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Lichens of *Cupressus sempervirens* on the Aegean islands of Kriti and Kos, Greece

Abstract

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72 epiphytic taxa are reported from *Cupressus sempervirens* stands of the islands of Kriti and Kos. Including previously published taxa, the known flora of epiphytic lichens of Greek *Cupressus* stands comprises 93 taxa. Two taxa, *Bacidia parathalassica* and *B. thurrenica* are new to Greece, 21 taxa are new to Kos and 4 taxa are new to Kriti.

Key words: Mediterranean cypress, epiphytic lichens, lichen diversity, Cos, Crete, Mediterranean region.

Introduction

A relatively high number of papers deal with the Greek lichen flora (see Christensen 1989). In recent years papers mainly authored or co-authored by S. N. Christensen, S. Pirintsos or H. J. M. Sipman have contributed further to the knowledge of the Greek lichen flora. Lately, the checklist of Kriti (Grube & al. 2001) seems to have stimulated publication of floristic work on the island (Spribille & al. 2006, Christensen & Svane 2007).

The high percentage of new records in recent papers underlines the incompleteness of the present knowledge. However, knowledge of the composition of the lichen flora and vegetation of particular substrates and habitats is even scantier (Spribille & al. 2006). The present paper is a small contribution to improve this situation.

Cupressus sempervirens is a chiefly E Mediterranean tree, which forms woodlands, mainly on limestone. Elsewhere in the Mediterranean it occurs naturally in coastal S Anatolia, Cyprus, Lebanon and the Cyrenaica. It also occurs in the Elburz area and in mountains of S Iran (Christensen 1997). Outside its natural area it is widely planted as an ornamental tree in churchyards and waysides. The investigated stands on Kriti and Kos thus represent together with those in the Cyrenaica the westernmost natural occurrences of *C. sempervirens*. A list of epiphytic lichens of this tree has not previously been published, neither from Greece, nor from elsewhere.

Material and methods

The specimens were collected on living *Cupressus sempervirens* trees. All specimens were collected by the present author; his collecting numbers are given in italics. For some specimens no separate vouchers were made: they co-occur with the specimens cited. The specimens are deposited at the Botanical Museum of Copenhagen (C) with minor sets in Berlin-Dahlem (B) and in the author's private herbarium.

Epiphytic taxa of *Cupressus sempervirens* published by Sipman & Raus (2002) or Spribille & al. (2006) and not found in this study are included in order to give as comprehensive a list as possible. Epiphytes on other phorophytes in *Cupressus* woodlands are not included.

The distribution of the taxa on the islands were checked using Grube & al. (2001), Spribille & al. (2006) and Christensen & Svane (2007) for Kriti and Sipman & Raus (2002) for Kos.

The lichens collected come from the following localities:

Kriti, Nomos Chanion, Lefka Ori Mts

1. About 6 km WNW of the village of Omalos, about 1½ km N of the village of Agia Irini, *Cupressus sempervirens-Quercus coccifera* woodland with scattered *Pinus brutia* on NNW slope; bedrock: limestone; 975-1050 m, 10.4.1986. This is the same as locality 4 of Christensen & Svane (2007).
2. About 24 km SSW of the town of Chania, about 3 km S of the village of Omalos, just N of Xyloskalo; degraded *Cupressus sempervirens-Quercus coccifera* woodland on SW slope; bedrock; limestone; 1200-1360 m, 3.4.1986. This is the same as locality 6 of Christensen & Svane (2007).

Kos

3. Between Asklepion and Platanos, *Cupressus sempervirens* avenue along asphalt paved road, 24.4.1988.
4. N slope of Mt Dikeos, just E of the village Ziá, *Cupressus sempervirens* woodland on N facing limestone slope, 300 m, 26.4.1988.
5. N slope of Mt Dikeos, above the village Ziá, open *Cupressus sempervirens-Pinus brutia* woodland with undervegetation of *Quercus coccifera* and *Cistus salvifolius* on N facing limestone slope, 340 m, date 26.4.1988.
6. N slope of Mt Dikeos, above the village Ziá, along the path to the summit, dense stand of tall *Cupressus sempervirens* trees along unpaved dirt road on W slope; bedrock: limestone; 460 m, 27.4.1988.
7. N slope of Mt Dikeos, above the village Ziá, along the path to the summit; open *Cupressus sempervirens* woodland on N slope; bedrock: sandstone; 580 m, 27.4.1988.

