



## Lichenized and lichenicolous fungi of Katırlı mountain in Bursa (Turkey) province

Züleyha DOĞRU<sup>1</sup>, Şaban GÜVENÇ<sup>\*1</sup>

<sup>1</sup> Uludag University, Arts and Sciences Faculty, Biology Department, Bursa, Turkey

### Abstract

In this study, 254 taxa were identified from 42 different localities at Katırlı mountain in the province of Bursa. Among of these, 36 taxa for Bursa and *Porpidia ochrolemma* (Vain.) Brodo & R. Sant. for Turkey are new records.

**Key words:** Lichen, biodiversity, Katırlı mountain, Bursa, Turkey

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### Bursa ilinde Katırlı dağlarının likenleşmiş ve likenikol mantarları

#### Özet

Bu çalışmada Bursa ilinde Katırlı dağındaki 42 farklı lokaliteden 254 takson tespit edilmiştir. Bu taksonlardan 36 tanesi Bursa için, *Porpidia ochrolemma* (Vain.) Brodo & R. Sant. Türkiye için yeni kayıttır.

**Anahtar kelimeler:** Likenler, biyoçeşitlilik, Katırlı dağı, Bursa, Türkiye

#### 1. Introduction

Bursa province is one of the most well studied provinces on the lichen diversity in Turkey. The first lichen records in Bursa province has started with 14 lichen species records given by Steiner (1916) at the beginning of the year of 1900. Many lichenized and lichenicolous fungi from Bursa province are gained as contribution to the lichen flora of Turkey (Doğru and Güvenç, 2007; Yazıcı, 2007; Yazıcı et al., 2007; Arslan et al., 2011; Oran, 2011; Oran and Öztürk, 2011, 2012). Numerous studies on lichens in the province of Bursa have been done in Uludag mountain (Öztürk, 1992; Güvenç and Öztürk, 2004; Töre and Öztürk, 2009), as the highest point of province, and the districts of Gemlik-Mudanya which located on the shores of Marmara sea (Özdemir and Öztürk, 1992; Öztürk, 1997; Oran and Öztürk, 2006), and Karacabey (Yazıcı, 1999) and Mustafakemalpaşa districts (Yazıcı and Aslan, 2006).

There are no studies on lichens in Katırlı mountain. Therefore, we aimed to contribute to the knowledge of the lichenized and lichenicolous fungi of Bursa province and Turkey.

#### 2. Materials and methods

The lichen samples were collected from 42 localities in Katırlı mountain at the northeast of the province of Bursa between 04 June 2003 and 07 November 2004 (Fig. 1). The specimens were examined with a Leica EZ4 model stereomicroscope, and an Olympus CH-2 light microscope for external morphology and anatomical observations. Ascospore measurements were carried out in water. Identifications were determined according to the literatures (Smith et al., 2009; Wirth et al., 2013). The specimens were stored in BULU (Herbarium of Faculty of Sciences and Arts in the Uludag University, Bursa, Turkey).

##### 2.1. The study area

Bursa province is located between 39°30'-40°37'N latitude and 28°06'-29°58'E longitude in the southeast of the Marmara region of Turkey. Bursa is usually dominated by Mediterranean climate, and also is a transition region

\* Corresponding author / Haberleşmeden sorumlu yazar: Tel.: +902242941793; Fax.: +902242941899; E-mail: saban@uludag.edu.tr

between the Mediterranean climate and the Black Sea climate. Bursa province has a humid climate due to influence of the Mediterranean climate and is experienced a significant drought during the summer (Öztürk, 2010). According to meteorological data (1950-2014), the mean annual temperature in Bursa (at 155 m) is 14.6°C and the mean annual rainfall is 696.3 mm (Anonymous, 2015). Bursa plain is located to the south of the Marmara region. Plain is bordered in the south by Uludağ mountain (2543 m) which is the highest mountain of the Marmara region, and by the north Mudanya Mountains and Katırlı mountain.

The study area, Katırlı mountain, is the highest point (1283 m) after Uludağ mountain in Bursa. Katırlı mountain in the northeast of the province of Bursa is located between 40°14'-40°25' N and 29°05'-29°26' E. Katırlı mountain is surrounded by the districts of Orhangazi in the north, Gemlik in the northwest, Osmangazi in the southwest, Gürsu and Kestel in the south, and Yenişehir in the east. Katırlı mountain height ranges from 90 meters up to 1283 meters. The highest point of Katırlı mountain is Gürle hill (1283 m). Other important elevations are Kırbayır hill (1108 m), Mağazataşı hill (1011 m), Gedik hill (907 m), Üçkaya hill (846 m) and Yankaya hill (529 m) (Erdoğan et al., 2011).

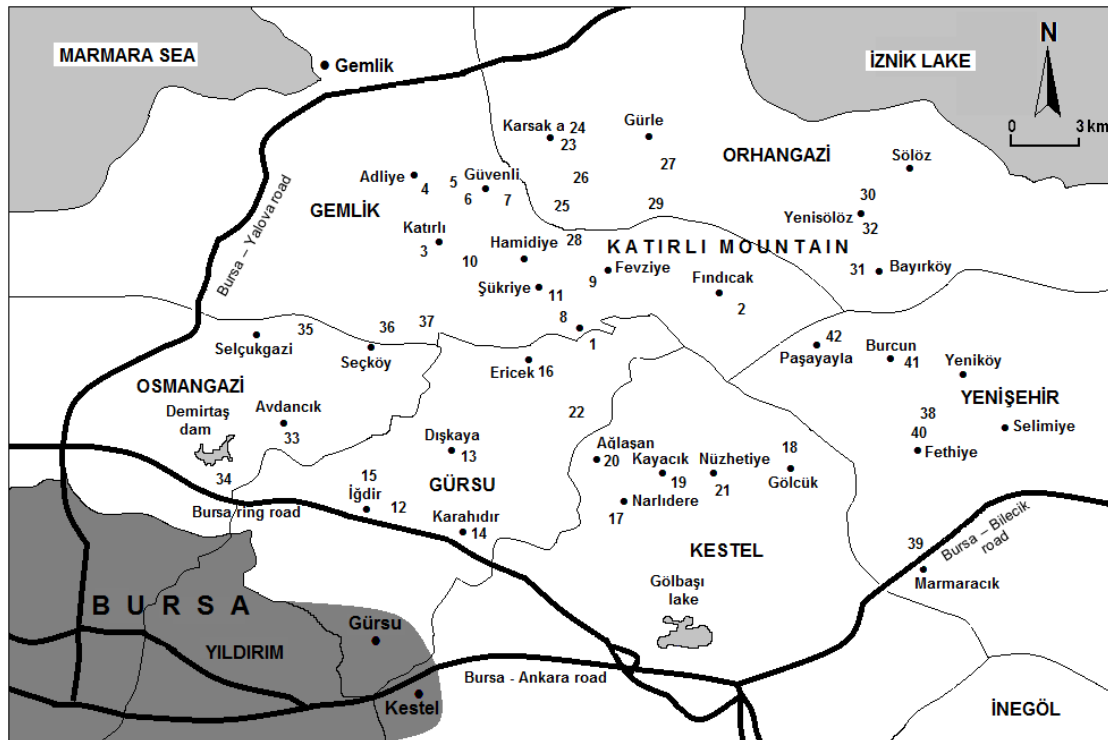


Figure 1. The localities in the study area

Table 1. The collected localities of lichen samples

No	District	Localities	Latitude	Longitude	Alt. (m)	Date
1.	Gemlik	Ericcek village	40°19'42"N	29°18'36"E	650	04.06.2003
2.	Gemlik	Fındıcak village	40°20'36"N	29°21'17"E	505	20.06.2003
3.	Gemlik	Katırlı village	40°21'54"N	29°12'36"E	475	19.07.2003
4.	Gemlik	between Adliye and Güvenli villages, maquis	40°23'03"N	29°12'45"E	450	01.01.2004
5.	Gemlik	Güvenli village	40°22'50"N	29°13'39"E	550	21.05.2004
6.	Gemlik	after 6 km from Güvenli village	40°22'42"N	29°13'44"E	950	21.05.2004
7.	Gemlik	Güvenli village, the forest road of Üçkaya hill	40°22'55"N	29°14'33"E	615	07.11.2004
8.	Gemlik	Ericcek village; Karagöl lake	40°20'21"N	29°16'22"E	700	15.08.2004
9.	Gemlik	Fevziye village, Oak forest	40°21'10"N	29°16'59"E	500	15.08.2004
10.	Gemlik	Hamidiye village	40°21'35"N	29°13'45"E	485	15.08.2004
11.	Gemlik	Şükriye village	40°20'44"N	29°15'46"E	487	15.08.2004
12.	Gürsu	between Gürsu – Dışkaya villages	40°15'35"N	29°12'59"E	269	04.06.2003
13.	Gürsu	Dışkaya village	40°16'52"N	29°14'43"E	750	20.06.2003

