

THE BRYOPHYTE FLORA OF ARDAHAN PROVINCE (TURKEY)

БРИОФЛОРА ПРОВИНЦИИ АРДАХАН (ТУРЦИЯ)

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Abstract

As a result of bryological excursion in the Ardahan Province in Turkey (Northeast Anatolia), a total of 408 bryophytes belonging to 141 genera and 55 families were determined from 120 different localities, including one hornwort, 37 liverworts and 370 mosses. Among them, *Hennediella heimii*, *Syntrichia minor* and *Bryum warneum* are reported for the second time from Turkey. Also, almost all bryophyte taxa are new for Ardahan Province.

Резюме

В результате бриологических исследований в 120 точках в провинции Ардахан в северо-восточной Турции (Северная Анатолия), выявлено 408 видов и разновидностей мохообразных из 141 родов и 55 семейств. В их числе 1 представитель антоцеротовых, 37 печеночников, 370 мхов. Из редких видов можно особо отметить *Hennediella heimii*, *Syntrichia minor* и *Bryum warneum*, находки которых – вторые для Турции. Почти все виды – новые для провинции.

KEYWORDS: Biodiversity, Ardahan, Bryophyte, Flora, Turkey

INTRODUCTION

To date, four Bryophytes (*Barbilophozia lycopodioides* (Wallr.) Loeske; *Hygrohypnum ochraceum* (Turner ex Wilson) Loeske, *Hageniella micans* (Mitt.) B.C. Tan & Y. Jia and *Herzogiella turfacea* (Lindb.) Z.Iwats.) have been reported from Ardahan region (Batan *et al.*, 2015; Batan *et al.*, 2016a; Batan *et al.*, 2016b; Batan & Özdemir, 2016). Ardahan province is located in the Euro-siberian floristic region. It is surrounded by Georgia to the North, Kars to the East, Erzurum to the South and Artvin to the West.

In the East Anatolia region (including Ardahan), the elevation of mountains exceeds 2000–3000 m. Ardahan is a mountainous province, mostly situated above 2000 m elevation. Black Sea Mountains and Caucasian Mountains hold the rain clouds, and so the area has the continental climate with long, cold winter and heavy snowfall. Also, Ardahan (including City center, Çıldır, Hanak, Damal and Göle districts) has warm and short summers with cool nights. The annual mean air temperature is below 4°C. The year's warmest month is July with 35°C and the coldest month is January with –38°C. The average annual rainfall is 533.4 mm. The most rainfall (rainy season) is seen in April, May and June. The annual average humidity is 71% (Akman, 1999; Yazıcı *et al.*, 2011).

On the other hand, the climate is different in Posof district (Ardahan) (Fig. 1), in where rainy winters and

hot summers. The precipitation is seen in every season. Average annual precipitation is 600 mm (Akman, 1999; Yazıcı *et al.*, 2011).

Alpine meadows covering a larger area especially in south and north of Ardahan province (including City center, Çıldır, Hanak, Damal and Göle districts), are common in this region. Forest are very small consisting of *Pinus sylvestris* L. occurring on outskirts of the some mountains in higher parts of the Ardahan region. *Salix* sp., *Populus* sp., *Pyrus* sp. and *Prunus* sp. are especially predominant in emplacements. Posof district has a rich forest cover, consisting of *Quercus* sp., *Pinus* sp. *Picea* sp., *Fagus* sp., *Carpinus* sp., *Ulmus* sp., *Corylus* sp. and alpine meadow on the mountains (Baytop & Denizci, 1963; Yazıcı *et al.*, 2011).

The paper adds noticeable information to knowledge of the bryophyte flora of Ardahan, East Anatolia region and Turkey. This is the first checklist of bryophytes for Ardahan province.

MATERIALS AND METHODS

The bryophyte samples were collected in 120 different localities between 2 June 2014 and 13 August 2016 from Ardahan province in Turkey (Fig. 1). The samples were examined with Carl Zeiss Stemi 2000-C stereomicroscope and Carl Zeiss Axio Imager A2 light microscope. Identifications were determined by consulting keys (Crum & Anderson, 1981; Ireland, 1982; Nyholm, 1986,

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1. Figure 1. Map of the study area.

1989, 1993, 1998; Lewinsky, 1993a, 1993b; Blom, 1996; Smith, 1996, 2004; Paton, 1999; Pedrotti, 2001, 2006; Greven, 2003; Heyn & Herrstadt, 2004; Frey *et al.*, 2006; Guerra *et al.*, 2006; Guerra & Cros, 2007; Kürschner & Frey, 2011).

The status of taxa for Turkey were evaluated by reviewing the related literature (Uyar & Çetin, 2004; Kürschner & Erdağ, 2005; Ozenoglu-Kiremit & Keceli, 2009; Kürschner & Frey, 2011; Ros *et al.*, 2013).

LIST OF SPECIES

The nomenclature of the species follows Ros *et al.* (2007) for liverworts and Ros *et al.* (2013), Plášek *et al.* (2015) and Lara *et al.* (2016) for mosses. Vouchers are deposited in the Biology Department, Faculty of Science, Karadeniz Technical University, Turkey. The collected bryophytes were investigated and 408 taxa (species, subspecies and varieties) belonging to 141 genera and 55 families were identified. Of them, *Hennediella heimii*, *Syntrichia minor* and *Bryum warneum* are recorded for the second time from Turkey.

ANTHOCEROTOPHYTA

Notoethyladaceae (Milde) Müll. Frib. ex Prosk.

Phaeoceros laevis (L.) Prosk. – 33, 41, 52, 54, 63: on rock.

MARCHANTIOPHYTA

Lunulariaceae H. Klinggr.

Lunularia cruciata (L.) Lindb. – 103, 105: on wet rock.

Aytoniaceae Cavers

Reboulia hemisphaerica (L.) Raddi - Loc. 105: on soil and rock.

Conocephalaceae Müll. Frib. ex Grolle

Conocephalum conicum (L.) Dumort. – 17, 111, 118: on soil.

Marchantiaceae Lindl.

Marchantia polymorpha L. – 16, 18, 68, 120: on soil and rock by streams.

Pelliaceae H. Klinggr.

Pellia endiviifolia (Dicks.) Dumort. – 17, 111, 113, 118: on wet soil.

P. epiphylla (L.) Corda – 16: on wet soil.

P. neesiana (Gottsche) Limpr. – 18: on wet soil.

Calypogeiaceae Arnell

Calypogeia muelleriana (Schiffn.) Müll. Frib. – 16: on wet soil.

Jungermanniaceae Rchb.

Jungermannia atrovirens Dumort. – 105: on soil and rock.

J. gracillima Sm. – 105: on soil and rock by stream.

J. hyalina Lyell – 105: on rock by stream.

Tritomaria quinquentata (Huds.) H. Buch – 16: on wet rock.

Lophocoleaceae Vanden Berghen

Chiloscyphus polyanthos (L.) Corda – 15, 62, 66, 68, 78, 119, 120: on wet soil and rock.

C. pallescens (Ehrh. ex Hoffm.) Dumort. – 105: on wet soil and rock.

Lophocolea bidentata (L.) Dumort. – 7, 10, 12, 16, 18, 22, 55, 78: on rock.

L. heterophylla (Schrad.) Dumort. – 1, 2, 5, 6, 7, 15, 18, 21, 50, 56, 79, 84: on trunk of tree.

L. minor Nees – 2, 17, 113: on trunk of tree and rock.

Scapaniaceae Mig.

Barbilophozia barbata (Schmidel ex Schreb.) Loeske – 4, 7, 19, 21, 22, 39, 50, 56, 59, 63, 71, 76, 78: on soil and rock.

B. haecheri (A. Evans) Loeske – 19, 56, 59: on rock.

Diplophyllum albicans (L.) Dumort. – 59, 86, 103: on soil and rock.

Lophozia ventricosa (Dicks.) Dumort. – 114, 116: on wet soil.

Scapania aspera Bernet et M. Bernet – 12, 59, 103: on wet soil and rock.

S. nemorea (L.) Grolle – 2, 12: on wet soil and rock.

S. subalpina (Nees ex Lindenb.) Dumort. – 2, 12: on wet soil by stream.

Arnelliaceae Nakai

Southbya tophacea (Spruce) Spruce – 18, 68, 119, 120: on soil and rock.

Plagiochilaceae Müll. Frib.

Plagiochila asplenioides (L. emend. Taylor) Dumort. – 1, 18, 47, 73, 113: on soil and rock.

P. porelloides (Torrey ex Nees) Lindenb. – 18, 73: on soil and rock.

Porellaceae Cavers

Porella cordaeana (Huebener) Moore – 23, 56, 97: on rock.

P. obtusa (Taylor) Trevis. – 18, 59: on rock.

P. pinnata L. – 103: on soil and rock by stream.

P. platyphylla (L.) Pfeiff. – 23, 25, 55, 56, 59, 65: on rock.

Radulaceae Müll. Frib.

Radula complanata (L.) Dumort. – 8, 12, 18, 23, 39, 50, 56, 57: on rock.

R. lindenbergiana Gottsche ex C. Hartm. – 1, 23, 25, 57, 59: on rock.

Frullaniaceae Lorch

Frullania dilatata (L.) Dumort. – 57, 86: on trunk of tree.

F. tamarisci (L.) Dumort. – 105: on rock.

Metzgeriaceae H. Klinggr.

Metzgeria conjugata Lindb. – 103: on trunk of tree and rock.

M. furcata (L.) Dumort. – 103: on trunk of tree and rock.

BRYOPHYTA

Polytrichaceae Schwägr.

