

## Additional Lichen Records from Karabük, Kastamonu and Sinop Provinces (Turkey)

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### Abstract

In this study a total of 112 species belonging to 52 genera were determined from 9 sampling stations in Karabük, Kastamonu and Sinop provinces. Of these, 27 species are reported as new from Karabük, 16 from Sinop and 10 from Kastamonu.

**Key Words:** Lichen, Karabük, Sinop.

### Karabük, Kastamonu ve Sinop İllerinden Ek Liken Kayıtları (Türkiye)

#### Özet

Bu çalışmada Karabük, Kastamonu ve Sinop illerinde yer alan 9 istasyondan 52 cinse ait toplam 112 tür tespit edilmiştir. Bu türlerden 27'si Karabük, 16'si Sinop ve 10'u Kastamonu ili için yenidir.

**Anahtar Kelimeler:** Liken, Karabük, Sinop.

#### 1. Introduction

Many studies on the lichen mycota of Turkey have increased in the last decade [e.g., 1-11], but the lichen mycota of some regions are still insufficiently.

So far, a total of 217 different lichen species have been reported in Kastamonu province [2, 8, 12-14], 157 different lichen species in Sinop province [2, 10-12]. and 113 lichen species in Karabük province [8,11].

In spite of the these studies, the lichen diversity of some regions in Karabük and Sinop provinces are still largely uncomplete, whereas the lichen mycota of Kastamonu province has been nearly completed with this study.

The present study aims to contribute further information on the lichen mycota of Karabük, Kastamonu and Sinop provinces.

#### 2. Material and Methods

The lichen samples were collected from 2 localities in Karabük province, 2 localities in

Kastamonu province and 5 localities in Sinop province in 2007.

After giving a collection number to each one of the collected specimens, they were stored by putting them into paper purses and envelopes.

A stereo microscope, light microscope and spot tests for determining lichen compounds and flora books were used in the identification of samples [e.g., 15-18].

Specimens are kept in the herbarium of Faculty of Science and Arts, Giresun University, Giresun.

The collecting localities were as follow:

1. KARABÜK: Eflani, Şenyurt village, forest area, 1103 m, 41° 28' 43" N, 33° 04' 52" E, 26 June 2007.
2. KARABÜK: Eflani, Esencik village, exposed rocky area, 974 m, 41° 28' 22" N, 33° 01' 43" E, 29 June 2007.
3. KASTAMONU: Daday, Aktaştekkke village, 1137 m, 41° 29' 07" N, 33° 06' 01" E, 31 June 2007.

4. KASTAMONU: Daday, Kayabağı village, 910 m, 41° 26' 50" N, 33° 31' 26" E, 5 Aug. 2007.
5. SİNOP: NW of Erfelek, near cascade, 236 m, 41° 53' 26" N, 34° 55' 33" E, 9 Aug. 2007.
6. SİNOP: Gerze, Acısu village, 685 m, 41° 46' 28" N, 35° 08' 28" E, 12 Novem. 2007.
7. SİNOP: Gerze, Yamacık village, 292 m, 41° 43' 55" N, 35° 13' 02" E, 14 Novem. 2007.
8. SİNOP: Boyabat, Yenimehmetli village, exposed rocky area, 575 m, 41° 23' 46" N, 34° 47' 02" E, 7 Feb. 2007.
9. SİNOP: Boyabat, Yiğren village, Üçoluklar, 636 m, 41° 23' 34" N, 34° 46' 17" E, 8 Feb. 2007.

### 3. Results

The species were listed in alphabetical order, followed by localities, substrata. Author names abbreviated according to Brummit & Powell [19]. Lichen species new to Karabük province are indicated (\*), those new to the Kastamonu province by (#) and those new to Sinop province (+).