List of lichens from Kriti and Kos epiphytic on *Cupressus sempervirens*

The following list includes two taxa, preceded by two asterisks (**), that are new to Greece, four taxa, preceded by a plus sign (+), new to Kriti and 21 taxa, preceded by an asterisk (*), new to Kos.

The numbers in brackets refer to the collecting localities given in the section "Material and methods".

Anaptychia ciliaris (L.) Körb. – (1) on trunk, *3276;* (2) on trunk, *2950, 2972, 2973,* on bark of twigs, with *Pseudevernia furfuracea 2977,* on decorticated wood of twigs, with *Pertusaria albescens* 2968.

****Bacidia parathalassica*** Llop & Gómez-Bolea – (6) on trunks, *4897a,* with *Physcia adscendens 4900, 4903;* (7) on trunks, *4920,* on thin branches, *4926,* with *B. thyrrenica 4922*. – All det. E. Llop.

****Bacidia thyrrenica*** Llop ad int. – (6) on a trunk, with *Physcia adscendens 4900;* (7) on a thin branch, *4916a, 4917a, 4922,* on cones, with *Lecanora horiza 4913*. – All det. E. Llop.

Buellia chloroleuca Körb. – Kriti (Spribille & al. 2006).

Buellia griseovirens (Turner & Borrer) Almb. – (2) on decorticated wood, *2945a*.

Caloplaca cerina (Hedw.) Th. Fr. – (2) on trunks, *2947, 2952;* (3) on trunks, *4770a, 4772, 4774a;* (5) on trunks, *4840;* (6) on a trunk, with *Catillaria chalybeia 4897*.

**Caloplaca flavorubescens* var. *quercina* (Flagey) Giralt & al. – (1) on bark of twigs, *3273;* (2) on bark of twigs and cones, with *Caloplaca haematites 2974,* with *Lecidella euphoria 2931, 2975,* with *Physcia leptalea 2976;* (4) on a twig, *4826;* (6) on trunks, with *Lecanora argentata 4905,* on cones, with *Rinodina pyrina 4902;* (7) on a thin branch, with *Lecanora argentata 4917,* with *Bacidia rosella 4917a, 4926,* on a twig, with *Lecanora meridionalis 4916,* with *Physcia leptalea 4930,* on cones, with *Lecanora horiza 4913,* with *Catillaria chalybeia 4915*. – See Christensen & Svane (2007).

**Caloplaca furfuracea* H. Magn. – (1) on a trunk and on decorticated wood, *3265a, 3269, 3270, 3271a*, with *Pertusaria albescens* var. *corallina 3264,* with *Ochrolechia turneri 3266,* with *Ochrolechia pallescens 3267,* with *Pertusaria coccodes* var. *coccodes 3272*. – No. *3271a* conf. U. Søchting. This species differs from *C. herbidella* in the non-corticate, K- "isidia".

**Caloplaca haematites* (St.-Amans) Zwackh – (1) on decorticated wood of a trunk (with *Caloplaca furfuracea 3270,* with *Rinodina* sp. *3270a,* on bark of twigs, with *Diplotomma alboatrum 3257,* with *Caloplaca flavorubescens 3273;* (2) on bark of twigs and on cones, *2974;* (4) on a twig, with *Caloplaca flavorubescens 4826;* (5) on trunks, with *Xanthoria parietina 4832,* on bark on dead twig, with *Lecanora chlarotera 4833;* (6) on a trunk, *4899b,* on shaded twigs, with *Diplotomma alboatrum 4909;* (7) on cones, with *Lecanora horiza 4913,* with *Catillaria chalybeia 4915*.

Caloplaca herbidella (Hue) H. Magn. – Kriti (Spribille & al. 2006).