Table 1. Continued

14.	Gürsu	Karahıdır village	40°14'53"N	29°14'52"E	100	25.09.2003
15.	Gürsu	İğdir village	40°15'54"N	29°12'00"E	140	25.09.2003
16.	Gürsu	Ericcek village	40°19'02"N	29°16'12"E	700	25.09.2003
17.	Kestel	the south slopes of Narlıdere village	40°15'38"N	29°17'58"E	156	27.08.2003
18.	Kestel	Gölcük village	40°17'21"N	29°22'48"E	325	27.08.2003
19.	Kestel	Kayacık village	40°15'28"N	29°20'04"E	412	27.08.2003
20.	Kestel	Ağlaşan village	40°17'00"N	29°17'34"E	550	08.07.2004
21.	Kestel	Nüzhetiye village	40°16'23"N	29°20'55"E	540	27.08.2003
22.	Kestel	between Ericcek and Ağlaşan villages	40°18'05"N	29°16'32"E	642	27.08.2003
23.	Orhangazi	Karsak village	40°24'10"N	29°15'29"E	198	27.06.2004
24.	Orhangazi	between Güvenli - Karsak villages	40°24'17"N	29°15'35"E	400	27.06.2004
25.	Orhangazi	The forest road of Güvenli - Üçkaya hill, 5. km	40°22'49"N	29°15'34"E	700	27.06.2004
26.	Orhangazi	Between Karsak - Üçkaya hill	40°23'30"N	29°16'06"E	905	27.06.2004
27.	Orhangazi	Gürle village; Hisar hill	40°23'30"N	29°18'17"E	905	27.06.2004
28.	Orhangazi	the forest road of Karsak - Gürle hill, the location of Karanlık stream 1	40°22'33"N	29°15'45"E	1000	27.06.2004
29.	Orhangazi	the forest road of Karsak - Gürle hill, the location of Karanlık stream 2	40°22'40"N	29°18'26"E	1095	27.06.2004
30.	Orhangazi	Yenisölöz village	40°23'09"N	29°23'45"E	295	19.09.2004
31.	Orhangazi	Bayırkoy village	40°21'32"N	29°24'28"E	500	21.05.2004
32.	Orhangazi	the road of Bayırköy - Yenisölöz	40°22'44"N	29°24'53"E	500	03.11.2004
33.	Osmangazi	Avdancık village	40°17'28"N	29°09'31"E	550	19.07.2003
34.	Osmangazi	after 3 km. from Demirtaş lawn ski centre	40°16'13"N	29°07'49"E	325	01.08.2004
35.	Osmangazi	Selçukgazi village	40°20'05"N	29°10'22"E	600	19.07.2003
36.	Osmangazi	the road of Seçköy - Ericcek village	40°20'10"N	29°13'05"E	550	01.08.2004
37.	Osmangazi	Seçköy village	40°20'15"N	29°13'10"E	800	03.10.2004
38.	Yenişehir	Yeniköy village	40°18'02"N	29°26'48"E	344	08.07.2004
39.	Yenişehir	Marmaracık village	40°14'37"N	29°26'18"E	264	19.09.2004
40.	Yenişehir	Between Fethiye and Yeniköy, 3.2 km to the road junction of Gölcük village	40°17'47"N	29°26'48"E	330	19.09.2004
41.	Yenişehir	Burcun village	40°19'36"N	29°26'05"E	450	19.09.2004
42.	Yenişehir	Paşayaylası village, the location of Kaymakamsuyu	40°19'53"N	29°22'32"E	440	19.09.2004

### 3. Results

The taxa were listed in alphabetical order, followed by locality, substrate and herbarium number. An alphabetical list of taxa names was created based on the latest current names in Index Fungorum (<http://www.indexfungorum.org/names/names.asp>). Lichen taxa new to Turkey are indicated by (\*), and new to Bursa province by (+).

(+) *Acarospora badiofusca* (Nyl.) Th. Fr.

28: Siliceous rock (7600).

*Acarospora cervina* A. Massal.

12, 14, 16, 19, 32, 33, 37, 39: Calcareous rock (6116, 6995, 6818, 6875, 7047, 7152, 7191, 6551).

*Acarospora macrospora* (Hepp) A. Massal. ex Bagl.

42: Calcareous rock (BULU 6593).

(+) *Acarospora veronensis* A. Massal.

1: Siliceous rock (7293).

(+) *Acrocordia gemmata* (Ach.) A. Massal.

8: *Carpinus* sp. (6681); 29: *Fagus* sp. (7623); 30: *Populus* sp. (7115).

*Amandinea punctata* (Hoffm.) Coppins & Scheid.

1, 26, 32: Siliceous rock (7295, 7493, 7059); 8: *Carpinus* sp. (6666), and *Quercus* sp. (6673); 17: *Quercus* sp.

- (7676); **20, 37:** *Pinus* sp. (7514, 7178); **28:** *Fagus* sp. (7616) and *Pinus* sp. (7612); **42:** *Salix* sp. (6612).
- Anaptychia ciliaris** (L.) Körb. ex A. Massal.  
**1:** *Pistacia* sp. (7395) and *Quercus* sp. (7389); **8, 17, 18, 22, 32:** *Quercus* sp. (6690, 6782, 6966, 6340, 7035); **27:** *Acer* sp. (7429) and *Pyrus* sp. (7446).
- Arthonia dispersa** (Schräd.) Nyl.  
**1:** *Juglans* sp. (7340) and *Populus* sp. (7344); **40:** *Populus* sp. (6555); **42:** *Salix* sp. (BULU 6579).
- (+) **Arthonia leucopellaea** (Ach.) Almq.  
**1:** *Quercus* sp. (7315).
- (+) **Arthonia punctiformis** Ach.  
**8, 9, 28:** *Fagus* sp. (6647, 6476, 7574).
- Arthonia radiata** (Pers.) Ach.  
**8:** *Carpinus* sp. (6652).
- (+) **Arthopyrenia punctiformis** A. Massal.  
**5:** *Quercus* sp. (6855).
- Aspicilia cinerea** (L.) Körber  
**2, 4, 13, 18, 19, 20, 21, 26, 27, 28, 29, 31, 32, 33, 35, 36, 42:** Siliceous rock (6149, 7653, 6121, 6947, 6878, 6374, 6929, 7486, 7458, 7602, 7411, 6460, 7049, 6247, 6618, 6438, 6594).
- Aspicilia radiosa** (Hoffm.) Poelt & Leuckert  
**10, 15, 16, 18, 28, 33, 37:** Calcareous rock (6512, 6996, 6828, 6954, 7584, 6231, 7208); **12, 13:** Calcareous (7214, 7250) and siliceous rocks (7213, 6106); **17, 19, 23, 27, 32, 35, 42:** Siliceous rock (6777, 6883, 7504, 7443, 7054, 6256, 6577).
- Athallia cerinella** (Nyl.) Arup, Frödén & Söchting  
**12:** *Pistacia* sp. (7238); **29:** *Fagus* sp. (7626); **32:** *Quercus* sp. (7011); **42:** *Salix* sp. (6607).
- Athallia holocarpa** (Hoffm.) Arup, Frödén & Söchting  
**1, 10, 14, 28, 33, 37, 41:** Calcareous rock (7294, 6506, 6752, 7594, 6199, 7183, 7102); **56:** *Fagus* sp. (6642); **9, 32:** *Quercus* sp. (6467, 7008); **11:** *Juglans* sp. (6517); **16:** Calcareous rock (6807) and *Crateagus* sp. (6792); **17, 22:** *Pinus* sp. (6765, 6349); **20:** *Juniperus* sp. (7523), *Pinus* sp. (6384) and *Quercus* sp. (6369); **21, 36:** *Phillyrea* sp. (69056, 6431); **30:** *Populus* sp. (7113) and *Prunus* sp. (7119); **35:** *Morus* sp. (6313), *Prunus* sp. (6308) and *Punica* sp. (6289).
- Bagliettoa parmigera** (J. Steiner) Gams  
**7, 10, 13, 14, 15, 39, 41:** Calcareous rock (7550, 6503, 7274, 6727, 6973, 6545, 7085).
- Blastenia crenularia** (With.) Arup, Söchting & Frödén (as *Caloplaca crenularia*)  
**2, 10, 20, 21, 26, 29, 31, 32, 36, 42:** Siliceous rock (6139, 6489, 6372, 6914, 7471, 7410, 6459, 7051, 6616, 6581).
- Blennothallia crispa** (Weber ex F.H. Wigg.) Otálora, P.M. Jørg. & Wedin  
**9:** On the calcareous wall (6468); **12:** Calcareous rock (7225) and soil (7236); **13, 18, 36:** Calcareous rock (7264, 6968, 6433); **28:** Calcareous soil (7585).
- Bryoria fuscescens** (Gyeln.) Brodo & D. Hawksw.  
**8:** *Quercus* sp. (6706).
- Buellia badia** (Fr.) A. Massal.  
**26, 27, 34, 36:** Siliceous rock (7488, 7436, 6406, 6633).
- Buellia disciformis** (Fr.) Mudd  
**1:** *Juglans* sp. (7394), *Populus* sp. (7367) and *Quercus* sp. (7284); **2, 20, 26, 32:** *Quercus* sp. (6141, 7530, 7481, 7029); **8:** *Fagus* sp. (6700) and *Quercus* sp. (6698); **28:** *Pinus* sp. (7611); **35:** *Prunus* sp. (6287); **40:** *Populus* sp. (6562).
- Buellia erubescens** Arnold  
**21:** *Phillyrea* sp. (6908).
- Calogaya pusilla** (A. Massal.) Arup, Frödén & Söchting  
**37:** Calcareous rock (7185).
- Caloplaca alociza** (A. Massal.) Mig.  
**33, 35, 41:** Calcareous rock (7156, 6253, 7107).
- Caloplaca aractina** (Fr.) Håyrén  
**19, 27:** Siliceous rock (6877, 7457).
- Caloplaca atroflava** (Turner) Mong.  
**31:** Siliceous rock (6462).
- Caloplaca cerina** (Hedw.) Th. Fr.  
**3, 10:** *Quercus* sp. (6330, 6509); **8:** *Carpinus* sp. (6677); **10:** *Juglans* sp. (6515) and *Olea* sp. (6498); **11:** *Juglans* sp. (6534); **14:** *Phillyrea* sp. (6737); **36:** *Cydonia* sp. (6425) and *Populus* sp. (6426).
- Caloplaca cerina** (Hedw.) Th. Fr. var. *muscorum* (A. Massal.) Jatta  
**27:** On moss (7451).
- Caloplaca chalybaea** (Fr.) Müll. Arg.  
**10, 13, 14, 16:** Calcareous rock (6509, 6115, 6753, 6790).
- Caloplaca erythrocarpa** (Pers.) Zwackh  
**14, 17, 38:** Calcareous rock (6743, 6866, 6391).
- Caloplaca ferruginea** (Huds.) Th. Fr.  
**3:** *Ficus* sp. (6324); **7, 21:** *Quercus* sp. (7555, 6904); **17:** *Pinus* sp. (6766) and *Quercus* sp. (7675); **20, 28:** *Pinus* sp. (6385, 7609); **33:** *Phillyrea* sp. (7146) and *Pistacia* sp. (7132); **35:** *Tilia* sp. (6271); **42:** *Salix* sp. (6604).
- Caloplaca inconnexa** (Nyl.) Zahlbr.  
**16:** On *Acarospora cervina* (6819).
- Caloplaca lactea** (A. Massal.) Zahlbr.  
**7, 12, 33, 35:** Calcareous rock (7546, 7231, 7168, 6266).
- Caloplaca ochracea** (Schaerer) Flagey  
**39:** Calcareous rock (6543).
- Caloplaca variabilis** (Pers.) Müll. Arg.  
**27, 35, 37, 39:** Calcareous rock (7452, 6265, 7192, 6537).
- Candelaria concolor** (Dicks.) Stein  
**13:** *Pyrus* sp. (7244).
- Candelariella aurella** (Hofm.) Zahlbr.  
**1, 4, 7, 12, 13, 14, 15, 19, 28, 33, 37, 39:** Calcareous rock (7291, 7648, 7545, 7217, 7668, 6733, 7003, 6880, 7581, 7172, 7209, 6538); **2:** *Pinus* sp. (6150); **16:** Calcareous rock (6786), *Crateagus* sp. (6802).
- Candelariella medians** (Nyl) A. L. Sm.  
**15:** Calcareous rock (6971).
- Candelariella vitellina** (Hoffm.) Müll. Arg.  
**1, 35:** *Quercus* sp. (7403, 6262); **3:** *Ficus* sp. (6322) and *Quercus* sp. (6329); **8:** *Fagus* sp. (6641); **10:** *Juglans* sp. (6508) and Siliceous rock (6495); **15, 17, 18, 19, 23, 26, 27, 34, 38, 42:** Siliceous rock (6992, 6779, 6941, 6873, 7506, 7491, 7454, 6409, 6398, 6566); **22:** Siliceous rock (6925) and *Quercus* sp. (6917); **32, 33:** *Pistacia* sp. (7019, 7130) and siliceous rock (7048, 6186); **36:** *Phillyrea* sp. (6430) and siliceous rock (6624); **41:** *Juglans* sp. (7083).
- (+) **Catapyrenium pilosellum** Breuss  
**19:** On soil (6879).
- Catapyrenium rufescens** (Ach.) Breuss  
**13, 16:** On soil (7246, 6799); **14, 15, 33, 37, 39, 42:** Calcareous rock (6750, 6972, 6219, 7198, 6539, 6588).
- (+) **Catapyrenium squamulosum** (Ach.) Breuss  
**14:** On soil (6740).
- Catillaria chalybeia** (Borrer) A. Massal.  
**39:** Calcareous rock (6544).
- Catillaria lenticularis** (Ach) Th. Fr.  
**15, 33:** Calcareous rock (6986, 6206); **17:** Siliceous rock (6778).
- Catillaria nigroclavata** (Nyl.) J. Steiner  
**10:** *Juglans* sp. (6505); **33:** *Pistacia* sp. (7127).
- Cetraria aculeata** (Schreb.) Fr.  
**21:** On soil (6927).