- Atrichum undulatum* (Hedw.) P. Beauv. – 10, 86: on soil.
Pogonatum urnigerum (Hedw.) P. Beauv. – 4, 19, 21, 73, 78, 101, 110, 116: on soil and rock.
Polytrichastrum alpinum (Hedw.) G.L.Sm. – 8, 19, 56, 71, 112: on soil.
P. sexangulare (Brid.) G.L.Sm. – 86, 110: on wet soil.
Polytrichum commune Hedw. – 11, 12, 19, 21, 50, 56, 71, 104, 110: on soil.
P. formosum Hedw. – 9, 11, 56, 71, 105, 113: on soil.
P. juniperinum Hedw. – 1, 2, 7, 15, 22, 23, 38, 39, 42, 45, 46, 50, 51, 53, 55, 56, 58, 59, 60, 62, 65, 66, 68, 71, 73, 74, 75, 76, 78, 79, 83, 84, 85, 92, 101, 104, 108, 113, 115, 116, 119, 120: on soil.
P. piliferum Hedw. – 4, 12, 21, 44, 55, 58, 60, 69, 105: on soil.
P. strictum Menzies ex Brid. – 52: on wet soil.

Timmiaceae Schimp.

- Timmia austriaca* Hedw. – 23, 39, 104, 108, 109: on wet soil and rock.
T. bavarica Hessel. – 24: on soil.
T. norvegica J.E.Zetterst. – 109: on soil.

3. Encalyptaceae Schimp.

- Encalypta ciliata* Hedw. – 23, 38, 39, 42, 45, 51, 65, 78, 112: on rock.
E. pilifera Funck in Sturm – 25, 31, 32, 39: on rock.
E. rhaptocarpa Schwägr. var. *rhaptocarpa* – 45: on rock.
E. rhaptocarpa var. *leptodon* Lindb. – 25, 36, 83: on rock.
E. streptocarpa Hedw. – 65, 67, 71, 74, 81, 106, 108: on rock.
E. vulgaris Hedw. – 11, 23, 38, 39, 45, 46, 74, 88, 90, 108: on soil and rock.

Funariaceae Schwägr.

- Entosthodon fascicularis* (Hedw.) Müll.Hal. – 2: on soil.
Funaria hygrometrica Hedw. – 57, 100: on soil.

Grimmiaceae Arn.

- Grimmia alpestris* (F.Weber & D.Mohr) Schleich. – 18, 44, 52: on rock.
G. anodon Bruch & Schimp. – 23, 25, 31, 38, 39, 44, 52, 57, 61, 91: on rock.
G. anomala Hampe ex Schimp. – 55, 60, 69, 70, 95: on rock.
G. decipiens (Schultz) Lindb. – 63, 67, 71, 110: on rock.
G. dissimulata E.Maier – 73: on rock.
G. donniana Sm. – 1, 7, 19, 21, 86, 117: on rock.
G. elatior Bruch ex Bals.-Criv. & De Not. – 55, 58: on rock.
G. elongata Kaulf. – 96: on rock.
G. funalis (Schwägr.) Bruch & Schimp. – 4, 21, 90: on rock.
G. laevigata (Brid.) Brid. – 23, 38, 39, 42, 45, 102: on rock.
G. lisae De Not. – 19, 29, 76, 86, 117: on rock.
G. longirostris Hook. – Loc. 26, 30, 31, 32, 33, 37, 57, 97: on rock.
G. montana Bruch & Schimp. – 18, 19, 102: on rock.
G. orbicularis Bruch ex Wilson – 23, 38, 39: on rock.
G. ovalis (Hedw.) Lindb. – 1, 3, 4, 5, 8, 9, 10, 11, 13, 14, 21, 23, 24, 25, 26, 27, 28, 29, 30, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 45, 46, 49, 50, 51, 65, 74, 77, 78, 81, 83, 91, 93, 96, 98, 99, 100, 102, 103, 105, 108, 110, 112: on rock.
G. pulvinata (Hedw.) Sm. – 11, 24, 28, 42, 51, 54, 83, 86, 87, 89, 91, 92, 95, 98, 100, 103, 105, 108, 117: on rock.
G. reflexidens Müll. Hal. – 24: on rock.
G. tergestina Tømm. ex Bruch & Schimp. – 42, 43, 75, 96: on rock.
G. trichophylla Grev. – 10, 11, 24, 103, 108, 110: on rock.

Racomitrium sudeticum (Funck) Bruch & Schimp. – 86: on rock.

- Schistidium apocarpum* (Hedw.) Bruch & Schimp. – 1, 5, 8, 9, 10, 20, 34, 55, 58, 73, 78, 86, 90, 96, 98, 102, 103, 105, 117: on rock.
S. atrofusum (Schimp.) Limpr. – 8, 96: on rock.
S. brunnescens Limpr. var. *brunnescens* – 57: on rock.
S. brunnescens subsp. *griseum* (Nees & Hornsch.) H.H.Blom – 57: on rock.
S. confertum (Funck) Bruch & Schimp. – 1, 42, 54, 62, 63, 65, 67, 71, 97, 100: on rock.
S. crassipilum H.H.Blom- Loc. 1, 93: on rock.
S. dupretii (Thér.) W.A.Weber – 20, 55, 69: on rock.
S. elegantulum H.H.Blom – 20: on rock.
S. helveticum (Schkuhr) Deguchi – 57, 112: on rock.
S. platyphyllum (Mitt.) H.Perss. – 55: on rock.
S. pruinatum (Wilson ex Schimp.) G.Roth – 90: on rock.
S. rivulare (Brid.) Podp. – 10, 57, 117: on rock.
S. spinosum H.H.Blom & Lüth – 63, 67, 71: on rock.
S. strictum (Turner) Loeske ex Martensson – 109: on rock.
S. trichodon (Brid.) Poelt – 1, 66, 86, 117: on rock.

Rhabdoweisiaceae Limpr.

- Cynodontium jenneri* (Schimp.) Stirt. – 59: on rock.
C. polycarpon (Hedw.) Schimp. – 59: on rock.
Dichodontium palustre (Dicks.) M. Stech – 2, on wet soil.
D. pellucidum (Hedw.) Schimp. – 16, 73: on rock by stream.
Dicranoweisia cirrata (Hedw.) Lindb. – 4, 21, 55: on trunk of tree and soil.
Hymenoloma crispulum (Hedw.) Ochyra – 1, 5, 7, 10, 11, 18, 20, 21, 23, 38, 39, 49, 50, 55, 56, 65, 66, 67, 69, 71, 102, 104, 110, 112, 115, 116: on rock.

Leucobryaceae Schimp.

- Dicranodontium denudatum* (Brid.) E. Britton – 50: on rock and in woodland.
Leucobryum glaucum (Hedw.) Lngstr. – Loc.103: on rotten tree.
Ditrichaceae Limpr.
Ceratodon conicus (Hampe) Lindb. – 23, 38, 39: on soil and rock.
C. purpureus (Hedw.) Brid. – 4, 20, 21, 23, 25, 36, 38, 39, 44, 52, 53, 55, 56, 58, 59, 60, 65, 67, 71, 83, 88, 94, 95, 101, 111, 116, 118: on soil and rock.
Distichium capillaceum (Hedw.) Bruch & Schimp. – 104: on rock.
D. inclinatum (Hedw.) Bruch & Schimp. – 56, 63, 71: on wet rock.
Ditrichum flexicaule (Schwägr.) Hampe – 96: on soil.
D. pusillum (Hedw.) Hampe – Loc.110: on soil.
Saellania glaucescens (Hedw.) Broth. – 73, 101, 104: on rock.
Dicranaceae Schimp.
Dicranella heteromalla (Hedw.) Schimp. – 54, 76, 106: on soil.
D. rufescens (With.) Schimp. – 1: on wet soil by stream.
D. varia (Hedw.) Schimp. – 2, 49, 50: on wet soil by stream.
Dicranum bonjeanii De Not. – 12, 53, 55, 59, 65, 67, 69, 71: on wet soil.
D. brevifolium (Lindb.) Lindb. – 56, 63, 71, 76: on soil and rock.
D. flagellare Hedw. – 78: on rotten tree.
D. flexicaule Brid. – 50: on soil and in woodland.
D. fulvum Hook. – 49, 50, 56, 57, 59, 61, 63, 71: on soil and in woodland.
D. fuscescens Sm. – 8, 9, 11, 34, 50, 108, 110: on rock.
D. majus Turner – 1, 5, 19, 20, 21, 48, 49, 50, 73, 78, 89, 98:

