Hedw.) Nieuwl. ex Gangulee — Cosmopolitan — On rock and soil.
- T. coreanum* (Cardot) Nog. & Z. Iwats. — 227 — On rocks.
- Thuidium assimile* (Mitt.) A. Jaeger — 26, 28, 36, 49, 132, 184 — On soil.
- T. delicatulum* (Hedw.) Schimp. — Cosmopolitan — On soil.
- T. recognitum* (Hedw.) Lindb. — 15, 16, 24 — On soil.
- T. tamarsicinum* (Hedw.) Schimp. — Cosmopolitan — On soil.
- Timmia austriaca* Hedw. — 225, 228 — On soil.
- T. megapolitana* Hedw. — 274 — On soil.
- Tomentypnum nitens* (Hedw.) Loeske — 111, 114, 116, 133, 145 — On rock and stone.
- Tortella flavovirens* (Bruch) Broth. — 115, 213, 293, 294, 301 — On tree root (*Quercus* sp.) and soil.
- T. fragilis* (Hook. & Wilson) Limpr. — Cosmopolitan — On soil and rock.
- T. humilis* (Hedw.) Jenn. — 115 — On soil.
- T. inclinata* var. *densa* (Lorentz & Molendo) Limpr. — 67 — On soil.
- T. inclinata* var. *inclinata* (R. Hedw.) Limpr. — 128, 135 — On soil.
- T. inflexa* (Bruch) Broth. — 115, 186, 213, 232, 236, 257, 258, 266, 268, 301 — On soil.
- T. nitida* (Lindb.) Broth. — 225, 227 — On soil.
- T. squarrosa* (Brid.) Limpr. — 24, 49, 52, 59, 60, 62, 75, 136, 139, 140, 144, 145, 181, 186, 190, 213, 214, 216, 271, 278, 280, 281, 291, 292 — On grounded rock and soil.
- T. tortuosa* (Hedw.) Limpr. — 7, 13, 23, 25, 29, 32, 62, 64, 120, 155, 181, 183, 213, 225, 226, 227, 228, 232, 235, 244, 274, 275, 276, 290 — On soil.
- Tortula atrovirens* (Sm.) Lindb. — 213, 218 — On soil.
- T. brevissima* Schiffn. — 166, 168, 173, 177, 178, 179, 180 — On soil.
- T. inermis* (Brid.) Mont. — 166, 167, 168, 172, 177, 178, 179, 180 — On soil.
- T. marginata* (Bruch & Schimp.) Spruce — 27, 29, 37, 38, 94, 128, 188, 232, 236, 238, 265, 275, 276 — On soil.
- T. mucronifolia* Schwägr. — Cosmopolitan — On soil.
- T. muralis* var. *aestiva* Brid. ex Hedw. — 213 — On rock.
- T. muralis* var. *muralis* Hedw. — Cosmopolitan — On rock and soil.
- T. schimperii* M.J. Cano, O. Werner & J. Guerra — 15, 16 — On grounded rock.

T. subulata Hedw. — 15, 16, 49, 207, 225, 227, 232, 239, 243, 249, 250, 260, 263, 264, 273, 289 — On grounded rock.
Trichostomum brachydontium Bruch. — 13, 54, 55, 57, 62, 68, 69, 70, 72, 73, 120, 132 — On soil.
T. crispulum Bruch. — 59, 60 — On soil.
Ulota crispa (Hedw.) Brid. — 17, 71, 118, 152, 188, 223, 230, 236 — On tree body (*Platanus* sp.).
U. hutchinsiae (Sm.) Hammar — 172 — On tree body.
Weissia brachycarpa (Nees & Hornsch.) Jur. — 8, 154, 156 — On soil.
W. controversa Hedw. — 62, 188, 238 — On soil.
W. rutilans (Hedw.) Lindb. — 185, 214, 216, 254, 265 — On soil.

NEW RECORD

Thamnobryum coreanum (Cardot) Nog. & Z. Iwats.
 Fig. 2

Turkey, Ordu Province, Gököy district; Düzyayla, 40°35'57"N/37°28'35"E, grows on rocks, 1275 m, 10.05.2014. (*leg.* and *det.* T. Özdemir & N. Batan), (OHN-333) New national record in Turkey.

It is quite small compared to other species of *Thamnobryum*. The end portions of the plant are light yellow green color and lower parts are dark green. Secondary stem 2.5–4 cm long and pinnately branched. Leaves are triangular, gradually transiting to ovate upper stem leaves. Stem leaves 1.5–1.8(–2.0)×0.6–0.8 µm long. Side branches are 1.5–2 cm long. Nerve is quite evident. There are a few teeth on the dorsal part of nerve. *Thamnobryum coreanum* and *T. neckeroides* (Hook.) E. Lawton are very similar in habitus, leaf shape and costa structure. However, *T. coreanum* is distinguished from *T. neckeroides* by mamillate laminal cells and median cells near costa with longest axes parallel to costa. Also, plants of *T. coreanum* are dull and plants of *T. neckeroides* are glossy. In Turkey, *Thamnobryum* has been represented by two species, *T. alopecurum* (Hedw.) Nieuwl. ex Gangulee and *T. neckeroides* (Uyar, 2005; Erdağ & Kürschner, 2005; Batan *et al.*, 2014). *Thamnobryum coreanum* can now be added to the moss flora of Turkey. This species was known previously in Japan, South Korea and Russia (Ignatova & Ignatov, 2011; Zhang & He, 2011), but now is new to Turkey.

DISCUSSION

This study was carried out between 2013 and 2015 in Ordu province of Turkey. 7500 bryophyte specimens collected from the research area were checked. As a result of the study, 1 hornwort taxa, 51 liverwort taxa (belonging to 25 families and 32 genera) and 365 moss taxa (belonging to 43 families and 128 genera) have been determined.

Frullania teneriffae (F. Weber) Nees, *Leucodon pendulus* Lindb., *Sematophyllum micans* (Mitt.) Braithw. (Özdemir & Batan 2016) and *Crytomnium hymenophylloides* (Hüb.) T. Kop., *Leucobryum bowringii* Mitt., *Rhizomnium striatulum* (Mitt.) T. Kop., *Leucodon corensis* Cardot. (Özdemir & Batan 2014), *Plagiothecium neckeroideum* Schimp., *Thamnobryum neckeroides* (Hook.) E. Lawton. (Batan *et al.* 2014) were previously recorded as

new for Turkish bryoflora during field works of this study while *Thamnobryum coreanum* (Cardot) Nog. & Z. Iwats.) is a new record for the Moss Flora of Turkey in this paper. And all taxa are new record for Ordu Province.

The dominant Bryophyta families in the study area were Pottiaceae (53 taxa), Brachytheciaceae (46), Grimmiaceae (31), Bryaceae (22), Amblystegiaceae (21), Orthotrichaceae (18), Hypnaceae (18) and Plagiotheciaceae (14). Up to 61.09 % of the bryophyte species identified in this study were in these families. The Pottiaceae (14.52 %) is the most species rich moss family in Ordu province, with 53 taxa in 15 genera. Pottiaceae contains many species tolerant to long drought seasons. Therefore, it is not a surprise that it is the most common and abundant family in the study area. The other families with the largerst number of taxa were Polytrichaceae (12), Plagiomniaceae (10), Leucobryaceae (10) and Bartramiaceae (10). These 12 families form 72.60 % of the total taxa in this study, and the other families constitute 30.30 %.

The most species-rich moss genera are as follows: *Orthotrichum* (15 taxa), *Brachythecium* (14), *Didymodon* (13), *Grimmia* (13), *Racomitrium* (11), *Hypnum* (11), *Bryum* (10), *Plagiothecium* (9), *Tortella* (9), *Tortula* (9), *Ptychostomum* (9), *Schistidium* (7), *Mnium* (7), *Plagiomnium* (7), *Syntrichia* (6), *Campylopus* (6), *Fissidens* (6), *Philonotis* (6), *Dicranella* (5), *Polytrichum* (5), *Sphagnum* (5), *Pohlia* (5), *Rhynchostegium* (5), and *Sciurohypnum* (5). Other genera are represented by 4 or fewer taxa in the area.

