

A NEW LICHEN RECORD FOR TURKEY AND ADDITIONS TO THE LICHEN DIVERSITY OF THE GİRESUN PROVINCE (TURKEY)

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A list of 136 lichen species from the Giresun province (Turkey) is reported. Among them, 73 are new records for province, and *Acarospora molybdina* is new to Turkey. Here with, the infraspecific taxa for the province rise from 475 to 548. Locality and substrate data is presented for each taxa. Brief taxonomic description and comments are also provided for the *Acarospora molybdina*.

Key words: Ascomycota, biodiversity, Giresun province, lichens, Turkey

INTRODUCTION

The first lichen record from Giresun province, which lies in East Black Sea Region of Turkey, was published by Steiner (1909) based on materials collected by Handel-Mazzetti. In last three decades, lichen diversity of the province was attracted the interest of lichenologists, and with the rise of the lichenology in Turkey, many floristic records were published from the area (Aslan and Yazıcı 2006, Aslan *et al.* 2002, Çobanoğlu 2011, Duman and Yurdakulol 2007, Halıcı and Şenkardeşler 2009, John 2007, John and Breuss 2004, Kınalıoğlu 2005, 2006, 2008, 2009, 2010*a, b, c*, Kınalıoğlu and Aptroot 2010, 2011, Kınalıoğlu and Engin 2004, Kınalıoğlu and Uzun 2016, Küçük 1990, Sezer 2016, Yazıcı and Aptroot 2008, Yazıcı and Aslan 2005, 2006).

The aim of this study is to contribute to the lichen flora of the province. Although Giresun is one of the most examined cities of Turkey in point of lichen diversity, our study shows clearly that the city still needs to be observed.

MATERIALS AND METHODS

Specimens were collected from 52 localities (Fig. 1) visited between 2004 and 2015. All specimens have been identified using routine microscope techniques and traditional chemical reagents with the aid of various lichen litera-

tures (e.g. Brodo *et al.* 2001, Dobson 2011, Smith *et al.* 2009, Wasser and Nevo 2005, Wirth 1995, Wirth *et al.* 2013). The list of sampling localities are presented below. Samples are placed in the herbarium of the Biology Department, Faculty of Science and Arts, Giresun University, Giresun, Turkey (GUB).

Sampling localities

1. Bulancak, N of Bayındır village, 1112 m, 40° 43' 22" N, 38° 08' 12" E, 05.05.2006.
2. Centre, Ayvasıl place, sea shore, 7 m, 40° 55' 35" N, 38° 18' 44" E, 25.05.2006.
3. Centre, SE slope of Gedikkaya hill, 190 m, 40° 54' 35" N, 38° 24' 48" E, 10.06.2006.
4. Centre, SW of Giresun city centre, SE of Boztekke village, 21 m, 40° 54' 34" N, 38° 19' 35" E, 11.08.2008.
5. Centre, SW of city centre, Boztekke village, 43 m, 40° 54' 10" N, 38° 19' 16" E, 10.04.2010.
6. Centre, Aksu district, near the stream, 19 m, 40° 53' 30" N, 38° 26' 26" E, 16.05.2015.
7. Centre, Küçükköy district, stream bank, 14 m, 40° 53' 49" N, 38° 26' 33" E, 16.05.2015.
8. Centre, Çaykara district, stream bank, 26 m, 40° 53' 14" N, 38° 26' 23" E, 16.05.2015.
9. Centre, Teyyaredüzü district, 13 m, 40° 54' 42" N, 38° 20' 12" E, 04.05.2015.
10. Dereli, Tamdere village, 1690 m, 40° 30' 14" N, 38° 21' 02" E, 06.05.2005.
11. Dereli, Tepeköknarlı village, 605 m, 40° 47' 28" N, 38° 26' 44" E, 14.04.2005.
12. Dereli, northern slopes of Karagöl mountains, 2810 m, 40° 31' 03" N, 38° 10' 02" E, 29.07.2007.
13. Dereli, Karagöl Mountains, 3050 m, 40° 31' 24" N, 38° 09' 10" E, 29.07.2007.
14. Dereli, Aymaç place, 1827 m, 40° 34' 18" N, 38° 24' 50" E, 29.05.2008.
15. Dereli, E of Kuzu gölü yaylası, 2143 m, 40° 34' 42" N, 38° 29' 21" E, 09.08.2008.
16. Dereli, N of Kümbet yaylası, 1650 m, 40° 33' 09" N, 38° 27' 36" E, 10.08.2008.
17. Dereli, SE of Yüce village, 1345 m, 40° 37' 37" N, 38° 28' 11" E, 17.05.2008.
18. Espiye, Gülburnu, sea shore, 1 m, 40° 57' 50" N, 38° 39' 14" E, 10.06.2006.
19. Espiye, S of Arpacık village, 196 m, 40° 53' 01" N, 38° 46' 33" E, 08.11.2014.
20. Espiye, SW of Bahçecik village, 220 m, 40° 53' 40" N, 38° 44' 17" E, 08.11.2014.
21. Espiye, Çepniköy village, 465 m, 40° 51' 25" N, 38° 43' 59" E, 08.11.2014.
22. Espiye, S of Direkbükü village, 167 m, 40° 51' 10" N, 38° 46' 12" E, 08.11.2014.
23. Espiye, E of Ericek village, 955 m, 40° 42' 58" N, 38° 43' 00" E, 08.11.2014.
24. Espiye, E of Güneyköy village, 560 m, 40° 52' 19" N, 38° 44' 45" E, 08.11.2014.
25. Espiye, Kızıldere district, 40 m, 40° 54' 36" N, 38° 44' 55" E, 08.11.2014.
26. Espiye, Soğukpınar town, 624 m, 40° 49' 08" N, 38° 43' 56" E, 08.11.2014.
27. Espiye, Kurugeriş village, 635 m, 40° 49' 30" N, 38° 46' 59" E, 08.11.2014.
28. Espiye, S of Yeşilköy village, 285 m, 40° 50' 01" N, 38° 45' 59" E, 08.11.2014.
29. Espiye, Yeşilyurt village, 472 m, 40° 53' 05" N, 38° 42' 51" E, 08.11.2014.
30. Espiye, E of Gülburnu, sea shore, 1 m, 40° 57' 04" N, 38° 40' 20" E, 17.05.2015.
31. Keşap, between Geçit village and Erköy village, 950 m, 40° 44' 04" N, 38° 35' 16" E, 25.08. 2004.
32. Keşap, SE of Ceylanpınar village, stream bank, 604 m, 40° 47' 34" N, 38° 32' 36" E, 25.08.2004.
33. Keşap, Dokuztepe village, 360 m, 40° 52' 46" N, 38° 31' 30" E, 03.11.2005.
34. Keşap, Değirmenağzı village, 12 m, 40° 58' 24" N, 38° 38' 34" E, 12.02.2006.
35. Keşap district, Değirmenağzı village, sea shore, 1 m, 40° 58' 20" N, 38° 37' 23" E, 11.04.2010.