- on rock.
- D. montanum* Hedw. – 99: on rock and in woodland.
- D. muehlenbeckii* Bruch & Schimp. – 19, 56, 71: on rock and in woodland.
- D. polysetum* Sw. ex anon. – 6, 78, 109, 110: on wet soil and in woodland.
- D. scoparium* Hedw. – 3, 5, 6, 7, 8, 9, 10, 13, 14, 15, 18, 20, 34, 35, 57, 66, 73, 79, 84, 85, 96, 103, 104, 105, 108, 110, 118: on rock, on trunk of tree and in woodland.
- D. spadiceum* J.E.Zetterst. – 57: on rock and in woodland.
- D. tauricum* Sapjegin – 76: on rotten tree, on rock.
- Fissidentaceae** Schimp.
- Fissidens adianthoides* Hedw. – 22, 76, 106: on wet soil and on wet rock.
- F. taxifolius* Hedw. – 1, 100: on soil and rock.
- Pottiaceae** Schimp.
- Anoetangium aestivum* (Hedw.) Mitt. – 112: on rock.
- Barbula convoluta* Hedw. – 21, 90, 93, 97: on soil.
- B. enderesii* Garov. – 22: on soil.
- B. unguiculata* Hedw. – 20, 48, 53, 61, 62, 68, 73, 90, 91, 100, 119, 120: on soil.
- Bryoerythrophyllum ferruginascens* (Stirt.) Giacom. – 23, 38, 39, 73, 86, 92, 93, 97, 100, 111, 113: on soil and on rock by stream.
- B. recurvirostrum* (Hedw.) P.C. Chen – 20, 22, 48, 53, 61, 62, 68, 72, 73, 77, 79, 80, 83, 84, 85, 86, 88, 97, 111, 119, 120: on soil and rock.
- B. rubrum* (Jur.) P.C. Chen – 25, 36, 88: on soil and on rock by stream.
- Dialytrichia mucronata* (Brid.) Broth. – 74, 81: on rock by stream.
- Didymodon acutus* (Brid.) K.Saito – 26, 30, 31, 32, 33, 37, 40, 86, 98, 100, 105, 108: on wet soil and rock.
- D. australasiae* (Hook. & Grev.) R.H.Zander – 112: on wet soil and rock.
- D. fallax* (Hedw.) R.H. Zander. – 42, 46, 78, 79, 84, 85: on wet soil.
- D. glaucus* Ryan – 56, 63, 71: on rock.
- D. icmadophilus* (Schimp. ex Müll.Hal.) K.Saito – 10, 105, 110, 112: on wet soil and rock.
- D. insulanus* (De Not.) M.O. Hill – 83: on soil.
- D. luridus* Hornsch. – Loc.42: on wet rock.
- D. nicholsonii* Culm. – 22, 57, 72, 74, 76, 77, 83: on rock.
- D.rigidulus* Hedw. – 1, 5, 23, 24, 38, 39, 104, 110, 108: on rock.
- D.tophaceus* (Brid.) Lisa – 89: on wet rock.
- D. vinealis* (Brid.) R.H.Zander – 23, 38, 39, 48, 54, 57, 59, 61, 65, 72, 75, 77, 79, 80, 81, 82, 83, 84, 85: on rock.
- Gymnostomum calcareum* Nees & Hornsch. – 65: on wet soil.
- G. viridulum* Brid. – 67: on soil.
- Hennediella heimii* (Hedw.) R.H.Zander – 19: on soil.
- Microbryum curvicollum* (Hedw.) R.H.Zander – 97: on soil.
- Oxystegus tenuirostris* (Hook. & Taylor) A.J.E.Sm. – 76: on rock.
- Syntrichia calcicola* J.J.Amann – 19, 45, 67, 71, 75, 83, 88, 102, 112: on soil.
- S. laevipila* Brid. – 98: on soil.
- S. minor* (Bizot) M.T.Gallego, J.Guerra, M.J.Cano, Ros & Sánchez-Moya – 18 19: on soil.
- S. montana* Nees – 1, 11, 18, 19, 22, 23, 24, 25, 27, 28, 29, 31, 32, 36, 38, 39, 40, 42, 44, 45, 50, 52, 53, 58, 60, 62, 65, 71, 74, 75, 76, 77, 78, 80, 82, 83, 88, 89, 90, 92, 94, 96, 97, 98, 99, 100, 102, 103, 106, 108, 114, 115, 118: on soil.
- S. norvegica* F.Weber – Loc.19, 79, 84, 97, 103: on soil.
- S. papillosissima* (Copp.) Loeske – 103, 107, 109: on soil.
- S. princeps* (De Not.) Mitt. – 43: on soil.
- S. ruralis* var. *ruraliformis* (Besch.) Delogne. – 42, 65, 67, 71, 77, 80, 102, 112, 115: on soil.
- S. ruralis* var. *ruralis* (Hedw.) F.Weber & D.Mohr – 3, 5, 8, 9, 10, 11, 12, 21, 24, 26, 27, 28, 31, 32, 33, 34, 37, 40, 42, 45, 46, 51, 54, 62, 63, 65, 77, 79, 80, 81, 84, 85, 98, 103, 105, 108, 109, 111: on soil.
- S. sinensis* (Müll.Hal.) Ochyra – 11: on soil.
- S. virescens* (De Not.) Ochyra – 54: on soil.
- Tortella fragilis* (Hook. & Wilson) Limpr. – 26, 30, 31, 33, 37, 103, 104, 108, 110: on soil and rock.
- T. humilis* (Hedw.) Jenn. – 10, 57, 61: on soil, on rock.
- T. inclinata* (R. Hedw.) Limpr. var. *Inclinata* – 110: on soil, on rock.
- T. inclinata* var. *densa* (Lorentz & Molendo) Limpr. – 110: on soil, on rock.
- T. tortuosa* (Hedw.) Limpr. – 9, 11, 25, 32, 36, 40, 45, 65, 71, 73, 77, 102, 104, 108, 110, 112, 118: on soil.
- Tortula atrovirens* (Sm.) Lindb. – 77, 88: on soil.
- T. canescens* Mont. – 2, 23, 38, 39, 44, 45, 46, 50, 98, 102: on soil.
- T. caucasica* Broth. – 18, 22, 108, 110: on soil.
- T. cuneifolia* (Dicks.) Turner – 97: on soil.
- T. hoppeana* (Schultz) Ochyra – 19, 21, 22, 76, 88, 111: on soil.
- T. inermis* (Brid.) Mont. – 52: on soil.
- T. lindbergii* Broth. – 42, 51: on soil.
- T. marginata* (Bruch & Schimp.) Spruce – 18, 97, 100, 112: on soil.
- T.mucronifolia* Schwägr. – 98: on soil.
- T. muralis* Hedw. var. *Muralis* – 18, 42, 51, 102: on soil.
- T. muralis* var. *aestiva* Brid. ex Hedw. – 43: on soil.
- T. schimperii* M.J.Cano, O.Werner & J.Guerra – 74, 81, 112: on soil.
- solmsii* (Schimp.) Limpr. – 18, 93: on soil.
- T. subulata* Hedw. – 15, 42, 54, 75, 97, 98, 102, 111: on soil.
- T. systylia* (Schimp.) Lindb. – 19, 66: on soil.
- T. truncata* (Hedw.) Mitt. – 19: on soil.
- T. vahliana* (Schultz) Mont. – 42, 43, 57, 60, 61: on soil.
- Trichostomum crispulum* Bruch – 22, 55, 69: on rock by stream.
- Weissia condensa* (Voit) Lindb. – 20, 72, 74: on wet rock and soil.
- W. controversa* Hedw. – 109: on wet rock and soil.
- W. longifolia* Mitt. – 105: on wet rock and soil.
- Orthotrichaceae** Arn.
- Lewinskya acuminata* (H.Philib.) F.Lara, Garilleti & Goffinet – 95, 98: on rock and on trunk of tree.
- L. affinis* (Schrad. ex Brid.) F.Lara, Garilleti & Goffinet – 8, 9, 19, 34, 35, 42, 46, 88, 91, 93, 97, 100, 102: on rock and on trunk of tree.
- L. rupestris* (Schleich. Ex Schwägr.) F.Lara, Garillet, i & Goffinet – 19, 22, 23, 25, 26, 30, 31, 32, 33, 36, 37, 38, 39, 42, 43, 48, 50, 65, 73, 79, 84, 85, 86, 88, 93, 98, 100, 102, 104, 115, 116, 117, 118: on rock and on trunk of tree.
- L. speciosa* (Nees) F.Lara, Garilleti & Goffinet – 9, 20, 72, 74, 78, 88, 92: on trunk of tree.
- L. striata* (Hedw.) F.Lara, Garilleti & Goffinet – 7, 25, 36, 86, 88, 89, 90, 91, 102, 117: on trunk of tree.
- Nyholmiella obtusifolia* (Brid.) Holmen & E.Warncke – 99: on trunk of tree.

