

Some Lichen Records From *Quercus vulcanica* Forests Around Yukarı Gökdere (Isparta, Turkey)

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ABSTRACT

The lichen flora of the *Quercus vulcanica* forests in Isparta was studied and 92 species belonging to 43 genera were found. 55 lichen taxa are new records for the Isparta province and 2 taxa, *Ochrolechia alboflavescens* and *Collema fasciculare* are new records for Turkey.

Key Words: Lichen, *Quercus vulcanica*, Isparta, Turkey.

INTRODUCTION

In the last two decades, numerous studies were published on the diversity of lichens in Turkey (John 1996; Çiçek and Özdemir Türk 1998; Halıcı et al 2005, Güvenç et al 2006). However, lichen diversity of some important ecosystems in Turkey, such as the *Quercus vulcanica* forests have not been studied yet.

To date, seven lichenological papers deal with several regions of Isparta province (Szatala 1960; Mayrhofer 1984; Mayrhofer et al 1990; Öztürk et al 1998; Öztürk and Kaynak 1999; Öztürk et al 2005; Çobanoğlu and Yavuz 2006). However, none of these focused on lichens in *Q. vulcanica* forests. *Quercus vulcanica*, is endemic to Turkey and is essentially found in Regions of Lakes, in the Mediterranean region. These forests were declared National Protected Areas in the year of 1987 (UNDP 2000).

This study aims at documenting the diversity of these oak forests in Turkey.

Study area

The province of Isparta is located in the north-western Mediterranean region of Turkey. It has a Mediterranean climate with dry and hot summers and cold and rainy winters. The mean annual precipitation is 600 mm and the mean annual temperature is 12.1 °C (Akman 1990).

The study area is located close to the village of Yukarı Gökdere in Eğirdir district of Isparta province. The most abundant occurrence of *Q. vulcanica* in The Region of Lakes, is at the south slopes of Asacak Hill (1289 m) in south east of Mount Davras. It occurs in monospecific stands or mixed with other species. The accompanying species include *Sorbus torminalis*, *S. umbellata*, *Fraxinus ornus*, *Acer hyrcanum*, *A. platanoides*, *Quercus cerris*, *Q. libani*, *Lonicera orientalis*, *Corylus avellana*, *Populus tremula*, *Cornus mas*, *C. sanguinea*, *Rosa* spp. and *Verbascum* spp. (Günel 1997).

MATERIALS AND METHODS

Lichen specimens were collected from three different areas around of Yukarı Gökdere in May, 2007 (Figure 1). The substrates of specimens included *Quercus cerris*, *Q. coccifera*, *Q. libani*, *Q. vulcanica*, calcareous and siliceous rocks and soil. Lichen taxa were identified with the aid of lichen floras (Clauzade and Roux 1985; Pulvis et al 1994; Wirth 1995). The names of authors are abbreviated according to Brummit and Powell (1992). Specimens collected from the study area are kept in BULU (Herbarium of the Faculty of Arts and Sciences, Uludağ University, Bursa).