36. Keşap district, Değirmenağzı village, sea shore, 4 m, 40° 58' 21" N, 38° 37' 22" E, 11.04.2010.
37. Keşap, Değirmenağzı village, sea shore, 2 m, 40° 58' 23" N, 38° 37' 30" E, 19.05.2015.
38. Piraziz, S of Hasanşeyh village, 425 m, 40° 53' 33" N, 38° 07' 43" E, 30.03.2006.
39. Piraziz, E of Gökçeali village, 422 m, 40° 54' 24" N, 38° 05' 39" E, 30.03.2006.
40. Piraziz, W of Çayırköy village, 745 m, 40° 52' 24" N, 38° 03' 57" E, 30.03.2006.
41. Şebinkarahisar, N of Asarcık village, 1850 m, 40° 25' 10" N, 38° 23' 33" E, 01.09.2015.
42. Şebinkarahisar, S of Eğribel pass, 2111 m, 40° 26' 27" N, 38° 23' 35" E, 01.09.2015.
43. Şebinkarahisar, E of Eğribel pass, 2264 m, 40° 27' 21" N, 38° 24' 02" E, 01.09.2015.
44. Şebinkarahisar, S of Eğribel pass, 2109 m, 40° 26' 28" N, 38° 23' 34" E, 01.09.2015.
45. Şebinkarahisar, between Asarcık village and Şaplıca village, stream bank, 1505 m, 40° 24' 13" N, 38° 25' 09" E, 01.09.2015.
46. Şebinkarahisar, W of Turna plain, 2561 m, 40° 28' 32" N, 38° 25' 20" E, 01.09.2015.
47. Şebinkarahisar, NE of Tamzara village, 1243 m, 40° 19' 53" N, 38° 26' 31" E, 01.09.2015.
48. Şebinkarahisar, between Baltaşlı village and Duman village, 1174 m, 40° 19' 53" N, 38° 26' 31" E, 01.09.2015.
49. Şebinkarahisar, NE of Duman village, near the Kılıçkaya dam, 1037 m, 40° 14' 18" N, 38° 16' 55" E, 01.09.2015.
50. Şebinkarahisar, E of Sarıyer village, woodland, 1598 m, 40° 16' 07" N, 38° 32' 37" E, 01.09.2015.

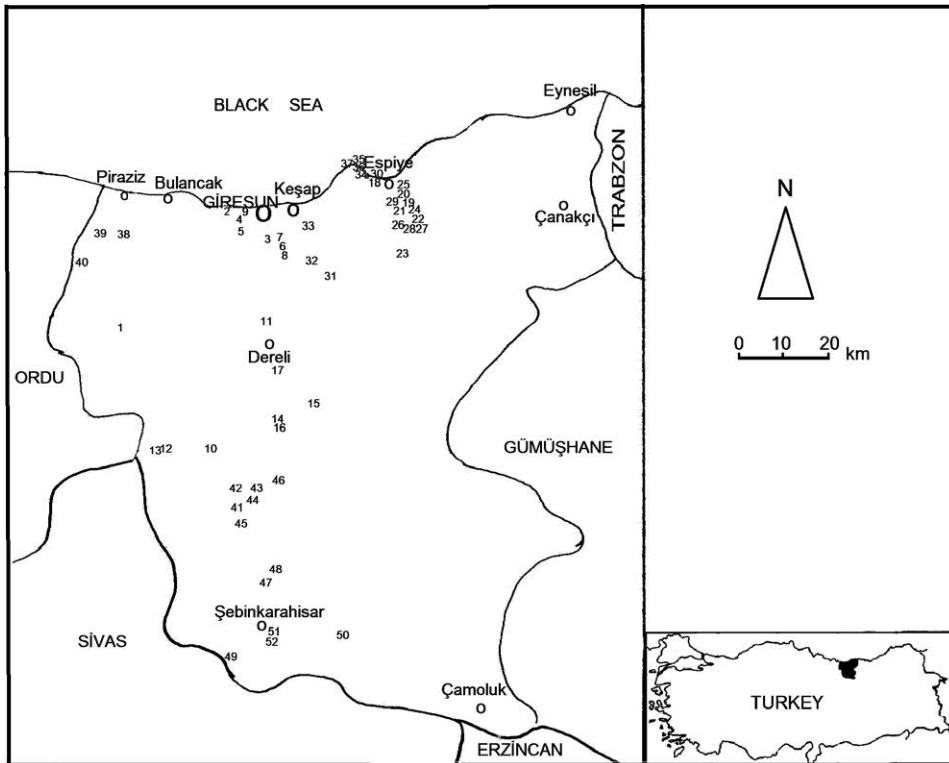


Fig. 1. Map of the collecting localities and numbers

51. Şebinkarahisar, near the top of Şebinkarahisar castle, 1515 m, 40° 17' 05" N, 38° 25' 42" E, 01.09.2015.
52. Şebinkarahisar, N slopes of Şebinkarahisar castle, 1515 m, 40° 17' 06"N, 38° 25' 45"E, 01.09.2015.

