

## Lichenized and lichenicolous fungi from nine different areas in Turkey

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**Abstract** — As a result of lichenological exploration in Turkey, in the regions of Ankara, Erzurum, Hatay, Ordu, Siirt, and Uşak, and on the islands Kınalıada, Heybeliada and Marmara, we report 297 taxa of lichenized and 14 of lichenicolous fungi. fungi representing 93 genera in the *Ascomycota*. *Aspicilia moenium*, *Lecanora albellula*, *Pertusaria pupillaris*, *Porina aenea* and *Rinodina fatiscens* are new to Turkey. 84 lichenized and 5 lichenicolous fungi are new records for Ankara, 93 lichenized fungi and 1 lichenicolous fungus for Ordu, 62 lichenized and 3 lichenicolous fungi for Uşak. Moreover 52 lichenized fungi are new for Hatay, 21 lichenized fungi and 1 lichenicolous fungus for Erzurum, 27 for Heybeliada island, 11 for the Kınalıada islands, while all taxa identified are new records for Siirt region and Marmara Island. Distribution and substrata are presented.

**Keywords** — *Ascomycetes*, biota, lichens

### Introduction

In recent years there has been an increasing number of studies on the lichen flora of Turkey (Aptroot & Yazici 2009, Candan & Özdemir Türk 2008, Etayo & Yazici 2009, Halici & Aksoy 2009, Halici et al. 2007, Yazici et al. 2007, 2008a,b, Yazici & Aptroot 2008, Yazici & Aslan 2009, Yavuz &

Çobanoğlu 2007). However, many regions of Turkey have remain unexplored.

As a contribution to the lichenological exploration of Turkey, the junior authors (Aslan 2000, Aslan et al. 2006, Aslan & Öztürk 1994, Kinalioglu 1998, 2008, Yazici & Aptroot 2008, Yazici et al. 2007, 2008a,b, Yazici & Aslan 2009) did field-work in 9 regions and islands. For 7 of these areas previous lichenological research has been conducted: the regions Ankara, Erzurum, Hatay, Ordu and Uşak, and the islands Kınalıada and Heybeliada (Aslan 2000, Aslan et al. 2006, Aslan & Öztürk 1994, Breuss & John 2004, Çobanoğlu 2005, Çobanoğlu & Akdemir 1997, Güvenç & Öztürk 1998, Güvenç et al. 2006, Huneck & Jakupov 1992, John et al. 2000, John 1992, 1996, 2002, John & Türk 2006, John & Nimis 1998, Karamanoğlu 1971, Kinalioglu 1998, 2008, Steiner 1909, Türk & John 2005, Türk et al. 2009, Zeybek et al. 1992). No lichens or lichenicolous fungus have thus far been reported for the region Siirt and the island Marmara.

### Material and methods

The lichen samples were collected at 40 different localities between Turkey from 16 April 2007 and 21 March 2009 (Table 1). The studied area covers parts of Ankara, Erzurum, Hatay, Ordu and Uşak, and the islands Kınalıada and Heybeliada (Figure 1). Air dried samples were studied with a Nikon SMZ1500 stereomicroscope and a Nikon Eclipse 80i light microscope. Standard identification methods for lichenized and lichenicolous fungi were employed (Calatayud et al. 2002, Esslinger 1994, 1977, 2000, Etayo & Sancho 2008, Giralt 2001, Hawksworth 1979, Mayrhofer 1988, Poelt 1969, Purvis et al. 1992, Thomson 1997, Torrente & Egea 1989, Wirth 1995). TLC analyses of some specimens were carried out when needed. Vouchers are deposited in the herbarium of the Biology Department, Faculty of Science, Karadeniz Technical University, Turkey (KTUB).

A continental climate dominates in Erzurum, with long and harsh winters and short and mild summers. The average temperature in the coldest month is -8.6°C, while the average temperature in the hottest month is 19.6°C. Average annual precipitation is 453 mm. Steppe formations are prevalent in this region. Forested areas are small, mainly consisting of scotch, pines and oaks. *Betula pendula*, *Cupressus sempervirens*, *Elaeagnus* spp., *Salix* spp., *Pinus sylvestris*, *Populus alba* and *P. tremula* are especially predominant in settlements (Akman 1999, Baytop & Denizci 1963).

In Uşak the mediterranean climate is predominant and characterized by hot and dry summers and cold winters with much snowfall. The mean total

rainfall per year is 557mm. The annual mean temperature is 12.5°C, the mean temperature of the hottest month is 23.6°C (July) and the mean temperature of the coldest month is 2.4°C (January). *Quercus cerris*, *Quercus infectoria*, *Pinus brutia* and *Pinus sylvestris* are the dominant trees (Akman 1999, Baytop & Denizci 1963).

Ordu has equally a mediterranean climate but is relatively dry. Streams occur in the mountains. Entrance is possible by deep and straight canyons along the coast. The flora is intermediate between the forests and the plateaus and is dominated by conifers. *Carpinus* spp., *Pinus* spp., *Picea* spp. and many kinds of forest plants are to be found there. Great damage is done to the land by erosion around the cultivated fields because of the continuous rains (Akman 1999, Baytop & Denizci 1963).

A mediterranean climate dominates also in Hatay. The winters are warm and rainy while the summers are hot and dry. The annual average temperature is between 16 and 21°C. 43.9°C is the highest temperature while -14.6°C is the lowest temperature. The average yearly rainfall is 638.5 mm and it varies between 570mm and 1174mm. The annual average humidity is 70%. The natural flora consists of maquis and forests. Above the maquis area the slopes of the Amanos mountains are covered with trees like *Juniperus* spp., and deciduous trees like *Quercus* spp., *Betula* spp., *Aucuba japonica*, *Populus* spp., *Platanus* spp. and *Melia azedarach*. Up to the 1200m there were wide areas of forests composed of *Pinus brutia*, *Pinus nigra*, *Cedrus* spp. and *Juniperus* spp. (Akman 1999, Baytop & Denizci 1963).

Ankara is situated in one of the driest places of Turkey and mostly surrounded by steppe vegetation. Ankara has a harsh, dry continental climate, with cold, snowy winters and hot, dry summers. The warmest months are July and August. Ankara has a low annual precipitation (Akman 1999, Baytop & Denizci 1963).

Siirt is drained by several tributaries of the Dicle River. The northeastern part is well-forested and mountainous and gives way to a series of broad plateaus with steppe vegetation in the south. The winters are more severe and rainy in the eastern and northern regions, and are moderate in the south and southwest. The summers are hot and dry (Akman 1999, Baytop & Denizci 1963).

The island of Kınalıada is nearest to the Asian side of Istanbul, about 12 km to the South. This is one of the least forested islands. Steppe is generally seen. The yearly average temperature varies between 15 and 16°C, the

highest temperature is 23-25°C, the lowest temperature 5-6°C. The amount of yearly average rainfall is 600-700mm. Kınalıada has an intermediate climate. The highest average monthly rainfall is 63.85mm in May. The yearly average humidity is 70% in Hatay (Akman 1999, Baytop & Denizci 1963).

On Marmara Island *Pinus brutia* is predominant except in the south, where maquis is dominating. Mountains are predominant in the middle, while the south and north are hilly. Marmara has a mediterranean climate which is characterized by warm to hot and dry summers, and cool, wet winters. The highest mean temperature is 24.6 in July, rainfall mostly occurs in December. In January the temperature is lowest. Snowfall is rare and occurs in January and February. Annual average rainfall is 700.2 mm (Akman 1999, Baytop & Denizci 1963).