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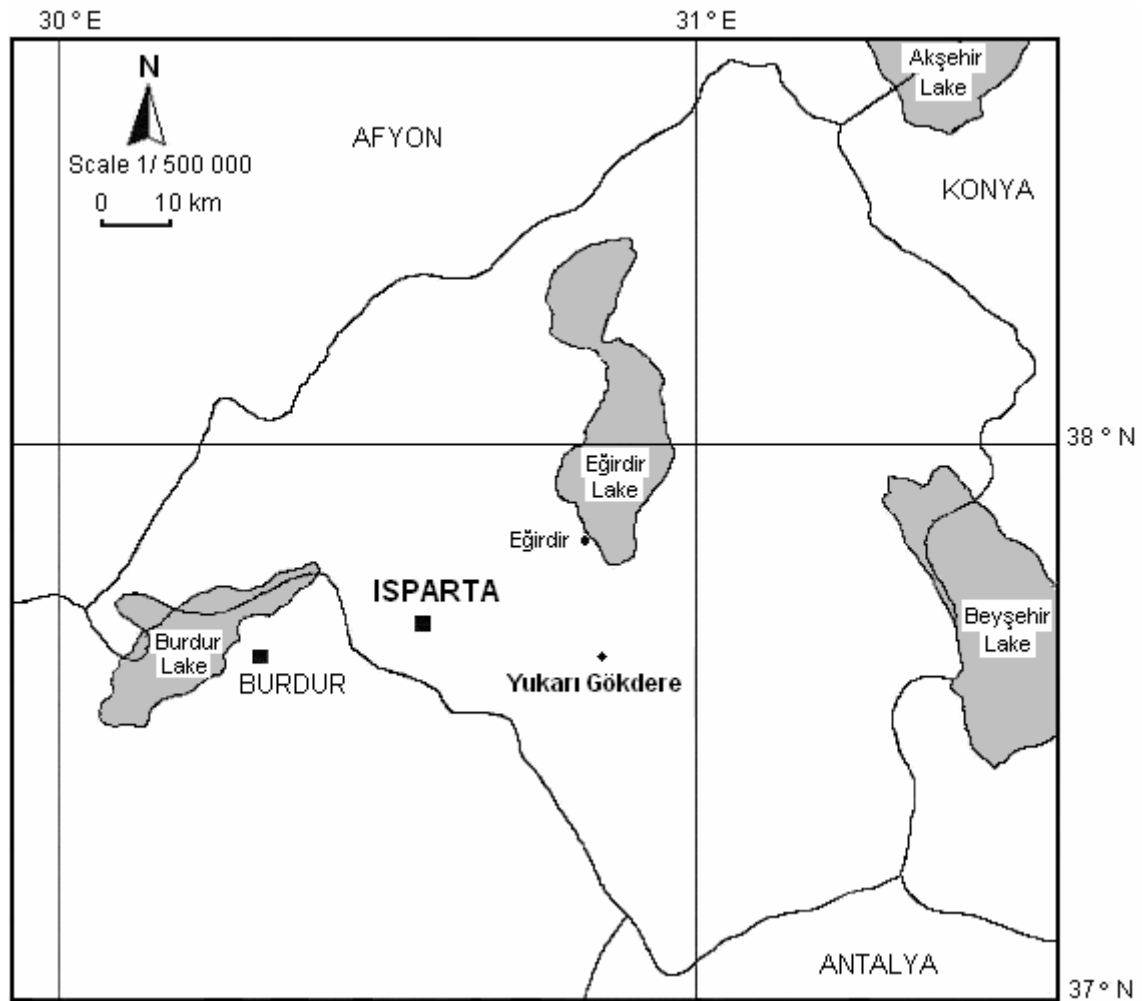


Figure 1. Map of the study area

RESULTS

The lichens are listed alphabetically for each locality and substrate. An asteriks (*) indicates new records for the province of Isparta and plus (+) indicates new records for The Mediterranean Region of Turkey. New records for Turkey are marked with #.

Loc. 1. Isparta: Eğirdir; north of Yukarı Gökdere village, 979 m, 37° 42' 05" N; 30° 50' 56" E, 12. 05. 2007.

on *Q. coccifera*

Anaptychia ciliaris (L.) Körb.

Evernia prunastri (L.) Ach.

Pertusaria albescens (Huds.) M.Choisy & Werner

* *Pleurosticta acetabulum* (Neck.) Elix & Lumbsch

on siliceous rocks

+ *Acarospora smaragdula* (Wahlenb.) A.Massal.

Anaptychia ciliaris (L.) Körb.

Aspicilia cinerea (L.) Körb.

Aspicilia contorta subsp. *contorta* (Hoffm.) Kremp.

* *Aspicilia contorta* subsp. *hoffmanniana* S.Ekman & Fröberg

* *Caloplaca crenularia* (With.) J.R.Laundon

Candelariella vitellina (Hoffm.) Müll.Arg.

Lecanora dispersa (Pers.) Röhl.

* *Lecidella carpathica* Körb.

- * *Leptochidium albociliatum* (Desm.) M.Choisy
- * *Leptogium gelatinosum* (With.) J.R.Laundon
- Leptogium lichenoides* (L.) Zahlbr.
- Lobothallia radiosa* (Hoffm.) Hafellner
- Physconia enteroxantha* (Nyl.) Poelt
- Physconia perisidiosa* (Erichsen) Moberg
- Protoparmeliopsis muralis* (Schreb.) M.Choisy
- * *Rhizocarpon geminatum* Körb.
- Rhizocarpon geographicum* (L.) DC.
- * *Squamarina cartilaginea* (With.) P.James
- Toninia candida* (Weber) Th.Fr.
- * *Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale
- * *Xanthoparmelia verruculifera* (Nyl.) O. Blanco, A.Crespo, Elix, D.Hawksw. & Lumbsch.

on soil

- Cladonia pyxidata* (L.) Hoffm.
- * *Peltigera canina* (L.) Willd.
- + *Peltigera ponojensis* Gyeln.
- * *Peltigera rufescens* (Weiss) Humb.

