Cryptogamie, Mycologie, 2006, 27 (4): 341-374

New records of lichens and lichenicolous fungi from Fuerteventura (Canary Islands), with descriptions of some new species

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Abstract – The flora of lichens and lichenicolous fungi of Fuerteventura (Canary Islands) has been studied. The recent catalogue of the Island was composed of 91 species. In the presented annotated list, 98 are additional records of the island, of which 29 species are new to the Canary Islands and among them *Caloplaca fuerteventurae*, *Lecanactis canariensis*, *Lichenostigma canariense* and *L. episulphurella* are described as new.

Macaronesia / new taxa / taxonomy / first records / ecology / chemistry / biodiversity

Resumen – Se estudia la flora liquénica y de hongos liquenícolas de la isla de Fuerteventura (Islas Canarias). El catálogo de líquenes y hongos liquenícolas de Fuerteventura se componía hasta el momento de 91 de la isla, mientras que en este trabajo se señalan 98 taxones nuevos para la isla, de los que 29 eran desconocidos en las Canarias. *Caloplaca fuerteventurae, Lecanactis canariensis, Lichenostigma canariense* y *L. episulphurella* se describen en este trabajo.

INTRODUCTION

During a one week trip to the Canary Island Fuerteventura in 2001 by the first author and a one week trip by the second author in 2003, lichens and lichenicolous fungi where collected on all available kind of substrata which was encountered. Most of the collected material has been identified and the results are presented below. Earlier lichen reports from the island were provided by Pitard & Harmand (1911), Krog & Østhagen (1980) and Østhagen & Krog (1976). Also in monographs such as Egea (1989) a few lichens were recorded. In the recent checklist of the Canary Islands (Hernandez-Padrón 2001), in which a compilation is given for all known species for each of the Canary Islands, 74 species are recorded for Fuerteventura while Hafellner (2005) adds another 17. Fuerteventura, a subdesert island was the least studied of the Canary Islands so far, with only 91 species of lichens and lichenicolous fungi, before Lanzarote with 152 known taxa in Hernández-Padrón (2001) and 18 taxa in Hafellner (2005). In the study presented here, 98 species are new to the island, including 19 lichenicolous

fungi. *Caloplaca fuerteventurae*, *Lecanactis canariensis*, *Lichenostigma canariense* and *L. episulphurella* are newly described. Lichenicolous fungi have rarely been recorded for the island in the past. In Hernández-Padrón (2001), the only record is *Stigmidium epixanthum* and in Hafellner (2005), five additional records have been published.The study area is not polluted by industrial activities, the only pollution is caused by some higher concentration of traffic near villages and touristic activities, so the poorness in lichens of Fuerteventura is due to its subdesert climate.

MATERIAL AND METHODS

Lichens and lichenicolous fungi were collected from volcanic rock, terricolous, epiphytic from trees and shrubs, from localities all over the island Fuerteventura (Canary Islands). More than 900 collections were made by both authors, from 34 spots. Specimens are deposited in the herbaria of the author's, however some duplicates and type specimens are deposited in TFC. For each spot, a species list and ecological notes were made. Most of the data is databased in access. Additional records of species not collected by us, but mentioned already in Hernández-Padrón (2001), is indicated as (H-P 2001), or Hafellner (2005) and are mentioned in the same list but in cursive and not in bold. All the species of which collections are made by the authors are written in bold. Canary Islands in the text are recorded as: H (El Hierro), G (La Gomera), P (La Palma), T (Tenerife), C (Gran Canaria), F (Fuerteventura) and L (Lanzarote). Air dried specimens were examined anatomically and morphologically with a stereo-microscope and a light microscope. The standard microchemical methods have been used according Orange *et al.* (2001). The collected specimens have been studied mostly according Wirth (1995) and Purvis *et al.* (1992). Nomenclature of lichens or lichenicolous fungi follows Hernández-Padrón (2001), Coppins (2002), Diederich & Sérusiaux (2000), Hawksworth (2003) and Santesson *et al.* (2004), with exception of some more recent nomenclatural changes. Lichenicolous fungi are pointed out in the text with a * before the name and species growing autonomous as well as lichenicolous with (*). The term "malpaís" is the canarian name for lava fields, a much accidented, blackish, landscape. In the course of the survey, some specimens have been sent by the first author to specialists (see acknowledgements).

Collecting sites :

1 = SE of Corralejo, near Playa Bajo Negro, E of road, sandy dune area with low mixed shrubs (abundant *Launaea arborescens*), 28° 41.9'N – 13° 50.7'W, 25 m, 26 February 2001, P. & B. van den Boom.

2 = 3 km NNW of La Oliva, along road to Lajares, W slope of volcano "Arena", open field with lava blocks, 28° 37.9'N – 13° 56.8'W, 150 m, 26 February 2001, P. & B. van den Boom.

3 = N of La Oliva, N of road from Lajares to the east, near Rosa de Combrillo, 28° 41.1'N – 13° 55.9'W, 150 m, 26 February 2001, P. & B. van den Boom.

4 = NE of La Oliva, Villaverde, centre of village, neglected field among houses with small stones on sandy soil, 28° 38.2'N – 13° 54.3'W, 200 m, 27 February 2001, P. & B. van den Boom.

5 = N of Betancuria, S side of road to Mirador, near crossing with main-road, SW exposed rocky slope with low shrubs, *Lycium*, *Launaea* etc., 28° 26.2'N – 14° 03.2'W, 550 m, 27 February 2001, P. & B. van den Boom.