Caloplaca obscurella (Körb.) Th. Fr. – Kos (Sipman & Raus 2002).

Caloplaca pyracea (Ach.) Th. Fr. – (4) on a twig, with *Caloplaca flavorubescens 4826;* (5) on trunks, with *Rinodian pyrina 4839,* with *Caloplaca cerina 4840,* with *Catillaria chalybeia 4850,* on bark on dead twig, with *Lecanora chlarotera 4833;* (6) on trunks, *4899a, 4899* conf. U. Søchting, on cones, with *Rinodina pyrina 4902,* on shaded twigs, with *Diplotomma alboatrum 4909;* (7) on cones, with *Lecanora horiza 4913*.

Candelariella faginea Nimis & al. – Kriti (Spribille & al. 2006).

Candelariella reflexa (Nyl.) Lettau – Kriti (Spribille & al. 2006).

Candelariella vitellina (Hoffm.) Müll. Arg. – (1) on a trunk, with *Pyrrhospora quernea 3252;* (2) on a trunk, *2935*.

Candelariella xanthostigma (Ach.) Lettau – (1) on a trunk, *3262,* on bark of twigs, *3261;* (6) on a trunk, with *Catillaria chalybeia 4897*.

Candelariella sp. 1 – Kriti (Spribille & al. 2006).

Catillaria chalybeia (Borrer) A. Massal. – (5) on trunks, *4844, 4834a, 4850;* (6) on trunk, *4897.* (7) on cones, *4915.*

Catillaria chalybeia var. *chloropoliza* (Nyl.) H. Kilias – Kos (Sipman & Raus 2002).

**Catillaria nigroclavata* (Nyl.) Schuler – (6) on trunks, with *Physcia adscendens 4900,* with *Bacidia rosella 4903*.

Catinaria atropurpurea (Schaerer) Vězda & Poelt – Kriti (Spribille & al. 2006).

**Cladonia chlorophaea* (Sommerf.) Spreng. – (2) on trunk, with *Lethariella intricata 2953;* (5) on the base of a trunk, *4845* (squamules only).

+*Cladonia* cf. *grayi* Sandst. – (2) on the base of a trunk, *2954*. – Cups relatively narrow, granulose sorediate, primary squamules esorediate. C-, K-. Two tlc-runs gave inconclusive results. Using the key of Ahti (1977), the specimen is best referred to *C. grayi*.

Collema furfuraceum (Arnold) Du Rietz – Kriti (Spribille & al. 2006).

Collema multipunctatum Degel. – Kriti (Spribille & al. 2006).

Diplotomma alboatrum (Hoffm.) Flotow – (1) on twigs, *3257;* (6) on a trunk, with *Ramalina canarinsis 4898,* on shaded twigs, *4909*.

Fuscopannaria olivacea (P. M. Jørg.) P. M. Jørg. – (1) on bark and decorticated wood, *3251, 3274*, both conf. P. M. Jørgensen.

+*Hypocenomyce caradocensis* (Nyl.) P. James & Gotth. Schneid. – (2) on decorticated wood, *2941* det. V. Alstrup.

Lecania cyrtellina (Nyl.) Sandst. – Kriti (Spribille & al. 2006).

Lecania naegelii (Hepp) Diederich & Van den Boom – (6) on a trunk, *4897b* det. E. Llop, *4908a;* (7) on cones, with *Lecanora horiza 4913* det. E. Llop.

**Lecanora argentata* (Ach.) Malme – (5) on trunks, *4841, 4848;* (6) on a trunk, *4905;* (7) on a thin branch, *4917,* on cones, with *Lecanora horiza 4913,* with *Catillaria chalybeia 4915*.

Lecanora chlarotera Nyl. – (1) on bark and wood of twigs and cones, with *Pertusaria albescens 3268;* (2) on a trunk, *2934,* on decorticated wood of twigs, with *Pertusaria albescens 2968*.

**Lercanora chlarotera* subsp. *chlarotera* f. *crassula* (H. Magn.) Poelt – (5) on bark on a dead twig, *4833*.

Lecanora dispersa (Pers.) Sommerf. – (3) on a trunk, *4773*.