RESULTS

An alphabetical list of the lichen species identified from the Giresun province is followed. First records for Turkey are marked by a hash symbol (#) and for Giresun by an asterisk (*).

**Acarospora badiofusca* (Nyl.) Th. Fr. – Loc. 43 (GUB-6227): siliceous rock.

#*Acarospora molybdina* (Wahlenb.) Trevisan – (Fig. 2) – Loc. 49 (GUB-6228): calcareous rock. – Thallus light brown. Apothecia immersed, mostly single, rarely a few per areole, disc dark brownish, to 1.8 mm diam. Epihymenium yellowish brown, hypothecium yellowish, hymenium 60–150 µm tall, I+ blue. Ascospores simple, colourless, rounded, ellipsoid, cylindrical, 2.5–5 µm × 2.25–2.5 µm. Thallus C–, K–, KC–, PD–.

A detailed descriptions of the species is given in Thomson (1997). *Acarospora molybdina* differs by its longer lobes and mostly sessile apothecia, but is



Fig. 2. *Acarospora molybdina* habit (scale bar = 1 mm)

more polymorphic than the samples of *A. macrocyclos* we examined (Knudsen *et al.* 2012). The Turkish material of *A. molybdina* differs from North American specimens by having bigger ascospores and a lower hymenium. In the North American collections the ascospores is $3\text{--}4 \times 1.5 \mu\text{m}$, and the hymenium is $90\text{--}185 \mu\text{m}$ high (Thomson 1997). The Turkish collection differs ecologically in occurring on calcareous rock. *A. molybdina* is a circumpolar arctic species, growing on acid rocks, and particularly on boulders manured by birds along coasts (Thomson 1997). Known from Norway, Sweden and the United States (Knudsen *et al.* 2012, Thomson 1997). In Turkey, it was collected from sunny calcareous rocks at an elevation of 1037 m near the Kılıçkaya dam in Şebinkarahisar County. This is the first report of the species from Turkey.

**Acarospora veronensis* A. Massal. – Loc. 44 (GUB-6229): siliceous rock; Loc. 49 (GUB-6230): calcareous rock.

Acrocordia macrospora A. Massal. – Loc. 37 (GUB-6231): siliceous rock.

Anisomeridium polypori (Ellis et Everh.) M. E. Barr. – Loc. 23 (GUB-6232): *Malus* sp.

Arthonia cinnabarina (DC.) Wallr. – Loc. 22 (GUB-6233): *Tilia* sp.

**Arthonia punctiformis* Ach. – Loc. 14 (GUB-6234): *Rhododendron* sp.; Loc. 9 (GUB-6235): *Corylus* sp.

Arthonia radiata (Pers.) Ach. – Loc. 14 (GUB-6236): *Rhododendron* sp.; Loc. 9 (GUB-6237): *Corylus* sp.

**Arthopyrenia cinereopruinosa* (Schaer.) A. Massal. – Loc. 5 (GUB-6238): *Corylus* sp.

**Arthopyrenia salicis* A. Massal. – Loc. 21 (GUB-6239): *Fagus* sp.

Arthopyrenia laevata (Ach.) Arnold – Loc. 10 (GUB-6240) and Loc. 40 (GUB-6241): siliceous rock.

**Bacidina sulphurella* (Samp.) M. Hauck et V. Wirth – Loc. 19 (GUB-6242): wooden telephone pole.

**Bagliettoa calciseda* (DC.) Gueidan et Cl. Roux – Loc. 1 (GUB-6243) and Loc. 32 (GUB-6244): calcareous rock.

Bellemerea cinereorufescens (Ach.) Clauzade et Cl. Roux – Loc. 44 (GUB-6245): siliceous rock.

Blennothallia crispa (Huds.) Otálora, P. M. Jørg. et Wedin – Loc. 7 (GUB-6246): mortar.

Bryoria fuscescens (Gyeln.) Brodo et D. Hawksw. – Loc. 46 (GUB-6247): moss.

**Buellia aethalea* (Ach.) Th. Fr. – Loc. 37 (GUB-6248) and Loc. 50 (GUB-6249): siliceous rock.

**Calicium abietinum* Pers. – Loc. 24 (GUB-6250): garden fence.

**Caloplaca ceracea* J. R. Laundon – Loc. 35 (GUB-6251): siliceous rock.

Caloplaca erythrocarpia (Pers.) Zwackh – Loc. 30 (GUB-6252) and Loc. 37 (GUB-6253): siliceous rock.

Caloplaca obscurella (J. Lahm) Th. Fr. – Loc. 45 (GUB-6254): *Quercus* sp.

**Caloplaca pellodella* (Nyl.) Hasse – Loc. 35 (GUB-6255), Loc. 37 (GUB-6256), Loc. 42 (GUB-6257), Loc. 43 (GUB-6258) and Loc. 44 (GUB-6259): siliceous rock.