6 = S of Betancuria, W of Vega de Rio Palmas, near storage lake, E slope with acid boulders and outcrops, 28° 23.1'N – 14° 06'W, 300 m, 27 February 2001, P. & B. van den Boom.
7 = 2 km N of Pájara, along road to Betancuria, W slope of Fénduca, volcanic boulders and outcrops with shrubs, 28° 22.2'N – 14° 05.9'W, 500 m, 27 February 2001, P. & B. van den Boom.
8 = Parc Natural de Jandía, 5 km NW of Morro Jable, E of Casas de Gran Valle, Cuchillo del Ciervo, SW slope, volcanic rocks with shrubs, 28° 05.1'N – 14° 22.7'W, 350 m, 28 February 2001, P. & B. van den Boom.
9 = Parc Natural de Jandía, 6 km NW of Morro del Jable, Cuchillo del Ciervo, N exposed volcanic rocks near top of mountain-ridge, 28° 05.6'N – 14° 22.9'W, 450 m, 28 February 2001, P. & B. van den Boom.
10 = Parc Natural de Jandía, 6 km NW of Morro del Jable, E slope of Fraile, E exposed volcanic rocks near top of mountain-ridge, 28° 05.6'N – 14° 23'W, 440 m, 28 February 2001, P. & B. van den Boom.
11 = S of Puerto del Rosario, unpaved coastal road from Casas de las Salinas to Casas de Pozo Negro (halfway), volcanic stones in field, 28° 22.4'N – 13° 52.8'W, 75 m, 1 March 2001, P. & B. van den Boom.
12 = S of Puerto del Rosario, 2 km W of Casas de Pozo Negro, S of road along old lava stream, open field with large lava boulders, 28° 19.6'N – 13° 54.8'W, 100 m, 1 March 2001, P. & B. van den Boom.
13 = 2 km N of Betancuria, halfway along road to crossing of Mirador Morro Velosa, exposed roadside Eucalyptus trees, 28° 26.1'N – 14° 03.8'W, 500 m, 2 March 2001, P. & B. van den Boom.
14 = 3 km N of Pájara, N slope of Fénduca, mirador Degollada de los Granadillos, NE exposed volcanic outcrops, 28° 22.4'N – 14° 05.7'W, 450 m, 2 March 2001, P. & B. van den Boom.
15 = 7 km NW of Pájara, 1 km W of Ajuy, coastal plane with volcanic boulders and stones, 28° 24.7'N – 14° 09.4'W, 50m, 2 March 2001, P. & B. van den Boom.
16 = 6 km NW of Pájara, 2 km E of Ajuy, Barranco de la Madre del Aqua, N side main-road, N exposed schistose outcrops along source, 28° 24.7'N – 14° 08.6'W, 100 m, 2 March 2001, P. & B. van den Boom.
17 = 2.2 km N of Pájara, NW slope of Fénduca, 2 km S of mirador Degollada de los Granadillos, N sloping volcanic outcrops, 28° 22.1'N – 14° 06.5'W, 450 m, 2 March 2001, P. & B. van den Boom.
18 = 7 km S of Antigua, Tiscamanita, W side of village, volcanic outcrops along cultivated field, on E exposed outcrops, 28° 21'N – 14° 03'W, 250 m, 3 March 2001, P. & B. van den Boom.
19 = 7.5 km SSW of Pájara, SW of Fayagua Degollada del Viento, near view point, N slope with volcanic outcrops and shrubs, 28° 17.4'N – 14° 09.2'W, 42 m, 3 March 2001, P. & B. van den Boom.
20 = SSW of Pájara, NW of Montaña Hendida, S slope of "Melindraga", SW sloping volcanic rock with calcareous parts, 28° 16.1'N – 14° 08.9'W, 350 m, 3 March 2001, P. & B. van den Boom.
21 = N of Pájara, nearby mirador Degollada de los Granadillos, N slope of Fénduca along road, W exposed sloping volcanic rock, 28° 22.3'N – 14° 05.6'W, 450 m, 3 March 2001, P. & B. van den Boom.
22 = N of Betancuria, S side of road to mirador, near crossing with main-road, SW exposed rocky slope, 400 m from entrance along path, 28° 26.2'N – 14° 02.8'W, 550 m, 3 March 2001, P. & B. van den Boom.
23 = Ampoyenta (village), *Cupressus* near the church, 270 m, 28R 0598499, 3149160, 17 July 2004, J. Etayo & E. Ros.
24 = Road from Antigua to Betancuria, Mirador de Morrovelosa, mountain ridge with shrubs and abundantly material of *Ramalina*, *Seirophora* and *Tornabea* growing on rocks and shrubs, 585 m, 28R 0592647, 3146560, 17 July 2004, J. Etayo & E. Ros.
25 = Between Betancuria and Pájara, Degollada de los Granadillos, mountain ridge with tabaibas (*Euphorbia*), 410 m, 28R 0588612, 3139934, 17 July 2004, J. Etayo & E. Ros.

26 = Ajuy, beach with outcrops of Parque Natural de Ajuy, a lichen poor area, 30 m, 28R 0582866, 3142273, 17 July 2004, J. Etayo & E. Ros.
27 = Corralejo, malpaís de Corralejo, nearby dunes, 18 July 2004, 10 m, 28R 0614223, 3170602, 18 July 2004, J. Etayo & E. Ros.
28 = Malpaís Grande, between Pozo Negro and Gran Tarajal, 80 m, 28R 0603330, 3134667, 18 July 2004, J. Etayo & E. Ros.
29 = Jandía, road to Cofete by track from Morro Jable, mountain ridge, sheltered windy side with species of *Ramalina* and *Diploicia*, at the exposed side with species of *Caloplaca* and *Xanthoria*, 240 m, 28R 0555680, 3107861, 19 July 2004, J. Etayo & E. Ros.
30 = Jandía, at the entrance of Las Salinas beach, 2 km from the lighthouse, shrubs (*Launaea*) without lichen growth, 20 m, 28R 0552019, 3106587, 19 July 2004, J. Etayo & E. Ros.
31 = Parque natural de El Cardón, road from El Cardón to Pájara, 400 m, 28R 0583704, 3128345, 20 July 2004, J. Etayo & E. Ros.
32 = Playa de El Cotillo, NW of the island, only a *Opegrapha* on *Salsola vera*, sandy plane and abandoned rock-shores, 20 m, 28R 059684, 3172287, 21 July 2004, J. Etayo & E. Ros.
33 = Road from Lajares to playa de Majamano, malpaís, rocks are covered for large areas with *Pertusaria* and *Ramalina*, etc., 140 m, 28R0604103, 3175124, 21 July 2004, J. Etayo & E. Ros.
34 = Malpaís de La Oliva, from Valverde to La Oliva, from the base of the volcano occupied by large populations of *Parmelia* s.l., *Ramalina* and *Roccella* etc., as well as Lichinaceae, 220 m, 28R 0603337, 3167388, 21 July 2004, J. Etayo & E. Ros.

THE SPECIES

Acarospora lavicola J. Steiner
A. lavicola resembles *A. heufleriana* but the spottest on the thallus is K-.
Although this species is common on the island, it was previously known from all the Canary Islands except the two "desert Islands" L and F.
Loc. 7, on top of a boulder, vertical facing, 25857, 25863 (hb. v.d. Boom); Loc. 11, on horizontal exposed surface of stone in open field, 25993, 25997, 26002 (hb. v.d. Boom); Loc. 12, on top of exposed boulder, 26011 (hb. v.d. Boom); Loc. 15, on low outcrop in open coastal plane, 26078 (hb. v.d. Boom); Loc. 26, basalt, 22076 (hb. Etayo); Loc. 28, common in malpaís, 22026, 22032 (hb. Etayo); Loc. 31, in small fissures of outcrops, 22022 (hb. Etayo).