**Lecanora hagenii* (Ach.) Ach. – (2) on twigs, with *Lecidella euphoria 2931;* (4) on a twig, with *Caloplaca flavorubescens 4826*.

Lecanora horiza (Ach.) Linds. – (4) on a twig, with *Caloplaca flavorubescens 4826;* (5) on a trunk, with *Rinodina pyrina 4839,* on bark on dead twig, with *Lecanora chlarotera 4833;* (6) on trunks, with *Caloplaca pyracea 4899,* with *Physcia adscendens 4900,* with *Physcia biziana 4908;* (7) on a trunk, *4927,* on twigs, *4912a,* on cones, *4913*.

Lecanora leuckertiana Zedda – Kos (Sipman & Raus 2002).

**Lecanora meridionalis* H. Magn. – (5) on a trunk, *4831;* (7) on a trunk, *4921,* on a twig, *4916*.

**Lecanora rugosella* Zahlbr. – (2) on decorticated wood of a trunk, *2937;* (5) on a trunk, *4830;* (6) on trunks, with *Caloplaca pyracea 4899,* with *Physcia adscendens 4899a;* (7) on twigs, with *Lecanora horiza 4912a.*

Lecanora saligna (Schrad.) Zahlbr. – Kriti (Spribille & al. 2006).

**Lecanora umbrina* (Ach.) A. Massal. – (6) on a trunk, with *Caloplaca pyracea 4899*.

Lecanora varia (Hoffm.) Ach. – (2) on decorticated wood, *2919, 2941a*.

Lecidea cf. *erythrophaea* Sommerf. – Kos (Sipman & Raus 2002).

Lecidella achristotera (Nyl.) H. Hertel & Leuckert – (2) on bark of twigs, with *Caloplaca cerina 2952,* with *Physcia leptalea 2976*.

Lecidella elaeochroma (Ach.) M. Choisy – (1) on decorticated wood, *3271;* (2) on decorticated wood of a dead branch, with *Ochrolechia alboflavescens 2943,* on bark of twigs, with *Pseudevernia furfuracea 2977;* (5) on a trunk, *4849;* (7) on a thin branch, with *Bacidia rosella 4922,* on cones, with *Catillaria chalybeia 4915*.

**Lecidella euphorea* (Flörke) Hertel – (1) on bark and wood of twigs and cones, with *Diplotomma alboatrum 3257,* with *Pertusaria albescens 3268,* with *Caloplaca flavorubescens 3273;* (2) on trunks, *2927, 2934a,* on decorticated wood of a trunk, *2937a, 2939,* on bark of twigs and cones, *2931, 2975;* (4) on a twig, *Caloplaca flavorubescens 4826;* (5) on trunks, with *Lecanora rugosella 4830,* with *Lecanora meridionalis 4831,* on bark on dead twig, with *Lecanora chlarotera 4833;* (7) on a twig, with *Physcia leptalea 4930,* on cones, with *Lecanora horiza 4913*.

Leptogium gelatinosum (With.) J. R. Laundon – (2) on mosses on trunks, *2917, 2918, 2959, 2962*.

Leptogium teretiusculum (Wallr.) Arnold – Kriti (Spribille & al. 2006).

Lethariella intricata (Moris) Krog – (2) on trunks, *2953, 2967*.

Megaspora verrucosa var. *mutabilis* (Ach.) Nimis & C. Roux – (2) on trunks, *2923, 2924*.

**Mycocalicium* cf. *minutellum* (Ach.) Nádv. – (5) on decorticated wood of a broken limb, *4853*.

Ochrolechia alboflavescens (Wulfen) Zahlbr. – (2) on decorticated wood of a dead branch, *2943*.

Ochrolechia balcanica Verseghy – Kriti (Spribille & al. 2006).

+*Ochrolechia microstictoides* Räsänen – (2) on decorticated wood, *2945*.

Ochrolechia pallescens (L.) A. Massal. – (1) on trunks, *3255, 3267;* (2) on trunks, *2971*.