- Acarospora cervina* A. Massal., 1, 2, 8: on calcareous rock.
- A. fuscata* (Nyl.) Arnold, 2: on calcareous rock.
- \* *A. macrospora* (Hepp) A. Massal. ex Bagl., 2: on calcareous rock.
- Anaptychia ciliaris* (L.) Körb. ex A. Massal., 6: on *Abies* sp., 1: on *Carpinus* sp., 2, 3: on *Quercus* sp.
- Arthonia radiata* (Pers.) Ach., 7: on *Quercus* sp.
- Aspicilia caesiocinerea* (Nyl. ex Malbr.) Arnold, 2: on calcareous rock.
- \* *A. calcarea* (L.) Körb., 2, 8: on calcareous rock.
- A. contorta* (Hoffm.) Kremp., 4, 8: on calcareous rock.
- + *Bacidia arceutina* (Ach.) Arnold, 9: on *Quercus* sp.
- \* *B. laurocerasi* (Delise ex Duby) Zahlbr., 1: on *Carpinus* sp.
- + *B. rubella* (Hoffm.) A. Massal., 9: on *Quercus* sp.
- Bryoria fuscescens* (Gyeln.) Brodo & D. Hawksw., 6: on *Abies* sp.
- Caloplaca cerina* (Ehrh. ex Hedw.) Th. Fr., 5: on *Pyrus* sp., 3, 9: on *Quercus* sp.
- C. cerinella* (Nyl.) Flagey, 3: on *Pyrus* sp., 9: on *Quercus* sp.
- + # *C. cerinelloides* (Erichsen) Poelt, 5: on *Olea europaea*, 3, 7, 9: on *Quercus* sp.
- \* *C. citrina* (Hoffm.) Th. Fr., 2: on calcareous rock.
- + *C. decipiens* (Arnold) Blomb. & Forse, 1, 8: on calcareous rock.
- \* *C. flavorubescens* (Huds.) J.R. Laundon, 1: on *Carpinus* sp., 3: on *Quercus* sp.
- \* *C. flavovirescens* (Wulfen) Dalla Torre & Sarnth., 2: on calcareous rock.
- C. herbidella* (Hue) H. Magn., 3: on *Malus* sp., 9: on *Quercus* sp.
- C. holocarpa* (Hoffm.) A.E. Wade, 4, 8: on calcareous rock.
- C. lactea* (A. Massal.) Zahlbr., 2: on calcareous rock.
- Candelariella aurella* (Hoffm.) Zahlbr., 2, 4, 8: on calcareous rock.
- C. vitellina* (Hoffm.) Müll. Arg., 2, 8: on calcareous rock.
- Chysothrix candelaris* (L.) J.R. Laundon, 1: on *Salix* sp., 3: on *Quercus* sp.
- Cladonia coniochrae* (Flörke) Spreng., 9: on base of *Salix* sp., 1: on *Quercus* sp., 2: on decayed wood.
- C. fimbriata* (L.) Fr., 9: on *Salix* sp., 1, 2, 7: on soil.
- + *C. foliaceae* (Huds.), 3, 8: on soil.
- C. pyxidata* (L.) Hoffm., 3: on soil.
- + *Collema cristatum* (L.) Weber ex F.H. Wigg., 8: on calcareous rock.
- \* *C. subflaccidum* Degel., 1: on *Salix* sp.
- Diplotomma alboatrum* (Hoffm.) Flot., 4: on calcareous rock.
- D. epipolium* (Ach.) Arnold, 9: on calcareous rock.
- Evernia prunastri* (L.) Ach., 2, 3, 5, 7: on *Pinus* sp., on *Quercus* sp., 9: on *Salix* sp.
- Flavoparmelia caperata* (L.) Hale, 5: on *Olea europaea*, 9: on *Pinus* sp., 7: on *Quercus* sp.
- Graphis scripta* (L.) Ach., 9: on *Salix* sp., 7, 9: on *Quercus* sp.
- Hypogymnia phsodes* (L.) Nyl., 3: on *Malus* sp., 2: on *Pinus* sp., 1: on *Salix* sp.
- H. tubulosa* (Schaer.) Hav., 6: on *Abies* sp., 5: on *Pinus* sp., on *Pyrus* sp. and on *Quercus* sp.
- \* *Hypocenomyce scalaris* (Ach. ex Lilj.) M. Choisy, 1: on *Pinus* sp.