**Caloplaca schoeferi* Poelt – Loc. 12 (GUB-6260) and Loc. 41 (GUB-6261): moss.

**Caloplaca stillicidiorum* (Vahl) Lyngé – Loc. 52 (GUB-6262): moss.

**Carbonea vorticosa* (Flörke) Hertel – Loc. 41 (6263): siliceous rock.

**Catillaria nigroclavata* (Nyl.) Schuler – Loc. 4 (GUB-6264): *Alnus* sp.

Chaenotheca trichialis (Ach.) Th. Fr. – Loc. 14 (GUB-6265): *Pinus* sp.

Cladonia cyathomorpha Stirt. ex Walt. Watson – Loc. 20 (GUB-6266): soil.

Cladonia humilis (With.) J. R. Laundon – Loc. 45 (GUB-6267): soil.

Cladonia pocillum (Ach.) O. J. Rich. – Loc. 52 (GUB-6268): soil.

Cladonia rei Schaer. – Loc. 28 (GUB-6269): moss.

Circinaria calcarea (L.) A. Nordin, S. Savić et Tibell – Loc. 12 (GUB-6270): soil.

**Circinaria gibbosa* (Ach.) A. Nordin, S. Savić et Tibell – Loc. 35 (GUB-6271): siliceous rock.

**Clauzadea monticola* (Ach.) Hafellner et Bellem. – Loc. 39 (GUB-6272): siliceous rock.

Collema flaccidum (Ach.) Ach. – Loc. 52 (GUB-6273): moss.

Dermatocarpon luridum (With.) J. R. Laundon – Loc. 13 (GUB-6274): siliceous rock.

**Endocarpon pusillum* Hedw. – Loc. 15 (GUB-6275) and Loc. 51 (GUB-6276): soil.

Enterographa zonata (Körb.) Källsten ex Torrente et Egea – Loc. 9 (GUB-6277): siliceous rock.

**Flavoplaca nigromarina* (Vondrák, P. Ríha, Arup et Søchting) Arup, Søchting et Frödén – Loc. 30 (GUB-6278) and Loc. 37 (GUB-6279): siliceous rock.

**Fuscidea cyathoides* (Ach.) V. Wirth et Vězda – Loc. 36 (GUB-6280): siliceous rock.

**Fuscopannaria mediterranea* (Tav.) P. M. Jørg. – Loc. 31 (GUB-6281): *Platanus* sp.

**Immersaria athrocarpa* (Ach.) Rambold et Pietschm. – Loc. 45 (GUB-6282): calcareous rock.

**Immersaria cupreoatra* (Nyl.) Calatayud et Rambold – Loc. 44 (GUB-6283) and Loc. 52 (GUB-6284): siliceous rock.

**Lathagrium auriforme* (With.) Otálora, P. M. Jørg. et Wedin – Loc. 52 (GUB-6285): calcareous rock.

- Lecania naegelii* (Hepp) Diederich et van den Boom – Loc. 6 (GUB-6286):
Ficus sp.
Lecanora carpinea (L.) Vain. – Loc. 17 (GUB-6387): *Prunus* sp.
Lecanora chlarotera Nyl. – Loc. 50 (GUB-6288): *Corylus* sp.
Lecanora intumescens (Rebent.) Rabenh. – Loc. 16 (GUB-6289): *Fagus* sp.
Lecanora saligna (Schrad.) Zahlbr. – Loc. 24 (GUB-6290): garden fence.
Lecanora subcarnea (Lilj.) Ach. – Loc. 41 (GUB-6291): calcareous rock.
 **Lecanora subrugosa* Nyl. – Loc. 38 (GUB-6292): *Corylus* sp.
Lecidea lapicida (Ach.) Ach. – Loc. 36 (GUB-6293): siliceous rock.
Lecidea lapicida var. *pantherina* Ach. – Loc. 45 (GUB-6294): iron-rich rock.
 **Lecidea promiscens* Nyl. – Loc. 15 (GUB-6295): siliceous rock.
Lecidella achristotera (Nyl.) Hertel et Leuckert – Loc. 4 (GUB-6296): *Corylus*
 sp.
 **Lecidella asema* (Nyl.) Knoph et Hertel – Loc. 36 (GUB-6297) and Loc. 44
 (GUB-6298): siliceous rock.
 **Lecidella patavina* (A. Massal.) Knoph et Leuckert – Loc. 28 (GUB-6299)
 and Loc. 51 (GUB-6300): siliceous rock.
Lecidella stigmattea (Ach.) Hertel et Leuckert – Loc. 3 (GUB-6301): mortar.
 **Lepraria caesioalba* (de Lesd.) J. R. Laundon – Loc. 15 (GUB-6302): moss.
 **Lobaria amplissima* (Scop.) Forssell – Loc. 31 (GUB-6303): *Platanus* sp.
 **Lobothallia melanaspis* (Ach.) Hafellner – Loc. 48 (GUB-6304): calcareous
 rock.
 **Lobothallia prae radiosa* (Nyl.) Hafellner – Loc. 46 (GUB-6305) and Loc. 51
 (GUB-9306): siliceous rock; Loc. 48 (GUB-6307): calcareous rock.
 **Micarea melaena* (Nyl.) Hedl. – Loc. 29 (GUB-6308): garden fence.
Micarea prasina Fr. – Loc. 24 (GUB-6309): dead tree.
 **Moelleropsis nebulosa* (Hoffm.) Gyeln. – Loc. 34 (GUB-6310): soil.
 **Mycobilimbia berengeriana* (A. Massal.) Hafellner et V. Wirth – Loc. 12
 (GUB-6311): soil.
 **Mycocalicium subtile* (Pers.) Szatala – Loc. 19 (GUB-6312): garden fence.
Myriolecis albescens (Hoffm.) Śliwa, Zhao Xin et Lumbsch – Loc. 24 (GUB-
 6313): garden fence.
Myriolecis dispersa (Pers.) Śliwa, Zhao Xin et Lumbsch – Loc. 7 (GUB-
 6314): mortar.
Myriolecis hagenii (Ach.) Śliwa, Zhao Xin et Lumbsch – Loc. 35 (GUB-
 6315): siliceous rock.
 **Myriolecis perpruinosa* (Fröberg) Śliwa, Zhao Xin et Lumbsch – Loc. 44
 (GUB-6316): siliceous rock.
 **Myriolecis semipallida* (H. Magn.) Śliwa, Zhao Xin et Lumbsch – Loc. 44
 (GUB-6317) and Loc. 47 (GUB-6318): siliceous rock.