- Orthotrichum alpestre* Hornsch. Ex Bruch & Schimp. – 23, 39, 40, 65, 83, 89, 91: on trunk of tree.
- O. anomalum* Hedw. – 1, 3, 4, 8, 12, 14, 21, 34, 42, 46, 54, 63, 67, 70, 71, 86, 87, 91, 92, 94, 96, 98, 99, 100, 102, 118: on trunk of tree, on rock.
- O. cupulatum* Brid. – 21, 49, 50, 98, 99: on trunk of tree, on rock.
- O. diaphanum* Brid. – 57, 88, 89, 92, 93: on trunk of tree.
- O. pallens* Bruch ex Brid. – 90, 91, 92, 108, 112: on trunk of tree, on rock.
- O. patens* Bruch & Brid. – 57, 61: on trunk of tree.
- O. pulchellum* Brunt. – 105: on trunk of tree.
- O. pumilum* Sw. ex anon. – 89, 99: on trunk of tree.
- O. stellatum* Brid. – 88: on trunk of tree.
- O. stramineum* Hornsch. Ex Brid. – 3, 8, 14, 29, 34, 57: on trunk of tree.
- O. tenellum* Bruch ex Brid. – 88: on trunk of tree.
- O. urnigerum* Myrin – 67, 71: on trunk of tree, on rock.
- Pulvigerella lyellii* (Hook. & Taylor) Plášek, Sawicki & Ochrya – 106: on trunk of tree.
- Ulota crispa* (Hedw.) Brid. – 86: on trunk of tree.
- Hedwigiaceae** Schimp.
- Hedwigia ciliata* (Hedw.) P.Beauv. var. *ciliata* – 9, 10, 11, 26, 30, 31, 33, 37, 103, 108: on rock.
- H. ciliata* var. *leucophaea* Bruch & Schimp. – 1, 4, 5, 8, 20, 21, 25, 32, 34, 35, 36, 40, 46, 65, 72, 74, 81, 83, 86, 88, 91, 92, 95, 97, 98, 99, 100, 102, 117, 118: on rock.
- Aulacomniaceae** Schimp.
- Aulacomnium androgynum* (Hedw.) Schwägr. – 12: on wet soil by stream.
- A. palustre* (Hedw.) Schwägr. – 9, 12: on rotten tree.
- Bartramiaceae** Schwägr.
- Bartramia halleriana* Hedw. – 1, 21, 23, 38, 39, 57, 110: on rock.
- B. ithyphylla* Brid. – 11, 12, 15, 16, 21, 56, 71, 78: on rock.
- B. pomiformis* Hedw. – 104: on rock.
- Philonotis caespitosa* Jur. – 7, 8, 75, 76: on wet soil by stream.
- P. calcarea* (Bruch & Schimp.) Schimp. – 9, 10, 12, 18, 47, 78: on wet soil by stream.
- P. capillaris* Lindb. – 52, 76: on wet soil by stream.
- P. fontana* (Hedw.) Brid. – 15, 17, 18, 43, 47, 52, 78, 87, 94, 105, 106, 107, 111, 113: on wet soil by stream.
- P. tomentella* Molendo – 18, 43, 87, 112: on wet soil by stream.
- Bryaceae** Schwägr.
- Anomobryum concinnatum* (Spruce) Lindb. – 15: on soil by streams
- Bryum argenteum* Hedw. – 3, 8, 11, 25, 34, 35, 36, 42, 45, 46, 51, 63, 64, 67, 71, 91, 93, 97, 100: on soil and rock.
- B. dichotomum* Hedw. – 21, 24, 45, 75, 83, 87: on soil and rock.
- B. gemmiparum* De Not. – 16: on wet soil.
- B. intermedium* (Brid.) Blandow – 16, 66: on soil and rock
- B. klinggraeffii* Schimp. – 16: on soil.
- B. kunzei* Hornsch. – 22: on soil and rock.
- B. radiculosum* Brid. – 94: on soil.
- B. ruderale* Crundw. & Nyholm – 65, 75, 89, 90, 92, 94: on soil.
- B. schleicheri* DC. – 5, 10, 17, 43, 78, 94, 104, 105, 107, 111: on soil and rock, sides of streams.
- B. turbinatum* (Hedw.) Turner – 56, 71, 97: on soil and rock.
- B. warneum* (Röhl.) Brid. – Loc. 88: sides of streams and on soil.
- B. weigelii* Spreng. – 105: sides of streams and on soil.
- Imbricarium alpinum* (Huds. ex With.) N. Pedersen – 16, 18, 42, 56, 63, 64, 65, 71, 75, 92, 111: on soil.
- I. mildeanum* (Jur.) J.R. Spence – 23, 25, 36, 38, 39, 44, 45, 46, 65, 78, 88, 90, 93, 99, 100, 114, 115: on soil and rock.
- Ptychostomum archangelicum* (Bruch & Schimp.) J.R. Spence – 12, 18, 26, 30, 31, 32, 33, 37, 45, 55, 56, 71, 73, 92, 97, 101, 102, 116: on soil.
- P. boreale* (F. Weber & D. Mohr) Ochrya & Bednarek-Ochrya – 92, 96, 101, 111, 112: on soil and rock.
- P. capillare* (Hedw.) Holyoak & N. Pedersen – 9, 20, 22, 52, 53, 58, 60, 61, 62, 68, 72, 86, 99, 119: on soil and rock.
- P. compactum* Hornsch. – 4, 8, 21, 48, 67, 71, 73, 105, 106: on soil and rock
- P. creberrimum* (Taylor) J.R. Spence & H.P. Ramsay – 2, 20, 52, 108, 109: on soil and rock.
- P. imbricatulum* (Müll. Hal.) Holyoak & N. Pedersen - Loc. 2, 21, 22, 25, 42, 43, 65, 78, 88, 92, 101, 102, 104, 105, 110, 116, 118: on soil and rock.
- P. moravicum* (Podp.) Ros & Mazimpaka – 1, 8, 20, 23, 25, 27, 34, 36, 38, 39, 40, 45, 46, 72, 77, 78, 79, 84, 85, 86, 97, 100, 102, 103, 117: on soil and rock.
- P. pallens* (Sw.) J.R. Spence – 12, 21, 43, 72, 74, 93, 96: on soil and rock
- P. pseudotriquetrum* (Hedw.) J.R. Spence & H.P. Ramsay var. *pseudotriquetrum* – 5, 8, 13, 17, 18, 20, 22, 23, 28, 38, 39, 40, 41, 42, 43, 46, 47, 50, 52, 54, 60, 61, 62, 66, 68, 69, 70, 75, 76, 78, 87, 100, 102, 111, 115, 116, 118, 119, 120: on damp soil by lakes and on wet rock.
- P. pseudotriquetrum* var. *bimum* (Schreb.) Holyoak & N. Pedersen – 2, 50, 55, 69, 86, 89: on soil.
- P. rubens* (Mitt.) Holyoak & N. Pedersen – 9, 22, 65, 66: on soil.
- P. torquescens* (Bruch & Schimp.) Ros & Mazimpaka – 12: on soil.
- P. zieri* (Hedw.) Holyoak & N. Pedersen – 88: on soil.
- Rhodobryum ontariense* (Kindb.) Kindb. – 20: on wet soil.
- R. roseum* (Hedw.) Limpr. – 6, 8, 34, 72, 74, 81: on wet soil.
- Mielichhoferiaceae** Schimp.
- Pohlia annotina* (Hedw.) Lindb. – 101: on wet soil.
- P. cruda* (Hedw.) Lindb. – 1, 7, 12, 19, 20, 26, 30, 33, 37, 48, 49, 73, 79, 84, 85, 104, 113: on wet soil and rock.
- P. elongata* Hedw. – 9, 42, 83, 110: on soil and rock.
- P. flexuosa* Hook. – 1, 7, 12, 20, 26, 33, 48, 73, 116: on soil and rock.
- P. longicolla* (Hedw.) Lindb. – 20: on wet soil.
- P. melanodon* (Brid.) A.J. Shaw – 15, 22, 23, 38, 39, 48, 49, 50, 55, 56, 57, 60, 61, 71, 72, 73, 74, 76, 77, 78, 83, 116: on wet soil.
- P. nutans* (Hedw.) Lindb. – 1, 5, 7, 10, 11, 19, 20, 21, 32, 40, 44, 45, 47, 56, 63, 65, 71, 101, 104, 108, 109, 110, 111, 112, 115, 116: on wet soil and rock.
- P. prolifera* (Kindb.) Lindb. ex Broth. – 18: on wet soil and rock.
- P. wahlenbergii* (F. Weber & D. Mohr) A.L. Andrews – 8, 42, 79, 103: on wet soil and rock.
- Mniaceae** Schwägr.
- Mnium hornum* Hedw. – 110: on soil and rock.
- M. lycopodioides* Schwägr. - Loc. 49, 50, 55, 69, 89: on soil.
- M. spinosum* (Voit) Schwägr. - Loc. 8, 12, 25, 34, 36, 92: on soil and in woodland.
- M. spinulosum* Bruch & Schimp. – 6, 13, 55, 58, 69, 112: on soil and in woodland.