## Results

The lichenological survey of Ankara, Erzurum, Hatay, Ordu, Siirt and Uşak and the islands Kınalıada, Heybeliada and Marmara yielded 297 taxa of lichenized and 14 of lichenicolous fungi. This includes 305 species, 4 subspecies and 2 varieties, representing 93 genera in the *Ascomycota*. Of these, 138 taxa were collected in Ankara, 156 in Hatay, 120 in Ordu, 111 in Uşak, 30 in Siirt, 49 in Erzurum, and 29 on the island of Heybeli, 13 on Kınalıada, and 64 on Marmara. 5 Species are new to Turkey: *Aspicilia moenium*, *Lecanora albellula*, *Pertusaria pupillaris*, *Porina aenea* and *Rinodina fatiscens*. Lichenicolous fungi are *Arthonia phaeophysciae*, *Buellia badia*, *Caloplaca grimmiae*, *Carbonea vitellinaria*, *Cercidospora macrospora*, *Endococcus macrosporus*, *Lichenostigma elongata*, *Lichenostigma rouxii*, *Lichenostigma triseptata*, *Muellerella pygmaea* (Körb.) D. Hawksw. var. *athallina*, *Muellerella pygmaea* (Körb.) D. Hawksw. var. *pygmaea*, *Muellerella ventosicola*, *Opegrapha glaucomaria* and *Zwackiomyces coepulonus*. New records from Ankara province include 84 lichenized and 5 lichenicolous fungi. Moreover, 93 taxa of lichens and 1 lichenicolous fungus were reported as new from Ordu, 62 lichenized and 3 lichenicolous fungi from Uşak, 52 from Hatay, 21 lichenized fungi and 1 lichenicolous fungus from Erzurum, 27 from Heybeliada island, 11 from Kınalıada island while all taxa identified are new for Siirt region (30 taxa) and Marmara island (64 taxa).

The lichen taxa are listed alphabetically. Asterisks indicate new records for Turkey while the regions are indicated as follows: "AN" designates Ankara, "ER" Erzurum, "HA" Hatay, "UŞ" Uşak, "OR" Ordu, "SI" Siirt, "HE" Heybeliada, "KI" Kınalıada and "MA" Marmara island.

### List of taxa

- Acarospora cervina* (Ach.) A. Massal.- Locality 6, 8, 10, 12, 15, 17, 23, 24; on calcareous rock [AN, MA].
- Acarospora fuscata* (Nyl.) Arnold - Locality 6, 8, 9, 11, 14, 15, 17, 22; on calcareous rock [HA, MA].
- Acarospora impressula* Th. Fr. - Locality 3, 6, 15; on siliceous rock [AN, ER, MA].
- Acarospora veronensis* A. Massal. - Locality 3, 8, 11, 15, 26; on siliceous rock [AN, ER, UŞ].
- Adelolecia pilati* (Hepp) Hertel & Hafellner - Locality 3; on siliceous rock [ER].
- Anaptychia ciliaris* (L.) Körb. - Locality 1, 2, 3; on siliceous rock.
- Arthonia dispersa* (Schrad.) Nyl. - Locality 22; on *Fraxinus* sp.[HA].
- Arthonia lapidicola* (Taylor) Branth & Rostr. - Locality 15; on calcareous rock [AN].
- Arthonia phaeophysciae* Grube & Matzer - Locality 36; on *Phaeophyscia orbicularis* [OR].
- Arthonia punctiformis* Ach. - Locality 34; on *Populus* sp [OR].
- Arthonia radiata* (Pers.) Ach. - Locality 22; on *Carpinus* sp.
- Arthopyrenia punctiformis* A.Massal. - Locality 22, 38, 40; on *Corylus* sp. and *Prunus* sp. [HA, OR].
- Aspicilia caesiocinerea* (Nyl. ex Malbr.) Arnold - Locality 1, 2, 3, 6, 8, 9, 11, 12, 13, 14, 15, 17, 22, 23, 35, 36, 40; on calcareous rock [AN, MA, UŞ].
- Aspicilia calcarea* (L.) Körb. - Locality 6, 8, 9, 10, 15, 19, 22, 24, 25, 28, 29, 30, 31, 35, 40İ; on calcareous rock [AN, MA, Sİ, UŞ].
- Aspicilia cheresina* (Müll. Arg.) Hue - Locality 19; on calcareous rock [Sİ].
- Aspicilia cinerea* (L.) Körb. - Locality 1, 2, 3, 4, 6, 8, 14, 15, 17, 22, 23; on siliceous rock [MA].
- Aspicilia contorta* (Hoffm.) Kremp subsp. *Contorta* - Locality 3, 6, 8, 10, 12, 14, 16, 22, 26, 30, 31, 32, 35; on calcareous rock [MA, UŞ].
- Aspicilia contorta* subsp. *hofmanniana* S. Ekman & Fröberg ex R. Sant. - Locality 6, 8, 13, 15, 22, 26, 40; on calcareous rock [AN, MA, OR, UŞ].
- Aspicilia desertorum* (Kremp.) Mereschk. - Locality 6, 8; on calcareous rock [MA].
- Aspicilia intermutans* (Nyl.) Arnold - Locality 3, 8; on siliceous rock [ER, AN].
- \**Aspicilia moenium* (Vain.) G. Thor & Timdal - Locality 8, 24; on siliceous rock [AN, UŞ].

- Aspicilia recedens* (Taylor) Arnold - Locality 7b; on siliceous rock [HE].
- Bacidia laurocerasi* (Delise ex Duby) Zahlbr. - Locality 40; on *Picea orientalis*, *Pinus* sp. and *Laurocerasus officinalis* [OR].
- Bagliettoa baldensis* (A. Massal.) Vězda - Locality 19, 22; on limestone [HA, SĪ].
- Bagliettoa parmigerella* (Zahlbr.) Vězda & Poelt - Locality 22; on limestone.
- Bagliettoa parmigera* (J. Steiner) Vězda & Poelt - Locality 22; on limestone.
- Bryoria fuscescens* (Gyeln.) Brodo & D. Hawksw. - Locality 22; on *Pinus* sp.
- Buellia aethalea* (Ach.) Th. Fr. - Locality 40; on siliceous rock [OR].
- Buellia badia* (Fr.) A. Massal. - Locality 6, 8, 14, 23; on *Xanthoparmelia pulla* and siliceous rock [MA, UŞ].
- Caloplaca aractina* (Fr.) Häyrén - Locality 8; on *Candelariella vitellina*.
- Caloplaca arenaria* (Pers.) Müll. Arg. - Locality 6, 8, 18, 36; on siliceous rock [MA, OR].
- Caloplaca aurantia* (Pers.) Hellb. - Locality 7b; on limestone [HE].
- Caloplaca cerina* (Ehrh. ex Hedw.) Th. Fr. - Locality 1, 2, 3, 4, 5, 15, 19, 23; on *Crataegus* sp. and *Salix* sp [AN, SĪ].
- Caloplaca cirrochroa* (Ach.) Th. Fr. - Locality 24; on calcareous rock [UŞ].
- Caloplaca citrina* (Hoffm.) Th. Fr. - Locality 7b, 40; on calcareous rock [HE, OR].
- Caloplaca crenularia* (With.) J.R. Laundon - Locality 9, 19, 22; on siliceous rock [SĪ].
- Caloplaca decipiens* (Arnold) Blomb. & Forssell - Locality 6, 7b, 10, 12, 15, 23; on calcareous rock and tile [AN, MA, UŞ].
- Caloplaca ferruginea* (Huds.) Th. Fr. - Locality 15, 23; on *Quercus* sp. [AN, UŞ].
- Caloplaca flavescens* (Huds.) J.R. Laundon - Locality 7a,b, 8, 11, 12, 22; on concrete and calcareous rock [AN, HE, KI].
- Caloplaca flavocitrina* (Nyl.) H. Olivier - Locality 24; on concrete [UŞ].
- Caloplaca flavorubescens* (Huds.) J.R. Laundon - Locality 21b, 22, 24; on *Quercus* sp. and *Pistacia* sp.[SĪ].
- Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth. - Locality 40; on siliceous rock [OR].
- Caloplaca grimmiae* (Nyl.) H. Olivier - Locality 6, 8, 18; on *Candelariella vitellina* [MA].
- Caloplaca herbidella* (Hue) H. Magn. - Locality 14; on *Pinus* sp.[AN].
- Caloplaca holocarpa* (Hoffm.) A.E. Wade - Locality 6, 8, 15, 16, 19, 23, 25, 35, 36; on *Juglans* sp. and calcareous rock [MA, OR, SĪ].
- Caloplaca irrubescens* (Arnold) Zahlbr. - Locality 13; on siliceous rock [AN].
- Caloplaca lactea* (A. Massal.) Zahlbr. - Locality 6, 22; on limestone [HA, MA].
- Caloplaca lobulata* (Flörke) Hellb. - Locality 20; on *Prunus amygdalus* [SĪ].