- **Naeotrocymbe punctiformis* (Pers.) R. C. Harris – Loc. 9 (GUB-6319): *Corylus* sp.
- **Opegrapha lithyriga* Ach. – Loc. 5 (GUB-6320): siliceous rock.
- **Opegrapha* cf. *niveoatra* (Borrer) J. R. Laundon – Loc. 34 (GUB-6321): *Corylus* sp.
- Opegrapha rufescens* Pers. – Loc. 17 (GUB-6322): *Prunus* sp.
- **Parvoplaca tirolensis* (Zahlbr.) Arup, Søchting et Frödén – Loc. 51 (GUB-6323): plant debris.
- Pertusaria corallina* (L.) Arnold – Loc. 37 (GUB-6324): siliceous rock.
- **Pertusaria* cf. *leioplaca* DC. – Loc. 25 (GUB-6325): *Laurocerasus* sp.
- Pertusaria leucosora* Nyl. – Loc. 17 (6326): moss; Loc. 47 (GUB-6327): siliceous rock.
- Physcia caesia* (Hoffm.) Hampe ex Fűrnr. – Loc. 52 (GUB-6328): moss.
- **Physconia detersa* (Nyl.) Poelt – Loc. 51 (GUB-6329): siliceous rock; Loc. 52 (GUB-6330): moss.
- **Physconia grisea* (Lam.) Poelt – Loc. 51 (GUB-6331): moss.
- **Physconia muscigena* var. *petraea* Poelt – Loc. 15 (GUB-6332): siliceous rock.
- **Placidium lachneum* (Ach.) de Lesd. – Loc. 15 (GUB-6333): moss.
- **Placidium* cf. *rufescens* (Ach.) A. Massal. – Loc. 42 (GUB-6334): soil.
- **Placopyrenium fuscillum* (Turner) Gueidan et Cl. Roux – Loc. 6 (GUB-6335): mortar.
- **Placopyrenium* cf. *iranicum* Breuss – Loc. 42 (GUB-6336): moss.
- **Placynthiella icmalea* (Ach.) Coppins et P. James – Loc. 15 (GUB-6337): soil.
- **Placynthiella uliginosa* (Schrad.) Coppins et P. James – Loc. 15 (GUB-6338): soil.
- Placynthium nigrum* (Huds.) Gray – Loc. 1 (GUB-6339): mortar; Loc. 37 (GUB-6340): siliceous rock.
- Polysporina simplex* (Taylor) Vězda – Loc. 15 (GUB-6341): siliceous rock.
- **Porina ahlesiana* (Körb.) Zahlbr. – Loc. 30 (GUB-6342): siliceous rock.
- Porpidia macrocarpa* (DC.) Hertel et A. J. Schwab – Loc. 11 (GUB-6343): siliceous rock.
- Porpidia tuberculosa* (Sm.) Hertel et Knoph – Loc. 45 (GUB-6344): iron-rich rock.
- Protoblastenia rupestris* (Scop.) J. Steiner – Loc. 39 (GUB-6345): siliceous rock.
- Protoparmelia badia* (Hoffm.) Hafellner – Loc. 45 (GUB-6346): iron-rich rock.
- **Protoparmeliopsis garovaglii* (Körb.) Arup, Zhao Xin et Lumbsch – Loc. 45 (GUB-6347): siliceous rock.