- M. stellare* Hedw. – 18, 104: on soil.
- M. thomsonii* Schimp. – 6, 43, 50, 73, 78, 113: on soil and woodland.
- Plagiomnium affine* (Blandow ex Funck) T.J.Kop. – 6, 13, 59, 105, 109: on wet soil and woodland.
- P. cuspidatum* (Hedw.) T.J.Kop. – 2, 3, 8, 20, 26, 30, 31, 33, 34, 37, 50, 52, 67, 71, 99, 103, 104, 108: on soil and rock.
- P. ellipticum* (Brid.) T.J.Kop. – 7, 8, 17, 18, 20, 34, 50, 59, 100, 102, 105, 111: on wet soil and rock, beside streams.
- P. medium* (Bruch & Schimp.) T.J.Kop. – 1, 7, 9, 12, 20, 40, 49, 50, 53, 55, 58, 59, 60, 61, 62, 68, 69, 70, 74, 81, 86, 87, 88, 89, 92, 93, 94, 96, 100, 103, 108, 113, 114, 116, 117, 118, 119, 120: on wet soil and rock, beside streams.
- P. rostratum* (Schrad.) T.J.Kop. – 7, 47, 50, 79, 81, 82, 84, 86, 94, 96, 103, 113, 119, 120: on wet soil and rock, beside streams.
- P. undulatum* (Hedw.) T.J.Kop. – 52, 100: on wet soil and rock, beside stream.
- Cincliaceae** Kindb.
- Rhizomnium magnifolium* (Horik.) T.J.Kop. – 2, 89: on wet soil.
- R. punctatum* (Bruch & Schimp.) T.J.Kop. – 2, 8, 12, 17, 18, 43, 74, 113: on wet soil.
- Hookeriaceae** Schimp.
- Hookeria lucens* (Hedw.) Sm. – 55: on wet rock, beside stream.
- Thuidiaceae** Schimp.
- Abietinella abietina* (Hedw.) M.Fleisch. var. *abietina* – 1, 6, 8, 9, 15, 18, 20, 29, 34, 35, 37, 45, 50, 54, 55, 56, 57, 60, 62, 67, 68, 71, 74, 75, 81, 83, 88, 96, 97, 98, 99, 100, 103, 105, 108, 109, 112, 113: on soil.
- A. abietina* var. *hystricosa* (Mitt.) Sakurai. – 13, 14, 20, 24, 26, 27, 31, 32, 33, 42, 45, 46, 49, 53, 68, 77, 79, 84, 85, 92, 102, 103, 104, 106, 109, 110, 114, 118, 119, 120: on soil.
- Thuidium delicatulum* (Hedw.) Schimp. – 53, 55, 58, 69, 77, 79, 80, 84, 85, 90: on wet soil and rock.
- T. tamariscinum* (Hedw.) Schimp. – 23, 25, 36, 38, 39, 78, 80, 86, 89, 90, 93, 117: on wet soil and rock.
- Neckeraceae** Schimp.
- Thamnobryum alopecurum* (Hedw.) Gangulee – 3, 8, 12, 34, 53, 55, 69, 103, 105: on rock, beside stream.
- Amblystegiaceae** Kindb.
- Amblystegium serpens* (Hedw.) Schimp. – 9, 20, 22, 28, 54, 62, 79, 80, 82, 83, 84, 86, 87, 88, 89, 93, 95, 97, 99, 100, 108, 118: on rotten tree, on rock, beside stream.
- Campyliadelphus chrysophyllus* (Brid.) R.S.Chopra – 22, 41, 50, 52, 53, 58, 62, 68, 72, 75, 79, 84, 85, 93, 119, 120: on wet soil, beside stream.
- C. elodes* (Lindb.) Kanda – 55, 96, 97: on wet soil, beside stream.
- Campylium protensum* (Brid.) Kindb. – 17, 43, 47, 52, 66, 72, 76, 79, 84, 85: on rock.
- C. stellatum* (Hedw.) Lange & C.E.O. Jensen – 101, 115: on wet soil and rock.
- Cratoneuron filicinum* (Hedw.) Spruce – 9, 22, 76, 79, 84, 85, 100, 104, 106, 108, 118: on wet soil and rock.
- Conardia compacta* (Drumm. ex Müll. Hal.) H. Rob. - Loc. 112: on wet soil and rock, beside stream.
- Drepanocladus aduncus* (Hedw.) Warnst. – 1, 11, 17, 47, 66, 75, 76, 82, 94: on wet soil, beside stream and river.
- D. polygamus* (Schimp.) Hedenäs – 41, 55, 75, 111: on wet soil.
- Hygroamblystegium fluviatile* (Hedw.) Loeske – 76: on wet rock, beside stream.
- H. tenax* (Hedw.) Jenn. – 19, 105: on wet rock, beside stream and river.
- H. varium* (Hedw.) Mönk. var. *varium* – 52, 63, 67, 71, 106: on wet rock, beside stream and river.
- H. varium* var. *humile* (P. Beauv.) Vanderp. & Hedenäs – 11, 24, 27, 29, 81, 82, 101, 106, 115: on wet rock, beside stream and river.
- Hygrohypnum duriusculum* (De Not.) D.W.Jamieson – 18, 111: on wet rock, beside stream and river.
- H. eugyrium* (Schimp.) Broth. – 9, 105: on wet rock, beside stream and river.
- H. luridum* (Hedw.) Jenn. – 52: on wet rock, beside stream and river.
- Leptodictyum riparium* (Hedw.) Warnst. – 11, 75, 82, 105, 111, 113: on trunk of tree.
- Palustriella commutata* (Hedw.) Ochyra – 52, 55, 82: beside stream and river.
- Pseudoamblystegium subtile* (Hedw.) Vanderp. & Hedenäs – 22, 48, 49, 50, 56, 73, 75, 83, 86, 88, 89, 91, 96, 99, 100, 102: on trunk of tree.
- Sanionia uncinata* (Hedw.) Loeske – 1, 4, 6, 7, 8, 10, 11, 12, 13, 14, 15, 20, 21, 27, 28, 29, 34, 54, 55, 56, 57, 58, 59, 60, 65, 66, 67, 69, 71, 73, 77, 78, 79, 80, 83, 84, 85, 86, 96, 100, 101, 105: on wet soil, on rotten tree.
- Scorpidium revolvens* (Sw. ex anon.) Rubers – 3, 8, 34: on wet soil, beside stream.
- Serpoleskea confervoides* (Brid.) Kartt. – 54, 79, 80, 84, 85: on wet rock.
- 24. Anomodontaceae** Kindb.
- Anomodon attenuatus* (Hedw.) Huebener. – 97: on soil and rock.
- A. rugelii* (Müll. Hal.) Keissl. - Loc. 55, 58: on soil and rock.
- A. viticulosus* (Hedw.) Hook. & Taylor. – 104, 118: on soil and rock.
- Leucodontaceae** Schimp.
- Leucodon sciuroides* (Hedw.) Schwägr. - Loc. 9, 25, 36, 42, 45, 46, 51, 65, 74, 86, 88, 91, 92, 96, 97, 100, 102, 103, 108, 112, 114, 115, 116, 118: on tree and rock.
- Nogopterium gracile* (Hedw.) Crosby & W.R. Buck – 20, 117: on soil and rock.
- Brachytheciaceae** Schimp.
- Brachytheciastrum trachypodium* (Brid.) Ignatov & Huttunen – 83: on rotten tree.
- B. velutinum* (Hedw.) Ignatov & Huttunen – 1, 3, 6, 7, 8, 13, 14, 18, 20, 22, 28, 29, 32, 34, 35, 40, 48, 56, 59, 60, 62, 65, 67, 70, 71, 72, 75, 77, 80, 83, 87, 88, 91, 102, 115: on rotten tree.
- Brachythecium albicans* (Hedw.) Schimp. – 1, 3, 6, 7, 8, 13, 14, 15, 20, 21, 27, 28, 29, 34, 35, 40, 48, 49, 50, 51, 55, 56, 59, 60, 61, 62, 64, 66, 68, 71, 72, 73, 77, 78, 81, 86, 87, 88, 89, 90, 91, 92, 96, 98, 99, 102, 107, 108, 113, 117, 118, 119, 120: on soil and rock.
- B. campestre* (Müll.Hal.) Schimp. - Loc. 7, 22, 50, 52, 56, 59, 63, 71, 82: on soil and rock.
- B. capillaceum* (F.Weber & D.Mohr) Giacom. – 1, 56, 59, 61, 63, 68, 71, 82, 89, 91, 93: on soil and rock.
- B. cirrosium* (Schwägr.) Schimp. - Loc. 67, 71: on rock.
- B. erythrorrhizon* Schimp. – 97: on wet soil, on rotten tree.
- B. geheebii* Milde. – 56, 71, 72, 74, 81: on soil.
- B. glareosum* (Bruch ex Spruce) Schimp. – 1, 3, 7, 8, 34, 35, 45, 46, 54, 56, 59, 62, 66, 68, 72, 79, 80, 83, 84, 85, 86, 89, 91, 93, 101, 103, 105, 109, 110, 112, 115, 119, 120: on soil and rock.