Ochrolechia turneri (Sm. & Sowerby) Hasselrot – (1) on a trunk, *3266.* – New to Nomos Chania, Kriti.

Parmelia saxatilis (L.) Ach. – (1) on a trunk, *3275;* (2) on decorticated wood on trunks, *2942, 2960.* – Kos (Sipman & Raus 2002).
Parmelina pastillifera (Harm.) Hale – (1) on decorticated wood on a trunk, *3254*.
Parmelina tiliacea (Hoffm.) Hale – (2) on a trunk, *2920*.
**Pertusaria albescens* (Huds.) Choisy & Werner – (1) on trunks, *3252a, 3256, 3265,* on bark and wood of twigs and cones, *3260, 3268;* (2) on trunks, *2930, 2946,* on decorticated wood of twigs, *2968;* (7) on a trunk, *4925*.
Pertusaria albescens var. *corallina* (Zahlbr.) J. R. Laundon – (1) on trunks, *3264, 3285,* on bark on thin branches and twigs, *3258, 3263;* (2) on trunks, *2944, 2948, 2963, 2964, 2969*. – This taxon dominated the epiphytic vegetation on trunks of *C. sempervirens* at loc. 2.
Pertusaria coccodes (Ach.) Nyl. var. *coccodes* – (1) on a trunk, *3272;* (2) on a trunk, with *Pertusaria pertusa* var. *meridionalis 2921*.
Pertusaria pertusa auct. – Kriti (Spribille & al. 2006).
Pertusaria pertusa var. *meridionalis* Zahlbr. – (2) on a trunk, *2921*.
Pertusaria rhodiensis Erichs. – (5) on a trunk, *4834* (K- or faintly yellow); (7) on a trunk, *4919* (K+ reddish). – The taxonomy of *P. rhodiensis* and related species needs urgent revision. Sipman & Raus (2002) and Spribille & al. (2006) discuss the species. – Kriti (Spribille & al. 2006).
Phaeophyscia orbicularis (Neck.) Moberg – Kos (Sipman & Raus 2002).
**Phlyctis argena* (Spreng.) Flotow – (7) on a trunk, *4929*. – Kriti (Spribille & al. 2006).
Physcia adscendens (Fr.) H. Olivier – (5) on a trunk, *4829;* (6) on trunks, *4899a, 4900,* on cones, with *Rinodina pyrina 4902*. – Kriti (Spribille & al. 2006).
Physcia biziana (A. Massal.) Zahlbr. – (6) on a trunk, *4908*.
Physcia biziana var. *leptophylla* Vězda – Kriti (Spribille & al. 2006).
Physcia leptalea (Ach.) DC. – (2) on a trunk, *2936,* on bark of twigs, *2976;* (5) on a trunk, *4828;* (6) on trunks, *4901, 4906;* (7) on a trunk, *4918,* on a twig, *4930,* on cones, with *Lecanora horiza 4913*.
Physcia tenella (Scop.) DC. – (2) on a trunk, *2951;* (6) on a trunk, with *Catillaria chalybeia 4897*.
Physconia distorta (With.) J. R. Laundon – Kriti (Spribille & al. 2006).
**Physconia grisea* (Lam.) Poelt – (3) on a trunk, *4770*.
Physconia subpulverulenta (Szatala) Poelt – (1) on a trunk, *3277*.
Physconia venusta (Ach.) Poelt – (1) on a trunk, *3284;* (2) on bark, *2932,* on decorticated wood on a trunk, *2958, 2961, 2965*.
Platismatia glauca (L.) W. L. Culb. & C. F. Culb. – (2) on a trunk, *2955*.
Pleurosticta acetabulum (Neck.) Elix & Lumbsch – (1) on decorticated wood on a trunk, *3278, 3286;* (2) on trunks, *2922, 2940.*
Pseudevernia furfuracea (L.) Zopf var. *furfuracea* – (2) on a trunk, *2933,* on bark of twigs, *2977*.
+*Pyrrhospora quernea* (Dicks.) Körb. – (1) on a trunk, *3252*. – Distinguished from *Lecanora expallens* by its UV+ orange fluorescence.
Ramalina canariensis J. Steiner – (6) on a trunk, *4898,* on shaded twigs, with *Diplotomma alboatrum 4909;* (7) on a twig, *4924*.
**Ramalina farinacea* var. *reagens* de Lesd. – (7) on twigs, *4928*.
Ramalina fraxinea (L.) Ach. – Kos (Sipman & Raus 2002).
Ramalina pollinaria (Westr.) Ach. – (2) on a trunk, *2966*. – Reported from Kriti by Rondon (1969).
**Ramalina subgeniculata* Nyl. – (7) on twigs and cones, *4912, 4914*.
Rinodina oleae Bagl. – (4) on a twig, with *Caloplaca flavorubescens 4826* det. H. Mayrhofer.
Rinodina plana H. Magn. – Kriti (Spribille & al. 2006).
**Rinodina pyrina* (Ach.) Arnold – (5) on a trunk, *4839* det. H. Mayrhofer; (6) on a trunk, with *Physcia leptalea 4901* det. H. Mayrhofer, on cones, *4902*.
**Rinodina septentrionalis* Malme – (5) on a trunk, *4831a* conf. H. Mayrhofer.
**Rinodina sophodes* (Ach.) A. Massal. – (3) on a trunk, *4774*.