Acarospora nodulosa (Dufour) Hue
This species has been recently recorded from Fuerteventura (Hafellner, 2005).

Acarospora versicolor Bagl. & Carestia
This specimen contains heavily pruinose thallus with dark immersed apothecia so the habitus is likely a *Aspicilia* and easily overlooked for a species of this latter genus. It was reported from all Canary Islands before, except F and L.
Loc. 6, on N side of low outcrop, 25809 (hb. v.d. Boom).

Acrocordia macrospora A. Massal.
This rather inconspicuous species was growing abundantly mainly in crevices. It was previously known from P and T.
Loc. 9, on N facing sheltered cliffs, 25937, 25962 (hb. v.d. Boom); Loc. 10, on E facing sheltered cliffs, 25977 (hb. v.d. Boom).

Anaptychia ciliaris (L.) Körb. (H-P 2001)
Loc. 10, on E facing cliff, on volcanic rock, 25976 (hb. v.d. Boom).

Anaptychia setifera Mereschk. ex Räsänen (H-P 2001)

Arthonia albopulverea Nyl.
[= *Arthothelium crozalsianum* (B. de Lesd.) B. de Lesd.]
This species is very similar to *A. punctiformis* but it contains submuriforme ascospores. The Fuerteventura specimen lives in similar habitats. New to the Canary Islands.
Loc. 33, on branches of shrub, 22083 (hb. Etayo).

Arthonia apatetica (A. Massal.) Th. Fr.
A. apatetica is easily overlooked for other species in the genus such as *A. muscigena* Th. Fr. However microscopical characteristics as ascospores are diagnostic. (12-15 × 4.5-5 µm, with rounded cells in *A. apatetica*). New to the Canary Islands.
Loc. 13, on exposed roadside *Eucalyptus* tree, 26033 (hb. v.d. Boom).

Arthonia cf. *caesiella* Nyl.
Without thallus, but with pruinose, roundish ascomata; epithecium green and hypothecium hyaline, ascospores 12-14 × 5-6 µm, uniseptate.
Loc. 25, on *Euphorbia* (tabaiba), 22004 (hb. Etayo).

****Arthonia diploiciae*** Calatayud & Diederich
A. diploicia is widely distributed in Europe (Hafellner 1995, v.d. Boom & Giralt 1996). Known already from H, G, C and recently from Fuerteventura (Hafellner, 2005).
Loc. 6, N side of low outcrop, on *Diploicia canescens*, 25822 (hb. v.d. Boom); Loc. 27, on *D. canescens* in malpaís, 21991 (hb. Etayo); Loc. 28, on *D. canescens* in malpaís, 22027 (hb. Etayo); Loc. 24, on *D. canescens* on shrubs, 22044 (hb. Etayo).

Arthonia punctiformis Ach.
This species is the only "lichen" without algae growing on branches and wood of shrubs in the meridional Jandía shore as well as the northern dune area. It is already mentioned from C and G.
Loc. 1, on wood of an unidentified shrub, 25669, 25670 (hb. v.d. Boom); Loc. 30, on branches of shrub, 22081 (hb. Etayo); Loc. 32, on wood of shrubs, 22082 (hb. Etayo).

Aspicilia calcarea (L.) Mudd (H-P 2001)
Recorded by Pitard & Harmand (1911) from Puerto de Cabras (Fuerteventura). Our records regards mainly the ochre colored form. The acidic substrate, thalline colour and the infection by a species of *Lichenostigma,* different from *L. elongata*, very common on mediterranean *A. calcarea*, could be symptoms we treat another species of *Aspicilia*, however that subject needs further study.
Loc. 2, on low calcareous outcrop, 25676 (hb. v.d. Boom); Loc. 26, on basalt, 22075 (hb. Etayo); Loc. 27, on rock in malpaís, 21997 (hb. Etayo); Loc. 28, common in malpaís, 22026, 22031 (hb. Etayo); Loc. 34, on rocks in malpaís, 21976 (hb. Etayo); Ibid., 21980 (TFC).

Aspicilia contorta (Hoffm.) Kremp.
This species was known from P, T and L .
Loc. 22, on SW exposed sloping rock outcrops, 26185 (hb. v.d. Boom); Loc. 24, on rocks, 22056 (hb. Etayo).

Bacidia subincompta (Nyl.) Arnold
This species is widely distributed in Europe and North America. New to Canary Islands.
Loc. 13, on an exposed roadside *Eucalyptus* tree, 26032 (hb. v.d. Boom).

Bactrospora carneopallida Egea & Torrente
Previously known from C, L and T.
Loc. 2, on N exposed vertical side of lava block, 25712 (hb. v.d. Boom); Loc. 9, on N facing cliffs near the top of a mountain-ridge, 25712 (hb. v.d. Boom); Loc. 27, in malpaís, 21990, 21992, 21998 (hb. Etayo), 21997 (TFC).

Bactrospora aff. *corticola* (Nyl.) Almq.
The thallus is weakly lichenized, the specimen contains ascospores of *Dryina*-type, c. 100 × 2-3 µm.
Loc. 1, on *Launaea arborescens* in sandy dune area, 25671 (hb. v.d. Boom).

Buellia dispersa A. Massal. (H-P 2001)
Recorded by Pitard & Harmand (1911) as *Lecidea dispersa* A. Massal. from Puerto de Cabras (Fuerteventura).
Loc. 2, on volcanic outcrop, 25716 (hb. v.d. Boom); Loc. 24, on rock, 22065 (TFC); Loc. 27, on rock in malpaís, 21997 (TFC); Loc. 33, on rocks in malpaís, 21983 (hb. Etayo).

Buellia maritima (A. Massal.) Bagl.
B. maritima is most definitely not synonymous with *B. stellulata*. It does not have the same chemistry (norstictic acid instead of 2-O'-methylperlatolic), a much more pruinose thallus with large amounts of Ca-oxalates, a rimose, non-areolate thallus, so it is completely different (Bungartz & Nash, 2004). In Bungartz & Grube (2005) is proved that even *Buellia subalbula* is not synonymous with *B. maritima*.
Loc. 20, on N facing rock, 26132 (hb. v.d. Boom).

Buellia aff. *stellulata* (Taylor) Mudd
Thallus white to pale grayish, apothecia inmersed, spottests K+ y, C- I- , ascospores psilate.
Loc. 11, on horizontal surface of low stones in open field, 25994 (hb v.d. Boom); Loc. 31, on exposed rock, 22019 (hb. Etayo).