The dominant liverwort family is Scapaniaceae (11). Up to 21.56 % of the liverwort species identified in this study were in this family. The other families with the most number of taxa were Frullaniaceae (3 taxa), Jungermanniaceae (3), Lophocoleaceae (3), Porellaceae (3), Plagiochilaceae (3), and Metzgeriaceae (3). Liverworts are more drought-sensitive than mosses. As a consequence they grow under more humid, shady and hygrophytic conditions in the study area. These seven families form 56.86 % of the total taxa in this study, and the other families constitute 43.14 %.

The most species-rich liverwort genera are as follows: *Scapania* (6 taxa), *Frullania* (4), *Jungermannia* (3), *Porella* (3), *Marchantia* (2), *Pellia* (2), *Leiocolea* (2), *Lophocolea* (2), *Diplophyllum* (2), *Plagiochila* (2), *Radula* (2), and *Metzgeria* (2). Other genera are represented by a single taxon in the area.

Conocephalum conicum, *Frullania tamarisci*, *Marchantia polymorpha*, *Metzgeria conjugata*, *M. furcata*, *Pellia epiphylla*, *Plagiochila asplenoides*, *P. porellae*, *Radula complanata*, and *R. lindenberghiana* are the most common species found in the study area for Marchantiophyta (Liverworts).

Abietinella abietina var. *abietina*, *Alleniella complanata*, *Amblystegium serpens*, *Anomodon attenuatus*, *A. viticulosus*, *Atrichum undulatum*, *Brachythecium albicans*, *B. rivulare*, *B. rutabulum*, *Calliergonella cuspidata*

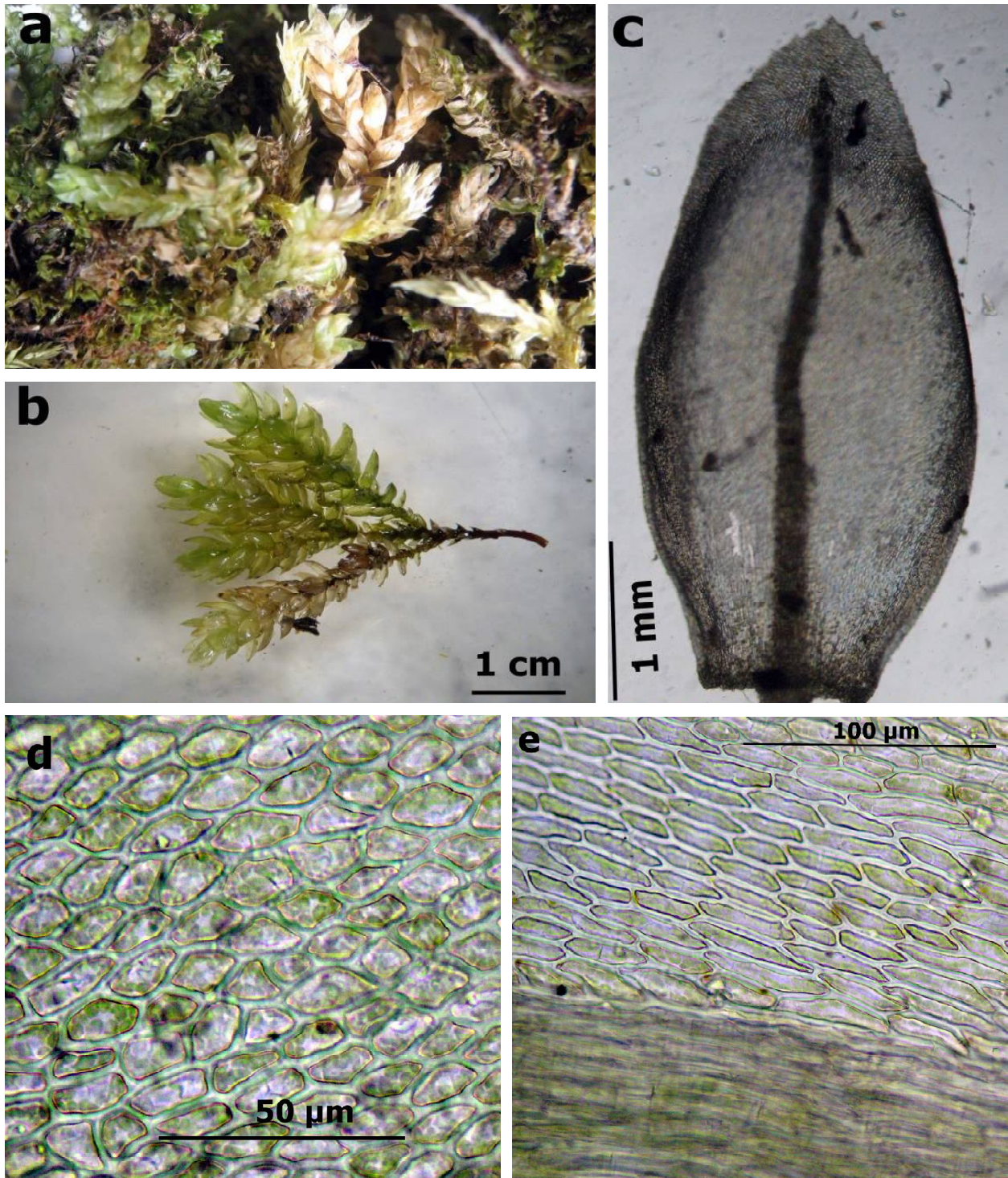


Fig. 2. *Thamnobryum coreanum*: a, b: gametophyte, c: leaf, d: basal cells, e: mid-leaf cells and costa.

ta, *Ctenidium molluscum*, *Dicranum scoparium*, *Didymodon rigidulus*, *Eurhynchiastrum pulchellum* var. *diversifolium*, *Eurhynchium striatum*, *Fissidens adiantoides*, *F. taxifolius*, *Grimmia trichophylla*, *Hedwigia ciliata* var. *ciliata*, *Homalothecium lutescens*, *H. sericeum*, *Hypnum cupressiforme* var. *cupressiforme*, *H. jutlandicum*, *Isothecium alopecuroides*, *Leucodon sciuroi-*

des, *Plagiomnium rostratum*, *P. undulatum*, *Pleurozium schreberi*, *Ptychostomum capillare*, *Rhodobryum roseum*, *Schistidium apocarpum*, *Sciuro-hypnum populeum*, *Thamnobryum alopecurum*, *Thuidium delicatulum*, *T. tamariscinum*, and *Tortula muralis* var. *muralis* are the most common species found in the study area for Bryophyta (Musci).

ACKNOWLEDGEMENTS

We gratefully acknowledge the financial support provided by the Scientific and Technological Research Council of Turkey (Project Code: KBAG-113Z228). We also thank Dr. Rayna Natcheva for the identification of some *Sphagnum* species.