- +, # *Lecania naegelii* (Hepp) Diederich & Van den Boom, 5: on *Olea europaea*  
 , Loc. 3: on *Pinus* sp., 7: on *Quercus* sp.  
*Lecanora albella* (Pers.) Ach., 6: on *Abies* sp.,  
 1: on *Carpinus* sp., 5: on *Olea europaea*, 3: on  
*Prunus domestica* and on *Quercus* sp., 5: on  
*Pyrus* sp., 9: on *Salix* sp., 7: on *Quercus* sp.  
 \* *L. argentata* (Ach.) Malme, 1, 9: on *Quercus*  
 sp., 5: on *Olea europaea*, 3: on *Pyrus* sp. and  
 on *Quercus* sp.  
*L. campestris* (Schaer.) Hue, 8: on calcareous  
 rock.  
*L. carpinea* (L.) Vain, 3: on *Malus* sp., 1, 9: on  
*Quercus* sp.  
*L. chlarotera* Nyl., Locality 1: on *Carpinus* sp.  
 3: on *Quercus* sp.  
 +, \* *L. cinereofusca* H. Magn., 1: on *Salix* sp., 7,  
 9: on *Quercus* sp.  
*L. dispersa* (Pers.) Sommerf., 2, 4, 8: on  
 calcareous rock.  
*L. hagenii* (Ach.) Ach., 5: on on *Olea europaea*,  
 1: on *Pinus* sp. and on *Salix* sp., 9: on *Quercus*  
 sp.  
 # *L. intumescens* (Rebent.) Rabenh., 3: on *Malus*  
 sp.  
 # *L. polytropa* ( Hoffm.) Rabenh, 4: on  
 calcareous rock.  
 + *L. sambuci* (Pers.) Nyl., 7: on *Quercus* sp.  
*L. subcarpinea* Szatala, 3: on *Prunus domestica*  
 on *Quercus* sp.  
*L. strobilina* (Spreng.) Kieff., 3: on *Quercus* sp.  
*L. symmicta* (Ach.) Ach., 3, 7: on *Carpinus* sp.  
*Lecidella carpathica* Körb., 4: on calcareous  
 rock.  
*L. elaeochroma* (Ach.) M.Choisy, 1, 2: on  
*Carpinus* sp., 5: on *Olea europaea*, 3, 5: on  
*Pyrus* sp., 9: on *Salix* sp. and on *Quercus* sp., 3,  
 7: on *Quercus* sp.  
*L. stigmatea* (Ach.) Hertel & Leuckert, 4: on  
 calcareous rock.  
*Lobaria pulmonaria* (L.) Hoffm., 1: on *Malus*  
 sp., 3: on *Quercus* sp.  
 \* *Lobothallia radiosa* (Hoffm.) Hafellner, 2, 4,  
 8: on calcareous rock.  
 \* *Melanohalea exasperata* (De Not.) O. Blanco  
 et al., 1: on *Carpinus* sp., 3: on *Malus* sp. and on  
*Quercus* sp.  
*M. exasperatula* (Nyl.) O. Blanco et al., 6: on  
*Abies* sp., 1: on *Salix* sp., 3: on *Quercus* sp.  
*Melanelixia subargentifera* (Nyl.) O. Blanco et  
 al., 6: on *Abies* sp., 5: on *Pinus* sp., 3: on *Prunus*  
*domestica*, 7, 9: on *Quercus* sp.  
*M. subaurifera* Nyl.) O. Blanco et al., 3: on  
*Pyrus* sp., 7: on *Quercus* sp.  
 \* *Ochrolechia pallescens* (L.) A.Massal, 1: on  
*Salix* sp.  
*Opegrapha atra* Pers., 7, 9: on *Quercus* sp.  
*Parmelia sulcata* Taylor, 6: on *Abies* sp., 2: on  
*Carpinus* sp., 3: on *Malus* sp., and on *Quercus*  
 sp., 5: on *Pyrus* sp., 1: on *Salix* sp., 7, 9: on  
*Quercus* sp.  
 \* *Parmeliopsis ambigua* (Wulfen) Nyl., 1: on  
*Pinus* sp.  
*Parmelina tiliaceae* (Hoffm.) Hale, 1, 2: on  
*Pinus* sp.  
*Parmotrema chinense* (Osbeck) Hale & Ahti, 7:  
 on *Quercus* sp.  
 \* *Peltigera horizontalis* (Huds.) Baumg., 1, 2:  
 on soil.  
*P. rufescens* (Weiss) Humb., 2, 4: on soil.  
 \* *Pertusaria albencens* (Huds.) M.Choisy &  
 Werner, 9: on *Salix* sp., 2: on *Quercus* sp., 1: on  
 wood.  
 # *P. pustulata* (Ach.) Duby, 3: on *Malus* sp.  
 # *Phaeophyscia nigricans* (Flörke) Moberg, 4:  
 on calcareous rock.  
 \* *P. orbicularis* (Neck.) Moberg, 4: on  
 calcareous rock and on *Quercus* sp., 5: on *Olea*  
*europaea*, 1: on *Salix* sp., 3, 5: on *Pyrus* sp., 7,  
 9: on *Quercus* sp.  
 \* *Physcia adscendes* (Th.Fr.) H.Olivier, 3: on  
*Malus* sp., 5: on on *Olea europaea*, 1: on *Salix*  
 sp., 5: on *Pyrus* sp., 3, 7: on *Quercus* sp.,  
*P. aipolia* (Ehrh. ex Humb.) Fürnr., 6: on *Abies*  
 sp., 1: on *Carpinus* sp., 5: on on *Olea europaea*,  
 3: on *Prunus domestica*, 5: on *Pyrus* sp., 2, 3, 7:  
 on *Quercus* sp.  
*P. dubia* (Hoffm.) Lettau, 2: on calcareous rock.  
*P. semipinnata* (J.F.Gmel.) Moberg, 3: on *Pyrus*  
 sp.  
*P. tenella* (Scop.) DC., 4: on calcareous rock.  
 \* *P. tribacia* (Ach.) Nyl., 2: on calcareous rock.  
*Physconia distorta* (With.) J.R.Laundon, 1: on  
*Salix* sp., 3, 7: on *Quercus* sp.  
 \* *P. muscigena* (Ach.) Poelt, 2: on mosses.  
*P. perisidiosa* (Erichsen) Moberg, 4: on mosses.  
 + *Placocarpus schaeereri* (Fr.) Breuss, 8: on  
 calcareous rock.  
 +, \*, # *Placynthium nigrum* (Huds.) Gray, 2, 4,  
 8: on calcareous rock.