- B. laetum* (Brid.) Schimp. – 1, 55, 59, 69, 70, 112: on soil.
- B. mildeanum* (Schimp.) Schimp. Ex Milde – 3, 7, 8, 22, 34, 35, 41, 47, 52, 54, 62, 68, 75, 78, 82, 93, 94, 100, 108, 109, 113, 119, 120: on wet soil.
- B. rivulare* Schimp. – 1, 2, 5, 10, 12, 15, 17, 22, 26, 30, 31, 32, 33, 37, 42, 43, 47, 50, 51, 52, 53, 58, 67, 68, 71, 78, 82, 87, 92, 93, 94, 100, 102, 103, 104, 105, 106, 107, 108, 111, 113, 118, 119, 120: on wet soil and rock, beside streams.
- B. rutabulum* (Hedw.) Schimp. – 2, 3, 8, 12, 16, 18, 34, 35, 41, 48, 52, 56, 67, 70, 71, 75, 78, 86, 87, 88, 91, 93, 94, 95, 97, 100, 105, 106, 107, 108, 117, 118: on wet soil and rock .
- B. salebrosum* (Hoffm. ex F. Weber & D. Mohr) Schimp. – 1, 2, 6, 7, 13, 29, 54, 56, 57, 61, 62, 64, 69, 71, 72, 77, 79, 80, 81, 83, 84, 85, 93, 98, 102, 112, 115, 119, 120: on wet soil and rock, on trunk of tree.
- B. tommasinii* (Sendtn. Ex Boulay) Ignatov & Huttunen – 57: on soil
- B. turgidum* (Hartm.) Kindb. – 7, 22, 88: on soil and rock.
- Cirriphyllum crassinervium* (Taylor) Loeske & M. Fleisch. – 2: on rock.
- C. piliferum* (Hedw.) Grout – 97, 103, 113: on soil and rock.
- Eurhynchium angustirete* (Broth.) T.J.Kop. – 22, 41, 45, 86, 103: on soil.
- E. striatum* (Hedw.) Schimp. – 53, 55, 56, 57, 60, 69, 71, 103: on soil and rock.
- Eurhynchiastrum pulchellum* (Hedw.) Ignatov & Huttunen – 1, 4, 5, 6, 8, 13, 20, 21, 22, 34, 35, 48, 50, 53, 55, 56, 57, 59, 62, 64, 67, 68, 69, 71, 73, 76, 78, 83, 86, 89, 92, 98, 101, 113, 116, 119, 120: on soil and rock.
- Homalothecium aureum* (Spruce) H.Rob. – 90: on rock.
- H. lutescens* (Hedw.) H.Rob. – 9, 24, 27, 28, 37, 42, 45, 46, 51, 66, 79, 80, 81, 84, 85, 86, 96, 100, 103, 104, 109, 117: on soil and rock.
- H. philippeanum* (Spruce) Schimp – 20, 45, 46, 59, 81, 95, 96, 97, 118: on soil and rock.
- H. sericeum* (Hedw.) Schimp. – 10, 11, 25, 36, 65, 86, 97, 104, 107, 108, 110: on rock.
- Kindbergia praelonga* (Hedw.) Ochyra – 21, 22, 54, 67, 71, 79, 80, 84, 85, 86: on soil.
- pumilum* (Wilson) Ignatov & Vanderp. – 93: on soil and rock.
- Oxyrrhynchium hians* (Hedw.) Loeske – 9, 26, 30, 31, 33, 37, 40, 44: on soil, beside streams.
- O. schleicheri* (R.Hedw.) Röhl – 9, 33, 113: on soil.
- O. speciosum* (Brid.) Warnst. – 1, 74, 81, 113: on soil.
- Palamocladium euchloron* (Müll.Hal.) Wijk & Margad. – 42: on rock.
- Plasteurhynchium striatulum* (Spruce) M. Fleisch. – 19, 59, 67, 71: on rock.
- Pseudoscleropodium purum* (Hedw.) M.Fleisch. – 52: on rock.
- Rhynchostegiella tenella* (Dicks.) Limpr. – 86: on rock.
- Rhynchostegium confertum* (Dicks.) Schimp. – 2, 4, 21, 43, 66, 93, 111: on rock.
- R. megapolitanum* (Blandow ex F.Weber & D.Mohr) Schimp. – 112: on wet soil.
- R. riparioides* (Hedw.) Cardot – 42, 43, 106, 108: on rock, beside streams.
- R. rotundifolium* (Scop. ex Brid.) Schimp. – 57: on rock.
- Sciuro-hypnum flotowianum* (Sendtn.) Ignatov & Huttunen – 1, 20: on soil.
- S.latifolium* (Kindb.) Ignatov & Huttunen – 59, 75: on soil.
- S.plumosum* (Hedw.) Ignatov & Huttunen – 41, 103: on soil.
- S.populeum* (Hedw.) Ignatov & Huttunen – 10, 11, 18, 55, 69, 72, 74, 103: on soil.
- Scleropodium cespitans* (Wilson ex Müll.Hal.) L.F.Koch – 52, 104, 109: on rock, beside streams.
- S. touretii* (Brid.) L.F.Koch – 106: on soil and rock.
- Scorpiurium circinatum* (Bruch) M.Fleisch. & Loeske – 76, 104: on soil and rock.
- Calliergonaceae** Vanderpoorten
- Calliergon cordifolium* (Hedw.) Kindb. – 41: on wet soil and marsh area.
- Sarmentypnum exannulatum* (Schimp.) Hedenäs – 17, 41, 47, 66, 82: on wet soil.
- Warnstorfia fluitans* (Hedw.) Loeske – 18, 59, 78: beside streams.
- Hypnaceae** Schimp.
- Calliergonella cuspidata* (Hedw.) Loeske – 18, 26, 30, 31, 33, 37, 45, 47, 52, 61, 64, 66, 67, 68, 71, 87, 94, 100, 105, 106, 108, 109, 113, 119, 120: on soil and rock.
- C. lindbergii* (Mitt.) Hedenäs – 11, 17, 41, 47, 48, 66, 75, 76, 87, 94, 111, 114, 115: on soil and rock, beside streams.
- Campylophyllum calcareum* (Crundw. & Nyholm) Hedenäs – 22, 76, 79, 84, 85: on soil and rock.
- Herzogiella seligeri* (Brid.) Z.Iwats. – 6, 13, 14, 20, 27, 53, 55, 58, 60, 69: on rotten tree.
- Homomallium incurvatum* (Schrad. ex Brid.) Loeske – 1, 11, 25, 36, 86, 99, 117: on rock.
- Hyocomium armoricum* (Brid.) Wijk & Margad. – 55: on wet rock, beside streams.
- Hypnum andoi* A.J.E.Sm – 11, 24, 27, 29: on rock.
- H. bambergeri* Schimp. – 57: on rock.
- H. callichroum* Brid. – 19, 57, 75, 76: on rock, on trunk of tree.
- H. cupressiforme* var. *cupressiforme* Hedw. – 19, 28, 32, 37, 61, 63, 64, 67, 71, 73, 88, 90, 96, 99, 109, 110, 112, 114, 115, 116: on rock, on trunk of tree.
- H. cupressiforme* var. *lacunosum* Brid. – 104, 110: on rock, on trunk of tree.
- H. cupressiforme* var. *resupinatum* (Taylor) Schimp. – 65: on rock, on trunk of tree.
- H. cupressiforme* var. *subjulaceum* Molendo – 88, 112: on rock, on trunk of tree.
- H. cupressiforme* var. *filiforme* Brid. – 73: on rock, on trunk of tree.
- H. hamulosum* Schimp. – 19, 41, 50: on soil and rock.
- H. imponens* Hedw. – 24, 110: on wet soil.
- H. jutlandicum* Holmen & E.Warncke – 108, 110, 112: on rock.
- H. pallescens* (Hedw.) P.Beauv. – 53, 55, 58, 60: on rotten tree.
- H.recurvatum* (Lindb. & Arnell) Kindb. – 19, 49, 50, 59, 112: on rock
- H. revolutum* (Mitt.) Lindb. – 21, 23, 25, 26, 30, 32, 33, 36, 37, 38, 39, 42, 47, 51, 57, 60, 78, 87, 101, 102, 104, 108, 115: on rock.
- Platydictya jungermannioides* (Brid.) H.A.Crum – 118: on rock.
- Pylaisia polyantha* (Hedw.) Schimp. – 8, 34, 57, 99: on trunk of tree.
- Climaciaceae** Kindb.
- Climacium dendroides* (Hedw.) F. Weber & D. Mohr – 11, 12, 43, 45, 46, 50, 53, 57, 61, 62, 63, 64, 67, 68, 71, 87, 93, 94, 95, 105, 107, 113, 118, 119, 120: on wet soil, beside streams.
- Entodontaceae** Kindb.
- Entodon concinnus* (De Not.) Paris – 20, 25, 36, 45, 74, 81, 89, 98, 108, 118: on rock.
- E. schleicheri* (Schimp.) Demet. – 26, 31, 33, 37: on soil and rock.

Fontinalaceae Schimp.

Fontinalis antipyretica (Hedw.) var. *antipyretica* – 2, 11, 17, 26, 42, 47, 66, 75, 82, 105: beside streams and rivers.

F. antipyretica subsp. *gracilis* (Lindb.) Schimp. – 43: beside streams and rivers.

F. hypnoides C.Hartm. – 18: beside streams and rivers.

F. squamosa Hedw. – 18, 78: beside streams and rivers.

Pseudoleskeaceae Schimp.

Lescuraea incurvata (Hedw.) E. Lawton. – 23, 38, 39, 49, 50, 52, 76, 104, 105: on rock.

L. mutabilis (Brid.) Lindb. ex I.Hagen – 4, 76: on trunk of tree.

L. patens Lindb. – 4, 21: on rock.

L. plicata (Schleich. ex F. Weber & D. Mohr) Broth. – 42, 51, 79, 84: on rock.

L. radicata (Mitt.) Mönk. – 15, 21, 76, 104: on rock.

L. saxicola (Schimp.) Molendo – 8, 21, 79, 84, 85, 110: on rock.

Pterigynandraceae Schimp.

Habrodon perpusillus (De Not.) Lindb. – 23, 39: on trunk of tree.

Heterocladium heteropterum (Brid.) Schimp. – 79, 80, 84: on wet soil and rock.

Pterigynandrum filiforme Hedw. – 7, 8, 9, 10, 34: on trunk of tree, on rock.

Plagiotheciaceae (Broth.) M.Fleisch.

Plagiothecium curvifolium Schlieph. ex Limpr. – 12: on rotten tree.

P. denticulatum (Hedw.) Schimp. – 100, 105: on soil and rock.

P. latebricola Schimp. – 50, 105: on trunk of tree.

P. nemorale (Mitt.) A.Jaeger – 43: on soil and rock.

P. undulatum (Hedw.) Schimp. – 52, 100: on soil and rock.

Lembophyllaceae Broth.

Isothecium alopecuroides (Lam. ex Dubois) Isov. – 12, 108: on soil and rock, beside streams.

I. myosuroides Brid. – 110: on rock.

Leskeaceae Schimp.

Pseudoleskeella catenulata (Brid. ex Schrad.) Kindb. – 18, 43, 57, 94: on rock.

P. nervosa (Brid.) Nyholm – 1, 18, 25, 34, 36, 48, 49, 52, 57, 61, 73, 92, 93, 94, 99, 102, 104, 107, 108, 109, 110, 118: on trunk of tree.

P. rupestris (Berggr.) Hedenäs & L.Söderstr. – 88: on trunk of tree.

P. tectorum (Funck ex Brid.) Kindb. ex Broth. – 88: on trunk of tree.

Hylocomiaceae (Broth.) M.Fleisch.

Ctenidium molluscum (Hedw.) Mitt. – 9, 10, 11, 12, 110, 112, 114: on trunk of tree, on soil.