- Chrysothrix candelaris* (L.) J.R. Laundon  
2: *Quercus* sp. (6140); 31: *Platanus* sp. (6175).
- Circinaria caesiocinerea* (Nyl. ex Malbr.) A. Nordin, Savić & Tibell  
2, 10, 36: Siliceous rock (6137, 6488, 6630).
- Circinaria calcarea* (L.) A.Nordin, Savić & Tibell  
13, 14, 15, 16, 28, 33, 37, 39, 41: Calcareous rock (7247, 6754, 6980, 6815, 7597, 7153, 7184, 6540, 7106).
- Circinaria contorta* (Hoffm.) A. Nordin, Savić & Tibell  
1, 19, 23, 27: Siliceous rock (7314, 6882, 7507, 7438); 4, 13, 14, 15, 16, 17, 18, 24, 28, 33, 36: Calcareous rock (7647, 7670, 6749, 6994, 6827, 6864, 6955, 7499, 7588, 7155, 6438).
- Cladonia coniocraea* (Flörke) Sprengel  
1, 7: Together with moss on the base of the trunk of *Pinus* sp. (7279, 7167); 32: Together with moss on the base of the trunk of *Quercus* sp. (7037).
- Cladonia convoluta* (Lam.) Anders  
33: Together with moss on soil (6193).
- Cladonia fimbriata* (L.) Fr.  
2: On Mosses (6128); 4, 33, 37: Calcareous soil (7651, 6187, 7199); 8: Together with moss on the base of the trunk of *Fagus* sp. (6714); 20: Siliceous soil (6368); 32: *Pinus* sp. (7021).
- Cladonia foliacea* (Huds.) Willd.  
2, 16, 19, 33, 41: Calcareous soil (6152, 6814, 6876, 7122, 7109); 20: Siliceous soil (6375).
- Cladonia furcata* (Huds.) Schrad.  
1: *Pinus* sp. (7311); 2: On Soil (6159).
- Cladonia pyxidata* (L.) Hoffm.  
1, 16, 33: On moss (7306, 6820, 6211); 8, 10, 13, 20, 21, 31, 32, 34, 37, 38, 41, 42: On Siliceous soil (6184, 6482, 7249, 6363, 6913, 6636, 7042, 6415, 7195, 6399, 7097, 6584); 22: Together with moss on the base of the trunk of *Pinus* sp. (6357).
- Cladonia rangiformis* Hoffm.  
4, 17, 18, 20, 21, 32, 33, 38, 41: On soil (7665, 6764, 6962, 7516, 6923, 7062, 7137, 6401, 7084).
- Cladonia symphyrcarpia* (Flörke) Fr.  
32: Calcareous soil (7070).
- (+) *Clauzadea immersa* (Hoffm.) Hafellner & Bellem.  
35: Calcareous rock (6264).
- Clauzadea metzleri* (Körber) Clauz. & Roux ex D. Hawksw.  
14, 17, 35: Calcareous rock (6734, 6861, 6254).
- Clauzadea monticola* (Ach.) Hafellner & Bellem.  
13, 33: Calcareous rock (7270, 7163).
- Collema flaccidum* (Ach.) Ach.  
29, 31: On siliceous rock with moss (7414, 6165); 28, 33: On calcareous rock with moss (7580, 6622).
- Collema subflaccidum* Degel.  
17, 22: *Quercus* sp. (6771, 6342); 34: Siliceous rock (6411); 41: *Platanus* sp. (7076).
- (+) *Collema subnigrescens* Degel.  
34: Siliceous rock (6417).
- Collema tenax* (Sw.) Ach.  
13: Calcareous soil (7248).
- Collema undulatum* Laurer ex Flot.  
39: Calcareous rock (6546).
- Dermatocarpon intestiniforme* (Körb.) Hasse  
31: Siliceous rock (6179).
- Dermatocarpon luridum* (Dill. ex With.) J.R. Laundon  
13, 28: Calcareous soil (7261, 7589); 17, 33, 39: Calcareous rock (6999, 6860, 7136, 6541).
- Dermatocarpon miniatum* (L.) W. Mann  
31: Siliceous rock (6167); 13, 32, 37: Calcareous rock (7267, 7053, 7179).
- Diploschistes muscorum* (Scop.) R.Sant  
21, 32: On moss and on thalli of *Cladonia* sp. (6918, 7022); 38, 41: On moss (6396, 7092).
- Diploschistes scruposus* (Schreb.) Norman  
17: Calcareous rock (6870); 19, 20, 31, 38, 42: Siliceous rock (6381, 6921, 6168, 6397, 6605).
- Diplotomma alboatrum* (Hoffm.) Flot.  
11, 33: *Juglans* sp. (6525, 6208) and *Populus* sp. (6523, 6244); 30, 36: *Populus* sp. (7118, 6427); 42: Calcareous rock (6568).
- Diplotomma chlorophaeum* (Hepp ex Leight.) Szatala  
1, 10, 35: Siliceous rock (7296, 6483, 6257).
- Diplotomma epipolium* (Ach.) Arnold  
12, 13, 14, 15, 16, 19, 23, 33, 37, 41: Calcareous rock (7224, 7258, 6742, 6985, 6833, 6872, 7502, 7123, 7203, 7088).
- Dirina massiliensis* (Durieu & Mont.) f. *sorediata* (Müll. Arg.) Tehler  
33: Calcareous rock (6224).
- Enchylium polycarpon* (Hoffm.) Otálora, P.M. Jørg. & Wedin  
14, 37: Calcareous rock (6751, 7188).
- Endocarpon pusillum* Hedw  
32: On moss (7039).
- Epyrenula leucoplaca* (Wallr.) R.C. Haris  
1, 8, 17: *Quercus* sp. (7361, 6638, 6775); 41: *Platanus* sp. (7075).
- Evernia prunastri* (L.) Ach.  
1: *Corylus* sp. (7355), *Phillyrea* sp. (7307), *Pistacia* sp. (7327), *Prunus* sp. (7364) and *Quercus* sp. (7309); 2: *Crateagus* sp. (6138), *Pinus* sp. (6146) and *Quercus* sp. (6163); 6, 29: *Fagus* sp. (6452, 7642); 7, 12, 18, 22, 26: *Quercus* sp. (7548, 72156, 6953, 6347, 7476), 8: *Crateagus* sp. (6688), *Fagus* sp. (6707), *Pinus* sp. (6670) and *Quercus* sp. (6703); 16: *Crateagus* sp. (6838); 17: *Pinus* sp. (6769) and *Quercus* sp. (6772); 20: *Juniperus* sp. (7520), *Phillyrea* sp. (7537) and *Pinus* sp. (7532); 21: *Crateagus* sp. (6892) and *Quercus* sp. (6934); 27: *Acer* sp. (7427); 32: *Pistacia* sp. (7007) and *Quercus* sp. (7018); 33: *Phillyrea* sp. (7143), *Pistacia* sp. (7124) and *Quercus* sp. (7148); 35: *Morus* sp. (6278), *Populus* sp. (6283) and *Tilia* sp. (6315); 36: *Erica* sp. (6619) and *Phillyrea* sp. (6432); 40: *Populus* sp. (6559), 42: *Quercus* sp. (6602) and *Salix* sp. (6564).
- Flavoparmelia caperata* (L.) Hale  
8, 18, 32: *Quercus* sp. (6695, 6965, 7017); 27: *Pyrus* sp. (7421).
- Flavoplaca citrina* (Hoffm.) Arup, Frödén & Söchting (as *Caloplaca citrina*)  
9: On the calcareous wall (6474); 33: Calcareous rock (6232).
- (+) *Flavoplaca oasis* (A. Massal.) Arup, Frödén & Söchting (as *Caloplaca oasis*)  
10: On *Bagliettoa parmigera* (6504).
- Flavoplaca polycarpa* (A. Massal.) Arup, Frödén & Söchting  
12, 16: On *Verrucaria calciseda* on calcareous rock (7221, 6997).
- (+) *Fuscidea cyathoides* (Ach.) V. Wirth & Vězda  
6: *Fagus* sp. (6446); 29: *Carpinus* sp. (7632).
- (+) *Gyalecta jenensis* (Batsch) Zahlbr.  
33: Calcareous rock (6215).
- Gyalolechia flavorubescens* (Huds.) Söchting, Frödén & Arup  
11: *Populus* sp. (6529); 21: *Quercus* sp. (6888).
- Gyalolechia flavovirescens* (Wulfen) Söchting, Frödén & Arup