- Caloplaca pelodella* (Nyl.) Hasse - Locality 1, 3; on siliceous rock [ER].
- Caloplaca persica* (J. Steiner) M. Steiner & Poelt - Locality 16, 17, 20, 23; on *Juglans* sp., *Prunus amygdalus* and *Quercus* sp. [AN, SI, UŞ].
- Caloplaca saxicola* (Hoffm.) Nordin - Locality 6, 8, 9, 23, 24; on calcareous rock [AN, MA, UŞ].
- Caloplaca variabilis* (Pers.) Müll. Arg. - Locality 6, 19, 22, 24, 26; on limestone [MA, SI].
- Caloplaca velana* (A.Massal.) Du Rietz - Locality 36; on limestone [OR].
- Candelaria concolor* (Dicks.) Stein - Locality 23, 31, 32, 36; on *Prunus amygdalus* and *Pyrus* sp. [OR, UŞ].
- Candelariella aurella* (Hoffm.) Zahlbr. - Locality 6, 8, 9, 11, 13, 14, 15, 16, 17, 22, 24, 25, 28, 29, 30, 31, 32, 36, 37; on calcareous rock, *Juglans* sp. and *Quercus* sp. [MA, OR].
- Candelariella reflexa* (Nyl.) Lettau - Locality 36; on shaded nutrient-enriched rock [OR].
- Candelariella vitellina* (Ehrh.) Müll. Arg. - Locality 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 15, 23, 22, 30, 31, 32, 36, 37, 40; on *Aspicilia cinerea* and siliceous rock [MA, OR].
- Candelariella xanthostigma* (Ach.) Lettau - Locality 13, 15, 22; on *Pyrus* sp. and *Salix* sp. [AN].
- Carbonea vitellinaria* (Nyl.) Hertel - Locality 8; on *Candelariella vitellina*.
- Cetraria aculeata* (Schreb.) Fr. - Locality 3, 23, 27; on soil [ER, UŞ].
- Cercidospora macrospora* (Uloth) Hafellner & Nav.-Ros. - Locality 6, 8; on *Protoparmeliopsis muralis* [AN, MA].
- Cetraria muricata* (Ach.) Eckfeldt - Locality 23; on soil [UŞ].
- Chrysothrix candelaris* (L.) J.R. Laundon - Locality 8, 22; on *Pinus* sp. [HA].
- Chrysothrix chlorina* (Ach.) J.R. Laundon - Locality 22; on siliceous rock.
- Cladonia caespiticia* (Pers.) Flörke - Locality 36; on moss [OR].
- Cladonia cariosa* (Ach.) Spreng. - Locality 22, 36; on soil [HA, OR].
- Cladonia cervicornis* (Ach.) Flot. - Locality 22, 36; on soil [HA, OR].
- Cladonia coccifera* (L.) Willd. - Locality 40; on bark of *Pinus* sp. [OR].
- Cladonia coniocraea* (Flörke) Spreng. - Locality 8, 11, 22, 35, 36, 37; on the base of *Pinus* sp. and moss [HA, OR].
- Cladonia cornuta* (L.) Hoffm. - Locality 36, 37; on moss [OR].
- Cladonia fimbriata* (L.) Fr. - Locality 8, 22, 36; on moss and soil.
- Cladonia foliacea* (Huds.) Willd. - Locality 8, 10, 22, 23, 27, 37, 40; on moss and soil [AN, OR, UŞ].
- Cladonia furcata* (Huds.) Schrad. - Locality 22, 40; on soil [HA, OR].
- Cladonia humilis* (With.) J.R. Laundon - Locality 7a,b, 22; on soil [HA, HE, KI].
- Cladonia macilenta* Hoffm. - Locality 22; on moss [HA].
- Cladonia portentosa* (Dufour) Coem. - Locality 22, 36; on soil [HA, OR].

- Cladonia pyxidata* (L.) Hoffm. - Locality 7a,b, 8, 10, 11, 22, 36, 37, 40; on soil [HE, KI, OR].
- Cladonia rangiformis* Hoffm. - Locality, 6, 7a,b, 9, 10, 11, 12, 18, 22, 36, 37; on moss and soil [AN, HE, MA].
- Cladonia subcervicornis* (Vain.) Kernst. - Locality 36; on soil [OR].
- Clauzadea monticola* (Ach.) Hafellner & Bellem. - Locality 40; on calcareous rock [OR].
- Collema auriforme* (With.) Coppins & J.R. Laundon - Locality 22, 40; on moss [OR].
- Collema cristatum* (L.) Weber ex F.H. Wigg. - Locality 22, 36, 37; on moss [OR].
- Collema flaccidum* (Ach.) Ach. - Locality 22, 36, 37; on moss [OR].
- Collema subflaccidum* Degel. - Locality 22, 37, 40; on moss [OR].
- Collema tenax* (Sw.) Ach. - Locality 6, 22, 28, 31, 32, 37, 40; on soil [MA, OR].
- Dermatocarpon intestiniforme* (Körb.) Hasse - Locality 1, 2, 3, 4; on calcareous rock.
- Dermatocarpon miniatum* (L.) W. Mann - Locality 8, 22, 35, 36, 37; on siliceous rock [AN, OR].
- Dimelaena oreina* (Ach.) Norman - Locality 1, 2, 3, 6, 8, 22; on siliceous rock [MA].
- Diploicia canescens* (Dicks.) A.Massal. - Locality 7b; on concrete.
- Diploschistes gypsaceus* (Ach.) Zahlbr - Locality 23; on soil.
- Diploschistes muscorum* (Scop.) R.Sant. - Locality 23, 29, 30; on soil [UŞ].
- Diploschistes ocellatus* (Vill.) Norman - Locality 23; on calcareous rock.
- Diploschistes scruposus* (Schreb.) Norman - Locality 22, 23, on siliceous rock [UŞ].
- Diplotomma alboatrum* (Hoffm.) Flot. - Locality 8, 22, 23; on calcareous rock [AN].
- Diplotomma epipolium* (Ach.) Arnold - Locality 6, 8, 23, 26, 28; on calcareous rock [MA].
- Diplotomma venustum* (Körb.) Körb. - Locality, 8, 17, 25; on calcareous rock [AN, UŞ].
- Endococcus macrosporus* (Hepp ex Arnold) Nyl. - Locality 6; on *Rhizocarpon geographicum* [MA].
- Evernia divaricata* (L.) Ach. - Locality 22, on *Pinus* sp.[HA].
- Evernia prunastri* (L.) Ach. - Locality 14, 22, 27, 30, 31, 40; on *Crataegus* sp. and *Pinus* sp.
- Enterographa hutchinsiae* (Leight.) A. Massal. - Locality 22, 40; on *Picea orientalis* [HA, OR].
- Flavoparmelia caperata* (L.) Hale - Locality 7b, 10, 12, 22, 34, 35, 36, 37; on *Corylus* sp., *Morus* sp., *Prunus* sp. and *Pinus* sp. [HE].