Buellia tesserata Körb.
In Rico *et al.* (2003), *B. tesserata* is treated and compared with the related *Dimelaena radiata*. It was recorded from La Palma as *Buellia fimbriata*. Our specimen is an unusual form (pers. comm. F. Bungartz).
Loc. 10, on E exposed volcanic outcrop, 26200 (hb v.d. Boom).

Buellia zoharyi Galun
This placodioide *Buellia* species is treated in Trinkaus & Mayrhofer (2000) and recorded for Lanzarote (Obermayer, exsiccate 125). The thallus of our specimen is infected by *Lichenostigma semiimmersa*.
Loc. 5, on soil in crevices of N exposed outcrop, 25770 (hb. v.d. Boom).

Caloplaca alociza (A. Massal.) Mig.
C. alociza is an inconspicuous mainly endolithic species and thus easily overlooked. New to the Canary Islands.
Loc. 24, on rock with *Diploicia canescens*, 22060 (hb. Etayo).

Caloplaca aurantia (Pers.) Hellb.
This species is very common in mediterranean areas, but in the Canary Islands only reported from L before.
Loc. 14, E exposed vertical rock-face, 26044 (hb. v.d. Boom).

Caloplaca aurantiellina Harmand
[= ?*Caloplaca aegatica* Giralt, Nimis & Poelt]
C. aurantiellina Harmand was described from Alegranza and Tenerife on the branches of *Lycium afrum* & *Euphorbia obtusifolia* (Pitard & Harmand, 1911). Altough with small differences in thallus colour, it seems to be the same species described from several localities in Mediterranean areas and Macaronesia by Giralt *et al.* (1992). New to Fuerteventura.
Loc. 23, *Cupressus* in hermitage, 22002 (hb. Etayo); Loc. 24, branches of shrub, 22049; Loc. 25, exposed shrub, 22005 (hb. Etayo); Loc. 29, branches of shrub, 22038 (TFC, hb. Etayo); Loc. 31, branches of shrubs, 22025 (TFC); Loc. 34, branches of shrubs in malpaís, 22016 (hb. Etayo).

Caloplaca cerina (Ehrh. ex Hedw.) Th. Fr.
This species seems to be common in the Canary Islands. It was only lacking in Fuerteventura.
Loc. 19, among N sloping outcrops, on branches of *Launaea*, 26124 (hb. v.d. Boom).

Caloplaca chalybaea (Fr.) Müll. Arg. (H-P 2001)
Recorded by Pitard & Harmand (1911) from Puerto de Cabras (Fuerteventura).
Loc. 2, on low calcareous outcrops, 25675 (hb. v.d. Boom); Loc. 11, on N facing outcropping rock, vertical surface, 25990 (hb. v.d. Boom).

Caloplaca citrina (Hoffm.) Th. Fr.
Although this species is very common in many places of Europe, and reported several times from the Canary Islands, this record is new for Fuerteventura.
Loc. 23, very small thallus on *Cupressus* mixed with *C. aurantiellina* in a garden, 22001 (hb. Etayo).

Caloplaca crenularia (With.) Laundon
Known from most islands (L, G, P, T), it was not recorded from Fuerteventura before.
Loc. 24, on rock, 22072 (hb. Etayo); Loc. 34, on rock in malpaís, 22014 (hb. Etayo).

Caloplaca erythrocarpa (Pers.) Zwack. (H-P 2001)
This species which is common in mediterranean areas in Europe, is recorded so far from F, L and T.
Loc. 6, on N facing vertical surface of low outcrop, 25820 (hb. v.d. Boom).

Caloplaca fuerteventurae van den Boom & Etayo sp. nov. – Fig. 1.

Diagnose latine – *Thallus saxicola, placodioideus, lobulis marginalibus ad 0.5-3 mm longis, superficie flava vel aurantiaco-flava, K + purpurea; apothecia frequentia, primum in thallo immersa, deinde sessilia, lecanorina, basi constricta, ad 0.9(-1) mm lata, disco plano aut leviter concavo, luteorubrus, margine thallino persistente, flavido-aurantiaco, K + (purpureo), ad 0.1(-0.15) mm crasso; excipulum prosoplect-enchymaticum; hymenium 65-75 µm altum, crystalla continens; hypothecium incoloratum; paraphyses clare septatae, cum base 2-2.5 µm et summa 3-5 µm crassa; asci anguste clavati, typo Teloschistacearum, octospori, 35-50 × 10-17 µm; ascosporae polariloculares, hyalinae, citriformes, 10-12 × 8-9 µm, septo 3.5-6 µm crasso.*

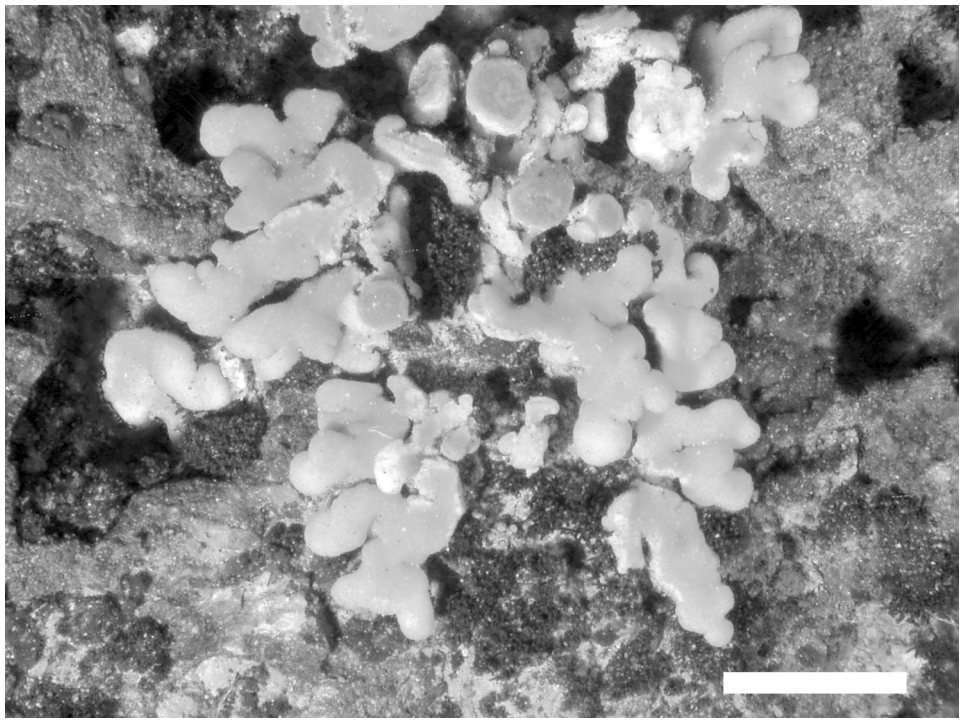

Fig. 1. *Caloplaca fuerteventurae* (holotype); Lobate thallus and apothecia. Scale: 2 mm.