LITERATURE CITED

- ABAY, G. & T. KEÇELİ. 2014. *Sphagnum molle* (Sphagnaceae, Bryophyta) in Turkey and SW Asia. – *Cryptogamie, Bryologie* **35**: 105–112.
- AGNEW, S. & M. VONDRACEK. 1975. A moss flora of Iraq. – *Feddes Repertorium*, **86**: 341–489.
- AKMAN, Y. 1999. İklim ve biyoiklim (Biyoiklim metodları ve Türkiye iklimleri). Ankara: *Kariyer Matbaacılık (in Turkish)*, 350 pp.
- ALLEN, B. 2002. Moss flora of Central America, Part 2: *Encalyptaceae-Orthotrichaceae*. – *The Missouri Botanical Garden, Missouri* **90**: 1–699.
- ATALAY, I. 1994. Vegetation geography of Turkey. – *Ege University Press, Izmir, Turkey*, 352 p.
- BATAN, N., M. ALATAŞ & T. ÖZDEMİR. 2013a. *Leptoscyphus cuneifolius* (Lophocoleaceae, Marchantiophyta) new to Southwest Asia. – *Cryptogamie, Bryologie* **34**: 373–377.
- BATAN, N., M. ALATAŞ, & T. ÖZDEMİR. 2013b. *Schistidium sordidum* new to Turkey and Southwest Asia. – *Archives of Biological Sciences* **65**: 1505–1509.
- BATAN, N., O. ÖZCAN, T. ÖZDEMİR. 2014b. New bryophyte records from Turkey and Southwest Asia. – *Telopea* **17**: 337–346.
- BATAN, N. & T. ÖZDEMİR. 2013a. New records for the moss flora of Turkey and Southwest Asia. – *Nova Hedwigia* **97**(3–4): 437–440.
- BATAN, N. & T. ÖZDEMİR. 2013b. Contributions to the moss flora of the Caucasian part (Artvin Province) of Turkey. – *Turkish Journal of Botany* **37**: 375–388.
- BATAN, N. & T. ÖZDEMİR. 2013c. Contribution to the moss flora of Eastern Black Sea Region (Artvin) in Turkey and new record to the Southwest Asia. – *Arctoa* **22**: 101–106.
- BATAN, N. & T. ÖZDEMİR. 2014a. *Schistidium boreale* Poelt new to the moss flora of Turkey and Southwest Asia. – In: Ellis, L.T. (ed.) *New national and regional bryophyte records* 39. *Journal of Bryology* **36** (2): 144–145.
- BATAN, N. & T. ÖZDEMİR. 2014b. *Pylaisia subcircinata* Cardot new record the moss flora of Turkey and Southwest Asia. – In: Ellis, L.T. (ed.), *New national and regional bryophyte records* 40. *Journal of Bryology* **36** (3): 235.
- BATAN, N., Y. JIA, T. ÖZDEMİR & M. ALATAŞ. 2014a. *Brotherella* and *Encalypta* species new to Turkey, Mediterranean and Southwest Asia. – *Plant Biosystems* **150**(3): 436–441; doi: 10.1080/11263504.2014.986247.
- CAN, S.M., R. KARA & T. EZER. 2013. Bryophyte flora of Melendiz Mountain in Turkey. – *Turkish Journal of Botany* **37**: 575–588.
- CASAS, C., M. BRUGUÉS, M.R. CROS, C. SÉRGIO & M. INFANTE. 2009. Handbook of liverworts and hornworts of the Iberian Peninsula and the Balearic Islands. – *Institut D'estudis Catalans, Spain*, 177 pp.
- CRUM, H.A., L.E. ANDERSON. 1981. Mosses of Eastern North America, Vol. 1–2. – *Columbia University Press, New York*, 1328 pp.
- ERDAG, A. & H. KÜRSCHNER. 2005. *Didymodon bistratosus* (Pottiaceae, Bryopsida), a new record to the bryophyta flora of Turkey. – *Cryptogamie, Bryologie* **26** (1): 232–236.
- EZER, T., R. KARA & M. ALATAŞ. 2013. *Scapania gracilis* Lindb. (Hepaticae, Scapaniaceae), new to bryophyte flora of Turkey. – *Folia Cryptogamica Estonica* **50**: 117–119.
- EZER, T., R. KARA & T. SEYLİ. 2014a. 7. *Cephalozia ambigua* C. Massal. – In: Ellis, L.T. (ed.) *New national and regional bryophyte records* 41. *Journal of Bryology* **36** (4): 308–309.
- EZER, T., R. KARA & T. SEYLİ. 2014b. 4. *Orthotrichum consimile* Mitt. – In: Ellis, L.T. (ed.) *New national and regional bryophyte records* 41. *Journal of Bryology* **36** (4): 315.
- FREY, W., J. P. FRAHM, E. FISCHER, W. LOBIN. 1995. Kleine kryptogamenflora, Band 4, Die Moos- und Farnpflanzen Europas. – *Gustav Fischer Verlag, Stuttgart*, 426 pp.
- GOFFINET, B. & A. J. SHAW. 2009. Bryophyte biology, Second edition. – *Cambridge University Press, Cambridge, U.K.*, 565 pp.
- HEDENÄS, L. 1992. Notes on Madeiran *Pseudotaxiphyllum*, *Brachythecium* and *Rhynchostegiella* species (Bryopsida). – *Nova Hedwigia* **54**: 447–457.
- HEYN, C.C. & I. HERRNSTADT. 2004. The bryophyte flora of Israel and Adjacent Regions. – *The Israel Academy of Sciences and Humanities, Oron*, 719 pp.
- HILL, M.O., N. BELL, M.A. BRUGGEMAN-NANNENGA, M. BRUGUÉS, M.J. CANO, J. ENROTH, K.I. FLATBERG, J.P. FRAHM, M.T. GALLEGÓ, R. GARILLETI, J. GUERRA, L. HEDENÄS, D.T. HOLYOAK, J. HYVONEN, M.S. IGNATOV, F. LARA, V. MAZIMPAKA, J. MUÑOZ, & L. SODERSTROM. 2006. An annotated checklist of the mosses of Europe and Macaronesia. – *Journal of Bryology* **28**: 198–267.
- IGNATOVA, E.A. & M.S. IGNATOV. 2011. The genus *Thamnobryum* (Neckeraceae, Bryophyta) in Russia. – *Arctoa* **20**: 137–151.
- IRELAND, R. 1982. Moss flora of maritime Provinces. – *National Museum of Natural Sciences, Publication in Botany No: 13, Ottawa*, 738 pp.
- KARA, R., T. EZER, M.C. GÖZCÜ & S.G. BOZDOĞAN. 2014. Bryophyte flora of Erciyes Mountain in Turkey, with 6 bryophyte records from the country. – *Turkish Journal of Botany*, **38**: 763–781.
- KIRMACI, M., H. ÖZENOGU-KEREMİT & S. GÜCEL. 2014a. 21. *Fossombronina caespitiformis* Rabenh. subsp. *multispira* (Schiffn.) J.R.Br. & D.C.Cargill. – In: Ellis, L.T. (ed.) *New national and regional bryophyte records* 40. *Journal of Bryology* **36** (3): 228–229.
- KIRMACI, M. & A. ERDAG. 2014. *Acaulon fontiquerianum* (Pottiaceae), A new species to the bryophyte flora of Turkey and Sw Asia. – *Polish Botanical Journal* **59** (2): 229–233.
- KIRMACI, M., M.Ç. KARAKAYA, N. KARAKAYA, & H. KÜRSCHNER. 2013. Three new records to the bryophyte flora of Turkey. – *Biological Diversity and Conservation* **6** (3): 52–56.
- KIRMACI, M., H. KÜRSCHNER. 2013. The genus *Sphagnum* L. in Turkey – with *S. contortum*, *S. fallax*, *S. magellanicum* and *S. rubellum*, new to Turkey and Southwest Asia. – *Nova Hedwigia* **96**: 383–397.
- KIRMACI, M., H. ÖZENOGU-KEREMİT & S. GÜCEL. 2014b. 52. *Tortula acaulon* var. *marginata* (Herrnst. & Heyn) R.H.Zander. – In: Ellis, L.T. (ed.) *New national and regional bryophyte records* 40. *Journal of Bryology* **36** (3): 238.
- KÜRSCHNER, H. 2013. *Jubula hutchinsiae* (Hook.) Dumort. subsp. *caucasica* Konstant. & Vilnet new for the bryophyte flora of Iran and Turkey. – *Polish Botanical Journal* **58**(1): 211–216.
- KÜRSCHNER, H. & A. ERDAG. 2005. A. Bryophytes of Turkey: An annotated reference list of the species with synonyms from the recent literature and an annotated list of Turkish bryological literature. – *Turkish journal of Botany* **29**: 95–154.
- KÜRSCHNER, H. & W. FREY. 2011. Liverworts, mosses and hornworts of Southwest Asia (Marchantiophyta, Bryophyta, Anthocerotophyta). – *Nova Hedwigia* **139**: 1–240.
- LAWTON, E. 1971. Moss flora of Pacific Northwest. – *Hattori Botanical Laboratory, Miyazaki*, 362 pp.
- LI X-J, H.E.S. & M. ZANG. 2007. Moss flora of China (Mniaceae). English version, Vol. 4. – *Science Press (Beijing, New York) and Missouri Botanical Garden Press (St. Louis)*: 93–144.
- LIN, B-J. & S. HE. 1999. Leucobryaceae. – In: He, Si (ed.). *Moss flora of China*, English version, Vol. 1. *Science Press (Beijing, New York) and Missouri Botanical Garden Press (St. Louis)*: 242–258.
- NOGUCHI, A. & Z. IWATSUKI. 1987. Illustrated moss flora of Japan, Part 1. – *The Hattori Botanical Laboratory, Miyazaki*, 242 pp.