- Flavoparmelia soledians* (Nyl.) Hale - Locality 22, 33, 36; on *Corylus* sp. and moss [HA, OR].
- Fuscopannaria leucophaea* (Vahl) P.M.Jørg. - Locality 22; on siliceous rock.
- Graphis scripta* (L.) Ach. - Locality 22, 33, 34, 40; on *Carpinus* sp., *Corylus* sp. and *Phoenix* sp. [OR].
- Hyperphyscia adglutinata* (Flörke) H. Mayrhofer & Poelt - Locality 22, 33, 34, 36, on *Corylus* sp., *Platanus orientalis*, *Pinus* sp., *Prunus* sp., *Pyrus* sp. and calcareous rock [OR].
- Hypogymnia physodes* (L.) Nyl. - Locality 7b, 10, 14, 15, 22; on *Pinus* sp. [HE].
- Hypogymnia tubulosa* (Schaer.) Hav. - Locality 11, 14, 15, 22; on *Pinus* sp.
- Immersaria athrocarpa* (Ach.) Rambold & Pietschm. - Locality 2, 6, 8, 9, 11, 12, 18, 25, 30, 32; on siliceous rock [AN, ER, MA, UŞ].
- Lecania cyrtella* (Ach.) Th.Fr. - Locality 6, 22, 23, 34; on *Prunus* sp. and *Pyrus* sp. [MA, OR, UŞ].
- Lecania cyrtellina* (Nyl.) Sandst. - Locality 40; on *Laurocerasus officinalis* [OR].
- Lecania erysibe* (Ach.) Mudd - Locality 7b, 14, 22; on *Pinus* sp. [AN, HA, HE].
- Lecania fuscella* (Schaer.) A. Massal. - Locality 15, 21b; on *Prunus amygdalus* and *Salix* sp. [AN, Sİ].
- Lecania naegelii* (Hepp) Diederich & van den Boom - Locality 22, 33, 40; on *Phoenix* sp. [OR].
- Lecania rabenhorstii* (Hepp) Arnold - Locality 7a,b, 15, 36; on calcareous rock [AN, HE, KI, OR].
- Lecanora aitema* (Ach.) Hepp - Locality 36; on *Prunus* sp. [OR].
- \**Lecanora albellula* (Nyl.) Th. Fr. - Locality 15; on *Pinus* sp. [AN].
- Lecanora albescens* (Hoffm.) Branth & Rostr., Locality 7b; on *Caloplaca flavescens* and *Verucaria lecideiodes* [HE].
- Lecanora argentata* (Ach.) Malme - Locality 16, 18, 22; on *Malus* sp. and *Quercus* sp.
- Lecanora carpineae* (L.) Vain. - Locality 6, 8, 9, 11, 22, 34, 35, 36, 37; on *Carpinus* sp., *Pinus* sp. and *Populus* sp. [MA, OR].
- Lecanora chlarotera* Nyl - Locality 8, 9, 22, 23, 26, 27, 29, 31; on *Crataegus* sp. and *Pinus* sp. [UŞ].
- Lecanora crenulata* (Dicks.) Hook. - Locality 15, 21a, 23, 25, 32; on concrete and calcareous rock [AN].
- Lecanora dispersa* (Pers.) Röhl. - Locality 6, 7a,b, 9, 11, 12, 15, 17, 21b, 22, 26, 29, 32, 33, 34, 35, 37, 40; on *Salix* sp. and calcareous rock [HE, KI, MA, OR].
- Lecanora frustulosa* (Dicks.) Ach. - Locality 1, 3, 5, on siliceous rock.

- Lecanora garovaglii* (Körb.) Zahlbr. - Locality 6, 8, 14, 23, 24; on calcareous rock [AN, MA, UŞ].
- Lecanora hagenii* (Ach.) Ach. - Locality, 7b, 8, 14, 15, 16, 18, 22, 23, 27, 28, 29, 33, 38, 39, 40; on *Crataegus* sp., *Populus* sp., *Prunus* sp., *Quercus* sp. and *Salix* sp. and calcareous rock [AN, HA, HE, OR].
- Lecanora polytropa* (Ehrh.) Rabenh. - Locality 1, 2, 3; on siliceous rock [ER].
- Lecanora pulicaris* (Pers.) Ach. - Locality 36, 38, 39; on *Prunus* sp.
- Lecanora rupicola* (L.) Zahlbr. - Locality 1, 2, 3, 4, 5, 6, 8, 10, 18, 22, 23, 29; on siliceous rock [HA, MA].
- Lecanora semipallida* H. Magn. - Locality 23; on calcareous rock [UŞ].
- Lecanora subcarpineae* Szatala - Locality 22; on *Quercus* sp.
- Lecanora symmicta* (Ach.) Ach. - Locality 22, 23, 40; on *Pinus* sp. [HA, OR, UŞ].
- Lecanora umbrina* (Ach.) A.Massal. - Locality 8; on *Quercus* sp. [AN].
- Lecidea atrobrunnea* (Ramond) Schaer. - Locality 1, 2, 3, 6, 8, 23; on siliceous rock [ER, MA, UŞ].
- Lecidea auriculata* Th. Fr. - Locality 3, 15; on siliceous rock [AN, ER].
- Lecidea fuscoatra* (L.) Ach. - Locality 3, 6, 8, 22, 23, 30; on siliceous rock [MA, UŞ].
- Lecidea grisella* Flörke - Locality 18; on siliceous rock [AN].
- Lecidea sarcogynoides* Körb. - Locality 6; on stone [MA].
- Lecidella achrostera* (Nyl.) Hertel & Leuckert - Locality 22, 34, 40; on *Carpinus* sp. and *Populus* sp. and [HA, OR].
- Lecidella asema* (Nyl.) Knoph & Hertel - Locality 36; on siliceous rock [OR].
- Lecidella carpathica* Körb. - Locality 6, 8, 10, 12, 23, 24, 36; on siliceous rock [MA, OR].
- Lecidella elaeochroma* (Ach.) M.Choisy - Locality 8, 9, 11, 22, 24, 27, 29, 30, 31, 33, 36; on *Crataegus* sp., *Morus* sp., *Phoenix* sp., *Pinus* sp., *Prunus* sp. and *Pyrus* sp. [OR].
- Lecidella euphorea* (Flörke) Hertel - Locality 22, 23, 33, 36, 38, 39; on *Crataegus* sp., *Morus* sp., *Phoenix* sp., *Prunus* sp. And *Quercus* sp. [HA, OR, UŞ].
- Lepraria incana* (L.) Ach. - Locality 6, 11, 12, 22, 33, 35, 36, 38, 39, 40; on siliceous rock and concrete [MA, OR].
- Lepraria lobificans* Nyl. - Locality 7b; on *Pinus* sp. [HE].
- Leprocaulon microscopicum* (Vill.) Gams - Locality 22; on moss.
- Leptogium lichenoides* (L.) Zahlbr. - Locality 22, on moss.
- Leptogium schraderi* (Bernh.) Nyl. - Locality 26; on calcareous rock [UŞ].

- Lichenostigma elongata* Nav.-Ros. & Hafellner - Locality 8; on *Aspicilia caesiocinera* [AN].
- Lichenostigma rouxii* Nav.-Ros., Calat. & Hafellner - Locality 25; on *Squamarina cartilaginea* [UŞ].
- Lichenostigma triseptata* Halici & D.Hawksw. - Locality 8; on *Aspicilia caesiocinerea* [AN].
- Lichina pygmae* (Lightf.) C. Agardh - Locality 25; on siliceous rock [UŞ].
- Lobaria pulmonaria* (L.) Hoffm. - Locality 22; on *Pinus* sp.
- Lobothallia alphoplaca* (Wahlenb.) Hafellner - Locality 1, 2, 3, 15, 17; on siliceous rock [AN, ER].
- Lobothallia radiosa* (Hoffm.) Hafellner - Locality 1, 2, 3, 4, 6, 8, 15, 17, 22, 23, 24, 28, 33, 37, 39, 40; on siliceous rock [AN, MA, OR].
- Melanelixia fuliginosa* (Fr. ex Duby) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch subsp. *glabratula* (Lamy) J.R. Laundon - Locality 6, 22, 23, 30; on *Pinus* sp. and *Quercus* sp. [MA, UŞ].
- Melanelixia fuliginosa* (Fr. ex Duby) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch subsp. *Fuliginosa* - Locality 22; on *Pinus* sp. [HA].
- Melanelixia subaurifera* (Nyl.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch - Locality 22, 36; on *Carpinus* sp. and *Laurocerasus officinalis* [OR].
- Melanohalea elegantula* (Zahlbr.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch - Locality 13, 15, 17, 23, 27; on *Crataegus* sp., *Prunus amygdalus* and *Quercus* sp. [UŞ].
- Melanohalea exasperata* (De Not.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch - Locality 6, 13, 14, 15, 22, 23, 27, 28; on *Crataegus* sp., *Pinus* sp., *Prunus amygdalus* and *Quercus* sp. [AN, MA].
- Melanohalea exasperatula* (Nyl.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch - Locality 14, 15, 23; on *Pinus* sp. [UŞ].
- Melanohalea infumata* (Nyl.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch - Locality 8; on siliceous rock.
- Miriquidica deusta* (Stenh.) Hertel & Rambold - Locality 8, 15, 16; on siliceous rock [AN].
- Micarea prasina* Fr. - Locality 22; on *Pinus* sp. [HA].
- Muellerella pygmaea* (Körb.) D. Hawksw. var. *athallina* (Müll.Arg.) Triebel - Locality 6, 19, 23; on *Aspicilia calcarea* and *Pertusaria* sp. [MA, SI, UŞ].
- Muellerella pygmaea* (Körb.) D. Hawksw. var. *Pygmaea* - Locality 6; on *Candelariella vitellina* [MA].
- Muellerella ventosicola* (Mudd) D. Hawksw. - Locality 8; on *Rhizocarpon geographicum* [AN].