Type: SPAIN, Canary Islands, Fuerteventura, Parc Natural de Jandía, 5 km NW of Morro Jable, E of Casas de Gran Valle, Cuchillo del Ciervo, SW slope, volcanic rocks with shrubs, on horizontal, well lit surface of volcanic outcrops, 28° 05.1'N – 14° 22.7'W, 350 m, 28 February 2001, P. & B. v.d. Boom 25889 (TFC-holotype; hb. v.d. Boom-isotype).

Thallus saxicolous, placodioid, forming irregular patches which are sometimes areolate in the centre, but always with elongate marginal lobes, sometimes imbricate at the tips; areoles 0.5 – 2 mm wide, flat to slightly convex; marginal lobes 0.5-3 mm long, 0.3-1 mm wide, loosely appressed, mostly somewhat upturning at the rim; upper surface smooth, somewhat shiny, yellow to yellowish orange; upper cortex c. 100 µm high, upper part yellowish, without crystals, hyphae of dense intricate structure; medulla not developed, algal layer c. 100 µm thick; undersurface indiscernible. **Apothecia** abundantly, initial immersed becoming erumpent and sessile, rounded, constricted at base, up to 0.9(-1) mm diam.; disc plane to slightly convex, orange; margin paler than the disc, pale orange to yellowish *c.* 0.1(-0.15) mm wide; excipulum hyaline, with a yellowish outer rim, composed of prosoplectencymatic cells; hymenium 65 – 75 µm high, incrusted with dark scattered granules up to 6 µm wide; epithecium yellowish brown; paraphyses simple to rarely branched, 2 – 2.5 µm wide, widened at apices and up to 5 µm wide; asci *Teloschistes*-type (Purvis *et al.*, 1992: 661); **Ascospores** 8 per ascus, hyaline,

polarilocular, ellipsoid when young becoming citriform, 10-12 × 8-9 µm, with a relative long septum (3.5-6 µm).

Chemistry: Thallus and apothecia K + dark purple.

Distribution and ecology: *C. fuerteventurae* is only known from the type locality, growing in an open vegetation, mainly on horizontal surfaces of volcanic outcrops. A rather large population was present in a community with *Diploicia canescens*, *Diplotomma alboatrum*, *Lecania spadicea*, *Phaeophyscia hirsuta* and *Xanthoria resendei*.

Notes: This species belongs to the *C. flavescens*-complex because of the citrus like ascospores. There are only a few species known which have similar ascospores. From the Canary Islands only *C. aurantia* and *C. flavescens* are known. Another member of the complex is *C. thallincola*, occurring in coastal areas. A further *Caloplaca* species with long lobules common in the Canary Islands is *C. gloriae*. It differs from *C. fuerteventurae* in its ascospores that are elipsoidales and the presence of pseudocyphellae in the thallus. *C. aegaea* Sipman, recently described in Sipman & Raus (2002), is known from Greece and southeastern Spain and is most related to this new species. *C. aegaea* differs in having shorter, more appressed, more reggular arranged marginal lobes, a darker coloured, more brownish-orange thallus, smaller ascospores and the presence of dark granules in the hymenium.

Caloplaca gloriae Llimona & Werner (H-P 2001)
A common and conspicuous (placodioide) species. Recorded as *Caloplaca gomerana* J. Steiner from Fuerteventura and also known from all the other islands.
Loc. 11, open field with volcanic stones, on horizontal surface of stone, 25995 (hb. v.d. Boom); Loc. 27, malpaís, 21991 (hb. Etayo).

Caloplaca holocarpa (Hoffm.) Wade
Under the name *C. holocarpa* this species is mentioned from G, L, P and T. Even the name *C. pyracea* (Ach.) Th. Fr. has been used in Hernández-Padrón (2001) from C, H, L and T. However it is not sure that these are separated species.
Loc. 2, on *Senecio kleinia*, 25686 (hb. v.d. Boom); Loc. 3, on *Lycium intricatum*, 25756 (hb. v.d. Boom); Loc. 8, on *L. intricatum*, (hb. v.d. Boom); Loc. 13, on exposed roadside *Eucalyptus*, (hb. v.d. Boom); Loc.19, on *Launaea* sp., 26125 (hb. v.d. Boom).

Caloplaca lithophila H. Magn.
Although most checklists gather this taxon under *C. holocarpa*, here we follow the checklist of Belgium (Diederich & Sérusiaux, 2000). In this latter publication, notes are given on this matter, to separate both species, *C. lithophila* and *C. holocarpa*. First recorded here for the Canary Islands.
Loc. 19, on N exposed, vertical rock, 26127 (hb. v.d. Boom).

Caloplaca scoriophila (A. Massal.) Zahlbr.
It is rather similar to *C. carphinea,* a species which has already been recorded for Fuerteventura (Hernández-Padrón, 2001) but with thicker thallus and red apothecia.
C. scoriophila is rather common in the Canary Islands and was known already from C, G, L, P, T and recently recorded from Fuerteventura by Hafellner (2005). This species is commonly parasited by an undescribed *Lichenostigma* that blackened the thallus.

Loc. 3, open field with lava blocks, on N side of top of boulder, 25735 (hb. v.d. Boom); Loc. 6, on E exposed slope, on N side and vertical surface of a boulder, 25799 (hb. v.d. Boom); Loc. 25, on outcrops, 22003 (hb. Etayo); Loc. 28, on outcrops in malpaís, 22031 (hb. Etayo); Loc. 34, on outcrops in malpaís, 22014, 22018, 22077 (hb. Etayo).

Candelariella aurella (Hoffm.) Zahlbr.
This species is very common in a lot of areas and wideley distributed in Europe. It must be overlooked in the Canary Islands because previously it was only recorded from T.
Loc. 24, on rock, 22064 (hb. Etayo).

Candelariella vitellina (Hoffm.) Müll. Arg. (H-P 2001)
This species is very common in the Canary Islands and known from all the islands.
Loc. 34, on rock in malpaís, also growing on other lichens, 22014 (hb. Etayo); Loc. 31, on rock, 22022 (hb. Etayo).

Catillaria chalybeia (Borrer) A. Massal.
This species seems to be common and even rather variable on the island F. The green pigment is lacking in some of our specimens. It was known from P and T.
Loc. 5, on SW exposed sloping rock, 25834 (hb. v.d. Boom); Loc. 7, on exposed rock, 25873 (hb. v.d. Boom); Loc. 14, on E facing rock, 26049 (hb. v.d. Boom); Loc. 33, on rock in malpaís, 21977 (hb. Etayo).