Loc. 2. Isparta: Eğirdir; Yukarı Gökdere village, entrance of *Q. vulcanica* National Park, 1362 m, 37° 43' 20" N; 30° 49' 58" E, 12. 05. 2007.

on *Q. cerris*

- Anaptychia ciliaris* (L.) Körb.
- Caloplaca cerina* (Ehrh. ex Hedw.) Th.Fr.
- Collema subflaccidum* Degel.
- * *Degelia atlantica* (Degel.) P.M.Jørg. & P.James
- + *Lecanora intumescens* (Rebent.) Rabenh.
- Lecidella elaeochroma* (Ach.) M.Choisy
- + *Melanohalea elegantula* (Zahlbr.) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
- Melanohalea exasperata* (De Not.) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
- * *Ochrolechia balcanica* Versegby
- * *Parmelia sulcata* Taylor
- Parmelina tiliacea* (Hoffm.) Hale
- Pertusaria albescens* (Huds.) M.Choisy & Werner
- Phaeophyscia orbicularis* (Neck.) Moberg
- Physconia distorta* (With.) J.R.Laundon
- * *Physconia subpulverulenta* (Szatala) Poelt
- * *Pleurosticta acetabulum* (Neck.) Elix & Lumbsch
- * *Ramalina fraxinea* (L.) Ach.
- Rinodina exigua* (Ach.) Gray

on *Q. libani*

- Anaptychia ciliaris* (L.) Körb.
- Caloplaca cerina* (Ehrh. ex Hedw.) Th.Fr.
- * *Degelia atlantica* (Degel.) P.M.Jørg. & P.James
- Evernia prunastri* (L.) Ach.
- Lecanora hagenii* (Ach.) Ach.
- + *Melanohalea elegantula* (Zahlbr.) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
- # *Ochrolechia alboflavescens* (Wulfen) Zahlbr.
- * *Ochrolechia balcanica* Versegby
- * *Parmelia saxatilis* (L.) Ach.
- Parmelina tiliacea* (Hoffm.) Hale
- * *Pertusaria flavida* (DC.) J.R.Laundon
- * *Pertusaria pertusa* (Weigel) Tuck.
- + *Pertusaria pustulata* (Ach.) Duby
- * *Phlyctis argena* (Spreng.) Flot.
- * *Physconia subpulverulenta* (Szatala) Poelt

- * *Physconia venusta* (Ach.) Poelt
 - * *Pleurosticta acetabulum* (Neck.) Elix & Lumbsch
 - Pseudevernia furfuracea* var. *ceratea* (Ach.) D.Hawksw.
 - Pseudevernia furfuracea* var. *furfuracea* (L.) Zopf.
 - * *Ramalina fraxinea* (L.) Ach.
 - + *Usnea fulvovireagens* (Räsänen) Räsänen
- on siliceous rocks**
- + *Buellia badia* (Fr.) A. Massal.
 - * *Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale

Loc. 3. Isparta: Eğirdir; Yukarı Gökdere village, *Q. vulcanica* forest, 1500 m, 37° 44' 37" N; 30° 49' 47" E, 12. 05. 2007.

on calcareous rocks

- Acarospora cervina* A.Massal.
- * *Caloplaca dolomiticola* (Hue) Zahlbr.
- Caloplaca variabilis* (Pers.) Müll. Arg.
- Collema cristatum* (L.) Weber ex F.H.Wigg.
- Lecidella stigmathea* (Ach.) Hertel & Leuckert
- Leptogium lichenoides* (L.) Zahlbr.
- + *Rinodina immersa* (Körb.) Arnold
- * *Sarcogyne regularis* Körb.