- Nephroma parile* (Ach.) Ach. - Locality 22; on moss.  
*Opegrapha atra* Pers. - Locality 22; on *Carpinus* sp.  
*Opegrapha glaucomaria* (Nyl.) Källsten. - Locality, 3, 5; on *Lecanora rupicola* [ER].  
*Opegrapha niveoatra* (Borrer) J.R. Laundon - Locality 40; on *Laurocerasus officinalis* [OR].  
*Opegrapha rufescens* Pers. - Locality 40; on *Carpinus* sp.[OR].  
*Opegrapha varia* Pers. - Locality 22, 23, 30, 32, 33, 38, 39, 40; on *Carpinus* sp., *Ficus* sp., *Juglans* sp., *Quercus* sp. and *Phoenix* sp. [OR, UŞ].  
*Opegrapha vulgata* (Ach.) Ach. - Locality 22, 23, 31, 33, 38, 39, on *Ficus* sp., *Juglans* sp., *Phoenix* sp., *Pyrus* sp. and *Quercus* sp. [OR, UŞ].  
*Parmelia saxatilis* (L.) Ach. - Locality 10, 11, 22, 38, 39, 40; on *Pinus* sp.  
*Parmelia submontana* Hale - Locality 22; on *Pinus* sp.[HA].  
*Parmelia sulcata* Taylor - Locality 7b, 8 9, 12, 13, 14, 22, 36, 38, 39; on *Corylus* sp., *Laurocerasus officinalis*, *Pinus* sp. And *Quercus* sp. [HE, OR].  
*Parmelina quercina* (Willd.) Hale - Locality 22; on *Quercus* sp.  
*Parmelina pastillifera* (Harm.) Hale - Locality 23; on *Quercus* sp.  
*Parmelina tiliacea* (Hoffm.) Hale - Locality 22; on moss.  
*Parmotrema perlatum* (Huds.) M. Choisy - Locality 22, 38, 39 40; on *Carpinus* sp.  
*Peltigera aphthosa* (L.) Willd. - Locality 22, 40; on moss [HA, OR].  
*Peltigera canina* (L.) Willd. - Locality 22, 23, 29, 37, 38, 39, 40; on moss [UŞ].  
*Peltigera didactyla* (With.) J.R. Laundon - Locality 22, 40; on moss [HA, OR].  
*Peltigera horizontalis* (Huds.) Baumg. - Locality 8 10, 22, 23, 28, 34, 35 37, 38, 39; on moss [AN, OR, UŞ].  
*Peltigera neckeri* Müll.Arg. - Locality 22, 40, on soil and moss [HA, OR].  
*Peltigera polydactyla* (Neck.) Hoffm - Locality 22, 40; on moss [HA].  
*Peltigera praetextata* (Sommerf.) Zopf - Locality 10, 11, 12, 14, 22, 23, 25, 26, 29, 33, 34, 37, 38, 39, 40; on moss and soil [AN].  
*Peltigera rufescens* (Weiss) Humb. - Locality 3, 8, 22, 23, 38, 39, 40; on moss [OR, UŞ].  
*Pertusaria albescens* (Huds.) M. Choisy & Werner - Locality 8, 22; on calcareous rock and moss.  
*Pertusaria amara* (Ach.) Nyl. - Locality, 6, 8, 22; on siliceous rock[MA].  
*Pertusaria aspergilla* (Ach.) J.R. Laundon - Locality 8; on siliceous rock [AN].  
*Pertusaria coccodes* (Ach.) Nyl. - Locality 22; on limestone.  
*Pertusaria hemisphaerica* (Flörke) Erichsen - Locality 22; on *Pinus* sp.  
*Pertusaria leioplaca* DC. - Locality 22; on *Carpinus* sp.[HA].

- Pertusaria pertusa* (L.) Tuck. - Locality 22; on siliceous rock.
- \**Pertusaria pupillaris* (Nyl.) Th. Fr. - Locality 22; on *Pinus* sp. [HA].
- Phaeophyscia nigricans* (Flörke) Moberg - Locality 16, 18, 23; on *Caloplaca decipiens*, *Malus* sp., *Prunus amygdalus*, calcareous rock and tile [AN, UŞ].
- Phaeophyscia chloantha* (Ach.) Moberg - Locality 33, 36, 40; on *Corylus* sp., *Carpinus* sp. and *Prunus* sp. [OR].
- Phaeophyscia ciliata* (Hoffm.) Moberg - Locality 36; on *Pyrus* sp., *Quercus* sp. [OR].
- Phaeophyscia orbicularis* (Neck.) Moberg - Locality 1, 3, 8 11, 12, 15, 16, 17, 18, 21b, 22, 24, 26, 27, 34, 36; on *Celtis* sp., *Corylus* sp., *Eleagnus* sp., *Juglans* sp., *Pistacia* sp., *Platanus orientalis*, *Populus* sp., *Prunus* sp., *Quercus* sp. and *Salix* sp. [AN, OR, SÍ].
- Phaeophyscia poeltii* (Frey) Clauzade & Cl. Roux - Locality 20; on *Pistacia* sp. [SÍ].
- Phlyctis argena* (Ach.) Flot. - Locality 22; on *Pinus* sp.
- Physcia adscendens* (Th. Fr.) H. Olivier, Locality 6, 7b, 9, 10, 12, 13, 14, 15, 16, 18, 22, 23, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39; on *Crataegus* sp., *Juglans* sp., *Morus* sp., *Pinus* sp., *Platanus orientalis*, *Populus* sp., *Prunus* sp., *Pyrus* sp. and *Quercus* sp., *Salix* sp. and calcareous rock [HE, MA, OR].
- Physcia aipolia* (Ehrh. ex Humb.) Fürnr. - Locality 1, 3, 11, 12, 15, 16, 18, 20, 22, 23, 29, 30, 31, 32, 36, 38, 39; on *Corylus* sp., *Juglans* sp., *Pistacia* sp., *Populus* sp., *Prunus* sp., *Quercus* sp. and *Salix* sp., [AN, OR, SÍ].
- Physcia biziana* (A.Massal.) Zahlbr. - Locality 16, 17, 21a, 22, 23; on *Pistacia* sp., *Populus* sp. and *Prunus* sp. [AN, SÍ, UŞ].
- Physcia caesia* (Hoffm.) Hampe ex Fürnr. - Locality 8, 9, 22; on calcareous rock [AN].
- Physcia dimidiata* (Arnold) Nyl. - Locality 6, 8, 20, 23; on siliceous rock, *Pistacia* sp. and *Prunus amygdalus* [AN, MA, SÍ, UŞ].
- Physcia dubia* (Hoffm.) Lettau - Locality 1, 3, 8, 10, 17, 23, 39, 40; on siliceous rock [ER, OR].
- Physcia stellaris* (L.) Nyl. - Locality 13, 15, 17, 22, 23, 27, 29; on *Juglans* sp., *Pinus* sp., *Prunus amygdalus*, *Quercus* sp. and *Salix* sp. [UŞ].
- Physcia tenella* (Scop.) DC. - Locality 7b, 13, 14, 15, 23, 33, 34; on *Pinus* sp., *Prunus amygdalus* and *Quercus* sp. [AN, HE, OR].
- Physconia detersa* (Nyl.) Poelt - Locality 23, 40; on soil and moss [OR, UŞ].
- Physconia distorta* (With.) J.R. Laundon - Locality 8, 12, 21a, 22, 23, 34, 36, 38, 39, 40; on *Carpinus* sp., *Pistacia* sp., *Populus* sp. and *Quercus* sp. [AN, SÍ].