- **Pseudephebe pubescens* (L.) M. Choisy – Loc. 46 (GUB-6348): siliceous rock.
- **Psora globifera* (Ach.) A. Massal. – Loc. 15 (GUB-6349): soil.
- **Psorotichia schaeferi* (A. Massal.) Arnold – Loc. 1 (GUB-6350): siliceous rock.
- Pyrenodesmia variabilis* (Pers.) A. Massal. – Loc. 49 (GUB-6351): calcareous rock.
- Pyrenula subelliptica* (Tuck.) R. C. Harris – Loc. 22 (GUB-6352): *Laurocerasus* sp.
- Rhizocarpon geographicum* (L.) DC. – Loc. 37 (GUB-6353): siliceous rock.
- **Rhizocarpon oederi* (Weber) Körb. – Loc. 45 (GUB-6354): iron-rich rock.
- **Rhizocarpon reductum* Th. Fr. – Loc. 18 (GUB-6355): siliceous rock.
- Rinodina atrocinerea* (Hook.) Körb. – Loc. 43 (GUB-6356): siliceous rock.
- **Rinodina bischoffii* (Hepp) A. Massal. – Loc. 49 (GUB-6357): calcareous rock.
- **Rinodina milvina* (Wahlenb.) Th. Fr. – Loc. 42 (GUB-6358): siliceous rock.
- **Rinodina oleae* Bagl. – Loc. 29 (GUB-6359): *Carpinus* sp.
- Rufoplaca arenaria* (Pers.) Arup, Søchting et Frödén – Loc. 44 (GUB-6360): siliceous rock.
- **Sarcogyne privigna* (Ach.) A. Massal. – Loc. 18 (GUB-6361): siliceous rock.
- Sarcogyne regularis* Körb. – Loc. 4 (GUB-6362) and Loc. 44 (GUB-6363): siliceous rock.
- Schaereria fuscocinerea* (Nyl.) Clauzade et Cl. Roux – Loc. 43 (GUB-6364): siliceous rock.
- Schismatomma decolorans* (Sm.) Clauzade et Vězda – Loc. 5 (GUB-6365): siliceous rock.
- Scoliciosporum umbrinum* (Ach.) Arnold – Loc. 15 (GUB-6366): siliceous rock; Loc. 17 (GUB-6367): *Prunus* sp.
- Staurothele areolata* (Ach.) Lettau – Loc. 44 (GUB-6368): siliceous rock.
- **Staurothele frustulenta* Vain. – Loc. 49 (GUB-6369): calcareous rock and concrete.
- **Staurothele rufa* (A. Massal.) Zschacke – Loc. 45 (GUB-6370): siliceous rock.
- Strigula glabra* (A. Massal.) V. Wirth – Loc. 20 (GUB-6371): *Corylus* sp.
- Thallinocarpon nigritellum* (Lettau) P. M. Jørg. – Loc. 51 (GUB-6372): siliceous rock.
- **Thelenella muscorum* (Fr.) Vain. – Loc. 41 (GUB-6373): moss.
- Trapelia coarctata* (Sm.) M. Choisy – Loc. 4 (GUB-6374), Loc. 26 (GUB-6375) and Loc. 27 (GUB-6376): siliceous rock.
- **Trapeliopsis granulosa* (Hoffm.) Lumbsch – Loc. 29 (GUB-6377): garden fence.

- **Umbilicaria polyphylla* (L.) Baumg. – Loc. 50 (GUB-6378): siliceous rock.
Umbilicaria subglabra (Nyl.) Harm. – Loc. 42 (GUB-6379): siliceous rock.
Usnea hirta (L.) F. H. Wigg. – Loc. 5 (GUB-6380): siliceous rock.
 **Usnea* cf. *lapponica* Vain. – Loc. 50 (GUB-6381): *Quercus* sp.
Vahlia leucophaea (Vahl) P. M. Jørg. – Loc. 15 (GUB-6382): moss.
 **Verrucaria latericola* (Erichsen) Nav.-Ros. et Cl. Roux – Loc. 48 (GUB-6384): calcareous rock.
Verrucaria muralis Ach. – Loc. 8 (GUB-6385): mortar.
Verrucaria nigrescens Pers. – Loc. 7 (GUB-6386): mortar.
 **Verrucaria ochrostoma* Borrer – Loc. 32 (GUB-6387): limestone; Loc. 42 (GUB-6388): siliceous rock.
 **Verrucaria polysticta* Borrer – Loc. 48 (GUB-6389) and Loc. 49 (GUB-6390): calcareous rock; Loc. 50 (GUB-6391): siliceous rock.
 **Verrucaria viridula* (Schrad.) Ach. – Loc. 49 (GUB-6392): calcareous rock.
 **Verrucula dolosa* Hepp – Loc. 33 (GUB-6383): siliceous rock.

Altogether 136 lichen taxa were yielded (134 species and 2 varieties) from Giresun province. The 109 taxa of them represent a crustose growth form, 15 represent a foliose growth form, 11 represent a fruticose growth form, and 1 represents leprose growth form.

A 73 species (54.08%) are new records for the Giresun province and *Acarospora molybdina* is new for the Turkish lichen biota.

Anisomeridium polypori, *Caloplaca schoeferi*, *Lecanora perpruinosa*, *Moelleropsis nebulosa*, *Placopyrenium* cf. *iranicum*, *Placynthiella uliginosa* and *Rhizocarpon oederi* were recorded for the second time in Turkey (John and Breuss 2004, Kocakaya *et al.* 2009, Şenkardeşler and Sukatar 2006, Vondrák *et al.* 2016, Yazıcı 1999, Yazıcı and Aptroot 2008, Yazıcı *et al.* 2015), while *Aspicilia gibbosa*, *Bacidina sulphurella* (Güvenç *et al.* 2006, Yazıcı *et al.* 2015; as *Bacidina arnoldiana* (Körb.) V. Wirth et Vězda), *Flavoplaca nigromarina*, *Cladonia cyathomorpha*, *Lecidea berengeriana* (Kınalıoğlu 2010b: as *Mycobilimbia berengeriana* (A. Massal.) Hafellner et V. Wirth), *Opegrapha* cf. *niveoatra*, *Porina ahlesiana* (Steiner 1899: as *Verrucaria ahlesiana* (Zwackh) Nik. Hoffm. et Hafellner), and *Schismatomma decolorans*, for the third time in Turkey (Kınalıoğlu, 2010b, d, Kınalıoğlu and Aptroot 2010, Güvenç *et al.* 2006, Özdemir Türk and Güner 1998, Yazıcı and Aslan 2003, Steiner 1899, 1916, Szatala 1927, Vondrák *et al.* 2009, Yazıcı and Aptroot 2007, 2008, Yazıcı *et al.* 2010, 2011).

The most rich 4 genera in the study area are *Lecanora* (6 species), *Myriolecis* (6 species), *Verrucaria* (6 species) and *Rinodina* (5 species).