- 13:** Calcareous rock (7260).
- Hypogymnia farinacea Zopf**  
**2:** *Pinus* sp. (6124); **8, 20:** *Quercus* sp. (66856, 7521).
- Hypogymnia physodes (L.) Nyl.**  
**1:** *Pinus* sp. (7305), *Pyrus* sp. (7346) and *Quercus* sp. (7388); **2:** *Crateagus* sp. (6151); **6, 29:** *Fagus* sp. (6448, 7633); **8:** *Pinus* sp. (6713) and *Quercus* sp. (6717); **17, 37:** *Pinus* sp. (6783, 7181); **20:** *Juniperus* sp. (7519); *Pinus* sp. (6383) and *Quercus* sp. (6373); **21:** *Juniperus* sp. (6939) and *Quercus* sp. (6916); **26:** *Quercus* sp. (7477); **35:** *Prunus* sp. (6310).
- Hypogymnia tubulosa (Schaer.) Hav.**  
**1, 17:** *Pinus* sp. (7288, 6762) and *Quercus* sp. (7300, 6768); **2:** *Crateagus* sp. (6123); **8:** *Fagus* sp. (6712) and *Quercus* sp. (6685); **20:** *Juniperus* sp. (7524) and *Pinus* sp. (7525); **21:** *Juniperus* sp. (6940); **26:** *Pyrus* sp. (7472); **28:** *Fagus* sp. (7605); **33:** *Phillyrea* sp. (7139); **37:** *Pinus* sp. (7177); **42:** *Quercus* sp. (6595).
- Lasallia pustulata (L.) Merat**  
**34:** Siliceous rock (6416).
- Lathagrium cristatum (L.) Otálora, P.M. Jørg. & Wedin**  
 (as *Collema cristatum*)  
**8, 14, 15, 17, 19, 31, 33, 37, 41:** Calcareous rock (66356, 6728, 6982, 6868, 6885, 6170, 7173, 7182, 7098); **16:** Calcareous rock (6817) and soil (6793); **21, 34:** Siliceous rock (6910, 6405); **32:** On siliceous rock with moss (7041).
- Lecania cyrtella (Ach.) Th. Fr.**  
**40:** *Juglans* sp. (6554).
- Lecania cyrtellina (Nyl.) Sandst.**  
**20:** *Pinus* sp. (7513); **35:** *Ficus* sp. (6288).
- Lecania erysibe (Ach.) Mudd**  
**12, 14, 15:** Calcareous rock (7227, 6745, 6988).
- Lecania fuscella (Schaer.) A. Massal.**  
**1, 33:** *Juglans* sp. (7335, 6217); **11:** *Populus* sp. (6530); **30:** *Populus* sp. (7114), *Prunus* sp. (7120); **42:** *Salix* sp. (6586).
- (+) **Lecanora albellula (Nyl.) Th. Fr. var. albellula**  
**2:** *Pinus* sp. (6155).
- (+) **Lecanora allophana (Ach.) Nyl.**  
**29:** *Carpinus* sp. (7631).
- Lecanora argentata (Ach.) Röhl.**  
**1, 2:** *Quercus* sp. (7304, 6143); **3:** *Ficus* sp. (6323); **6, 28:** *Fagus* sp. (6455, 7599); **8, 25:** *Carpinus* sp. (6680, 7565); **10:** *Olea* sp. (6500); **22:** *Pinus* sp. (6358); **33:** *Pistacia* sp. (7161), *Populus* sp. (6214) and *Prunus* sp. (6210); **35:** *Tilia* sp. (6285).
- Lecanora campestris (Schaer.) Hue**  
**2, 18, 20, 32, 38, 42:** Siliceous rock (6125, 6969, 6362, 7046, 6402, 6598); **12:** Calcareous rock (7243).
- Lecanora carpinea (L.) Vain.**  
**1, 2, 18, 21:** *Quercus* sp. (7398, 6142, 6959, 6903); **13:** *Crateagus* sp. (7271); **22:** *Pinus* sp. (6352); **35:** *Olea* sp. (6295).
- Lecanora chlarotera Nyl.**  
**1:** *Corylus* sp. (7400), *Populus* sp. (7352) and *Quercus* sp. (7303); **3, 8, 9, 17, 18, 21, 32:** *Quercus* sp. (6332, 6697, 6719, 6761, 6960, 6902, 7028); **6:** *Carpinus* sp. (6440); **11, 30:** *Populus* sp. (6526, 7111); **22:** *Pinus* sp. (6359); **27:** *Pyrus* sp. (7432); **28:** *Fagus* sp. (7613); **33:** *Juglans* sp. (6209) and *Populus* sp. (6218); **35:** *Morus* sp. (6304), *Quercus* sp. (6261) and *Tilia* sp. (6274); **41:** *Morus* sp. (7077) and *Prunus* sp. (7072).
- Lecanora crenulata Hook.**  
**13:** Calcareous rock (7255).
- Lecanora dispersa (Pers.) Röhl.**  
**1, 7, 8, 12, 13, 16, 31, 37:** Calcareous rock (7292, 7547, 6644, 7228, 7669, 6816, 6463, 7205); **10, 32:** Siliceous rock (6492, 7066).
- Lecanora frustulosa (Dicks.) Ach.**  
**27:** Siliceous rock (7463).
- Lecanora hagenii (Ach.) Ach.**  
**3:** *Quercus* sp. (6333); **10:** *Juniperus* sp. (6519); **11:** *Populus* sp. (6519); **12:** *Quercus* sp. (7233) and *Pistacia* sp. (7239).
- (+) **Lecanora persimilis (Th. Fr.) Arnold**  
**29:** *Fagus* sp. (7625).
- Lecanora pruinoso Chaub.**  
**1, 33:** Calcareous rock (7318, 6228).
- Lecanora pulicaris (Pers.) Ach.**  
**1, 24:** *Quercus* sp. (7384, 7494); **28, 29:** *Fagus* sp. (7575, 7627).
- Lecanora rupicola (L.) Zahlbr. subsp. subplanata (Nyl.) Leuckert & Poelt**  
**27, 36:** Siliceous rock (7460, 6626).
- Lecanora sambuci (Pers.) Nyl.**  
**11:** *Populus* sp. (6531); **29:** *Fagus* sp. (7624).
- Lecanora subcarpinea Szatala**  
**1:** *Quercus* sp. (7286), *Populus* sp. (7353) and *Pyrus* sp. (7351); **2, 16:** *Crateagus* sp. (6161, 6836); **3:** *Ficus* sp. (6316) and *Quercus* sp. (6331); **4:** *Juglans* sp. (7660); **5:** *Acer* sp. (6848); **6, 28:** *Fagus* sp. (6450, 7579); **7, 20, 26, 32:** *Quercus* sp. (75456, 7533, 7479, 7010); **8:** *Carpinus* sp. (6684), *Fagus* sp. (6650) and *Quercus* sp. (6701); **9:** *Fagus* sp. (6470) and *Quercus* sp. (6475); **10:** *Olea* sp. (6499) and *Juglans* sp. (6514); **11:** *Populus* sp. (6527); **27:** *Pyrus* sp. (7430); **33:** *Pistacia* sp. (7165); **35:** *Ficus* sp. (6309), *Morus* sp. (6292), *Prunus* sp. (6307) and *Tilia* sp. (6275); **36:** *Cydonia* sp. (6422); **41:** *Morus* sp. (7081) and *Prunus* sp. (7073); **42:** *Quercus* sp. (6601) and *Salix* sp. (6599).
- Lecanora sulphurea (Hoffm.) Ach.**  
**21, 27, 34:** Siliceous rock (6930, 7459, 6410).
- Lecanora filamentosa (Stirt.) Elix & Palice**  
**1, 5, 42:** *Quercus* sp. (7396, 6846, 6590).
- Lecidea fuscoatra (L.) Ach.**  
**1, 2, 21, 26, 27, 28, 31, 36, 38, 42:** Siliceous rock (7281, 6126, 6936, 7475, 7455, 7587, 6182, 6617, 6389, 6608).
- Lecidella carpathica Körb.**  
**1, 2, 4, 19, 31, 32, 33, 42:** Siliceous rock (7298, 6134, 7650, 6871, 6183, 7057, 6203, 6580).
- Lecidella elaeochroma (Ach.) M. Choisy**  
**1:** *Quercus* sp. (7312), *Corylus* sp. (7339), *Juglans* sp. (7368), *Pistacia* sp. (7380), *Populus* sp. (7354) and *Pyrus* sp. (7350); **2, 13, 21:** *Crateagus* sp. (6160, 7254, 6906); **3:** *Ficus* sp. (6319); **4:** *Juglans* sp. (7664); **5, 8:** *Carpinus* sp. (6852, 6678) and *Quercus* sp. (6847, 6660); **6:** *Carpinus* sp. (6441) and *Fagus* sp. (6445); **7, 17, 18, 22, 23:** *Quercus* sp. (7554, 6770, 6945, 6351, 7509); **9:** *Fagus* sp. (6473) and *Quercus* sp. (6466); **10:** *Olea* sp. (6510); **12, 32:** *Pistacia* sp. (7237, 7031) and *Quercus* sp. (7232, 7005); **20:** *Juniperus* sp. (7511), *Pinus* sp. (6387) and *Quercus* sp. (6370); **25:** *Carpinus* sp. (7570); **27:** *Pyrus* sp. (7431); **2, 8, 29:** *Fagus* sp. (7576, 7639) **30, 40:** *Populus* sp. (7116, 6558); **33:** *Juglans* sp. (6216), *Phillyrea* sp. (7144), *Pistacia* sp. (7131) and *Prunus* sp. (6240); **35:** *Morus* sp. (6305), *Olea* sp. (6296), *Prunus* sp. (6306), *Quercus* sp. (6263) and *Tilia* sp. (6272); **36:** *Phillyrea* sp. (6429) and *Quercus* sp. (6437); **41:** *Morus* sp. (7080) and *Prunus* sp. (7074); **42:** *Salix* sp. (6574).
- Lecidella stigmatea (Ach.) Hertel & Leuckert**  
**16, 15, 28:** Calcareous rock (6829, 6865, 7591).