on *Q. vulcanica*

- Anaptychia ciliaris* (L.) Körb.
- * *Arthonia radiata* (Pers.) Ach.
- + *Bryoria capillaris* (Ach.) Brodo & D.Hawksw.
- * *Bryoria fuscescens* (Gyeln.) Brodo & D.Hawksw.
- Caloplaca cerina* (Ehrh. ex Hedw.) Th.Fr.
- * *Caloplaca flavorubescens* (Huds.) J.R.Laundon
- + *Candelariella reflexa* (Nyl.) Lettau
- # *Collema fasciculare* (L.) Weber ex F.H.Wigg.
- * *Collema furfuraceum* Du Rietz
- * *Collema nigrescens* (Huds.) DC.
- * *Degelia atlantica* (Degel.) P.M.Jørg. & P.James
- Evernia prunastri* (L.) Ach.
- * *Hypogymnia tubulosa* (Schaer.) Hav.
- Lecanora chlarofera* Nyl.
- + *Lecanora cinereo fusca* H.Magn.
- + *Lecanora intumescens* (Rebent.) Rabenh.
- * *Lecanora saligna* (Schrad.) Zahlbr.
- + *Lecanora subcarpineae* Szatala
- Lecidella elaeochroma* (Ach.) M.Choisy
- * *Leptogium saturninum* (Dicks.) Nyl.
- * *Lobaria scrobiculata* (Scop.) P.Gaertn.
- Megaspora verrucosa* (Ach.) Hafellner & V.Wirth
- * *Melanelixia glabra* (Schaer.) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
- + *Melanohalea elegantula* (Zahlbr.) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
- Melanohalea exasperata* (De Not.) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
- + *Melanohalea exasperatula* (Nyl.) O.Blanco, A.Crespo, Divakar, Essl., D.Hawksw. & Lumbsch
- * *Ochrolechia arborea* (Kreyer) Almb.
- * *Ochrolechia balcanica* Verseghy
- * *Ochrolechia pallescens* (L.) A.Massal.
- + *Ochrolechia turneri* (Sm.) Hasselrot
- + *Parmelia submontana* Nádv. ex Hale
- * *Parmelia sulcata* Taylor
- Parmelina tiliacea* (Hoffm.) Hale
- * *Peltigera collina* (Ach.) Röhl.

- Peltigera praetextata* (Flörke ex Sommerf.) Vain.
Pertusaria albescens (Huds.) M.Choisy & Werner
* *Phlyctis argena* (Spreng.) Flot.
Physcia adscendens (Th. Fr.) H.Olivier
Physcia aipolia (Ehrh. ex Humb.) Fürnr.
Physconia distorta (With.) J.R.Laundon
Physconia perisidiosa (Erichsen) Moberg
* *Physconia subpulverulenta* (Szatala) Poelt
* *Physconia venusta* (Ach.) Poelt
* *Pleurosticta acetabulum* (Neck.) Elix & Lumbsch
Pseudevernia furfuracea var. *ceratea* (Ach.) D.Hawksw.
Pseudevernia furfuracea var. *furfuracea* (L.) Zopf.
* *Ramalina farinacea* (L.) Ach.
* *Ramalina fraxinea* (L.) Ach.
+ *Usnea filipendula* Stirt.
* *Usnea fulvovirens* (Räsänen) Räsänen
+ *Usnea hirta* (L.) Weber ex F.H.Wigg.

DISCUSSION

A total of 92 lichen taxa was found in 43 genera. Of these, 55 taxa do not appear to have been previously reported from Isparta province. *Ochrolechia alboflavescens* and *Collema fasciculare* are new records for Turkey .

The most speciose genera are *Caloplaca* (5 taxa), *Collema* (5 taxa), *Lecanora* (7 taxa), *Ochrolechia* (5 taxa), *Peltigera* (5 taxa), and *Physconia* (5 taxa). 61 species are corticolous, 30 of them are saxicolous and 5 species are terricolous.

The epiphytic lichen taxa are very rich in number of species in the study area, especially at the third locality. 51 of the corticolous taxa were found on the trunks of this species, only. *Q. vulcanica* is an excellent phorophyte. Among these, the percentage of foliose taxa is 45%. Foliose taxa on *Q. vulcanica* include *Collema fasciculare*, *Degelia atlantica*, *Leptogium saturninum* and *Lobaria scrobiculata*, which grow on old broad-leaved trees in humid woodlands, were found to correspond with the literature (Purvis et al 1994).

Previous floristic studies in the area (Szatala 1960, Öztürk and Kaynak 1999, Öztürk et al 2005, Çobanoğlu and Yavuz 2006), recorded mostly saxicolous species, while our study was focused on corticolous habitats.

Given the small local area studied here the richness of the lichen diversity in the *Quercus vulcanica* forest is remarkable, demonstrating their importance for the lichen flora in general.

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