From a total of 136 lichen taxa, 78 were saxicolous, 33 epiphytic, 12 muscicolous and 11 terricolous. In addition, one taxon was both muscicolous and

saxicolous (*Physconia detersa*) and one taxon corticolous and saxicolous (*Scoliosporum umbrinum*).

The collecting site nr. 15 is characterised by the highest number of taxa (11 taxa), site nrs 37 and 44 with 9-9 taxa and site nr. 49 with 8 taxa.

According to the studies from Giresun province, 475 lichen taxa are recorded so far. After our contribution, the number of lichen taxa known in the province reaches now to 548. The knowledge of lichen biota of Giresun province may be considered as nearly complete as a result of this research. However, due to the high lichen diversity of the province, additional records might occur during future studies.

REFERENCES

- Aslan, A. and Yazıcı, K. (2006): Contribution to the lichen flora of Giresun Province of Turkey. – *Acta Bot. Hung.* **48**(3–4): 231–245. <https://doi.org/10.1556/ABot.48.2006.3-4.1>
- Aslan, A., Aptroot, A. and Yazıcı, K. (2002): New lichens for Turkey. – *Mycotaxon* **84**: 227–280.
- Brodo, I. M., Sharnoff, S. D. and Sharnoff, S. (2001): *Lichens of North America*. – Yale University Press, New Haven and London, 795 pp.
- Çobanoğlu, G. (2011): Additional and new lichen records for the province of Giresun. – *Marmara Üniversitesi Fen Bilimleri Dergisi* **23**(2): 83–88.
- Dobson, F. S. (2011): *Lichens: an illustrated guide to the British and Irish species*. – Richmond Publishing, Slough, 496 pp.
- Duman, C. and Yurdakulol, E. (2007): Lichen records from Sarıçiçek Mountain in Southern Giresun Province, Turkey. – *Turk. J. Bot.* **31**: 357–365.
- Halıcı, M. G. and Şenkardeşler, A. (2009): Giresun için yeni kayıt: Phaeosporobolus usneae. – *T. LT. Büll.* **7**: 11–12.
- Güvenç, Ş., Öztürk Ş. and Aydın S. (2006): Contributions to the lichen flora of Kastamonu and Sinop Provinces in Turkey. – *Nova Hedwigia* **83**(1–2): 67–98. <https://doi.org/10.1127/0029-5035/2006/0083-0067>
- John, V. (2007): Lichen Anatolici Exsiccati. – *Arnoldia* **26**, Fasc. 8 (no. 176–200).
- John, V. and Breuss, O. (2004): Flechten der östlichen Schwarzmeer-Region in der Türkei (BLAM Exkursion 1997). – *Herzogia* **17**: 137–156.
- Kınalıoğlu, K. (2005): Lichens of Giresun District, Giresun Province, Turkey. – *Turk. J. Bot.* **29**: 417–423.
- Kınalıoğlu, K. (2006): Lichens of Keşap District (Giresun, Turkey). – *Acta Bot. Hung.* **48**(1–2): 65–76. <https://doi.org/10.1556/ABot.48.2006.1-2.9>
- Kınalıoğlu, K. (2008): Three new records for the lichen biota of Turkey. – *Mycotaxon* **103**: 123–126.
- Kınalıoğlu, K. (2009): Additional lichen records from Giresun Province, Turkey. – *Mycotaxon* **109**: 137–140. <https://doi.org/10.5248/109.137>
- Kınalıoğlu, K. (2010a): Cladonia, Lecanographa, Ochrolechia, and Placidium species new to Turkey. – *Myxotaxon* **113**: 203–208. <https://doi.org/10.5248/113.203>
- Kınalıoğlu, K. (2010b): New and interesting records of lichens from Turkey. – *Myxotaxon* **114**: 85–90. <https://doi.org/10.5248/114.85>