- Physconia enteroxantha* (Nyl.) Poelt - Locality 15, 23; on *Quercus* sp. and moss.
- Physconia grisea* (Lam.) Poelt - Locality 1, 2, 3; on calcareous rock [ER].
- Physconia muscigena* (Ach.) Poelt - Locality 1, 2, 3, 21a,b, 23, 24, 27, 38, 40; on *Carpinus* sp., *Pistacia* sp. and *Pyrus* sp. [ER, OR, Sİ, UŞ].
- Physconia perisidiosa* (Erichsen) Moberg - Locality 23; on moss.
- Physconia venusta* (Ach.) Poelt - Locality 20; on *Pistacia* sp.[Sİ].
- Placynthiella icmalea* (Ach.) Coppins & P.James - Locality 22; on moss [HA].
- Pleurostictia acetabulum* (Neck.) Elix & Lumbsch - Locality 22; on *Quercus* sp.
- \**Porina aenea* (Wallr.) Zahlbr. - Locality 22, 33, 40; on *Carpinus* sp., *Laurocerasus officinalis*, *Phoenix* sp., *Ficus* sp., *Picea orientalis* and *Pinus* sp. [HA, OR].
- Porpidia macrocarpa* (DC.) Hertel & A.J. Schwab - Locality 23; on siliceous rock.
- Protoblastenia incrustans* (DC.) J.Steiner - Locality 22, 40; on calcareous rock [HA, OR].
- Protoblastenia rupestris* (Scop.) J. Steiner - Locality 22, 40; on calcareous rock.
- Protoparmelia badia* (Hoffm.) Hafellner - Locality 6; on siliceous rock [MA].
- Protoparmelia montagnei* (Fr.) Poelt & Nimis - Locality 1; on siliceous rock[ER].
- Protoparmeliopsis bolcana* (Pollini) Poelt - Locality 6, 8, 14, 15, 17, 23, 36; on siliceous rock and moss [MA, OR, UŞ].
- Protoparmeliopsis muralis* (Schreb.) M. Choisy - Locality 1, 2, 3, 4, 5, 6, 7a,b, 8, 9, 10, 12, 14, 15, 17, 19, 21a, 22, 23, 24, 25, 28, 29, 33, 34, 35, 36, 37, 38, 39, 40; on *Salix* sp., calcareous rock and wall [AN, HE, KI, MA, Sİ].
- Pseudevernia furfuracea* (L.) Zopf var. *cratea* (Ach.) D. Hawksw. - Locality 13, 14, 15, 22, 23, 40; on *Pinus* sp. and *Quercus* sp.[HA, OR].
- Pseudevernia furfuracea* (L.) Zopf var. *Furfuracea* - Locality 10, 11, 13, 14, 15, 22, 23, 37, 38, 40; on *Pinus* sp., *Prunus amygdalus* and *Quercus* sp.
- Psora decipiens* (Hedw.) Hoffm. - Locality 23; on soil [UŞ].
- Pyrenula nitida* (Weigel) Ach. - Locality 22; on *Carpinus* sp.[HA].
- Pyrrhospora querneae* (Dicks.) Körb. - Locality 22; on *Pinus* sp.
- Ramalina calicaris* (L.) Röhl. - Locality 22; on *Pinus* sp.
- Ramalina farinacea* (L.) Ach. - Locality 22, 39, 40; on *Carpinus* sp. and *Pinus* sp.

- Ramalina fastigiata* (Pers.) Ach. - Locality 40; on *Carpinus* sp.  
*Ramalina obtusata* (Arnold) Bitter - Locality 22; on *Pinus* sp.[HA].  
*Ramalina pollinaria* (Westr.) Ach. - Locality 37, 40; on *Pinus* sp.[OR].  
*Ramalina polymorpha* (Lilj.) Ach. - Locality 1, 2, 3, 4, 5, 22, 40; on siliceous rock [HA].  
*Ramalina thrausta* (Ach.) Nyl. - Locality 22; on *Pinus* sp.[HA.]  
*Rhizocarpon distinctum* Th. Fr. - Locality 8; on siliceous rock.  
*Rhizocarpon geminatum* Körb. - Locality 6, 8, 22; on siliceous rock [AN, MA].  
*Rhizocarpon geographicum* (L.) DC. - Locality 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 15, 22, 23, 25, 26, 40; on siliceous rock [MA].  
*Rhizocarpon lecanorinum* Anders - Locality 6, 23; on siliceous rock [MA].  
*Rhizocarpon reductum* Th. Fr. - Locality 8, 15; on siliceous rock [AN].  
*Rhizoplaca chrysoleuca* (Sm.) Zopf - Locality 1, 2, 3, 4, 5, 10, 17; on siliceous rock [AN].  
*Rhizoplaca melanophthalma* (DC.) Leuckert - Locality 1, 2, 3, 4, 5, 8; on siliceous rock.  
*Rhizoplaca peltata* (Ramond) Leuckert & Poelt - Locality 17; on siliceous rock.  
*Rinodina bischoffii* (Hepp) A. Massal. - Locality 6, 8, 19, 23; on siliceous rock [MA, SĪ].  
*\*Rinodina fatiscens* (Th.Fr.) Vain. - Locality 8; on siliceous rock [AN].  
*Rinodina guzzini* Jatta - Locality 24; on calcareous rock [UŞ].  
*Rinodina milvina* (Wahlenb.) Th. Fr. - Locality 6; on siliceous rock [MA].  
*Rinodina oleae* Bagl. - Locality 15; on *Salix* sp. [AN].  
*Rinodina pyrina* (Ach.) Arnold - Locality 8, 10, 12, 13, 14, 15, 16, 17, 18, 23, 27, 34; on *Crataegus* sp., *Pinus* sp., *Populus* sp., *Prunus* sp., *Prunus amygdalus*, *Quercus* sp. and *Salix* sp. [AN, OR, UŞ].  
*Rinodina sophodes* (Ach.) A. Massal. - Locality 18, 22, 40; on *Malus* sp.[AN, OR].  
*Rinodina teichophila* (Nyl.) Arnold - Locality 8, 36; on calcareous rock [AN, OR].  
*Sarcogyne privigna* (Ach.) A. Massal. - Locality 8, 22, 23; on calcareous rock [AN, HA, UŞ].  
*Sarcogyne regularis* Körb. - Locality 15, 19, 22; on calcareous rock[AN, SĪ].  
*Schaereria fuscocinerea* (Nyl.) Clauzade & Cl. Roux - Locality 15; on siliceous rock [AN].  
*Schismatomma decolorans* (Turner & Borrer ex Sm.) Clauzade & Vězda - Locality 22, 36; on *Picea orientalis* [HA, OR].  
*Scoliosporum gallurae* Vězda & Poelt - Locality 34; on *Populus* sp.[OR]

- Scoliciosporum umbrinum* (Ach.) Arnold, (Ach.) Arnold - Locality 22, 40; on siliceous rock [OR].
- Sporastatia testudinea* (Ach.) A. Massal. - Locality 8; on siliceous rock [AN].
- Squamarina cartilaginea* (With.) P. James - Locality 6, 11, 12, 22, 23, 25; on soil [MA].
- Squamarina lentigera* (Weber) Poelt - Locality 23; on soil.
- Staurothele hymenogonia* (Nyl.) Th. Fr. - Locality 19; on limestone [Sİ].
- Staurothele rufa* (A. Massal.) Zschacke - Locality 40; on limestone [OR].
- Staurothele rugulosa* (A. Massal.) Arnold - Locality 7b; on limestone [HE].
- Tephromela atra* (Huds.) Hafellner - Locality 1, 2, 3; on siliceous rock.
- Toninia physaroides* (Opiz) Zahlbr. - Locality 28; on soil [UŞ].
- Toninia opuntiioides* (Vill.) Timdal - Locality 23; on soil [UŞ].
- Toninia sedifolia* (Scop.) Timdal - Locality 6, 22, 26, 28, 29, 32; on soil [HA, MA].
- Toninia taurica* (Szatala) Oksner - Locality 22, 23; on soil [UŞ].
- Trapelia coarctata* (Turner ex Sm.) M. Choisy - Locality 36, 40; on siliceous rock [OR].
- Umbilicaria cylindrica* (L.) Delise ex Duby - Locality 1, 2, 3; on siliceous rock.
- Umbilicaria decussata* (Vill.) Zahlbr. - Locality 1, 3; on siliceous rock [ER].
- Umbilicaria nylanderiana* (Zahlbr.) H. Magn. - Locality 1, 3; on siliceous rock [ER].
- Umbilicaria subglabra* (Nyl.) Harm. - Locality 1, 2, 3; on siliceous rock [ER].
- Umbilicaria vellea* (L.) Ach. - Locality 1, 2, 3; on siliceous rock.
- Usnea filipendula* Stirt. - Locality 22, 40; on *Picea orientalis* and *Carpinus* sp. [HA].
- Usnea florida* (L.) Weber ex F.H. Wigg. - Locality 22, 40; on *Picea orientalis* and *Fagus orientalis* [HA].
- Usnea hirta* (L.) Weber ex F.H. Wigg. - Locality 22, 40; on *Picea orientalis* and *Carpinus* sp. [HA, OR].
- Verrucaria caerulea* DC. - Locality 15, 19; on limestone [AN, Sİ].
- Verrucaria calciseda* DC. - Locality 6, 19, 22, 24; on limestone [MA, Sİ, UŞ].
- Verrucaria compacta* (A. Massal.) Jatta - Locality 23; on limestone [UŞ].
- Verrucaria dolosa* Hepp - Locality 7a, 15, 36; on limestone [AN, OR, KI].
- Verrucaria fuscella* (Turner) Winch - Locality 7b, 15, 19, 22; on calcareous rock [AN, HA, HE, Sİ].
- Verrucaria hochstetteri* Fr. - Locality 22; on calcareous rock [HA].
- Verrucaria latericola* Erichsen - Locality 8; on concrete with *Caloplaca saxicola* [AN].