- NOGUCHI, A. & Z. IWATSUKI. 1988. Illustrated moss flora of Japan, Part 2. – *The Hattori Botanical Laboratory, Miyazaki*, 249 pp.
- NOGUCHI, A. & Z. IWATSUKI. 1989. Illustrated moss flora of Japan, Part 3. – *The Hattori Botanical Laboratory, Miyazaki*, 250 pp.
- NOGUCHI, A., Z. IWATSUKI & T. YAMAGUCHI. 1991. Illustrated moss flora of Japan, Part 4. – *The Hattori Botanical Laboratory, Miyazaki*, 269 pp.
- NOGUCHI, A., Z. IWATSUKI & T. YAMAGUCHI. 1994. Illustrated moss flora of Japan, Part 5. – *The Hattori Botanical Laboratory, Miyazaki*, 240 p.
- NYHOLM, E. 1986. Illustrated Flora of Nordic Mosses, Fasc. 1. *Fissidentaceae – Seligeriaceae*. – *The Nordic Bryological Society, Lund*, 1–72.
- NYHOLM, E. 1989. Illustrated flora of Nordic mosses, Fasc. 2. *Pottiaceae – Splachnaceae – Schistostegaceae*. – *The Nordic Bryological Society, Lund*, 75–141.
- NYHOLM, E. 1993. Illustrated flora of Nordic mosses, Fasc. 3. *Bryaceae – Rhodobryaceae – Mniaceae – Cinclidiaceae – Plagiomniaceae*. – *The Nordic Bryological Society, Lund*: 145–244.
- NYHOLM, E. 1998. Illustrated flora of Nordic mosses, Fasc. 4. *Aulacomniaceae – Meesiaceae – Catocopiaceae – Bartramiaceae – Timmiaceae – Encalyptaceae – Grimmiaceae – Pteromitriaceae – Hedwigiaceae – Orthotrichaceae*. – *The Nordic Bryological Society, Lund*, 145–244.
- ÖREN, M., B. SARI & S. URSAVAŞ. 2015. *Syntrichia minor* (Bizot) M.T.Gallego, J.Guerra, M.J.Cano, Ros & Sánchez-Moya and *Cephalozia integerrima* (Lindb.) Warnst. – *Archives of Biological Sciences* **67**(2): 367–372.
- ÖZENOĞLU KİREMİT, H. & T. KEÇELİ. 2009. An annotated checklist of the hepaticae and anthocerotae of Turkey. – *Cryptogamie Bryologie* **30** (3): 343–356.
- ÖZDEMİR, T. & N. BATAN. 2014. New and noteworthy moss records for Turkey and Southwest Asia. – *Telopea* **17**: 35–42.
- ÖZDEMİR, T. & N. BATAN. 2016. *Frullania tenerifae*, *Sematophyllum micans* and *Leucodon pendulus* new records for the moss flora of Turkey. – In: Ellis, L.T. (ed.) *New national and regional bryophyte records* 47. *Journal of Bryology* **38** (1): 7, 9, 10.
- PATON, J. 1999. The Liverworts flora of the British Isles. – *Harley Books, England*, 626 pp.
- PEDROTTI, C.C. 2001. Flora dei muschid'Italia, Sphagnopsida, Andreaopsida, Bryopsida (1 parte). – *Antonia Delfino Editore, Roma*. 1–817 p.
- PEDROTTI, C.C. 2006. Flora dei muschid'Italia, Bryopsida (II parte). – *Antonia Delfino Editore, Roma*. 827–1235.
- ROS, R.M., V. MAZIMPAKA, U. ABOU-SALAMA, M. ALEFFI, T.L. BLOCKEEL, M. BRUGUES, R.M. CROS, M.G. DIA, G.M. DIRKSE, I. DRAPER, W. ELSAADAWI, A. ERDAG, A. GANEVA, R. GABRIEL, J.M. GONZALEZMANEBO, C. GRANGER, I. V. HERRNSTADT, K. HUGONNOT, KHALIL, H. KÜRSCHNER, A. LOSADA-LIMA, L. LUIS, S. MIFSUD, M. PRIVITERA, M. PUGLISI, M. SABOVLJEVIĆ, C. SERGIO, H.M. SHABBARA, M. SIM-SIM, A. SOTIAUX, R. TACCHI, A. VANDERPOORTEN & O. WERNER. 2013. Mosses of the Mediterranean, an Annotated Checklist. – *Cryptogamie, Bryologie* **34**: 99–283.
- SAVICZ-LJUBITZKAJA, L.I. & Z.N. SMIRNOVA. 1970. The handbook of the mosses of the U.S.S.R. Acrocarpous mosses. – *Academy of Sciences of USSR & Komarov Botanical Institute*, 458 pp.
- SHARP, A.J., H. CRUM, & P.M. ECKEL. 1994. The moss flora of Mexico, Parts 1–2. – *Memories of The New York Botanical Garden* **69**: 1113 pp.
- SMITH, A.J.E. 1996. The Liverworts of Britain and Ireland. – *Cambridge University Press, Cambridge*, 384 p.
- SMITH, A.J.E. 2004. The moss flora of Britain and Ireland. Second Edition. – *Cambridge University Press, Cambridge*, 1012 p.
- TONGUÇ-YAYINTA, Ö. 2013a. 17. *Neckera pennata* Hedw., Turkey. – In: Ellis, L.T. (ed.) *New national and regional bryophyte records* 36. *Journal of bryology* **35**: 233.
- TONGUÇ-YAYINTAŞ, Ö. 2013b. New moss records from Western part of Turkey. – *Bangladesh Journal of Botany* **42** (2): 371–375.
- TONGUÇ-YAYINTAŞ, Ö. 2014. Contributions to the moss flora of Western Turkey: Biga Peninsula (Canakkale) and Thrace Region of Turkey. – *The Global Journal of Science Frontier Research* **14** (3): 1–24.
- URSAVAŞ, S. & B. ÇETİN. 2014. *Cinclidotus asumaniae* Ursavas & Çetin (Bryopsida, Pottiaceae), sp. nov., a new species to the hygrophytic moss flora of Southern Turkey. – *Nova Hedwigia*, **98** (3–4): 467–472.
- UYAR, G. & B. ÇETİN. 2004. A new check-list of the mosses of Turkey. – *Journal of Bryology*, **26**: 203–220.
- UYAR, G. & M. ÖREN. 2013. Three remarkable new moss records for South-West Asia from northern Turkey. – *Turkish Journal of Botany* **37**: 363–368.
- WATSON, E.V. 1981. British mosses and liverworts. – *Cambridge University Press, Cambridge*. 519 p.
- ZHANG M-X. & S. H.E. 2011. Moss flora of China (Leucodontaceae), English version, Vol. 5, *Science Press (Beijing, New York) and Missouri Botanical Garden Press (St. Louis)*: 153–181.

Table 1. Details of the study sites (SN: Site number, Lat: Latitude, Long: Longitude Alt (m): Altitude).

SN	Localities	Lat-Long	Alt (m)	Date
1	Gülyalı: Center, Çıraklı District-1	37°45'56"N/30°08'25"E	90	24.10.2013
2	Gülyalı: Center, Çıraklı District-2	40°96'08"N/38°05'14"E	239	24.10.2013
3	Gülyalı: Certer District	40°57'46"N/38°03'35"E	53	24.10.2013
4	Gülyalı: Soğukoluk village-1	40°56'52"N/38°02'32"E	300	24.10.2013
5	Gülyalı: Soğukoluk village-2	40°56'55"N/38°02'51"E	316	24.10.2013
6	Gülyalı: Soğukoluk village	40°56'52"N/38°02'32"E	393	24.10.2013
7	Gülyalı: Soğukoluk and Şahintepesi districts	40°57'14"N/38°02'31"E	275	24.10.2013
8	Gülyalı: Soğukoluk District-1	40°57'14"N/38°02'31"E	355	24.10.2013
9	Gülyalı: Soğukoluk District-2	40°56'51"N/38°03'02"E	230	24.10.2013
10	Gülyalı: Taflancık village	40°56'23"N/38°01'26"E	650	24.10.2013
11	Gülyalı: Taflancık sub-village	40°56'33"N/38°01'36"E	548	24.10.2013
12	Gülyalı: Sayaca District	40°56'23"N/38°01'26"E	634	24.10.2013
13	Kabadüz: Between Yokuşdibi and Emine Pınarı Promenade	40°44'37"N/37°56'26"E	1235	25.10.2013
14	Kabadüz: Emine Pınarı Promenade	40°43'32"N/37°50'28"E	1560-1700	25.10.2013
15	Kabadüz: Top of the plateau of Çambaşı-1	40°58'35"N/37°57'54"E	1850	25.10.2013
16	Kabadüz: Top of the Plateau of Çambaşı-2	40°58'35"N/37°57'54"E	1710	25.10.2013
17	Kabadüz: Yolaydın village	40°46'55"N/37°55'07"E	1178	25.10.2013
18	Kabadüz: Esenyurt village (Melet Valley)	40°53'17"N/37°54'13"E	101	25.10.2013
19	Kabadüz: Gelinkaya Köyü (Melet Valley)	40°46'28"N/37°52'17"E	219	25.10.2013
20	Kabadüz: Kirazdere Village	40°49'35"N/37°55'06"E	610-650	25.10.2013
21	Kabadüz: Between Kirazdere and Gülpınar villages	40°50'16"N/37°54'49"E	635 m	25.10.2013
22	Kabadüz: Between Esenyurt and Kabadüz village	40°52'03"N/37°54'02"E	471	25.10.2013