Hylocomium splendens (Hedw.) Schimp. – 3, 6, 7, 8, 9, 11, 14, 20, 29, 34, 59, 64, 69, 79, 80, 84, 85, 97, 98, 103, 104, 108, 110: on soil.

Pleurozium schreberi (Willd. ex Brid.) Mitt. – 7, 48, 59, 67, 71, 73: on soil

Rhytidiadelphus triquetrus (Hedw.) Warnst. – 1, 6, 7, 8, 9, 20, 34, 48, 49, 50, 57, 59, 61, 67, 71, 73, 77, 78, 79, 80, 84, 85, 86, 90, 98, 103, 104, 105, 109, 110, 113, 114: on soil.

Pylaisiadelphaceae Goffinet & W.R.Buck

Platygyrium repens (Brid.) Schimp. – 94: on trunk of tree.

Rhytidiaceae Broth.

Rhytidium rugosum (Hedw.) Kindb. – 9, 11, 18, 20, 67, 71, 90, 97, 99, 102, 103, 104, 110, 112, 114, 115: on soil.

DISCUSSION

We determined 408 taxa (species, subspecies and varieties) belonging to 141 genera in the study. Furthermore, *Henediella heimii*, *Syntrichia minor* and *Bryum warneum* are recorded for the second time in Turkey.

Syntrichia minor known from eastern Canary Islands, Cyprus, Greece, Iran, Jordan, Lebanon, Morocco, Spain, Turkey (Ahayoun *et al.*, 2013; Gallego *et al.*, 2000; Kürschner and Frey, 2011; Ros *et al.*, 2013; Ören *et al.*, 2015). It has been so far known only from the Black Sea region in Turkey (Kastamonu province) (Ören *et al.*, 2015). This new locality extends its distribution range to the north-east Anatolia and Caucasus (Turkey).

Henediella heimii reported from North America, South America, Europe, Asia, Pacific Islands (New Zealand), Australia, Antarctica (Crum & Anderson, 1981; Frey *et al.*, 2006; Ros *et al.*, 2013).

Henediella heimii has been so far known only from the Eastern Anatolia Region in Turkey (Hazer, 2010). This new record extends its distribution range to the East Anatolia (Turkey).

Bryum warneum first time reported from Iğdır province, Ağrı Mountain, on wet soil beside stream by Batan & Özdemir (2013) in Turkey. This species is mainly known in western and Baltic coasts of Europe, from N. France to arctic Norway. It was also reported from North temperate and montane areas in the Himalayas and the Altai Mountains (C. Asia) and Canada (N. America), Alaska (Steere, 1978; Shaw & Marcotte, 1983; Nyholm, 1993; Smith, 2004; Frey *et al.*, 2006; Kürschner & Frey, 2011; Ros *et al.*, 2013). This record extend its distribution range to the Eastern Anatolia Region in Turkey.

The family with the highest number of species in this study were *Pottiaceae* (61), *Brachytheciaceae* (45), *Grimmiaceae* (35), *Bryaceae* (30), *Amblystegiaceae* (22), *Hypnaceae* (22), *Orthotrichaceae* (20), *Dicranaceae* (16), *Mniaceae* (12), *Mielichhoferiaceae* (9), *Polytrichaceae* (9), *Bartramiaceae* (8), *Ditrichaceae* (7), *Encalyptaceae* (6), *Rhabdoweisiaceae* (6), *Pseudoleskeaceae* (6), *Plagiotheciaceae* (5).

The most common genera of mosses are *Grimmia* (19), *Tortula* (17), *Schistidium* (15), *Hypnum* (14), *Brachythecium* (14), *Dicranum* (13), *Ptychostomum* (13), *Bryum* (12), *Orthotrichum* (12), *Syntrichia* (11), *Didymodon* (11), *Pohlia* (9), *Encalypta* (6) and *Mnium* (6) in the study area. Moreover genus *Grimmia* has the greatest diversity among the genera (represented by 19 taxa, growing on mostly rocks). The second most common genus is *Tortula* (represented by 17 taxa, occurring mostly on soil).

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No	Locality	Coordinates	Altitude (m)	Collecting date
1.	Ardahan(Merkez):YalnızçamForest	41°02'43"N/42°29'00"E	1918-2000	07.09.2014
2.	Ardahan(Merkez):BetweenArdahanandŞavşat (Çambelipassageway-1)	41°13'00"N/42°32'28"E	2410-2460	05.09.2014
3.	Ardahan(Merkez):TaşlıdereVillage	41°04'07"N/42°50'50"E	1920	06.09.2014
4.	Ardahan(Merkez):Hasköy	40°59'06"N/42°54'03"E	1965	06.09.2014
5.	Ardahan(Merkez):TepelerVillage	41°02'45"N/42°35'24"E	1983-2034	06.09.2014
6.	Ardahan(Merkez):ExitofArdahan,CemalTuranNaturePark	41°07'23"N/42°47'05"E	1970	06.09.2014
7.	Ardahan(Merkez):Village(YalnızçamForest)	41°01'58"N/42°22'53"E	2000-2100	07.09.2014
8.	Ardahan(Merkez):BetweenÇıldırardArdahan	41°08'13"N/42°54'00"E	1930-2000	06.09.2014
9.	Ardahan(Merkez):YalnızçamForest,HasköyVillage1	41°01'44"N/42°25'15"E	1893-1950	07.09.2014
10.	Ardahan(Merkez):YalnızçamForest,HasköyVillage2	41°01'46"N/42°23'47"E	2000-2150	07.09.2014
11.	Ardahan(Merkez):Çambelipassageway	41°12'02"N/42°31'56"E	2308-2400	05.09.2014
12.	Ardahan(Merkez):BilbilanPlateau	41°03'51"N/42°18'50"E	2552-2650	07.09.2014
13.	Ardahan(Merkez):ÇamlıçatakVillage	41°06'31"N/42°49'30"E	1960	16.07.2014
14.	Ardahan(Merkez):ÖlçekVillage	41°06'51"N/42°50'57"E	1878	16.07.2014
15.	Ardahan(Merkez):BetweenArdahanandŞavşat, YalnızçamMountain(Çambelipassageway-2)	41°13'27"N/42°32'28"E	2460-2600	23.06.2015
16.	Ardahan(Merkez):YalnızçamMountain(Çambelipassageway-3)	41°15'52"N/42°34'41"E	2570-2600	23.06.2015
17.	Ardahan(Merkez):BetweenArdahanandŞavşat,DeğirmenliVillage	41°11'30"N/42°33'55"E	2100-2150	23.06.2015
18.	Ardahan(Merkez):BağdeşenVillage(YalnızçamMountain)	41°03'58"N/42°22'43"E	2230-3500	23.06.2015
19.	Ardahan(Merkez):Hasköy,KısırMountain-1(NebiogluPlateau)	40°56'54"N/43°01'11"E	2711	24.06.2015
20.	Ardahan(Merkez):ÖlçekVillage	41°06'02"N/42°49'56"E	1930-2000	24.06.2015
21.	Ardahan(Merkez):Hasköy,Sakaltutanpassageway	40°55'50"N/42°58'03"E	2170-2250	24.06.2015
22.	Çıldır:GüvenocakPlateau,neartheÇıldırLake	41°02'16"N/43°10'33"E	1980-2050	08.09.2014
23.	Çıldır:BetweenTaşdoğanVillageandDamlicaVillage	41°07'58"N/43°18'00"E	1960-2100	08.09.2014
24.	Çıldır:EntranceofÇıldır,ŞeytanCastle	41°07'53"N/43°07'56"E	1970-2000	08.09.2014
25.	Çıldır:Mozeretpassageway,neartheAktaşLake	41°09'39"N/43°08'26"E	2050-2150	08.09.2014
26.	Çıldır:BetweenGölebakanVillageGölbelenköyleVillage	41°02'44"N/43°09'54"E	1988-2050	08.09.2014
27.	Çıldır:EskibeyrehatunVillage	41°07'08"N/42°57'47"E	1955	08.09.2014
28.	Çıldır:YenibeyrehatunVillage	41°08'27"N/42°57'54"E	1910	09.09.2014
29.	Çıldır:MeryemköyVillage	41°07'38"N/43°01'19"E	14	09.09.2014
30.	Çıldır:KurtkaleVillage	41°15'51"N/43°07'48"E	1615	09.09.2014
31.	Çıldır:KısırMountain-1,GölebakanVillage	41°01'28"N/43°04'52"E	2200-4200	14.07.2015
32.	Çıldır:KısırMountain-2,GölebakanVillage	41°00'18"N/43°09'00"E	2200-2700	14.07.2015
33.	Çıldır:SemihaŞakirVillage	41°07'50"N/43°02'55"E	1964	13.08.2016
34.	Çıldır:ExitofÇıldır,SaymalıVillage-1	41°08'21"N/43°10'01"E	2008	13.08.2016
35.	Çıldır:ExitofÇıldır,SaymalıVillage-2	41°08'02"N/43°09'29"E	1960	13.08.2016
36.	Çıldır:AşıkşenlikVillage	41°08'41"N/43°12'42"E	1918	13.08.2016
37.	Çıldır:YıldırımtepeVillage	41°07'53"N/43°07'34"E	1990	13.08.2016
38.	Çıldır:GüvenocakVillage	41°06'39"N/43°12'52"E	1935	13.08.2016
39.	Çıldır:BaşköyVillage	41°07'29"N/43°17'34"E	1985	13.08.2016
40.	Çıldır:AkdarıVillage	41°16'37"N/43°08'59"E	1730	09.09.2014
41.	Damal:aşağı,ortaveyukarıDamalaylaPlateau	41°23'14"N/42°53'47"E	2330-2370	17.07.2014
42.	Damal:BetweenOburcakVillageandAraplarPlateau	41°21'37"N/42°55'36"E	2284	17.07.2014
43.	Damal:AraplarPlateau	41°26'21"N/42°40'50"E	1680-1780	17.07.2014
44.	Damal:DamalPlateau	41°23'13"N/42°54'55"E	2440-2500	17.07.2014
45.	Damal:BetweenAşağıGündesVillageandKalenderdereVillage	41°22'00"N/42°49'13"E	2040-2200	18.07.2014
46.	Damal:Yukarıgündes-Seyitörenköyleri	41°23'14"N/42°48'39"E	2060-2130	18.07.2014
47.	Damal:BetweenEskikılıçPlateauandDamalPlateau	41°22'52"N/42°54'26"E	2350-2400	18.07.2014
48.	Damal:BurmaderVillage	41°18'26"N/42°47'10"E	2015	18.07.2014
49.	Damal:DereköyVillage	41°19'4"N/42°48'08"E	2021	18.07.2014
50.	Damal:BetweenTepeköyVillageandOtağlıköyPlateau	41°21'17"N/42°46'44"E	2294	12.08.2016
51.	Damal:İkizdereVillage	41°20'21"N/42°54'30"E	2175	12.08.2016
52.	Damal:İlgarMountain-1	41°24'18"N/42°45'45"E	2438-2550	12.08.2016
53.	Göle:ExitofGöle	40°46'17"N/42°35'23"E	2048	19.10.2014
54.	Göle:DemirkapıVillage	40°50'59"N/42°44'19"E	2028	18.10.2014
55.	Göle:SamandökenVillage	40°49'07"N/42°31'02"E	2076	17.10.2014
56.	Göle:UğurluMountain	40°00'18"N/42°34'07"E	2251-3050	18.10.2014
57.	Göle:BalçesmeVillage-1	40°51'16"N/42°48'17"E	2080	17.10.2014
58.	Göle:ÇakırüzümVillage	40°48'18"N/42°33'09"E	2135	17.10.2014
59.	Göle:GölePlateau	40°45'32"N/42°36'53"E	2191-2300	17.10.2014
60.	Göle:ÇakırüzümPlateau	40°46'55"N/42°34'25"E	2163-2250	18.10.2014
61.	Göle:BalçesmeVillage-2	40°50'58"N/42°46'17"E	2077	17.10.2014
62.	Göle:SenemoğluVillage	40°46'40"N/42°39'39"E	2040	18.10.2014
63.	Göle:UğurtaşVillage	40°56'07"N,42°28'16"E	1985	18.10.2014
64.	Göle:KöprülüVillage	40°53'13"N,42°27'42"E	2050	18.10.2014
65.	Göle:KarıncadüzüForest-1	40°46'03"N/42°33'50"E	2190-2250	25.06.2015
66.	Göle:GöleKarıncadüzüForest-2	40°44'24"N/42°34'53"E	2180-2300	25.06.2015
67.	Göle:UğurluMountain-1,betweenGöleandArdahan	41°01'26"N/42°34'00"E	2130-2200	25.06.2015
68.	Göle:BetweenKoyunluVillageandGümüşKavakPlateau	40°47'56"N/42°45'59"E	2116	14.08.2016
69.	Göle:SerinçayırVillage	40°51'58"N/42°29'49"E	2059-2061	14.08.2016
70.	Göle:KöprülüVillage	40°53'13"N/42°27'42"E	2050	14.08.2016
71.	Göle:UğurluMountain-2,betweenGöleandArdahan	40°54'57"N/42°35'48"E	1980-2000	14.08.2016
72.	Hanak:BetweenBaştokluVillageandAlaçamVillage	41°11'58"N/42°48'29"E	1895-1920	05.07.2014