- Kınalıoğlu, K. (2010c): Five new records for the lichen biota of Turkey. – *Myxotaxon* **112**: 371–375. <https://doi.org/10.5248/112.371>
- Kınalıoğlu, K. (2010d): Epiphytic and saxicolous lichens of district centre of Arakli and in vicinity (Trabzon, Turkey). – *Pakistan J. Biol. Sci.* **13**(12): 588–595. <https://doi.org/10.3923/pjbs.2010.588.595>
- Kınalıoğlu, K. and Aptroot, A. (2010): Catillaria, Cladonia, Strigula, and Cresporhaphis species new to Turkey and Asia. – *Myxotaxon* **114**: 329–332. <https://doi.org/105248/114.329>
- Kınalıoğlu, K. and Aptroot, A. (2011): Carbonea, Gregorella, Porpidia, Protomicarea, Rinodina, Solenopsora, and Thelenella lichen species new to Turkey. – *Myxotaxon* **115**: 125–129. <https://doi.org/10.5248/115.125>
- Kınalıoğlu, K. and Engin, A. (2004): Bülbülan (Artvin), Ayder, Anzer (Rize), Kalecik (Trabzon) ve Kümbet (Giresun) Yaylalarının Likenleri. – *Ot Sistematiik Botanik Dergisi (The Herb J. Syst. Bot.)* **11**(2): 167–190.
- Kınalıoğlu, K. and Uzun, G. (2016): Şebinkarahisar (GİRESUN) İlçesinden Liken ve Likenikol Mantar Kayıtları. (Lichenized and lichenicolous fungi records from Şebinkarahisar District (GİRESUN)). – *AKÜ FEMÜBİD* **16** (011003): 16–25. <https://doi.org/10.5578/fmbd.25264>
- Kocakaya, M., Halıcı, M. G. and Aksoy, A. (2009): Lichens and lichenicolous fungi of Kızıldağ (Derebucak, Konya). – *Turk. J. Bot.* **33**: 105–112. <https://doi.org/10.3906/bot-0810-2>
- Küçük, M. (1990): Giresun Adası'nın Floristik Yapısı. – *Ormancılık Araştırma Enstitüsü Yayınları* **36**(2): 58.
- Knudsen, K., Flakus, A. and Kukwa, M. (2012): A contribution to the study of Aca-rosporaceae in South America. – *Lichenologist* **44**(2): 253–262. <https://doi.org/10.1017/s0024282911000703>
- Özdemir Türk, A. and Güner, H. (1998): Lichens of the Thrace region of Turkey. – *Turk. J. Bot.* **22**: 397–407.
- Şenkardeşler, A. and Sukatar, A. (2006): Lichens of Denizli. – *JFS* **29**: 52–66.
- Sezer, O. (2016): Türkiye liken biyotasına katkılar. – *AÇU Orman Fak. Derg.* **17**(1): 70–81.
- Smith, C. W., Aptroot, A., Coppins, B. J., Fletcher, A., Gilbert, O. L., James, P. W. and Wolseley, P. A. (2009): *The lichens of Great Britain and Ireland*. – British Lichen Society, London, 1046 pp.
- Steiner, J. (1899): Lichenes. In: Fritsch, K.: Beitrag zur Flora von Constantinopel, Bearbeitung der von J. Nemetz in den Jahren 1894–1897 in den Umgebung von Constantinopel gesammelten Pflanzen. I. Kryptogamen. – *Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl.* **68**: 219–249.
- Steiner, J. (1909): Lichenes. In: Handel-Mazzetti, D. H. F. V.: Ergebnisse einer botanischen Reise in das Pontische Randgebirge im Sandschak Trapezunt, etc. – *Ann. Naturhist. Hofmuseum Wien* **23**: 107–123.
- Steiner, J. (1916): Aufzählung der von J. Bornmüller im Oriente gesammelten Flechten. – *Ann. Naturhist. Hofmuseum Wien* **30**: 24–39.
- Szatala, Ö. (1927): Lichenes in Asia minore ab directore Dre Stefano Györffy de Szigeth (Budapest) et Dre Andrasovszky collecti. – *Folia Cryptog.* **1**: 272–278.
- Thomson, J. W. (1997): *American arctic lichens. 2. The microlichens*. – The University of Wisconsin Press, Madison, 675 pp.
- Vondrák, J., Říha, P., Arup, U. and Søchting, U. (2009): The taxonomy of the Caloplaca citrina group (Teloschistaceae) in the Black Sea region; with contributions to the cryptic

- species concept in lichenology. – *Lichenologist* **41**(6): 571–604. <https://doi.org/10.1017/S0024282909008317>
- Vondrák, J., Halıcı, M. G., Güllü, M. and Demireli, R. (2016): Taxonomy of the genus *Athalia* and its diversity in Turkey. – *Turk. J. Bot.* **40**: 319–328. <https://doi.org/10.3906/bot-1502-12>
- Wasser, S. P. and Nevo, E. (2005): *Lichen-forming, lichenicolous, and allied fungi of Israel*. – A. R. G. Gantner Verlag K. G., Ruggell, 384 pp.
- Wirth, V. (1995): *Die Flechten Baden-Württembergs*. Teil 1–2. – Ulmer, Stuttgart, 1006 pp.
- Wirth, V., Hauck, M. and Schultz, M. (2013): *Die Flechten Deutschlands*. – Ulmer, Stuttgart, 1244 pp.
- Yazıcı, K. (1999): Lichen flora of Trabzon. – *Turk. J. Bot.* **23**: 97–112.
- Yazıcı, K. and Aptroot, A. (2007): Five lichen species new to Turkey. – *Mycotaxon* **100**: 21–26.
- Yazıcı, K. and Aptroot, A. (2008): Corticolous lichens of the city of Giresun with descriptions of four species new to Turkey. – *Myxotaxon* **105**: 95–104.
- Yazıcı, K. and Aslan, A. (2003): Lichens from the regions of Gümüşhane, Erzincan and Bayburt (Turkey). – *Cryptogamie, Mycol.* **24**(2): 287–300.
- Yazıcı, K. and Aslan, A. (2005): Six new lichen records from Turkey. – *Myxotaxon* **93**: 359–363.
- Yazıcı, K. and Aslan, A. (2006): Four new lichens from Turkey. – *Myxotaxon* **95**: 315–318.
- Yazıcı, K., Aptroot, A., Aslan, A., Etayo, J., Spier, L. and Karagöz, Y. (2010): Lichenized and lichenicolous fungi from nine different areas in Turkey. – *Myxotaxon* **111**: 113–116. <https://doi.org/10.5248/111.113>
- Yazıcı, K., Aptroot, A., Aslan, A., Vitikainen, O. and Piercey-Normore, M. D. (2011): Lichen biota of Ardahan province (Turkey). – *Myxotaxon* Link page: **116**: 480. <https://doi.org/10.5248/116.479>; *Regional Checklists online* (<http://www.mycotaxon.com/resources/checklists/Yazici-v116-checklist.pdf>)
- Yazıcı, K., Aptroot, A., Aslan, A., Sipman, H. and Piercey-Normore, M. D. (2015): The Lichen biota of Burdur Province (Turkey). – *Myxotaxon* Link page: **130**: 926. <https://doi.org/10.5248/130.925>; *Regional Checklists online* (<http://www.mycotaxon.com/resources/checklists/Yazici-v130-3-checklist.pdf>)