Catillaria mediterranea Hafellner
It was known from all the Canary Islands except Fuerteventura (Tretiach & Hafellner 1998), however it has recently been recorded in Hafellner (2005). It is especially recorded on *Ramalina bourgeana* from the Canary Islands.
Loc. 5, on N exposed vertical rock on *R. bourgeana*, 25841 (hb. v.d. Boom).

Cladonia foliacea (Huds.) Willd. (H-P 2001)
This species was found growing on sandy soil sometimes close with *Squamarina concrescens*, in a smaller population. It doesn't seem to be rare on the island.
Loc. 2, terricolous, among and under overhanging outcrop, 25706, 25713, 25724 (hb. v.d. Boom); Loc. 6, terricolous, close along a steep rock-face and a boulder, 25789, 25790, 25801 (hb. v.d. Boom); Loc. 14, terricolous sheltered along a steep rock-face, 26041 (hb. v.d. Boom); Loc. 21, sheltered, along N facing outcrop, on soil, 26164 (hb. v.d. Boom).

Cladonia rangiformis Hoffm.
This cosmopolitan species is common all over Europe, Most probably this is one of the most common *Cladonia* species on the Canary Islands, previously known from all islands except F, where it doesn't seem to be common. The encountered few populations were rather small.
Loc. 6, terricolous along N side of outcrop, 25788, 25792 (hb. v.d. Boom); Loc. 21, terricolous along N side of outcrop, 26162 (hb. v.d. Boom).

Clauzadea metzleri (Körb.) Clauz. & Roux ex D. Hawksw.
In the field this species could be overlooked for a Verrucariaceae, by the inconspicuous thallus and subimmersed apothecia. New to the Canary Islands.
Loc. 20, on N facing calcareous rock, 26143 (hb. v.d. Boom).

Clauzadea monticola (Ach.) Hafellner & Bellem.
Although this species is not easily overlooked, by the conspicuous black, sessile lecideine apothecia, it was previously recorded for Macaronesia (Madeira) by Tavares (1952), but not for the Canary Islands.
Loc. 22, on N facing outcrops, 26177 (hb. v.d. Boom).

****Clypeococcum epicrassum*** (H. Olivier) Hafellner & Nav.-Ros.
This species is most probably a common species in the Canary Island and previously known from C, G, L, P and T.
Loc. 6, terricolous among outcrops, on *Squamarina concrescens,* 25814 (hb. v.d. Boom).

Collema auriforme (With.) Coppins & Laundon
The genus *Collema* is rather well presented in the Canary Islands with 14 species mentioned in (H-P 2001). However from the five species mentioned here, only *C. tenax* seems to be rather common. *C. auriforme* was only known from T.
Loc. 5, on N facing, vertical outcrops, 25838 (hb. v.d. Boom).

Collema crispum (L.) Weber ex F.H. Wigg.
Known already from C and T.
Loc. 6, on compact sand over low outcrop, 25806 (hb. v.d. Boom).

Collema polycarpon Hoffm.
Previously only mentioned from T.
Loc. 14, on calcareous volcanic outcrop, 26065 (hb. v.d. Boom); Loc. 34, on outcrops in malpaís, 22079 (hb. Etayo).

Collema ryssoleum (Tuck.) A. Schneider
Recorded already from H, L, P and T.
Loc. 6, on N side of high outcrop, 25798 (hb. v.d. Boom).

Collema tenax (Sw.) Ach. em Degel. (H-P 2001)
This species is the only one in the genus previously reported from Fuerteventura, but also from C, H, P and T.
Loc. 3, on N side at top of boulder, 25736 (hb. v.d. Boom); Loc. 28, on argillous soil between malpaís, 22030 (hb. Etayo).

Collemopsidium calcicolum J. Steiner (H-P 2001)
Recorded by Pitard et Harmand (1911) from Fuerteventura. The description is not clear enough to identify this species, so we consider this as a doubtful record.

Dimelaena californica (H. Magn.) Sheard
Previously only known from coastal SW California (North America) and Baja California (Mexico). Norstictic acid has been found by TLC (chemotype I). New to the Canary Islands.
Loc. 7, on horizontal surface on outcrop, in a well lit situation, 25856 (hb v.d. Boom).

Dimelaena radiata (Tuck.) Hale & W. L. Culb. (H-P 2001)
This species seems to be very common on the Canary Islands and is recorded from all islands except G.
Loc. 3, on top of volcanic block, 25738, 25739 (hb. v.d. Boom); Loc. 7, on top of volcanic outcrop, vertical surface, 25859 (hb. v.d. Boom); Ibid., on volcanic stones in open field, 26003 (hb. v.d. Boom); Loc. 12, on top of boulder, 26012 (hb. v.d. Boom); on volcanic boulder and stones, 26077 (hb. v.d. Boom); Loc. 28, on outcrops in malpaís, 22031, 22032 (hb. Etayo); Loc. 31, on outcrops, 22021, 22022 (hb. Etayo).

Diploicia canescens (Dicks.) A. Massal. (H-P 2001)
According to Molina *et al.* (2002), *D. subcanescens* should be included in a different genus, *"Diplotomma"* . However we prefer not to use this new name before it is universally accepted. It is recorded by Pitard & Harmand (1911) as

Lecidea (Buellia) canescens Ach. from Puerto de Cabras (Fuerteventura). This is a very common species on te study island.
Loc. 6, on low shaded volcanic outcrop, 25821 (hb. v.d. Boom); Loc. 8, on horizontal surface of boulder, 25894 (hb. v.d. Boom); Loc. 20, N facing vertical outcrop, 26152 (hb. v.d. Boom); Loc. 24, on unidentified shrubs, 22042, 22044, 22046, 22052 (hb. Etayo, TFC); Loc. 24, on rock, 22060 (hb. Etayo), 22066 (TFC); Loc. 27, (steril), in malpaís, 21991 (hb. Etayo); Loc. 28, on malpaís, 22027 (hb. Etayo); Loc. 29, on branches of shrub, 22037, 22038 (TFC); Loc. 31, branches of shrub and rock, 22025 (TFC); Loc. 33 (fructified), branches of shrub, 21975 (hb. Etayo); Ibid., on outcrops (steril), 21982, 21989 (hb. Etayo), 21987 (TFC); Loc. 34, rocks in malpaís, 22014 (hb. Etayo); Ibid., on branches of shrubs, 22016, 22038 (hb. Etayo).