73. Hanak:ÇiçekliDağMountain(ÇatVillage)	41°17'57"N/42°42'55"E	2050-2150	06.07.2014
74. Hanak:KoyunpınarVillage	41°14'18"N/42°46'58"E	1852	06.07.2014
75. Hanak:BetweenHanakandÇavdarlıVillage	41°16'54"N/42°45'55"E	2008-2050	06.07.2014
76. Hanak:KarakaleköyüPlateauandUzunderePlateau	41°19'25"N/42°41'41"E	2320-2800	06.07.2014
77. Hanak:ExitofHanak	41°15'52"N/42°52'31"E	2054	19.07.2014
78. Hanak:BetweenAşağıAydereandYukarıAydereVillage	41°20'16"N/42°43'18"E	2186-2400	07.07.2014
79. Hanak:AvclarVillage-1	41°15'24"N/42°50'43"E	1869-2000	07.07.2014
80. Hanak:ÇayağzıVillage	41°11'26"N/42°50'58"E	1795	07.07.2014
81. Hanak:AvclarVillage-2	41°15'09"N/42°49'40"E	1850	07.07.2014
82. Hanak:YünbükenVillage	41°16'21"N/42°51'40"E	1946	07.07.2014
83. Hanak:SulakçayırVillage	41°18'10"N/42°54'08"E	2044	07.07.2014
84. Hanak:AlaçamVillage	41°12'31"N/42°48'35"E	1850	12.08.2016
85. Hanak:BaştokluVillage	41°12'05"N/42°47'06"E	1980-2000	12.08.2016
86. Posof:SürgülüVillage-1	41°27'18"N/42°52'17"E	1888-1900	02.06.2014
87. Posof:BetweenSarıçiçekVillageandÇayırçimenVillage	41°33'45"N/42°40'19"E	1975	03.06.2014
88. Posof:KurşunçavuşVillage	41°31'29"N/42°37'52"E	1792-185	04.06.2014
89. Posof:EminbeyVillage	41°33'13"N/42°47'10"E	1515	03.06.2014
90. Posof:BetweenİncedereVillageandTaşkırınVillage	41°33'41"N/42°46'39"E	1565	03.06.2014
91. Posof:GümüüşKavakVillage	41°31'37"N/42°46'04"E	1707	03.06.2014
92. Posof:BetweenYaylaaltıVillageandGönülaçanVillage	41°33'57"N/42°43'21"E	1602	06.06.2014
93. Posof:SoğukolukVillage	41°27'23"N/42°42'13"E	1810-1860	06.06.2014
94. Posof:SarıçiçekVillage	41°34'07"N/42°39'32"E	1979	03.06.2014
95. Posof:SürgülüVillage-2	41°27'42"N/42°52'41"E	1645-1750	05.06.2014
96. Posof:DemirdövenVillage	41°29'16"N/42°39'48"E	1790-1890	05.06.2014
97. Posof:NeartheBaşduranVillage,AşıkzülaliVillage, BeykentVillage,AlabalıkVillage,HakönüVillage	41°26'21"N/42°40'50"E	1686-1800	05.06.2014
98. Posof:BetweenArılıVillageandUğurluVillage	41°28'56"N/42°41'05"E	1620-1700	05.06.2014
99. Posof:ArmutverenVillage	41°34'27"N/42°47'38"E	1357	05.06.2014
100. Posof:YeniköyVillage	41°28'10"N/42°50'05"E	1625-1700	02.06.2014
101. Posof:PlateauofBalgözeVillage,SütölükVillage,DerindereVillage	41°23'35"N/42°57'56"E	2662	17.07.2014
102. Posof:DerindereVillage	41°25'34"N/42°56'57"E	2140-2400	02.06.2014
103. Posof:BetweenAlköyVillageandYeniköyVillage	41°28'42"N/42°46'54"E	1660-1700	02.06.2014
104. Posof:BalgözeVillage	41°26'41"N/42°54'37"E	1990-2200	02.06.2014
105. Posof:GünbatanVillage	41°28'56"N/42°35'30"E	1940-2200	04.06.2014
106. Posof:NeartheDoğruluk,Uğurca,OrbarıVillage	41°31'04"N/42°41'06"E	1173	04.06.2014
107. Posof:ErimVillage	41°35'18"N/42°44'16"E	1682	03.06.2014
108. Posof:ŞavaşırVillage	41°27'44"N/42°51'04"E	1670-2000	02.06.2014
109. Posof:BetweenGünlüceVillageandKurşunçavuşVillage	41°31'12"N/42°39'44"E	1833-1950	04.06.2014
110. Posof:PlateauofSürgülüVillage	41°26'44"N/42°52'47"E	2291-2300	02.06.2014
111. Posof:ArsiyanMountain,KolköyüPlateau-1	41°25'25"N/42°34'09"E	2283-2400	12.07.2015
112. Posof:ArsiyanMountain,KolköyüPlateau-2	41°25'42"N/42°35'26"E	2130-2200	12.07.2015
113. Posof:KayınlıVillage	41°32'20"N/42°44'29"E	1900-1950	13.07.2015
114. Posof:İlgarMountain-2	41°27'20"N/42°45'32"E	1930-2100	13.07.2015
115. Posof:İlgarMountain-3	41°26'46"N/42°47'46"E	2090-2100	13.07.2015
116. Posof:İlgarMountain-1,ÇamyazıVillage	41°27'54"N/42°44'37"E	910	13.07.2015
117. Posof:AşıkzülaliVillage	41°25'48"N/42°41'14"E	1985	11.08.2016
118. Posof:BaykentVillage	41°24'49"N/42°39'32"E	1874	11.08.2016
119. Posof:AlabalıkVillage	41°23'58"N/42°38'01"E	2035	11.08.2016
120. Posof:AşıküzeyirVillage	41°26'16"N/42°40'54"E	1894	11.08.2016