Rinodina spp. – (1) on a trunk, *3270a;* (2) on a trunk, with *Pertusaria albescens* var. *corallina 2944,* with *Caloplaca cerina 2952;* (5) on bark on dead twig, with *Lecanora chlarotera 4833*. – All det. H. Mayrhofer.

Tephromela atra (Huds.) Hafellner – (2) on decorticated wood of a trunk, *2938;* (7) on a twig, with *Physcia leptalea 4930,* on cones, *Lecanora horiza 4913*.

Xanthoria parietina (L.) Th. Fr. – (1) on a trunk, *3283;* (3) on a trunk, *4771* a very shaded and dust affected specimen with rugose central part of the thallus, reminiscent of *X. calcicola* Oxner; (5) on a trunk, *4832;* (6) on trunks, *4904, 4907,* on shaded twigs, with *Diplotomma alboatrum 4909;* (7) on trunks, with *Lecanora meridionalis 4921,* with *Lecanora horiza 4927,* on twigs, with *Lecanora meridionalis 4916,* with *Ramalina canariensis 4924,* with *Physcia leptalea 4930,* on a thin branch, with *Lecanora argentata 4917,* with *Bacidia rosella 4926,* on cones, with *Lecanora horiza 4913,* with *Catillaria chalybeia 4915*.

Discussion

The higher mountains of Kriti and the larger E Aegean islands are the natural habitat of *Cupressus sempervirens* in Greece. According to Walter & Lieth (1960) the whole of the island of Kos belongs to the climate group VI_2, while the mountainous areas of Kriti belong to climate group IV_4. No climate data exist from Kos, but it is safe to expect the precipitation to be lower than that of Kriti on account of the different position of the two islands in relation to westerly humid winds. Deduced from Hager (1985), the precipitation of the investigated localities of Kriti is 1400 (loc. 1) to >1800 (loc. 2) mm/y. Despite the high precipitation of the localities of Kriti, a marked hygrophytic element is not present in the flora. On Kos, however, the number of *Ramalina* species may indicate some level of humidity, probably due to fog formation.

In Table 1 the taxa are arranged in accordance with their occurrences in the seven localities studied. Where possible, the taxa are tentatively referred to phytosociological units, mainly by use of James & al. (1977) and Wirth (1980), keeping in mind that communities described from northern or western Europe may not be directly applicable to Kriti and Kos. Species may occur in more than one units and some species referred to either Physcietum ascendentis, a community of nutrient rich substrates, or to Lecanoretum subfuscae, a community of relatively nutrient rich substrates, may as well have been referred to the other unit, e.g., *Lecidella elaeochroma*. The two newly described *Bacidia* species are referred to Physcietum ascendentis on account of the accompanying species (see species list).