- Verrucaria macrostoma* Dufour ex DC. - Locality 7b, 8, 13, 15, 19, 22, 23; on calcareous rock [AN, HE, SI, UŞ].
- Verrucaria muralis* Ach. - Locality 7a, 15, 19, 22, 23, 36, 40; on calcareous rock [AN, KI, SI, UŞ, OR].
- Verrucaria nigrescens* Pers - Locality 3, 6, 7a,b, 8, 11, 12, 13, 15, 19, 22, 23, 25, 29, 26, 32, 35, 36, 38, 39, 40; on calcareous rock [AN, ER, HE, KI, MA, SI, UŞ].
- Verrucaria pinguicula* A. Massal. - Locality 7a; on limestone [KI].
- Verruculopsis lecideoides* (A.Massal.) Gueidan & Cl.Roux - Locality 7b, 13, 15, 19, 24; on concrete [AN, HE, SI, UŞ].
- Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale - Locality 6, 7b, 8, 9, 11, 12, 22, 23, 30, 32, 36, 37, 38, 39, 40; on siliceous rock [AN, HE, MA].
- Xanthoparmelia cumberlandia* (Gyeln.) Hale - Locality 6, 8, 22; on siliceous rock [AN, HA, MA].
- Xanthoparmelia loxodes* (Nyl.) O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch - Locality 8; on siliceous rock [AN].
- Xanthoparmelia mexicana* (Gyeln.) Hale - Locality 8, 22; on siliceous rock [AN].
- Xanthoparmelia pokornyii* (Körb.) O. Blanco, A. Crespo, Elix, D. Hawksw. & Lumbsch - Locality 8, 25; on soil [AN, UŞ].
- Xanthoparmelia protomatrae* (Gyeln.) Hale - Locality 3; on soil [ER].
- Xanthoparmelia pulla* (Ach.) O. Blanco, A. Crespo, Elix, D. Hawksw. & Lumbsch - Locality 1, 2, 3, 6, 8, 9, 14, 15, 17, 23, 39, 40; on siliceous rock [MA, OR].
- Xanthoparmelia stenophylla* (Ach.) Ahti & D.Hawksw. - Locality 6, 8, 14, 22, 36, 40; on calcareous rock [MA, OR].
- Xanthoparmelia tinctina* (Maheu & A. Gillet) Hale - Locality 6, 7b, 8, 14, 22, 23, 31, 40; on siliceous rock [AN, HE, MA, OR, UŞ].
- Xanthoparmelia verruculifera* (Nyl.) Essl. O.Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch - Locality 1, 3, 8, 17, 22, 40; on siliceous rock [AN, ER, OR].
- Xanthoria calcicola* Oxner - Locality 3, 40; on calcareous rock [OR].
- Xanthoria candelaria* (L.) Th.Fr. - Locality 6, 8; on *Eleagnus* sp., *Celtis* sp. and *Quercus* sp. [AN, MA].
- Xanthoria elegans* (Link) Th. Fr. - Locality 1, 2, 3, 4, 5, 6, 8, 11, 12, 17, 22, 23, 26, 30, 37, 40; on calcareous rock [HA, MA, OR, UŞ].
- Xanthoria fallax* (Hepp ex Arnold) Arnold - Locality 15, 17, 18, 22, 23; on *Populus* sp., *Prunus amygdalus* and *Quercus* sp. and *Salix* sp. [AN, HA, UŞ].
- Xanthoria parietina* (L.) Beltr. - Locality 6, 7a, b, 11, 12, 15, 17, 18, 22, 23, 25, 26, 27, 28, 33, 34, 35, 36, 38, 39, 40; on calcareous rock,

*Corylus* sp., *Morus* sp., *Pinus* sp., *Platanus orientalis*, *Populus* sp.,  
*Prunus* sp., *Pyrus* sp., *Quercus* sp. and *Salix* sp. [AN, KI, MA, OR].  
*Xanthoria polycarpa* (Hoffm.) Rieber - Locality 7b, 23; on *Quercus* sp. [HE].  
*Xanthoria ulophyllodes* Räsänen - Locality 3; on siliceous rock.  
*Zwackiomyces coepulonus* (Norman) Grube & R.Sant. - Locality 17; on  
*Xanthoria elegans* [AN].

### Discussion

Besides lichenicolous fungi (14 taxa), of the 297 taxa, 178 are crustose, 82 foliose, 34 fruticose, and 3 leprose. 112 taxa were epiphytic only, 145 saxicolous, 20 terricolous, 12 epiphytic or saxicolous, 5 terricolous and muscicolous and 21 muscicolous only. On the other hand 8 taxa were growing on other lichenized fungi as parasites (of these 5 are strictly lichenicolous fungi). These are *Arthonia phaeophysciae*, *Buellia badia*, *Caloplaca aractina* (lichen), *Caloplaca grimmiae*, *Candelariella vitellina* (lichen), *Carbonea vitellinaria*, *Lecanora albescens* (lichen) and *Opegrapha glaucomaria*. Substrates varied, with 129 taxa growing on rocks, 83 on deciduous trees, 48 on coniferous trees, 21 on mosses and 16 on limestone. In the study area the species were found on 47 different substrata. *Caloplaca*, *Cladonia*, *Lecanora*, *Rinodina*, *Verrucaria* and *Xanthoparmelia* are the more common genera in the study area. Among these, *Caloplaca* is the most diverse (represented by 24 species, mostly on rocks and *Prunus*), with 12 taxa occurring in Ankara and 10 in Uşak. 13 members of the genus *Cladonia* were found in Ordu and 11 in Hatay (on moss and soil). On the other hand 10 species of *Lecanora* were found in Ankara and 8 in Hatay (mostly on deciduous trees and rocks). Foliose genera such as *Flavoparmelia*, *Parmelia*, *Phaeophyscia*, *Physcia*, *Physconia*, *Melanelixia*, *Melanohalea*, *Peltigera*, *Xanthoparmelia* and *Xanthoria* were mostly found in Ankara, Hatay and Ordu on mostly deciduous (i.e. *Prunus*, *Pyrus*, *Crataegus*, *Quercus*) and coniferous trees (i.e. *Pinus*), and moss. *Phaeophyscia*, *Physcia* and *Physconia* were mostly found in Ankara and Ordu especially on deciduous trees. *Melanelixia* and *Melanohalea* were found growing especially on deciduous trees and rocks in Hatay, Uşak, Ordu and Ankara. On the other hand *Peltigera* spp. were seen growing mostly on moss and soil in Hatay and Ordu while *Xanthoria* spp. and *Xanthoparmelia* spp. were deciduous trees and rocks in Ankara and Ordu. Saxicolous crustose lichens were found at all the stations and are very common, especially in Ankara, Erzurum and Siirt and on Marmara island. Localities 19 and 22 are situated near a lime pit *Aspicilia calcarea*, *Bagliettoa baldensis*, *B. parmigera*, *Verrucaria calciseda*, *Verrucaria fuscella*, *V. marmorea*, *V. muralis* and *V. nigrescens*, which are indicator species of lime and calcareous substratum, were found in Siirt and

Hatay. On the other hand, the saxicolous species *Verrucaria fuscella*, *V. marmorea* and *V. nigrescens* were also recorded at station 19 and 22.