23	Kabadüz: Above Turnalık district	40°38'56"N/37°56'13"E	1751	25.10.2013
24	Ulubey: The output of Ulubey-1	40°52'28"N/37°47'18"E	553	26.10.2013
25	Ulubey: The output of Ulubey-2	40°53'20"N/37°44'24"E	673	26.10.2013
26	Ulubey: Kadıncık Village-1	40°53'10"N/37°43'23"E	711	26.10.2013
27	Ulubey: Between Ulubey and Gürgentepe districts, distinction of Şeyhler village	40°51'45"N/37°40'45"E	1065	26.10.2013
28	Ulubey: Kalıcak village 1	40°49'50"N/37°45'40"E	240	27.10.2013
29	Ulubey: Küpkaya Canyon (Kalıcak sub-village)	40°49'51"N/37°45'32"E	199	27.10.2013
30	Ulubey: Küpkaya Canyon (Kalıcak and Kumanlar sub-village)	40°49'50"N/37°45'50"E	200	27.10.2013
31	Ulubey: Sayacabaşı promenade-2	40°53'20"N/37°41'43"E	910	26.10.2013
32	Ulubey: Sayacabaşı promenade-1	40°53'18"N/37°41'18"E	952	26.10.2013
33	Ulubey: Sayacabaşı promenade-3	40°53'10"N/37°41'21"E	949	26.10.2013
34	Ulubey: Kiranyağmur sub-village	40°50'40"N/37°45'43"E	503	26.10.2013
35	Ulubey: Kalıcak village entrance	40°49'50"N/37°45'40"E	195	14.11.2013
36	Ulubey: Kalıcak village-2	40°52'41"N/37°43'15"E	540	26.10.2013
37	Ulubey: Şehler village	40°50'32"N/37°42'35"E	522	26.10.2013
38	Ulubey: Şehler sub-village	40°51'26"N/37°40'56"E	934	26.10.2013
39	Ulubey: Akoluk village	40°49'53"N/37°42'03"E	515	26.10.2013
40	Ulubey: Between Şahinkaya and Yukarıkızılın villages	40°47'35"N/37°42'17"E	721	26.10.2013
41	Ulubey: Uzunmahmut village	40°47'55"N/37°45'18"E	630	26.10.2013
42	Ulubey: Oyumgürten village	40°49'18"N/37°44'18"E	249	26.10.2013
43	Ulubey: Örenköy, Başcardak and Çubuklu villages	40°44'35"N/37°46'33"E	979	26.10.2013
44	Ulubey: Kumanlar village	40°49'07"N/37°46'48"E	467	26.10.2013
45	Ulubey: Kardeşler village	40°50'03"N/37°45'18"E	230	26.10.2013
46	Ulubey: Örenci village	40°54'02"N/37°42'52"E	617	26.10.2013
47	Ulubey: Yenısayaca village	40°54'04"N/37°44'43"E	514	26.10.2013
48	Ulubey: Akpınar, Cevizlik and Fındıklı villages	40°53'28"N/37°47'33"E	427	26.10.2013
49	Perşembe: Between Şenyurt and Sarayköy villages	41°01'09"N/37°42'11"E	40	14.11.2013
50	Perşembe: station 1	41°05'17"N/37°45'28"E	236	23.03.2014
51	Perşembe: Perşembe City Center	41°02'50"N/37°37'33"E	27	23.03.2014
52	Perşembe: Station 2	41°06'05"N/37°43'97"E	132	23.03.2014
53	Perşembe: Station 3	41°05'44"N/37°44'11"E	317	20.03.2014
54	Perşembe: Efirlı district	41°01'10"N/37°47'53"E	28	30.01.2014
55	Perşembe: Beyli village	41°00'05"N/37°46'05"E	317	30.01.2014
56	Perşembe: Soğukpınar village	41°01'09"N/37°45'10"E	198	30.01.2014
57	Perşembe: Güzelyurt village	40°56'37"N/37°44'17"E	553	30.01.2014
58	Perşembe: Güzelyurt village, Hacıoğlu District	41°00'32"N/37°44'56"E	285	30.01.2014
59	Perşembe: Bekirli village	41°00'08"N/37°45'14"E	431	30.01.2014
60	Perşembe: Yeniköy village	41°06'37"N/37°42'46"E	18	20.03.2014
61	Perşembe: Yağzılı village	40°57'46"N/37°48'41"E	426	29.01.2014
62	Perşembe: Kayadibi, Güngören, Yeşilköy and Işıklı villages	40°56'37"N/37°44'12"E	551	29.01.2014
63	Perşembe: (Selimiye) Kurşuncal forest and waterfalls 1	40°55'59"N/37°41'35"E	600	20.03.2014
64	Perşembe: Perşembe (Selimiye) forest and waterfalls 2	40°56'53"N/37°40'19"E	525	21.03.2014
65	Perşembe: Between Çaytepe and Kovanlı Villages 1	41°06'37"N/37°42'46"E	76	20.03.2014
66	Perşembe: Between Çaytepe and Kovanlı villagess 2	41°06'37"N/37°42'46"E	76	20.03.2014
67	Perşembe: Medreseönü Village	41°05'58"N/37°41'20"E	64	20.03.2014
68	Perşembe: Between Aziziye and Kurtuluş villages	41°06'24"N/37°42'30"E	39	20.03.2014
69	Perşembe: İstanbulboğazi, Bolatlı, Anaç and Ortatepe villages	41°03'26"N/37°42'52"E	300	20.03.2014
70	Perşembe: Mersin, Ramazan and Yumrutaş villages	41°06'18"N/37°45'25"E	135	23.03.2014
71	Perşembe: Between Tepeköy and Kırılı village	41°01'09"N/37°42'11"E	690	23.03.2014
72	Perşembe: Ekinciler village	41°00'16"N/37°43'32"E	527	30.01.2014
73	Perşembe: Doğan köy village	40°59'09"N/37°45'03"E	298	30.01.2014
74	Perşembe: Saray village	41°01'30"N/37°46'02"E	114	30.01.2014
75	Kumru: Duman sub-village	40°50'08"N/37°15'14"E	956	24.04.2014
76	Kumru: Between Fizme and Pelitli villages	40°49'33"N/37°18'34"E	777	24.04.2014
77	Kumru: Çatılı village	40°47'56"N/37°11'34"E	938	24.04.2014
78	Kumru: Şenyurt village	40°48'47"N/37°10'53"E	1086	24.04.2014
79	Kumru: Konaklı village	40°48'34"N/37°13'14"E	1130	24.04.2014
80	Kumru: Karacalar sub-village	40°50'09"N/37°12'05"E	984	24.04.2014
81	Kumru: Balı sub-village	40°49'56"N/37°12'52"E	707	24.04.2014
82	Kumru: Yenidivan village	40°51'25"N/37°12'03"E	895	24.04.2014
83	Kumru: Kayabaşı village	40°51'19"N/37°12'39"E	826	24.04.2014
84	Kumru: Between Akcadere and Duman villages	40°51'23"N/37°16'25"E	581	25.04.2014
85	Kumru: Between Ergentürk and Yeniergen Villages	40°56'11"N/37°15'45"E	581	25.04.2014
86	Kumru: Ballık villages	40°57'51"N/37°15'43"E	628	25.04.2014
87	Kumru: Yeniakcaalan village	40°57'01"N/37°17'16"E	507	25.04.2014
88	Kumru: Yeniakcaalan türk village	40°56'28"N/37°17'56"E	401	25.04.2014
89	Kumru: Esence village	40°55'52"N/37°17'05"E		25.04.2014
90	Kumru: Yalınzdam village	40°52'31"N/37°19'04"E	507	25.04.2014
91	Kumru: Karaağaç village	40°53'44"N/37°19'36"E	467	25.04.2014
92	Kumru: Between Derbent and Yemişkent villages	40°53'44"N/37°16'59"E	525	25.04.2014
93	Kumru: Fizme village	40°50'49"N/37°18'28"E	740	24.04.2014
94	Korgan: Perşembe High Plateau	40°38'02"N/37°17'02"E	1425	25.04.2014
95	Korgan: Between Yeşilyurt and Yeniköy villages	40°47'34"N/37°23'14"E	540	25.04.2014
96	Korgan: Tatarcık village	40°47'25"N/37°21'54"E	523	25.04.2014
97	Korgan: Büyükakçakese village	40°47'12"N/37°21'28"E	620	25.04.2014
98	Korgan: Entrance of Çiftlik village	40°49'30"N/37°24'01"E	343	25.04.2014
99	Korgan: Entrance of Çamlı district	40°48'55"N/37°22'47"E	450	25.04.2014
100	Korgan: Entrance of Korgan District	40°50'27"N/37°20'54"E	545	26.04.2014