- (+) *Lempholemma polyanthes* (Bernh.) Malme  
39: Calcareous rock (6550).
- (+) *Lepraria eburnea* J.R. Laundon  
1, 18, 26: *Quercus* sp.(7362, 6957, 7485); 31: *Platanus* sp. (6169); 21: *Phillyrea* sp. (6907); 25: Siliceous rock (7568); 29: *Fagus* sp. (7640).
- (+) *Lepraria flavescens* Clauzade & Cl. Roux  
33: Calcareous rock (6230).
- Lepraria incana* (L.) Ach.  
1, 28: *Pinus* sp. (7308, 7604); 18: *Quercus* sp. (6950); 25: *Carpinus* sp. (7567); 34: Siliceous rock (6404).
- Lepraria lobificans* Nyl.  
1: *Pyrus* sp. (7405) and *Quercus* sp. (7301); 31: On moss (6181) and *Salix* sp. (6464); 5, 7: *Quercus* sp. (6853, 7552); 8: *Fagus* sp. (6711) and *Quercus* sp. (6710); 10, 27, 33, 41: On moss (6491, 7433, 6237, 7099); 26, 29, 36: Siliceous rock (7470, 7416, 6613); 28: *Fagus* sp. (7573); 32: *Quercus* sp. (7027) and Siliceous rock (7040).
- Lepraria vouauxii* (Hue) R.C. Harris  
20: *Juniperus* sp. (7518), *Quercus* sp. (7527).
- (+) *Leprocaulon microscopicum* (Vill.) Gams  
10, 32, 34: On soil (6487, 7052, 6413); 42: On soil on siliceous rock (6606).
- (+) *Leptoplaca cirrochroa* (Ach.) Arup, Frödén & Söchtling  
33: Calcareous rock (6225).
- Leptoplaca xantholyta* (Nyl.) Nyl.  
33, 39: Calcareous rock (6239, 6549).
- Leptorhaphis atomaria* (Ach.) Szat.  
11: *Populus* sp. (6524).
- Lobaria pulmonaria* (L.) Hoffm.  
29: *Fagus* sp. (7619).
- Lobothallia farinosa* (Flörke) A. Nordin, Savić & Tibell  
17: Calcareous rock (6869).
- Melanelia stygia* (L.) Essl.  
20: Siliceous rock (6364).
- Melanelia subargentifera* (Nyl.) Essl.  
1: *Corylus* sp. (7337), *Juglans* sp. (7356), *Pistacia* sp. (7348) and *Quercus* sp. (7287); 6: *Acer* sp. (6444) and *Carpinus* sp. (6443); 8: *Fagus* sp. (6696); 17, 18, 20, 21, 28: *Quercus* sp. (7673, 6964, 6366, 6889, 7578); 25: *Carpinus* sp. (7569); 26: *Pyrus* sp. (7484); 32: *Pistacia* sp. (7024); 35: *Olea* sp. (9293), *Prunus* sp. (6311) and *Tilia* sp. (6297).
- Melanelia subaurifera* (Nyl.) Essl.  
1: *Prunus* sp. (7322) and *Pyrus* sp. (7349); 2: *Crateagus* sp. (6145), *Pinus* sp. (6157) and *Quercus* sp. (6164); 7, 9, 42: *Quercus* sp. (7558, 6472, 6587); 16: *Crateagus* sp. (6759); 28: *Pinus* sp. (7603); 29: *Fagus* sp. (7618); 31: *Platanus* sp. (6178); 33: *Morus* sp. (6221), *Phillyrea* sp. (7160) and *Quercus* sp. (7169); 35: *Juglans* sp. (6301) and *Punica* sp. (6290); 36: *Phillyrea* sp. (6434); 40: *Populus* sp. (6560).
- Melanelixia glabratula* (Lamy) Sandler & Arup  
36: Siliceous rock (6620).
- Melanohalea elegantula* (Zahlbr.) O. Blanco et al.  
5, 20: *Quercus* sp. (6849, 6781); 8: *Carpinus* sp. (6686) and *Quercus* sp. (6662); 42: *Salix* sp. (6583).
- Melanohalea exasperata* (De Not.) O. Blanco et al.  
4: *Juglans* sp. (7662); 20, 37: *Pinus* sp. (7517, 7211); 24: *Quercus* sp. (7496); 29: *Fagus* sp. (7641).
- Melanohalea exasperatula* (Nyl.) O. Blanco et al.  
20: *Pinus* sp. (7517); 22: *Juglans* sp. (6355).
- (+) *Micarea prasina* Fr.  
2, 8: *Pinus* sp. (6148, 6667).
- Ochrolechia pallescens* (L.) A. Massal  
27: *Acer* sp. (7441).
- Ochrolechia parella* (L.) A. Massal.  
2, 38, 42: Siliceous rock (6156, 6388, 6591).
- Ochrolechia turneri* (Sm.) Hasselrot  
1: *Quercus* sp.(7331).
- Parmelia glabra* (Schaer.) Nyl.  
26: *Quercus* sp. (7466).
- Parmelia saxatilis* (L.) Ach.  
1: *Quercus* sp. (7302); 29: *Fagus* sp. (7643)
- Parmelia sulcata* Taylor  
1: *Corylus* sp. (7363), *Pistacia* sp. (7347), *Prunus* sp. (7321) and *Quercus* sp. (7278); 2, 21: *Crateagus* sp. (6147, 6905) and *Quercus* sp. (6162, 6935); 4: *Juglans* sp. (7658); 5, 7, 9, 18, 22, 28: *Quercus* sp. (6843, 7540, 6721, 6948, 6339, 7577); 6, 29: *Fagus* sp. (6456, 7630); 8: *Carpinus* sp. (6671), *Fagus* sp. (6716) and *Quercus* sp.(6648); 17: *Pinus* sp. (6763) and *Quercus* sp. (6784); 20: *Phillyrea* sp. (7536); 25: *Carpinus* sp. (7572); 26: *Pyrus* sp. (7483) 27: *Acer* sp. (7420) and *Pyrus* sp. (7447); 32: *Pistacia* sp. (7006) and *Quercus* sp. (7004); 35: *Prunus* sp. (6312) and *Punica* sp. (6298); 42: *Quercus* sp. (6578) and *Salix* sp. (6576).
- Parmelina pastillifera* (Harm.) Hale.  
8: *Quercus* sp. (6654).
- Parmelina quercina* (Willd.) Hale  
1, 3, 5, 7, 8, 26, 32, 42: *Quercus* sp. (7316, 6328, 6850, 7557, 6694, 7480, 7033, 6611); 10: *Juglans* sp. (6507); 33: *Pistacia* sp. (7138); 35: *Cerasus* sp. (6280), *Morus* sp. (6314) and *Tilia* sp. (6284).
- Parmelina tiliacea* (Hoffm.) Hale  
1, 17, 21, 22, 24, 32: *Quercus* sp. (7342, 6760, 68956, 6354, 7497, 7016); 13, 26, 27: Siliceous rock (6117, 7482, 7435); 36: *Pinus* sp. (6629); 42: *Quercus* sp. (6573) and siliceous rock (6571).
- Parmeliopsis ambigua* (Wulfen) Nyl.  
36: *Cydonia* sp. (6421).
- Parmularia demissa* (Flot.) Croz.  
23: Siliceous rock (7505).
- Peltigera collina* (Ach.) Schrad.  
13: On wood of *Quercus* sp. (7262).
- Peltigera horizontalis* (Huds.) Baumg.  
1, 7: *Quercus* sp. (7310, 7404).
- Peltigera membranacea* (Ach.) Nyl.  
28: On moss (10013).
- Peltigera praetextata* (Flörke ex Sommerf.) Zopf.  
2, 8, 13, 19, 31, 33, 42: Together with moss on soil (6131, 6640, 7268, 6379, 6169, 6229, 6565); 25: Together with moss on the base of the trunk of *Carpinus* sp. (7566); 36: On siliceous rock with moss (6615).
- Peltigera rufescens* (Weiss) Humb.  
41: On soil (7093).
- Pertusaria albescens* (Huds.) M. Choisy & Werner  
1, 18, 22, 31: *Quercus* sp. (7360, 6967, 6353, 6174); 6, 29: *Fagus* sp. (6454, 7638); 8: *Carpinus* sp. (6679), *Fagus* sp. (6708) and *Quercus* sp. (6637); 21: *Phillyrea* sp. (6924); 26, 42: Siliceous rock (7474, 6589); 27: *Acer* sp. (7448) and *Pyrus* sp. (7437); 32: *Quercus* sp. (7034) and siliceous rock (7050); 33: *Phillyrea* sp. (7135) and *Pistacia* sp. (7166).
- Pertusaria amara* (Ach.) Nyl.