# *Platismatia glauca* (L.) W.L. Culb. & C.F. Culb., 3: on *Quercus* sp., 1: on *Salix* sp.  
 # *Pleurosticta acetabulum* (Neck.) Elix & Lumbsch, 1: on *Pinus* sp., 2, 3, 4: on *Quercus* sp.  
 + *Porina aenea* (Wallr.) Zahlbr., 3, 7: on *Quercus* sp.  
 +, \* *Punctelia subrudecta* (Nyl.) Krog, 6: on *Abies* sp., 2: on *Quercus* sp.  
*Protoparmeliopsis muralis* (Schreb.) M.Choisy, 2, 8: on calcareous rock.  
*P. furfuracea* (L.) Zopf var. *furfuracea*, 2: on *Pinus* sp., 3, 5: on *Pyrus* sp. and on *Quercus* sp., 1, 9: on *Salix* sp.  
*Ramalina farinacea* (L.) Ach., 6: on *Abies* sp., 1: on *Pinus* sp., 5: on *Pyrus* sp., 9: on *Salix* sp. and on *Quercus* sp., 2, 7: on *Quercus* sp.  
*R. fastigiata* (Pers.) Ach., 6: on *Abies* sp., 5: on *Pyrus* sp.  
*R. fraxinea* (L.) Ach., 3: on *Pyrus* sp., 2: on *Quercus* sp.  
 \* *Rinodina bischoffii* (Hepp) A. Massal., 2: on calcareous rock.  
 # *R. teichophila* (Nyl.) Arnold, 3: on *Pyrus* sp.  
 \* *R. sophodes* (Ach.) A. Massal, 1: on *Carpinus* sp., 9: on *Quercus* sp.  
*Sarcogyne regularis* Körb., 8: on calcareous rock.