101	Korgan: Between Korgan and Kumru Districts	40°49'52"N/37°19'35"E	545	26.04.2014
102	Korgan: Belalan village	40°45'46"N/37°14'23"E	1145	26.04.2014
103	Korgan: Çayrkent district	40°43'44"N/37°13'57"E	1196	26.04.2014
104	Korgan: Between Terzili and Beypınarı Villages	40°41'44"N/37°16'46"E	1058	24.04.2014
105	Korgan: Tepealan district	40°44'08"N/37°17'42"E	767	26.04.2014
106	Korgan: Yeşilalan district	40°45'14"N/37°20'23"E	805	26.04.2014
107	Korgan: Aşağıkozpınar village	40°46'45"N/37°19'44"E	789	26.04.2014
108	Korgan: Yukarıkozpınar village, on road	40°46'53"N/37°18'06"E	848	26.04.2014
109	Korgan: Yeşildere sub-village	40°47'28"N/37°16'59"E	1054	26.04.2014
110	Çamaş: Budak village	40°55'51"N/37°33'06"E	134	15.11.2013
111	Çamaş: Promenade of Gelinkaya district	40°55'20"N/37°30'43"E	579	15.11.2013
112	Çamaş: Between Çamaş and Işıktepe districts	40°53'25"N/37°31'55"E	650	15.11.2013
113	Çamaş: On way, exit of Gürgentepe District	40°54'19"N/37°31'51"E	585	15.11.2013
114	Çamaş: Entrance of Çamaş district (Çatalpınar side)	40°54'23"N/37°30'15"E	383	15.11.2013
115	Çamaş: Kocaman village	40°55'01"N/37°30'11"E	392	15.11.2013
116	Çamaş: Hisarköy village	40°55'44"N/37°30'09"E	302	15.11.2013
117	Çamaş: Edirli village	40°56'18"N/37°31'02"E	307	15.11.2013
118	Gürgentepe: Refahiye district	40°51'26"N/37°39'18"E	969	15.11.2013
119	Gürgentepe: Işıktepe district, between Çamaş and Gürgentepe)	40°47'29"N/37°35'54"E	1199	15.11.2013
120	Gürgentepe: Ohtamış and Şirin Villages	40°47'29"N/37°35'55"E	1187	15.11.2013
121	Gürgentepe: Exit of Eskiöy District	40°51'26"N/37°39'18"E	967	17.11.2013
122	Gürgentepe: Alascher village	40°51'34"N/37°37'10"E	801	17.11.2013
123	Gürgentepe: Bahtiyarlar village	40°53'01"N/37°36'05"E	447	17.11.2013
124	Gürgentepe: Between Tuzla and Hasancık villages	40°50'34"N/37°36'18"E	841	17.11.2013
125	Gürgentepe: Tepeköy village	40°47'14"N/37°30'18"E	1105	17.11.2013
126	Gürgentepe: Döşek district	40°45'33"N/37°35'43"E	1056	17.11.2013
127	Aybastı: Exit of Çakırlı district	40°40'28"N/37°22'11"E	1040	08.05.2014
128	Aybastı: Perşembe High Plateau 1	40°39'08"N/37°21'21"E	1320	08.05.2014
129	Aybastı: Perşembe High Plateau 2	40°37'13"N/37°19'01"E	1495	08.05.2014
130	Aybastı: Exit of Alakent District	40°44'35"N/37°23'07"E	709	08.05.2014
131	Aybastı: Toygar High Plateau	40°37'41"N/37°21'21"E	1314	09.05.2014
132	Aybastı: Between Pelitözü and Kızılot High Plateau	40°35'53"N/37°28'35"E	1173	09.05.2014
133	Aybastı: Pelitözü District (Kızılot High Plateau)	40°40'04"N/37°22'28"E	914	09.05.2014
134	Aybastı: Uzundere High Plateau	40°35'10"N/37°26'10"E	1140	09.05.2014
135	Aybastı: Beşdam village	40°38'12"N/37°15'11"E	1435	08.05.2014
136	Aybastı: Zaferimli village	40°38'07"N/37°23'26"E	749	09.05.2014
137	Aybastı: Hisarcık village, in valley	40°41'12"N/37°28'32"E	1048	09.05.2014
138	Aybastı: Exit of Aybastı District (Perşembe High Plateau)	40°40'28"N/37°22'11"E	1050	08.05.2014
139	Kabataş: Alankent and Kayıncık districts	40°44'18"N/37°22'18"E	775	11.05.2014
140	Kabataş: Alankent and Düz districts	40°44'05"N/37°24'34"E	608	11.05.2014
141	Kabataş: Alankent district	40°45'54"N/37°24'57"E	784	11.05.2014
142	Kabataş: Kabataş city center	40°44'41"N/37°26'54"E	448	11.05.2014
143	Kabataş: Belenköy Village	40°44'48"N/37°28'59"E	861	11.05.2014
144	Kabataş: Entrance of Beylerli village	40°43'38"N/37°27'58"E	789	11.05.2014
145	Kabataş: Between Kabataş and Gököy district, on way	40°42'59"N/37°28'01"E	639	11.05.2014
146	Altınordu: Dikence village	40°56'47"N/37°47'01"E	455	29.01.2014
147	Altınordu: Between Samsun and Ordu provinces on highway	40°00'22"N/37°50'03"E	80	29.01.2014
148	Altınordu: Boztepe village	40°00'02"N/37°50'25"E	318	29.01.2014
149	Altınordu: Orhaniye village	40°59'59"N/37°51'18"E	365	29.01.2014
150	Altınordu: Boztepe district	40°59'25"N/37°51'24"E	524	29.01.2014
151	Altınordu: Between Günören and Kısacık Villages	40°56'09"N/37°44'31"E	463	29.01.2014
152	Altınordu: Near the Kızılıhsar, Oğmaca and Şenköy Villages	40°57'53"N/37°48'18"E	383	29.01.2014
153	Altınordu: Melet River, between Sarılar and Ordu near the way (Hacılar District)	40°51'37"N/37°50'42"E	160	29.01.2014
154	Altınordu: Between Uzunmusa and Kurtulmuş Villages	40°57'39"N/37°46'23"E	407	29.01.2014
155	Altınordu: Between Yağızlı and Kayadibi villages	40°56'18"N/37°47'33"E	301	29.01.2014
156	Altınordu: Between Yeşilköy and Karaoluk villages	40°56'10"N/37°42'59"E	766	29.01.2014
157	Altınordu: Between Burhanettinköy and Çavuşlar villages	40°57'12"N/37°50'12"E	18	29.01.2014
158	Altınordu: Boztepe village and Hocaoglu District	40°49'24"N/37°46'23"E	340	29.01.2014
159	Altınordu: Kızılıhsar village	40°59'23"N/37°50'20"E	252	29.01.2014
160	Altınordu: Boyadı village	40°54'03"N/37°53'41"E	292	25.10.2014
161	Altınordu: Cevizlik village	40°53'17"N/37°47'44"E	385	11.09.2014
162	Altınordu: Top of Şuayip	40°52'47"N/37°47'32"E	490	11.09.2014
163	Altınordu: Gelincik rocks	40°56'47"N/38°20'31"E	455	11.09.2014
164	Altınordu: Arpaköy village	40°52'45"N/37°51'22"E	410	11.09.2014
165	Altınordu: Osmaniye village	40°54'10"N/38°00'14"E	672	12.09.2014
166	Altınordu: Saraycık village, exit of the country forest	40°55'54"N/37°59'06"E	196	12.09.2014
167	Altınordu: Turnasuyu valley, near the building site	40°41'07"N/37°57'54"E	1377	12.09.2014
168	Altınordu: City forest	40°55'52"N/38°01'08"E	720	12.09.2014
169	Altınordu: Sub-city forest	40°55'46"N/38°00'38"E	543	12.09.2014
170	Altınordu: Saraycık center (Değirmen suyu)	40°55'55"N/37°58'40"E	75	13.09.2014
171	Altınordu: Entrance of Saraycık district, near the Turnasuyu village	40°56'23"N/37°59'43"E	150	13.09.2014
172	Altınordu: Between Saraycık and Turnasuyu village	40°57'08"N/38°00'07"E	35	13.09.2014
173	Altınordu: Between Saraycık village and exit of Topluca village	40°55'46"N/37°58'10"E	116	13.09.2014
174	Altınordu: Between Saraycık village and exit of Emenköy village	40°55'51"N/37°59'46"E	347	13.09.2014
175	Altınordu: Akçatepe village	40°57'49"N/37°57'33"E	65	14.09.2014
176	Altınordu: Sarıca district	40°57'27"N/37°58'48"E	223	14.09.2014
177	Altınordu: Yukarıtepe village	40°56'18"N/37°57'48"E	26	14.09.2014
178	Altınordu: Zaferköy village	40°54'43"N/37°58'14"E	388	14.10.2014