- 6:** *Fagus* sp. (6451); **18, 32:** *Quercus* sp. (6951, 7009); **21:** *Phillyrea* sp. (6937); **27:** *Acer* sp. (7419); **29:** *Carpinus* sp. (7620).
- Pertusaria coccodes* (Ach.) Nyl.**  
**8:** *Fagus* sp. (6692); **29:** *Carpinus* sp. (7621).
- Pertusaria coronata* (Ach.) Th. Fr.**  
**1:** *Quercus* sp. (7402).
- Pertusaria flavida* (DC.) J.R. Laundon**  
**1:** *Quercus* sp. (7280, 7401); **5:** *Carpinus* sp. (6856); **8:** *Carpinus* sp. (6674) and *Quercus* sp. (6675); **27:** *Acer* sp. (7442); **28, 29:** *Fagus* sp. (7590, 7628).
- Pertusaria leucosora* Nyl.**  
**21, 36, 38:** Siliceous rock (6919, 6614, 6394).
- Pertusaria pertusa* (L.) Tuck.**  
**1, 17, 32:** *Quercus* sp. (7345, 6780, 7020); **6, 28:** *Fagus* sp. (64456, 7592); **8:** *Fagus* sp. (6702) and *Quercus* sp. (6693); **27:** Siliceous rock (7422); **29:** *Carpinus* sp. (7629), *Fagus* sp. (7644) and Siliceous rock (7408).
- (+) ***Pertusaria pustulata* (Ach.) Duby**  
**8:** *Quercus* sp. (6665).
- Phaeophyscia nigricans* (Flörke) Moberg**  
**10:** Siliceous rock (6479).
- Phaeophyscia orbicularis* (Neck.) Moberg**  
**3:** *Ficus* sp. (6321); **9:** *Quercus* sp. (6477); **11, 41:** *Juglans* sp. (6522, 7082); **15:** Calcareous rock (6987); **30:** *Populus* sp. (7117).
- Phlyctis agelaea* (Ach.) Flot.,**  
**1:** *Quercus* sp. (7276).
- Phlyctis argena* (Ach.) Flot.**  
**6, 25:** *Carpinus* sp. (64356, 7571); **8:** *Quercus* sp. (6655); **29:** *Fagus* sp. (7637).
- Physcia adscendens* (Fr.) H. Olivier**  
**1:** *Corylus* sp. (7357), *Pistacia* sp. (7366), *Prunus* sp. (7371) and *Quercus* sp. (7375); **2, 37:** Calcareous rock (6158, 7176); **4:** Calcareous rock (7654) and *Juglans* sp. (7656); **10:** *Juglans* sp. (6502); **5:** *Acer* sp. (6851); **6:** *Carpinus* sp. (6442); **7, 17, 20:** *Quercus* sp. (7556, 7674, 6365); **9:** *Fagus* sp. (6469); **11:** *Populus* sp. (6532) and *Juglans* sp. (6521); **12, 22:** *Pistacia* sp. (7241, 6350) and *Quercus* sp. (7222, 6348); **13:** Calcareous rock (6107) and *Crateagus* sp. (7253); **14:** *Phillyrea* sp. (6738); **16:** *Crateagus* sp. (6841) and moss (6822); **21:** *Crateagus* sp. (6894) and *Quercus* sp. (6901); **26:** Siliceous rock (7468); **31:** *Platanus* sp. (6171); **33:** *Morus* sp. (6238), *Phillyrea* sp. (7134), *Pistacia* sp. (7140) and siliceous rock (6241); **35:** *Cerasus* sp. (6303), *Juglans* sp. (6270), *Olea* sp. (6294), *Punica* sp. (6286) and *Quercus* sp. (6299); **36:** *Phillyrea* sp. (6436) and *Populus* sp. (6418); **40:** *Populus* sp. (6556); **41:** Calcareous rock (7091), *Morus* sp. (7078), *Phillyrea* sp. (7090), *Pistacia* sp. (7087) and *Rosa* sp. (7096); **42:** *Salix* sp. (6609).
- Physcia aipolia* (Ehrh. ex Humb.) Fűrnr.**  
**1:** *Juglans* sp. (7334) and *Quercus* sp. (7336); **4, 10:** *Juglans* sp. (7659, 6497); **7, 17, 22, 24, 32:** *Quercus* sp. (7559, 6774, 6346, 7495, 7032); **16:** *Crateagus* sp. (6839); **33:** *Morus* sp. (6226) and *Quercus* sp. (7142); **35:** *Morus* sp. (6291); **36:** *Cydonia* sp. (6419) and *Populus* sp. (6420).
- Physcia caesia* (Hoffm.) Hampe ex Fűrnr.**  
**10, 26, 27, 36:** Siliceous rock (6480, 7469, 7439, 6632).
- (+) ***Physcia clementei* (Turner) Lyngæ**  
**21:** Siliceous rock (6915).
- (+) ***Physcia dimidiata* (Arnold) Nyl.**  
**13:** On Calcareous rock moss (6109).
- Physcia dubia* (Hoffm.) Lettau**  
**27:** Siliceous rock (7440).
- Physcia leptalea* (Ach.) DC.**  
**1:** *Juglans* sp. (7378), *Pistacia* sp. (7365) and *Prunus* sp. (7338); **3:** *Ficus* sp. (6317) and *Quercus* sp. (6334); **7, 18:** *Quercus* sp. (7564, 6943); **12:** Calcareous rock (7223); **13:** *Crateagus* sp. (7251); **21:** *Crateagus* sp. (6895) and *Quercus* sp. (6890); **33:** *Pistacia* sp. (7125); **35:** *Punica* sp. (6279).
- Physcia stellaris* (L.) Nyl.**  
**1, 18, 21, 35:** *Quercus* sp. (7329, 6944, 6897, 6249); **11:** *Populus* sp. (6528); **12:** *Pistacia* sp. (7242); **14:** *Punica* sp. (6747); **37:** *Crateagus* sp. (7190).
- Physcia tenella* (Scop.) DC.**  
**22:** *Quercus* sp. (6338).
- Physconia distorta* (With.) J.R. Laundon**  
**1, 7, 35:** *Quercus* sp. (7386, 7562, 6250).
- Physconia enteroxantha* (Nyl.) Poelt**  
**1, 8, 9, 17, 21, 22, 26:** *Quercus* sp. (7381, 6672, 6723, 6776, 6896, 6345, 7465); **10:** Siliceous rock (6485); **16, 31, 32, 42:** On moss (6824, 6180, 7038, 6570).
- Physconia grisea* (Lam.) Poelt**  
**42:** *Quercus* sp. (6575).
- Physconia perisidiosa* (Erichsen) Moberg**  
**22, 32:** *Quercus* sp. (6337, 7014); **27:** On moss (7425) **41:** *Platanus* sp. (7071).
- Placocarpus schaeereri* (Fr.) Breuss**  
**13, 33, 37:** Calcareous rock (7272, 7157, 7194).
- Placynthium nigrum* (Huds.) Gray**  
**1, 12, 14, 16, 17, 18, 37, 41:** Calcareous rock (7330, 7216, 6724, 6835, 6867, 6961, 7197, 7100).
- Platismatia glauca* (L.) W.L. Culb. & C.F. Culb.**  
**2:** *Quercus* sp. (6130); **6, 28:** *Fagus* sp. (6447, 7634).
- Pleurosticta acetabulum* (Neck.) Elix & Lumbsch**  
**1, 2, 7, 8, 17, 24, 32, 36:** *Quercus* sp. (7313, 6144, 7563, 6663, 6722, 6758, 7501, 7030, 6428); **16:** *Crateagus* sp. (6840); **22:** *Pinus* sp. (6335) and *Quercus* sp. (6343); **27:** *Pyrus* sp. (7445); **35:** *Morus* sp. (6277) and *Quercus* sp. (6251); **37:** *Pinus* sp. (7196).
- Porpidia crustulata* (Ach.) Hertel & Knoph**  
**1, 20:** Siliceous rock (7277, 7672).
- Porpidia macrocarpa* (DC.) Hertel & A.J. Schwab**  
**4, 6, 29, 31, 33, 42:** Siliceous rock (7655, 6453, 7414, 6177, 6201, 6600).
- (\*) ***Porpidia ochrolemma* (Vain.) Brodo & R. Sant.**  
This sorediate crustose lichen is characterized by having a smooth, ± continuous or rimose, creamy yellow to orange yellow gray, areolate thallus containing stictic acid (K + yellow, Pd + orange) and numerous round to irregular, tuberculate, grey-white soralia. *P. ochrolemma* is chemically similar to *P. soredizodes*, but *P. soredizodes* is distinguished by its much thinner, grey thallus with farinose to granular, often blue-grey or cream-coloured soredia. *P. ochrolemma* is known only from the British Isles, continental Europe and North America (Jablonska et al., 2011). This species grows on siliceous rock.  
**3:** Siliceous rock (6176).
- (+) ***Protoblastenia calva* (Dicks.) Zahlbr.**  
**8, 17, 33:** Calcareous rock (6646, 6858, 6191).
- Protoparmeliopsis muralis* (Schreb.) M. Choisy**  
**1:** Calcareous rock (7285), *Corylus* sp. (7372), *Pistacia* sp. (7326), *Prunus* sp. (7323) and *Quercus* sp. (7320); **2, 10, 18, 21, 26, 29, 32, 36, 38, 42:** Siliceous rock (6129, 6493, 6958, 6931, 7482, 7409, 7068, 6625, 6395, 6582); **4, 7, 13, 14, 19, 23, 71, 37, 39:** Calcareous rocks (7652,