*Scoliciosporum umbrinum* (Ach.) Arnold, 9: on *Quercus* sp.  
*Toninia sedifolia* (Scop.) Timdal, 2: on soil.  
 + *T. toniniana* (A. Massal) Zahlbr., 8: on calcareous rock.  
 + *Squamarina cartilaginea* (With.) P.James, 8: on calcareous rock.  
 \* *Usnea cornuta* Körb., Locality 1: on *Pinus* sp.  
*U. florida* (L.) Weber ex F.H.Wigg, 6: on *Abies* sp. 1, 2, 3: on *Pinus* sp., 5: on *Pyrus* sp., 9: on *Quercus* sp.  
 \* *Verrucaria nigrescens* Pers., 2, 8: on calcareous rock.  
*Xanthoparmelia pulla* (Ach.) O. Blanco et al., 8: on calcareous rock.  
 + *X. stenophylla* (Ach.) Ahti & D. Hawksw., 4, 8: on calcareous rock.  
 \* *Xanthoria candelaria* (L.) Th.Fr., 1: on *Salix* sp.  
*X. fulva* (Hoffm.) Poelt & Petut., 3: on *Pyrus* sp.  
*X. parietina* (L.) Th.Fr., 4: on calcareous rock, 1: on *Carpinus* sp., 5: on *Olea europaea*, 3, on *Prunus* sp. on *Quercus* sp., 5: on *Pyrus* sp., 2, 9, *Quercus* sp.  
*X. polycarpa* (Hoffm.) Rieber, 3: on *Quercus* sp.

#### 4. Discussion

In this study, 112 lichen species belonging to 52 genera were determined from 9 stations in the Karabük, Kastamonu and Sinop provinces.

Of the species 56 are crustose, 44 are foliose and 13 are fruticose.

According to the literature literature knowledges [2, 8, 10-14], 27 species are new for Karabük, 16 species are new for Sinop and 10 species are new for the Kastamonu provinces.

The richest genera are *Lecanora* Ach., (14 species), *Caloplaca* Th. Fr. (10 species) and *Physcia* (Schreb.) Michx. (6 species).

The most abundant lichens species at this study were *Lecidella elaeochroma* and *Parmelia sulcata* (8 stations) *Lecanora albella* and *Phaeophyscia orbicularis* (7 stations) and *Physcia aipolia* and *Xanthoria parietina* (6 stations).

Most of species got an opportunity to grow on trees because of rather rich trees cover most of the study area (Table 1).

**Table 1.** Distribution of lichens species according to the habitats.

Habitats	Number of Species
Quercus sp.	53
Rock	40
Salix sp.	22
Pyrus sp.	21
Pinus sp.	15
Abies sp.	12
Carpinus sp.	12
Olea europaea	11
Malus sp.	9
Soil	6
Prunus domestica	5
Mosses	2
Wood	1
Decayed wood	1

Table 1 shows that *Quercus* sp. was the habitat that houses most lichen species. It is followed by Rocks. The habitats on which one or few species have been found, are infrequently observed.

3 of terricolous taxa include dimorphic *Cladonia* species growing together 3 foliose species, *Peltigera horizontalis*, *P. rufescens* and *Toninia sedifolia*. *Physconia muscigena* and *P. perisidiosa* were seen growing on mosses only in stations 2 and 4.

The most lichen taxa were determined at 1137 m and the least at 650 m.(Table 2).

On the other hand *Phaeophyscia orbicularis* and *Xanthoria parietina* were observed. different types substrata.

When the lichen species diversity of the 9 localities are compared, locality 3 is the richest. Locality 3 have density and diversity of trees, and at high altitude. Hence, these features of this locality make it richer than the other localities in terms of lichen diversity. Localities 6 has the least numbers of taxa because of sparse tree vegetation and rocky substrates.

**Table 2.** Distribution of lichen species according to altitudes.

Altitude (m)	Number of Species
236	21
292	23
575	21
636	29
685	12
974	38
910	18
1103	39
1137	29

As regards to choosing substrata *Lecanora albella*, *Xanthoria parietina* and *Parmelia sulcata* were defined to be the least sensitive.

*Parmelia sulcata* and *Xanthoria parietina* grew on 7 different substrata while *Lecanora albella* on 8 different substrata at altitudes from 236to1137m.

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