Diploicia subcanescens (Werner) Hafellner & Poelt (H-P 2001)
The status of this species is discussed in Molina *et al*. (2002). According to that study *D. sucanescens* should be included in a different genus and is synonym with *"Diplotomma" canescens*. However we prefer not to use this new name before it is universally accepted.
Loc. 27, on volcanic rocks in malpaís, 21992 (hb. Etayo), 21996 (TFC).
Loc. 29, very abundant on wind exposed outcrops, 22036 (TFC, hb. Etayo).

Diploschistes actinostoma (Pers. ex Ach.) Zahlbr.
Known already from H, P and T.
Loc. 11, on horizontal surface of volcanic stones in a field, 26006 (hb. v.d. Boom).

Diploschistes diacapsis (Ach.) Lumbsch (H-P 2001).

Diplotomma alboatrum (Hoffm.) Flot.
The genus *Diplotomma* is not well represented in the Canary Island. *D. alboatrum* is known from H and T. *D. nivalis* is recorded from L. Our specimens have cream coloured thallus with pruinose apothecia.
Loc. 10, on E facing cliff, on volcanic outcrops, 25979 (hb. v.d. Boom); Loc. 24, on unidentified shrubs, 22044, 22049 (hb. Etayo); Ibid., on rock, 22064 (hb. Etayo);
Loc. 27, on rocks in malpaís, 21991 (hb. Etayo); Loc. 33, on rocks in malpaís, 21983 (hb. Etayo).

Dirina ceratoniae Fr. (H-P 2001)
Loc. 8, on *Lycium intricatum*, 25898 (hb. v.d. Boom); Loc. 23, on *Cupressus* in hermitage, 22001 (hb. Etayo).

Dirina insulana (C. Tav.) Tehler
Previously known only from T.
Loc. 27, on rocks in malpaís, 21990 (hb. Etayo).

Dirinaria applanata (Fée) Awasthi
Previously known from all the Canary Islands except Fuerteventura.
Loc. 24, on rocks, 22063 (hb. Etayo).

Endocarpon loscosii Müll. Arg.
This species was previously known from continental subdesert areas in northern Spain (Aragón and Navarra). New to the Canary Islands.
Loc. 18, on E exposed vertical rock, 26122 (hb. v.d. Boom).

****Endococcus verrucosus*** Hafellner
Parasite on *Aspicila calcarea* in Fuerteventura, the sample has large perithecia, semiimmersed to erumpent, hymenium I+ blue, asci 8-spored, and ascospores

yellowish when young, slightly verruculose and brown, psilate when mature, with darker zones in torus and apices, of 10-14,5 × 6-7 µm, notably smaller than typical *E. verrucosus*.
Loc. 34, on *A. calcarea* in outcrops in malpaís, 22077 (hb. Etayo).

Farnoldia jurana (Schaer.) Hertel
F. jurana is widely distributed in Europe and also known from North America. New to the Canary Islands.
Loc. 10, on E exposed volcanic rock, 25969, 25974 (hb. v.d. Boom).

Fulgensia fulgens (Sw.) Elenkin
This species was known from the more eastern part of the Canary Islands (C, L, T).
Loc. 5, terricolous among stones and low outcrops, 26186 (hb. v.d. Boom); Loc. 22, N side of rock, in crevices, 25772 (hb. v.d. Boom).

****Gelatinopsis roccellae*** Etayo, Paz-Bermúdez & Diederich
This lichenicolous species was recently described from Spain (Etayo *et al*., 2001). First record of the Canary Islands.
Loc. 9, on E exposed cliff, on *Roccella*, 25939 (hb. v.d. Boom).

Gloeoheppia turgida (Ach.) Nyl. (H-P 2001)
Recorded before by Egea (1989) from Fuerteventura.
Loc. 28, on argillous soil in malpaís, 22028 (hb. Etayo).

Heppia despreauxii (Mont.) Tuck. (H-P 2001)

Heppia lutosa (Ach.) Nyl. (H-P 2001)

Heterodermia leucomelos (L.) Poelt (H-P 2001)

H. leucomelos ssp. *boryi* Swinscow & Krog (H-P 2001)

Heteroplacidium contumescens (Nyl.) Breuss
This is a widely distributed species which was also known from continental Spain (Llimona & Hladun, 2001). New to the Canary Islands.
Loc. 3, on the S side of top of boulder, 25746 (hb. v.d. Boom).

Heteroplacidium phaeocarpoides (Nyl.) Breuss
This species is yet known from France, Spain, Algeria and Tunesia (pers. comm. O. Breuss). New to the Canary Islands.
Loc. 20, on N facing rock, 26139 (hb. v.d. Boom).

****Intralichen lichenicola*** (M. S. Christ. & D. Hawksw.) D. Hawksw. & M. S. Cole
Neither in (H-P 2001) nor in Hafellner (2005), this species is mentioned, so we regard this as new to the Canary Islands.
Loc. 24, growing in the hymenium of *Candelariella aurella*, on rock, 22064 (hb. Etayo).

Lecanactis canariensis van den Boom & Etayo sp. nov. – Fig. 2.

Diagnose latine – *Thallus epiliticus, rimoso-areolatus, albus vel griseoalbus, in sectione usque ad 0.3 mm latus; ascomata rotundata, 0.6 mm in diam. vel ellipsoidea, 0.5 × 0.8 mm, sessilia vel stipitata, immarginata vel margine obscuro, ad 0.05 mm crasso; discus fuscus, moderate griseus pruinosus; hymenium ad 100 µm altum;*