- 7544, 7257, 6744, 7000, 6884, 7503, 7175, 6553); **12, 16, 28, 33**: Calcareous (7225, 6797, 7596, 7129) and siliceous rocks (7215, 6834, 7601, 6204); **20**: *Pinus* sp. (7528), siliceous rock (6371).
- Pseudevernia furfuracea** (L.) Zopf var. *ceratea* (Ach.) D. Hawksw.  
**8**: *Pinus* sp. (6691).
- Pseudevernia furfuracea** (L.) Zopf var. *furfuracea*  
**1, 22, 28, 37**: *Pinus* sp. (7299, 6341, 7606, 7180); **7, 21, 42**: *Quercus* sp. (7561, 6933, 6592); **8, 17**: *Pinus* sp. (6709, 6773) and *Quercus* sp. (6669, 6759); **20**: *Juniperus* sp. (7534) and *Pinus* sp. (6376); **26, 27**: *Pyrus* sp. (7473, 7434); **33**: *Phillyrea* sp. (7133); **36**: *Erica* sp. (6622) and *Pinus* sp. (6628).
- Psora decipiens** (Hedw.) Hoffm.  
**19**: Calcareous soil (6886).
- (+) **Ramalina canariensis** J. Steiner  
**18**: *Quercus* sp. (6956).
- Ramalina capitata** (Ach.) Nyl.  
**34**: Siliceous rock (6407).
- Ramalina farinacea** (L.) Ach.  
**1**: *Pistacia* sp. (7399), *Pyrus* sp. (7328), *Prunus* sp. (7397) and *Quercus* sp. (7385); **8, 18, 36**: *Quercus* sp. (6676, 6949, 6435); **20**: *Phillyrea* sp. (7529) and *Pinus* sp. (7522); **21**: *Phillyrea* sp. (6912); **27**: *Acer* sp. (7428); **29**: *Fagus* sp. (7617).
- Ramalina fastigiata** (Pers.) Ach.  
**1**: *Pistacia* sp. (7393), *Pyrus* sp. (7269) and *Quercus* sp. (7376); **6**: *Fagus* sp. (6457); **32, 42**: *Quercus* sp. (7025, 6569).
- Ramalina fraxinea** (L.) Ach.  
**1**: *Pyrus* sp. (7359) and *Quercus* sp. (7382); **8, 18, 22, 32**: *Quercus* sp. (6682, 6963, 6336, 7015); **27**: *Acer* sp. (7450); **35**: *Morus* sp. (6276).
- Rhizocarpon distinctum** Th. Fr.  
**13, 20, 27, 32, 36, 42**: Siliceous rock (6110, 6380, 7462, 7064, 6621, 6567).
- Rhizocarpon geminatum** Körb.  
**11**: Siliceous rock (6486).
- Rhizocarpon geographicum** (L.) DC.  
**1, 10, 16, 19, 20, 21, 26, 27, 31, 32, 33, 34, 36, 38, 42**: Siliceous rock (7282, 6494, 6821, 6887, 6382, 6938, 7490, 7444, 6458, 7043, 7151, 6408, 6627, 6400, 6585).
- Rhizocarpon lecanorinum** Anders  
**2, 13**: Siliceous rock (6135, 6112).
- Rhizocarpon petraeum** (Wulfen) A. Massal.  
**31**: Siliceous rock (6185).
- Rhizocarpon reductum** Th. Fr.  
**31**: Siliceous rock (6172).
- Rhizocarpon viridiatrum** (Wulfen) Körb.  
**2**: Siliceous rock (6136).
- Rinodina bischoffii** (Hepp) A. Massal.  
**1, 12, 14, 15, 28, 33, 41**: Calcareous rock (7290, 7226, 6731, 7666, 7598, 7150, 7108).
- (+) **Rinodina confragosa** (Ach) Körb.  
**23, 29**: Siliceous rock (7508, 7413).
- Rinodina exigua** (Ach.) Gray  
**2, 7, 13, 16, 37**: *Crateagus* sp. (6127, 7541, 7269, 6803, 7187); **3, 5, 21, 42**: *Quercus* sp. (6326, 6844, 6900, 6596); **4**: *Juglans* sp. (7657); **8, 28**: *Fagus* sp. (66456, 7586); **17, 22**: *Pinus* sp. (6767, 6356); **20**: *Pinus* sp. (6386) and *Quercus* sp. (7531); **33**: *Morus* sp. (6227), *Pistacia* sp. (7141) and *Quercus* sp. (7147); **35**: *Cerasus* sp. (6302), *Punica* sp. (6281) and *Tilia* sp. (6273); **40**: *Populus* sp. (6561).
- Rinodina gennarii** Bagl.  
**16**: Calcareous rock (6800).
- Rinodina immersa** (Körb.) J. Steiner  
**15, 33, 35, 37, 39**: Calcareous rock (6989, 6196, 6267, 7204, 6548).
- Rinodina lecanorina** (A. Massal.) A. Massal.  
**33, 37**: Calcareous rock (7158, 7202).
- Rinodina pyrina** (Ach.) Arnold  
**1**: *Juglans* sp. (7406) and *Quercus* sp. (7343); **10, 11**: *Juglans* sp. (6496, 6533); **32**: *Quercus* sp. (7012); **41**: *Rosa* sp. (7101); **42**: *Salix* sp. (6572).
- Rinodinella controversa** (A. Massal.) H. Mayrhofer & Poelt  
**15, 37**: Calcareous rock (7001, 7201).
- (+) **Rinodinella dubyanoides** (Hepp) H. Mayrhofer & Poelt  
**15, 16**: Calcareous rock (6974, 6806).
- Rufoplaca arenaria** (Pers.) Arup, Søchting & Frödén  
**21, 33, 34**: Siliceous rock (6928, 6192, 6412).
- Sarcogyne regularis** Körb.  
**14, 18, 28**: Calcareous rock (6739, 6952, 7582).
- Scoliosporum umbrinum** (Ach.) Arnold  
**1**: *Populus* sp. (7325) and *Quercus* sp. (7377); **3**: *Juglans* sp. (7663); **5**: *Acer* sp. (6854); **7, 32**: *Quercus* sp. (7553, 7036); **26**: Siliceous rock (7489).
- Scytinium gelatinosum** (With.) Otálora, P.M. Jørg. & Wedin  
**41**: On moss (7094).
- Scytinium lichenoides** (L.) Otálora, P.M. Jørg. & Wedi  
**28, 33, 37**: On moss (7593, 6246, 7206).
- (+) **Solenopsis candicans** (Dicks.) J. Steiner  
**15, 33**: Calcareous rock (6990, 6236).
- Sphinctrina turbinata** (Pers.) De Not.  
**29**: On *Pertusaria pertusa* on *Fagus* sp. (7636).
- Squamarina cartilaginea** (With.) P. James var. *cartilaginea*  
**1, 13, 14, 15, 16, 17, 33, 37, 38, 41**: Calcareous rock (7297, 6114, 6725, 6981, 6813, 6862, 7174, 7193, 6392, 7103).
- (+) **Strangospora pinicola** (A. Massal.) Körb.  
**20**: *Pinus* sp. (7515).
- Tephromela atra** (Huds.) Hafellner  
**1, 2, 4, 20, 21, 26, 29**: Siliceous rock (7283, 6153, 7649, 6378, 6932, 7487, 7418).
- (+) **Thelenella modesta** (Nyl.) Nyl.  
**33**: *Populus* sp. (6248).
- (+) **Thelidium papulare** (Fr.) Arnold  
**31**: Siliceous rock (6465).
- (+) **Toensbergia leucococca** (R. Sant.) Bendiksby & Timdal  
**37**: *Pinus* sp. (7212).
- Toninia candida** (Weber) Th. Fr.  
**13, 37, 39**: Calcareous soil (7245, 7207, 6535); **33**: Calcareous rock (6245).
- Toninia sedifolia** (Scop.) Timdal  
**12, 14, 15, 17, 32, 33, 37, 39**: Calcareous soil (7218, 6748, 6984, 6863, 7055, 7126, 7210, 6552); **13, 16**: On calcareous soil with moss (7256, 6825).
- (+) **Trapelia placodioides** Coppins & P. James  
**29**: Siliceous rock (7415).
- Trimmatothelopsis smaragdula** (Wahlenb.) Cl. Roux & Nav.-Ros.  
**7**: Calcareous rock (7542); **32, 35, 36**: Siliceous rock (7067, 6252, 6623).