With the exception of loc. 3 on Kos, which was an avenue, all investigated *Cupressus* stands on the two islands are natural woodlands. However, none of the stands is unaffected by human influence. Selective cutting occurred in earlier times. Presently, to different degrees, they all are affected by raised nutrient levels from flocks of sheep and goats and other human activities. The nutrient status is reflected in the presence of the following species, which occur on half or more of the localities: *Caloplaca cerina, C. flavorubescens, C. haematites, C. pyracea, Lecanora horiza, L. rugosella, Lecidella elaeochroma, L. euphorea, Physcia leptalea* and *Xanthoria parietina*.

The two Cretan localities were rather open mixed woodlands of *Cupressus sempervirens* and *Quercus coccifera*. They harbour mainly a mixture of Pseudevernietum furfuraceum and Physcietum adscendentis with a minor quantum of species belonging to the Lecanoretum subfuscae. Finally few xylicolous lichens of the Lecanorion variae were present. The vegetation of the trunks of *Cupressus* trees at loc. 2 was dominated by *Pertusaria albescens* var. *corallina*. This taxon was also abundant at loc.1. *Pertusaria albescens* var. *corallina* is a species of nutrient enriched bark (Xanthorion) (Wirth 1980). It was, however, not found on *C. sempervirens* on Kos despite the relatively high percentage of nutrient-demanding species found on the localities of this island.

Pseudevernietum furfuracea is a common community (alliance) of many coniferous trees. In the present study it was only found in *Cupressus* woodlands of Kriti, and only in an impoverished form, including the following species: *Lethariella intricata, Ochrolechia alboflavescens,*

Table 1. The list of lichen taxa reported, their phytosociological affinities and their distribution; localities 1+2 = Kriti, 3-7 = Kos. Phytosociological units: Ls = Lecanoretum subfuscae, Lv = Lecanorion variae, Pa = Physcietum ascendentis, Pf = Pseudevernietum furfuraceae, Rf = Ramalinetum fastigiatae.

	Locality	1	2	3	4	5	6	7
	Fuscopannaria olivacea	x						
Lv	*Caloplaca furfuracea*	x						
Pf	*Ochrolechia turneri*	x						
Pa	*Parmelina pastillifera*	x						
Pa	*Physconia subpulverulenta*	x						
Pa	*Pyrrhospora quernea*	x						
Pa	*Anaptychia ciliaris*	x	x					
Pa	*Candelariella vitellina*	x	x					
Ls	*Lecanora chlarotera*	x	x					
Pa	*Ochrolechia pallescens*	x	x					
Pf	*Parmelia saxatilis*	x	x					
Pa	*Pertusaria albescens corallina*	x	x					
Pa	*Pertusaria coccodes*	x	x					
Pa	*Physconia venusta*	x	x					
Pa	*Pleurosticta acetabulum*	x	x					
Ls	*Buellia griseovirens*		x					
	Cladonia grayi		x					
Lv	*Hypocenomyce caradocensis*		x					
Lv	*Lecanora varia*		x					
Ls	*Lecidella achristotera*		x					
	Leptogium gelatinosum		x					
Pf	*Lethariella intricata*		x					
Pf	*Megaspora verrucosa mutabilis*		x					
Pf	*Ochrolechia alboflavescens*		x					
Pf	*Ochrolechia microstictoides*		x					
	Pertusaria pertusa meridionalis		x					
Pf	*Platismatia glauca*		x					
Pf	*Pseudevernia furf. furfuracea*		x					
Pa	*Parmelina tiliacea*		x					
Pa	*Ramalina pollinaria*		x					
	Cladonia chlorophaea		x			x		
	Tephromela atra		x					x
Pa	*Caloplaca cerina*		x	x		x	x	
Pa	*Xanthoria parietina*	x		x		x	x	x
Pa	*Caloplaca flavorubescens*	x	x		x		x	x