179	Altınordu: Gökömer village	40°53'34"N/37°57'01"E	373	14.09.2014
180	Altınordu: Bayramlı village	40°51'32"N/37°56'10"N	277	14.09.2014
181	Fatsa: Yanyaylacık village	40°49'34"N/37°18'34"E	775	29.01.2014
182	Fatsa: Kocaman village	40°48'36"N/37°18'47"E	776	29.01.2014
183	Fatsa: Yalnızdam village	40°56'43"N/37°34'44"E	230	29.01.2014
184	Fatsa: Budak village, in valley	40°55'05"N/37°33'38"E	125	14.11.2013
185	Fatsa-İlica 2	40°58'45"N/ 37°35'12"E	50	14.11.2013
186	Fatsa: İlica 1	40°58'27"N/37°36'03"E	88	14.11.2013
187	Fatsa: İlica 3	40°58'45"N/37°35'12"E	50	14.11.2013
188	Fatsa: İlica 4 (Akçakese district)	40°58'42"N/37°34'55"E	58	21.03.2014
189	Fatsa: Between Dereyurt and Klavuzömer Districts, in valley	40°55'51"N/ 37°33'38"E	126	14.11.2013
190	Fatsa: Between Kabakdağı and Dağlarca villages	40°57'48"N/37°39'51"E	461	14.11.2013
191	Fatsa: Between Dereyurt and Klavuzömer villages	40°55'51"N/37°33'38"E	126	14.11.2013
192	Fatsa: Yapraklı Village	41°03'51"N/37°26'33"E	139	23.03.2014
193	Fatsa: Between Başköy and Yapraklı villages	41°02'59"N/37°27'18"E	288	23.03.2014
194	Fatsa: Sazcılar village	41°01'56"N/37°26'47"E	152	21.03.2014
195	Fatsa: Yeşiltepe village	41°01'29"N/37°26'07"E	324	21.03.2014
196	Fatsa: Çötel village	41°02'08"N/37°25'20"E	286	21.03.2014
197	Fatsa: Suludere village	41°00'40"N/37°25'00"E	254	21.03.2014
198	Fatsa: Hoylu village 1	41°00'20"N/37°29'04"E	204	21.03.2014
199	Fatsa: Aşağıtepe village	41°00'40"N/37°27'00"E	151	21.03.2014
200	Fatsa: Bahçeler village	40°59'37"N/37°25'35"E	178	21.03.2014
201	Fatsa: Yukarıbahçeler village	40°59'16"N/37°24'21"E	348	21.03.2014
202	Fatsa: Çömlekçi village	40°59'35"N/37°28'02"E	204	21.03.2014
203	Fatsa: Bucaklı village	40°58'28"N/37°28'09"E	378	21.03.2014
204	Fatsa: Karataş village	40°58'17"N/37°28'51"E	235	22.03.2014
205	Fatsa: Bozdağı village	40°58'26"N/37°26'31"E	228	22.03.2014
206	Fatsa: Büyükköç village	40°56'56"N/37°26'58"E	566	22.03.2014
207	Fatsa: Kulak village	40°56'24"N/37°28'11"E	300	22.03.2014
208	Fatsa: Salihli village	40°56'42"N/37°23'59"E	208	22.03.2014
209	Fatsa: Bacanak village	40°55'08"N/37°24'53"E	453	22.03.2014
210	Fatsa: Kösbucağı district	40°53'33"N/37°24'11"E	337	22.03.2014
211	Fatsa: Hatipli district	40°56'56"N/37°21'56"E	222	22.03.2014
212	Fatsa: Yenidoğan village	40°53'42"N/37°23'21"E	310	22.03.2014
213	Çatalpınar: Exit of Çatalpınar 1	40°51'26"N/37°39'18"E	979	16.11.2013
214	Çatalpınar: Exit of Çatalpınar 2	40°37'23"N/37°27'34"E	265	16.11.2013
215	Çatalpınar: Sayacatürk village	40°49'23"N/37°27'34"E	258	16.11.2013
216	Çatalpınar: Ortaköy village	40°49'07"N/37°26'22"E	760	16.11.2013
217	Çatalpınar: Madenköy village	40°51'49"N/37°24'23"E	518	16.11.2013
218	Çatalpınar: Karahamza village	40°53'49"N/37°25'30"E	547	16.11.2013
219	Çatalpınar: Akkaya village	40°54'06"N/37°26'20"E	314	16.11.2013
220	Çatalpınar: Gündoğdu village	40°50'46"N/37°27'55"E	538	16.11.2013
221	Çatalpınar: Keçili village	40°51'18"N/37°28'33"E	758	16.11.2013
222	Gölköy: Between Karahasan and Aydoğan Districts	40°40'22"N/37°32'29"E	918	10.05.2014
223	Gölköy: Ulugöl Nature Park	40°37'39"N/37°33'00"E	1200	10.05.2014
224	Gölköy: Güzelyurt district	40°41'12"N/37°28'31"E	1047	10.05.2014
225	Gölköy: Güzelyayla district	40°35'48"N/37°34'14"E	1400	10.05.2014
226	Gölköy: Between Haruniye and Süleymaniye villages	40°37'40"N/37°32'59"E	1100-1200	10.05.2014
227	Gölköy: Düzyayla district	40°35'57"N/37°28'35"E	1275	10.05.2014
228	Gölköy: Alanyurt district	40°40'26"N/37°33'26"E	1000	10.05.2014
229	Gölköy: Between Gölköy and Mesudiye Districts, near the way	40°37'45"N/37°37'42"E	1223	22.08.2014
230	Gölköy: between Gölköy – Mesudiye districts, Harçbeli passage	40°35'44"N/37°38'14"E	1540	22.08.2014
231	Gölköy: Entrance of Kozören village	40°40'50"N/37°39'51"E	1020 m	22.08.2014
232	Mesudiye: Kızılağaç High Plateau	40°35'03"N/37°50'54"E	1695-1750	21.08.2014
233	Mesudiye: Armutkolu High Plateau	40°36'16"N/37°55'41"E	1956-2200	21.08.2014
234	Mesudiye: Zile High Plateau	40°35'06"N/37°52'42"E	1930-2000	21.08.2014
235	Mesudiye: Mahmudiye, Çukuralan and Hamzalı Forests	40°35'35"N/37°40'22"E	1200	22.08.2014
236	Mesudiye: Entrance of Topçam District	40°37'36"N/37°46'51"E	794	21.08.2014
237	Mesudiye: Eastern of Topçam Dam	40°35'52"N/37°48'55"E	1539	21.08.2014
238	Mesudiye: Exit of Doğançam Village	40°30'17"N/37°52'11"E	1757	20.08.2014
239	Mesudiye: Doğançam village	40°30'16"N/37°51'29"E	1570	20.08.2014
240	Mesudiye: Between Konacık and Sarıyayla villages	40°31'23"N/37°47'49"E	1268	22.08.2014
241	Mesudiye: Near the Kışlacık, Çardaklı and Çavdar villages	40°23'34"N/37°41'22"E	1461	20.08.2014
242	Mesudiye: Between Ilışar and Göçbeyi villages	40°25'09"N/37°43'16"E	1518	20.08.2014
243	Mesudiye: Between Türkköyü and Esatlı Villages	40°25'19"N/37°42'22"E	1294	20.08.2014
244	Mesudiye: The top of the village Herközü and Karacaören villages	40°30'15"N/37°55'18"E	1620-1650	20.08.2014
245	Mesudiye: Bayraklı Village	40°29'55"N/37°54'19"E	1443	20.08.2014
246	Mesudiye: Between Aşağı Gökçe and Yukarı Gökçe Villages	40°28'48"N/37°50'52"E	1333	20.08.2014
247	Mesudiye: Upward Kaleköy and Çerçi Villages	40°29'29"N/37°46'34"E	1310	21.08.2014
248	Mesudiye: Near Sarıyayla, Yağmurlar and Konacık Villages	40°31'15"N/37°47'30"E	1268	21.08.2014
249	Mesudiye: Arpaalan High Plateau	40°21'15"N/37°52'11"E	1676	23.08.2014
250	Mesudiye: Keyfalan High Plateau	40°24'31"N/37°52'37"E	1956	23.08.2014
251	Mesudiye: Between Güvenli and Musalı Villages	40°25'59"N/37°50'59"E	1489	23.08.2014
252	Mesudiye: Side of Yeşilce, Yeveli, Gülpınar and Beyağaç Villages	40°32'15"N/37°49'35"E	1377	23.08.2014
253	Akkuş: Karaça village, in valley	40°45'49"N/37°04'34"E	1250-1350	26.10.2014
254	Akkuş: Şehit Kerim village	40°51'00"N/36°47'29"E	989	26.10.2014
255	Akkuş: Between Çukurköy and Gedikli villages	40°49'03"N/36°52'56"E	953-1000	28.01.2015
256	Akkuş: Meyveli village	40°45'29"N/36°53'39"E	770	25.10.2014
257	Akkuş: Exit of Çavdarlı village	40°45'12"N/36°51'22"E	1154	25.10.2014