- Umbilicaria grisea* Ach.  
34: Siliceous rock (6414).
- Umbilicaria hirsuta* (Sw. ex Westr.) Ach.  
27: Siliceous rock (7423).
- Usnea fulvovirens* (Räsänen) Räsänen  
8: *Quercus* sp. (6651).
- Usnea glabrescens* (Nyl. ex Vain.) Vain.  
1: *Corylus* sp. (7370); 8: *Quercus* sp. (6683); 28: *Pinus* sp. (7615).
- Usnea hirta* (L.) Weber ex F.H. Wigg.  
17, 20: *Pinus* sp. (6756, 7535).
- Usnea rigida* (Ach.) Röhl.  
8: *Quercus* sp. (6661); 28: *Fagus* sp. (7610).
- Usnea subfloridana* Stirt.  
29: *Fagus* sp. (7635).
- Varicellaria hemisphaerica* (Flörke) I. Schmitt & Lumbsch  
18: Together with moss on the base of the trunk of *Quercus* sp. (6970).
- Variospora aurantia* (Pers.) Arup, Frödén & Søchting  
13, 14, 33: Calcareous rock (7266, 6741, 7128).
- Variospora dolomiticola* (Hue) Arup, Søchting & Frödén  
13, 14, 16, 33: Calcareous rock (7263, 6978, 6801, 6235).
- Variospora flavescens* (Huds.) Arup, Frödén & Søchting  
8, 15, 16, 17, 33, 37, 39: Calcareous rock (6635, 7002, 6832, 6857, 6234, 7186, 6536).
- Verrucaria calciseda* DC.  
12, 14, 15, 16, 27: Calcareous rock (7220, 6726, 6998, 6798, 7453).
- Verrucaria macrostoma* Dufour ex DC.  
7, 10, 15: Calcareous rock (7543, 6511, 6993).
- Verrucaria marmorea* (Scop.) Arnold  
15, 16, 33: Calcareous rock (6975, 6831, 7121).
- Verrucaria muralis* Ach.  
1, 33: Calcareous rock (7317, 6213).
- Verrucaria nigrescens* Pers.  
7, 8, 13, 16, 28, 32, 33, 39, 41: Calcareous rock (7551, 6645, 7275, 6826, 7583, 7045, 7159, 6542, 7105); 18, 19: Siliceous rock (6942, 6874).
- Xalocoa ocellata* (Fr.) E. Kraichak, R. Lücking & Lumbsch  
16, 17, 38, 41: Calcareous rock (6810, 6859, 6390, 7104).
- Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale  
27, 33, 36: Siliceous rock (7456, 7154, 6634).
- Xanthoparmelia mougeotii* (Schaer.) Hale  
35: Siliceous rock (6255).
- Xanthoparmelia pulla* (Ach.) O. Blanco et al.  
2, 12, 13, 16, 20, 21, 26, 27, 31, 32, 33, 36: Siliceous rock (6133, 7230, 6122, 6837, 7539, 6922, 7478, 7461, 6173, 7044, 6202, 6631).
- Xanthoparmelia somloensis* (Geln.) Hale  
10, 13, 17, 21, 27, 33, 38: Siliceous rock (6490, 6113, 6755, 6911, 7464, 6194, 6393).
- Xanthoparmelia tinctina* (Maheu & A. Gillet) Hale  
2, 10, 12, 15, 19, 20, 34: Siliceous rock (6122, 6484, 7235, 6991, 6881, 7538, 6403).
- Xanthoparmelia verruculifera* (Nyl.) O. Blanco et al.  
10: Siliceous rock (6481).
- Xanthoria elegans* (Link) Th. Fr.  
27: Siliceous rock (7424).
- Xanthoria parietina* (L.) Th. Fr.  
1: *Corylus* sp. (7391), *Juglans* sp. (7379), *Pistacia* sp. (7358), *Prunus* sp. (7387), *Pyrus* sp. (7407) and *Quercus* sp. (7383); 3: *Ficus* sp. (6318), *Populus* sp. (6320) and *Quercus* sp. (6327); 4: *Juglans* sp. (7661) and *Quercus* sp. (6845); 7, 8, 9, 17, 18, 22, 24, 32: *Quercus* sp. (7560, 6653, 6471, 6757, 6946, 6344, 7498, 7013); 10: *Juglans* sp. (6501); 11, 40: *Populus* sp. (6518, 6563) and *Juglans* sp. (6520, 6557); 12: *Pistacia* sp. (7240) and *Quercus* sp. (7234); 13, 16: *Crateagus* sp. (7252, 6842); 14, 33: *Phillyrea* sp. (6736, 7145); 21: *Crateagus* sp. (6893) and *Quercus* sp. (6891); 26: Siliceous rock (7467); 30: *Populus* sp. (7110) and *Prunus* sp. (7112); 35: *Ficus* sp. (6268), *Juglans* sp. (6269), *Populus* sp. (6282) and *Quercus* sp. (6300); 36: *Cydonia* sp. (6423) and *Populus* sp. (6424); 37: Calcareous rock (7200) and *Crateagus* sp. (7189); 41: *Morus* sp. (7079), *Phillyrea* sp. (7089), *Pistacia* sp. (7086) and *Rosa* sp. (7095); 42: *Quercus* sp. (6603) and *Salix* sp. (6610).
- (+) *Xanthoria polycarpa* (Hoffm.) Rieber  
33: *Quercus* sp. (7171)..

#### 4. Conclusions and discussion

In this study, 254 taxa were identified from 42 different localities. Of these, 36 taxa were new for Bursa, and *Porpidia ochrolemma* (Vain.) Brodo & R. Sant. was new for Turkey. The most common genera with the species numbers in the study area were *Lecanora* (18), *Caloplaca* (12), *Physcia* (9), *Cladonia* and *Pertusaria* (8), *Rhizocarpon* and *Rinodina* (7), *Xanthoparmelia* (6), *Collema*, *Lepraria*, *Peltigera*, *Ramalina*, *Usnea* and *Verrucaria* (5). The percentages of crustose, foliose, fruticose and squamulose type thallus growth forms of the total 254 taxa were 62.21%, 29.92%, 4.33% and 3.54 %, respectively.

The most common species with occurrence frequency were *Lecidella elaeochroma* (32), *Xanthoria parietina* (27), *Physcia adscendens* (26), *Lecanora subcarpinea* (25), *Protoparmeliopsis muralis* (24), *Evernia prunastri* (23), *Candelariella vitellina* (22), *Parmelia sulcata* (21), *Athallia holocarpa* (19), *Rinodina exigua* (18), *Lecanora carpinea* (17), *Aspicilia cinerea*, *A. radiosa* and *Cladonia pyxidata* (16), *Circinaria contorta*, *Lepraria lobificans* and *Rhizocarpon geographicum* (15), *Candelariella aurella*, *Pleurosticta acetabulum* and *Pseudevernia furfuracea* (L.) Zopf var. *furfuracea* (14), *Melanelia subaurifera* and *Pertusaria albescens* (13), *Lathagrium cristatum*, *Melanelia subargentifera*, *Physcia aipolia* and *Physconia enteroxantha* (12), *Hypogymnia physodes*, *Hypogymnia tubulosa*, *Lecanora argentata*, *Parmelina quercina*, *Parmelina tiliacea* and *Xanthoparmelia pulla* (11), *Blastenia crenularia* and *Diplotomma epipolium* (10).

62 taxa were identified on calcareous rock. Some of the common and, characteristics species of calcareous rocks were *Acarospora cervina*, *Athallia holocarpa*, *Bagliettoa parmigera*, *Caloplaca chalybaea*, *C. lactea*, *Candelariella aurella*, *Circinaria calcarea*, *Diplotomma alboatrum*, *D. epipolium*, *Placocarpus schaeereri*, *Placynthium nigrum*, *Rinodina bischoffii*, *Sarcogyne regularis*, *Variospora aurantia*, *V. dolomiticola*, *V. flavescens* and *Verrucaria calciseda*. On the other hand, 64 taxa were identified on siliceous rock. Some of the common and characteristics species

of siliceous rocks were *Aspicilia cinerea*, *Blastenia crenularia*, *Candelariella vitellina*, *Diplotomma chlorophaeum*, *Lecidea fuscoatra*, *Lecidella carpathica*, *Porpidia macrocarpa*, *Rhizocarpon distinctum*, *Rh. geographicum*, *Tephromela atra*, *Xanthoparmelia conspersa*, *X. pulla*, *X. somloensis* and *X. tinctina*.

Determined lichenicolous species were *Caloplaca inconnexa* on the thallus of *Acarospora cervina*, *Flavoplaca oasis* on the thallus of *Bagliettoa parmigera*, *Flavoplaca polycarpa* on the thallus of *Verrucaria calciseda* and *Sphinctrina turbinata* on the thallus of *Pertusaria pertusa*.

A total of 78 species have been identified on oaks which is one of the most common trees in the study area. The most common species on *Quercus* sp. according to the number of localities, respectively, were *Lecidella elaeochroma* (14 localities), *Parmelia sulcata* (13), *Evernia prunastri* (12), *Lecanora chlarotera* and *L. subcarpineae* (9), *Parmelina quercina* (8), *P. tiliacea* (7), *Anaptychia ciliaris*, *Buellia disciformis*, *Melanelia subargentifera* and *Pertusaria albescens* (6).

So far, at 40 studies on lichen in the province of Bursa, a total of 447 taxa were identified (Fig. 2). The number of taxa was reached to 484 together with 37 new records for Bursa province in this study.

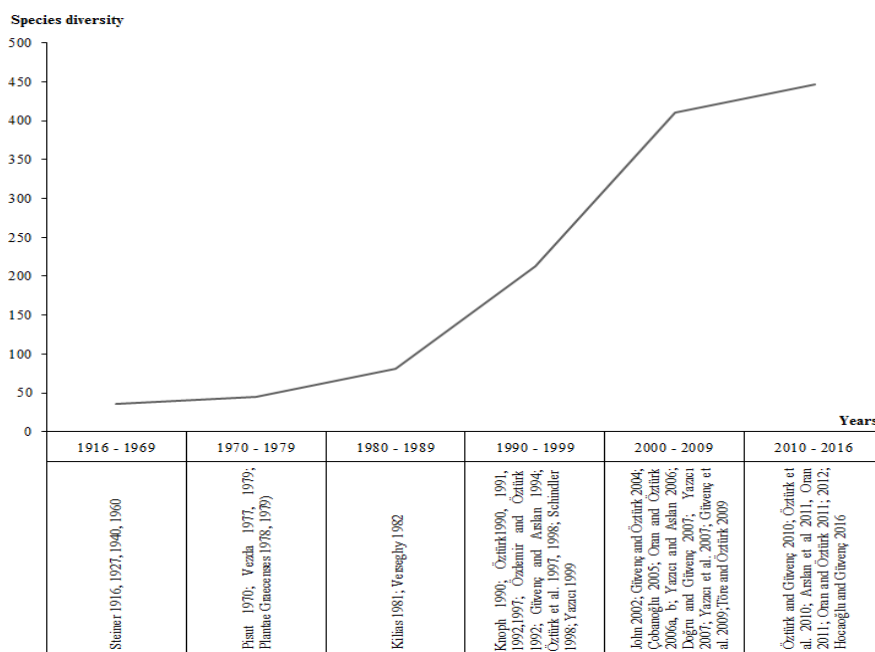


Figure 2. Changes in the species diversity by the years in Bursa province

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