Crustose species were seen at nearly all stations and they are very common on limestone rock, and on deciduous trees in Ankara, Hatay, Ordu, Siirt and Uşak, because rock and deciduous trees are predominant in these areas. In Ordu crustose species were found to be mostly growing on rocks and deciduous trees. Foliose genera were mostly found in Ankara, Hatay and Ordu on deciduous trees and rock. On the other hand fruticose taxa were mostly found in Ordu, Hatay and Uşak. Several sensitive species, according to Purvis et al. (1992) and Wirth (1995), such as *Lobaria pulmonaria*, *Pertusaria* spp., *Physcia* spp., *Physconia* spp., *Ramalina* spp. and *Usnea* spp. were found in the study area, especially in Ordu and Hatay. *Lichenostigma rouxii*, *Lichenostigma triseptata*, *Muellerella ventosicola*, *Phaeophyscia poeltii*, *Placynthiella icmalea*, *Rinodina oleae*, *Scoliciosporum gallurae*, *Staurothele hymenogonia*, *Staurothele rugulosa*, *Verrucaria latericola*, *Verrucaria pinguicula*, *Xanthoparmelia mexicana*, *Xanthoparmelia pokornyii* and *Xanthoparmelia protomatrae* have been recorded for the second time in Turkey, but also *Leptogium schraderi*, *Lecidella asema*, *Lecanora frustulosa*, *Lecanora symmicta*, *Lecanora aitema*, *Lecania rabenhorstii*, *Melanohalea infumata*, *Micarea prasina*, *Endococcus macrosporus*, *Caloplaca pelodella*, *Aspicilia recedens*, *Arthonia phaeophysciae*, *Phaeophyscia chloantha*, *Rhizoplaca peltata*, *Enterographa hutchinsiae* and *Arthonia lapidicola* have rarely been recorded in Turkey so far.

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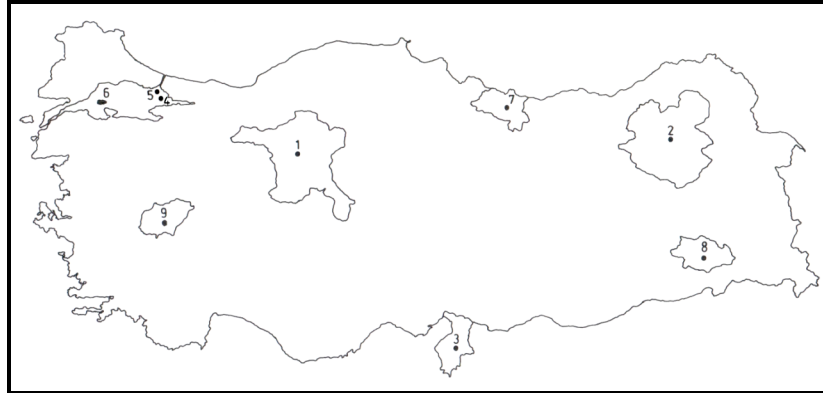


Figure 1. Map of Turkey showing the nine areas surveyed in this paper. 1: Ankara, 2: Erzurum, 3: Hatay, 4: Heybeliada, 5: Kınalıada, 6: Marmara Island, 7: Ordu, 8: Siirt, 9: Uşak

**Table 1.** Collecting localities.

No	Locality	Coordinate	Altitude (m)	Date
1.	Erzurum-Oltu road, Güngörmez village turning	40°08'N 41°25'E	1900	16.04.2007
2.	Erzurum-Oltu Road, Köşk village, road turning	40°06'N 41°23'E	1860	20.04.2007
3.	Palandöken Dağı	39°52'N 41°17'E	2135	01.05.2007
4.	Erzurum-Horasan road, Hamam deresi	39°58'N 41°28'E	1800	08.05.2007
5.	Erzurum-Çat road, Yağmurcuk village	39°47'N 41°07' E	2020	12.05.2007
6	Marmara Island, Çınarlı coastline	40°36'56"N 27°32'41"E	50-70	05.07.2007
7a	Kınalıada	40°54'14"N 29°03'01"E	70	06.07.2007
7b	Heybeliada	40°52'12"N 29°04'40"E	45	07.07.2007
8	Ankara: Güdül, Akbaş village	40°13'55"N 32°17'19"E	910	14.07.2007
9	Ankara: Güdül, Meyvabükü village	40°15'49"N 32°19'48"E	840	15.07.2007
10	Ankara: Güdül, Yeşilöz vilage	40°15'21"N 32°15'52"E	710	16.07.2007
11	Ankara, Güdül, Kamanlar village	40°13'31"N 32°15'46"E	790	17.07.2007
12	Ankara, Güdül, Hacılar village	40°13'24"N 32°16'37"E	815	17.07.2007
13	Ankara: Beypazarı İnözü valley, Akşamoldu village	40°12'02"N 31°54'05"E	785	12.03.2009
14	Ankara: Ayaş Ayaşbeli, center	40°03'11"N 32°21'49"E	1200	22.03.2009

15	Ankara: Beypazarı, İnözü valley	40°11'35"N 31°54'22"E	755	24.06.2009
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**Table 1.** Collecting localities.

No	Locality	Coordinate	Altitude (m)	Date
16	Ankara, Ayaş, Bayram village	40°04'32"N 32°19'28"E	940	25.06.2009
17	Ankara, Ayaş, Atderesi	40°04'22"N 32°27'45"E	1000	26.06.2009
18	Ankara, Ayaş Yağmurdede vilage, side of creek	40°08'32"N 32°20'57"E	855	27.06.2009
19	Siirt, Aydınlar, Kale	37°56'50"N 42°02'33"E	1334	19.07.2007
20	Siirt, Aydınlar, surrounding of İbrahim Hakkı Haz. Türbesi	37°56'40"N 42°00'39"E	1163	21.07.2007
21a	Siirt, Aydınlar, surrounding of Gavsul Memduh Hz. Evi	37°56'47"N 42°00'30"E	1216	22.07.2007
21b	Siirt-Bağtepe, Bağevi	37°57'17"N 41°59'10"E	1096	22.07.2007
22	Hatay, Dört Yol, Topaktaş plateau	36°51'54"N 36°16'47"E	690	23.07.2007
23	Uşak, Karahallı, Paşalar, center	38°20'39"N 29°29'18"E	960	15.08.2007
24	Uşak, Karahallı, Paşalar, İkisaray Village	38°40'29"N 29°28'43"E	870	16.08.2007
25	Uşak, Karahallı, Paşalar, Örentepe	38°19'52"N 29°30'14"E	985	17.08.2007
26	Uşak, Karahallı, Paşalar, Harmanyeri	38°20'52"N 29°29'21"E	985	18.08.2007
27	Uşak, Karahallı, Paşalar village, Sızıntı Tepesi, Koru forest	38°20'33"N 29°29'07"E	980	19.08.2007
28	Uşak, Karahallı, Paşalar village, Donanlar Bahçesi	38°20'36"N 29°29'09"E	970	20.08.2007
29	Uşak, Karahallı, Paşalar	38°20'48"N	980	21.08.2007



	village, Huzur Park, Picnic area	29°29'15"E		
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**Table 1.** Collecting localities.

No	Locality	Coordinate	Altitude (m)	Date
30	Uşak, Karahallı, Kavaklı village	38°21'36"N 29°28'03"E	870	22.08.2007
31	Uşak, Karahallı, Beki vilage	39°19'48"N 29°26'30"E	880	23.08.2007
32	Uşak, Karahallı, Külköy	38°21'42"N 29°32'08"E	930	24.08.2007
33	Ordu, Ünye, Kabakçı mahallesi	41°07'15"N 37°16'20"E	26	10.03.2009
34	Ordu, Ünye Sahil-Çamlık	41°08'34"N 37°17'18"E	37	11.03.2009
35	Ordu, Ünye, Center	41°07'31"N 37°17'09"E	40	12.03.2009
36	Ordu, Ünye, Tekkiraz-Nurettin village	40°57'12"N 37°06'56"E	770	17.03.2009
37	Ordu, Çaybaşı, İlküvez village	40°56'41"N 37°00'28"E	1035	18.03.2009
38	Ordu, Çaybaşı, center	41°01'00"N 37°06'03"E	485	19.03.2009
39	Ordu, Çaybaşı, Ulubey village	41°01'58"N 37°05'18"E	510	20.03.2009
40	Ordu, Çaybaşı, İçeribükü village	40°58'59"N 37°03'52"E	650	21.03.2009