258	Akkuş: Between Akgün and Ceyhanlı Villages	40°45'12"N/36°51'22"E	1152	25.10.2014
259	Akkuş: Şahinköy district	40°53'26"N/36°47'18"E	1030-1100	25.10.2014
260	Akkuş: Between Yolbaşı and Gökçebayır districts	40°42'33"N/37°00'50"E	995-1050	23.10.2014
261	Akkuş: Yukarı Düğenceli village	40°45'23"N/37°01'32"E	1216-1250	24.10.2014
262	Akkuş: Seferli district	40°49'39"N/36°50'46"E	998-1100	28.01.2015
263	Akkuş: Ortabölme village	40°49'18"N/36°53'20"E	1195	26.10.2014
264	Akkuş: Exit of Akkuş district, on the Niksar way	40°46'07"N/37°02'08"E	1376-1400	24.10.2014
265	Akkuş: Yukarı Düğenceli village	40°44'37"N/37°02'11"E	1143-1200	24.10.2014
266	Akkuş: Akpınar District (Kuzköy), in valley	40°52'06"N/36°52'31"E	921-1000	28.01.2015
267	Akkuş: Kemikgeriş Village	40°50'00"N/36°55'03"E	991-1100	25.10.2014
268	Akkuş: Between Şehitkerim and Tapoluk districts	40°50'19"N/36°45'30"E	665	24.10.2014
269	Akkuş: Yolbaşı village (on the Niksar way)	40°42'01"N/36°59'54"E	1060-1150	23.10.2014
270	Akkuş: On the Yolbaşı village road (border of Niksar District)	40°41'34"N/36°59'43"E	1043-1150	23.10.2014
271	Akkuş: Kargı village, in valley	40°51'47"N/36°42'31"E	215-300	29.01.2015
272	Akkuş: Çökek village	40°51'55"N/36°42'25"E	239	29.01.2015
273	Akkuş: Between Dağyolu and Ambergürgen villages	40°53'15"N/36°47'22"E	1100	29.01.2015
274	Akkuş: Çukurköy Village	40°46'21"N/36°56'08"E	914-1050	25.01.2015
275	Akkuş: Exit of Akkuş district, on the Salman way	40°47'49"N/36°59'13"E	1073-1120	25.01.2015
276	Akkuş: Entrance of Salman district	40°51'39"N/36°50'35"E	1258	28.01.2015
277	İkizce: Entrance of Yoğunluk district	40°57'55"N/36°57'44"E	962	30.01.2015
278	İkizce: Entrance of Devecik Village	40°57'39"N/36°59'09"E	862	30.01.2015
279	İkizce: Kaynartaş district	41°00'14"N/37°01'11"E	60	30.01.2015
280	İkizce: Şenoluk district	41°02'13"N/36°59'50"E	558	30.01.2015
281	İkizce: Between İkizce and Kaynartaş districts	41°01'33"N/37°02'48"E	247	31.01.2015
282	İkizce: Between İkizce and Şenoluk districts	41°02'03"N/37°00'29"E	389	31.01.2015
283	İkizce: Düzmeşe villages	41°04'33"N/37°02'00"E	272	31.01.2015
284	İkizce: Between Esentepe and Kiraztepe villages	41°05'32"N/37°03'33"E	484	31.01.2015
285	İkizce: Exit of Dumanlıtepe district	41°06'01"N/37°04'32"E	370	27.01.2015
286	Çaybaşı: Between Çaybaşı and İkizce villages	41°02'14"N/37°05'15"E	500-550	29.04.2015
287	Çaybaşı: Between Akbaba and İçeribükü districts	40°58'52"N/37°05'25"E	680-700	30.04.2015
288	Çaybaşı: Göksu village	40°55'24"N/36°59'26"E	818-850	30.04.2015
289	Çaybaşı: Köklü village	40°58'22"N/37°01'54"E	860-900	30.04.2015
290	Çaybaşı: Kapılı village	40°58'49"N/36°59'30"E	1030-1100	30.04.2015
291	Ünye: Ünye Castle	41°05'48"N/37°14'22"E	182	02.05.2015
292	Ünye: Yenikent district	40°56'01"N/37°07'09"E	922-1000	02.05.2015
293	Ünye: Between Yavi village and Ataköy district	41°03'54"N/37°08'58"E	260-300	02.05.2015
294	Ünye: Between Kuşçulu and Düzköy districts	41°03'18"N/37°18'03"E	200-250	30.04.2015
295	Ünye: Yeşilkent district	41°00'35"N/37°14'41"E	168	02.05.2015
296	Ünye: Saraycık village	41°02'37"N/37°16'44"E	240-260	01.05.2015
297	Ünye: Between Çiğdem and Yahyalı Villages	41°03'26"N/37°19'34"E	98	01.05.2015
298	Ünye: Between Sarıhalil and Erenyurt districts	40°59'36"N/37°22'18"E	660-700	01.05.2015
299	Ünye: Sarıhalil village	41°00'49"N/37°21'10"E	245-150	01.05.2015
300	Ünye: Between Yeniköy and Ortaköy villages	40°54'41"N/37°09'41"E	478-550	02.05.2015
301	Ünye: Asarkaya district (Country forest)	41°05'43"N/37°20'58"E	265-350	01.05.2015
302	Ünye: Şenyurt village	41°02'25"N/37°24'22"E	246	21.07.2015
303	Ünye: Keş village	41°03'03"N/37°24'52"E	84	22.07.2015
304	Fatsa: Yusufllu village	40°57'41"N/37°23'01"E	367	22.07.2015
305	Fatsa: Oluklu village	40°57'34"N/37°24'01"E	369	23.07.2015
306	Fatsa: Bozdağı village	40°56'57"N/37°26'56"E	554	23.07.2015
307	Fatsa: Hıdırbeyli village	40°58'52"N/37°26'46"E	200	24.07.2015
308	Fatsa: Between Saraytepe and Aşağıardıç districts	40°59'11"N/37°27'28"E	189	24.07.2015
309	Fatsa: Between Çömllekli and Tahtabaş districts	40°59'37"N/37°28'06"E	226	24.07.2015
310	Fatsa: Hoylu Village-2	41°00'14"N/37°28'54"E	205	25.07.2015