	Locality	1	2	3	4	5	6	7
Pa	*Caloplaca haematites*	x	x		x	x	x	x
Pa	*Candelariella xanthostigma*	x					x	
Pa	*Diplotomma alboatrum*	x					x	
Pa	*Lecanora hagenii*		x		x			
Pa	*Pertusaria albescens*	x	x					x
Pa	*Physcia tenella*		x				x	
Pa	*Physcia leptalea*		x			x	x	x
Ls	*Lecidella elaeochroma*	x	x			x		x
Ls	*Lecidella euphorea*	x	x		x	x		x
Ls	*Lecanora rugosella*		x			x	x	x
Pa	*Lecanora dispersa*			x				
Pa	*Physconia grisea*			x				
Ls	*Rinodina sophodes*			x				
Ls	*Rinodina oleae*				x			
Pa	*Caloplaca pyracea*				x	x	x	x
Pa	*Lecanora horiza*				x	x	x	x
Pa	*Catillaria chalybeia*					x	x	x
Ls	*Lecanora argentata*					x	x	x
Pa	*Physcia adscendens*					x	x	
Pa	*Rinodina pyrina*					x	x	
Pa	*Catillaria nigroclavata*						x	
Pa	*Lecanora umbrina*						x	
Pa	*Physcia biziana*						x	
Ls	*Rinodina septentrionalis*					x		
	Mycocalicium minutellum					x		
Ls	*Lecanora chl. chl. crassula*					x		
Ls	*Lecanora meridionalis*					x		x
Pf	*Pertusaria rhodiensis*					x		x
Pa	*Bacidia parathalassica*						x	x
Pa	*Bacidia thyrrenica*						x	x
	Lecania naegelii						x	x
Rf	*Ramalina canariensis*						x	x
Rf	*Ramalina farinacea reagens*							x
Rf	*Ramalina subgeniculata*							x
Ls	*Phlyctis argena*							x

O. microstictoides, Parmelia saxatilis, Platismatia glauca and *Pseudevernia furfuracea*. This is perhaps a result of competition from species favoured by nutrients and calcareous dust.

The natural woodland localities of Kos (loc. 4-7) were located at different altitudes on the north slope of a single mountain. The lower altitude of the localities at Kos compared to those of Kriti (300-580 m vs. 975-1360 m) results in a higher level of human activity, including animal husbandry. This again results in a higher nutrient level, which is reflected in the species composition: lack of Pseudevernietum and other elements of nutrient poor conditions (Table 1). At loc. 7, the woodland was more open than at the lower localities (4-6). The presence here of higher abundance and more species of the genus *Ramalina* may be the result of the more open environment in combination with the higher altitude (fog, precipitation?).

The *Cupressus* avenue (loc. 3) harboured only a few species. They are all characteristic of nutrient enriched substrates: *Caloplaca cerina, Lecanora dispersa, Physconia grisea, Rinodina sophodes* and *Xanthoria parietina*.

In all 72 epiphytic taxa were collected on *Cupressus sempervirens* on the two islands. Excluding *Rinodina* spp., this paper reports 45 epiphytic taxa from Kriti and 40 from Kos. 30 epiphytic taxa occurring on Kriti were not found on Kos, while 25 epiphytic taxa found on Kos were not found on Kriti (Table 1). Disregarding genera with only one species encountered, it is notable that the genera *Ochrolechia* and *Parmelina* were only found on the island of Kriti, while *Bacidia* and *Catillaria* were only found on Kos. The genera *Ramalina* and *Rinodina* are represented with more species on the island of Kos than on Kriti, while the opposite was the case for *Pertusaria*. Sipman & al. (2005) ascribe similar differences in the epiphytic lichen flora on the two Aegean islands of Naxos and Ikaria to restrictions in dispersal and chance colonisation. However, the differences in species composition on *C. sempervirens* on the isles of Kriti and Kos may well reflect the preliminary status of the floristic work on the islands.

The high percentage of taxa reported new to Kriti and Kos in particular underlines the present insufficient state of knowledge of the lichen flora of these islands. Further studies are obviously needed. Based on a purely floristic work, attempts to explain the difference in composition of the floras of the localities can only be speculative. Ecological investigations are, therefore, in great need to provide a better understanding of the impact of environment on the vegetation of the Mediterranean biotopes.

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