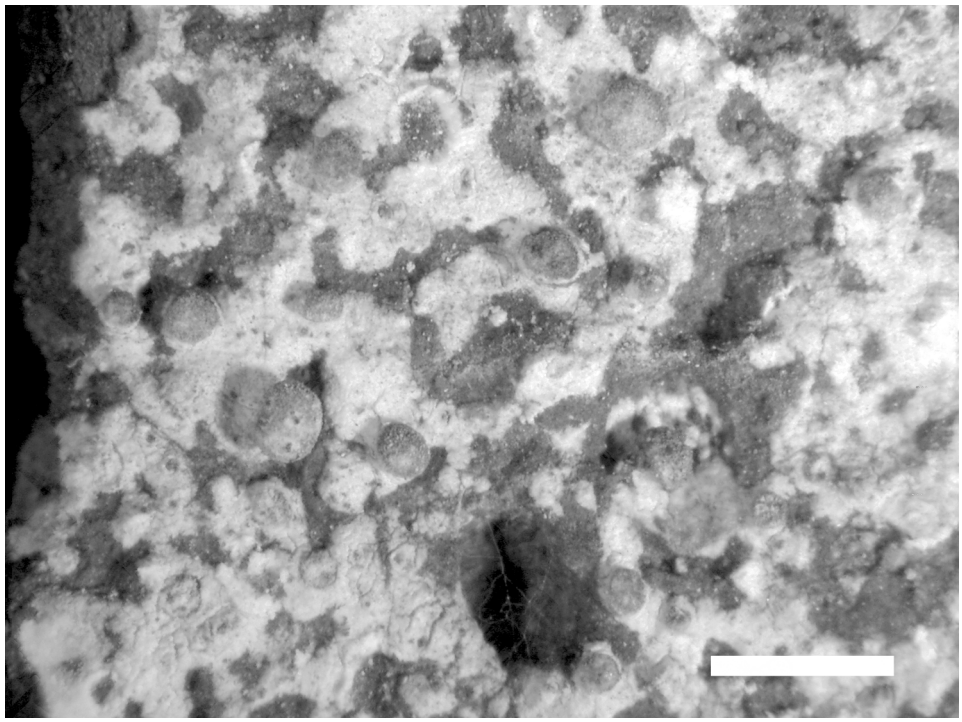

Fig. 2. *Lecanactis canariensis* (holotype); Crustose thallus and apothecia. Scale: 2 mm.

epithecium griseo-brunneum; hypothecium fusco-nigrum; paraphysoides ramosae et anastomosantes, usque ad 2.5 µm crassae; asci cylindrici-clavati, fissitunicati, 30-45 × 15-18 µm, octospori; ascosporae fusiformes, 22-28 × 4-5.5 µm, triseptatae; pycnidia immersa, nigra, 30-100 µm diam.; conidia 12-18 × 0.8 µm, curvata. Thallus et apothecia K-, C-, P-, KC-, materialia chemicalia non continens.

Type: SPAIN, Canary Islands, Fuerteventura, N of Betancuria, S side of road to mirador, SW exposed rocky slope, on N facing vertical volcanic outcrop, 550 m, 3 March 2001, P. & B. van den Boom 26180 (TFC-holotype; hb v.d. Boom-isotype).

Thallus crustose, effuse, rimose-areolate or weakly areolate, thin, up to 0.3 mm thick; areoles 0.2 – 0.5 mm. diam.; prothallus not observed; upper surface white, dull, with a somewhat powdery appearance, no cortex differentiated. **Photobiont** *Trentepohlia*, algal cells 8-16 µm diam. **Apothecia** frequent, roundish to irregulary ellipsoid, sessile to somewhat short stipitate, strongly constricted at base, up to 0.6 mm in diam. or 0.5 × 0.8 mm; margin not developed or thin up to 0.05 mm wide, with a few algal cells and interspersed with fine crystals; disc dark brown, plane to weakly convex, slightly grayish pruinose; exciple weakly developed; hymenium 90-110 µm high, I+ blue; paraphyses branched and anastomosed, up to 2.5 µm in diam.; epithecium grayish brown, to dark brown; hypothecium dark brown black; asci clavate, fissitunicate, *Abietina*-type (Egea & Torrente 1994, 20: fig. 1A),

30-45 × 15-18 µm, 8-spored. **Ascospores** fusiform, straight to slightly curved, 3-septate, hyaline 22-28 × 4-5.5 µm. **Pycnidia** abundantly, immersed, black in appearance, 30-100 µm diam.; conidia filiform, strongly curved, 12-18 × 0.8 µm.

Chemistry: No substances detected by TLC (solvent c).

Distribution and ecology: *L. canariensis* is known from two Canary Islands, Fuerteventura and La Palma, occurring in a species poor community. The Fuerteventura specimen is accompanied only by *Lecanora gangaleoides*, the La Palma specimen is without accompanying lichen species.

Notes: *L. canariensis* is easily recognized by the thin almost white thallus with pale grey- pruinose, roundish to ellipsoid, sessile to stipitate apothecia, which possess only rarely a very small thalline margin. A somewhat similar saxicolous species from Brasil, *L. rufoatra*, has a rather thick (up to 150 µm high) white cretaceous thallus with more or less roundish apothecia (up to 1 mm diam.) which have a conspicuous persistent thalline margin and a hyaline hypothecium. The pycnidia of this species are unknown (Egea & Torrente 1994).

Additional specimens examined: La Palma, 2.7 km NNE of Fuencaliente, Pino de la Virgin, path to Zona recreativa Fuente de los Roques, E exposed steep rock-face in *Pinus* forest, 1020 m, 1 May 1999, P. v.d. Boom 22060 (hb. v.d. Boom).

Lecania cyrtella (Ach.) Th. Fr.
A small population of this species was found on a row of *Eucalyptus* trees along the road, and it is not rare on shrubs. It was only known from T.
Loc. 13, on exposed roadside *Eucalyptus* trees, 26022 (hb. v.d. Boom); Loc. 23, *Cupressus* in hermitage, 22000 (hb. Etayo); Loc. 31, branches of shrub, 22025 (TFC); Loc. 33, on branches of shrub, 21975 (hb. Etayo).

Lecania poeltii van den Boom, Alonso & Egea
In continental Europe *L. poeltii* is known from the most south-western part of Portugal (Algarve), but it is also known from several localities in Morocco (v.d. Boom *et al*., 1996). It seems to be rather common on Fuerteventura, especially the population in Loc. 3 was exceptionally large. New to the Canary Islands.
Loc. 2, on *Senecio kleinia*, 25685 (hb. v.d. Boom); Loc. 3, on *Lycium intricatum*, 25757 (hb. v.d. Boom); Loc. 8, on *L. intricatum*, 25905 (hb. v.d. Boom); Loc. 27, in malpaís with *X. calcicola*, on volcanic rock, 21994 (hb. Etayo).

Lecania spadicea (Flot.) Zahlbr.
This species is widely distributed in Fuerteventura and rather common. It often forms atypical thallus patches in crevices and is easily overlooked. It was previously known only from P.
Loc. 2, 6, on low outcrop, 25818, 25810 (hb. v.d. Boom); Loc. 7, vertical low ledge on steep rock-face, 25866, 25868 (hb. v.d. Boom); Loc. 12, on large volcanic boulder, 26007 (hb. v.d. Boom); Loc. 14, on E vertical rock-face, 26052 (hb. v.d. Boom); Loc. 17, on N exposed strong sloping rock, 26106 (hb. v.d. Boom); Loc. 19, on N vertical rock-face, 26129 (hb. v.d. Boom); Loc. 20, on SW vertical facing rock 26138 (hb. v.d. Boom).

Lecania turicensis (Hepp) Müll. Arg.
This species is easily overlooked for other species in the genus such as *L rabenhorstii* and *L. inundata*. The former has been recorded from P (H-P 2001). New to the Canary Islands.

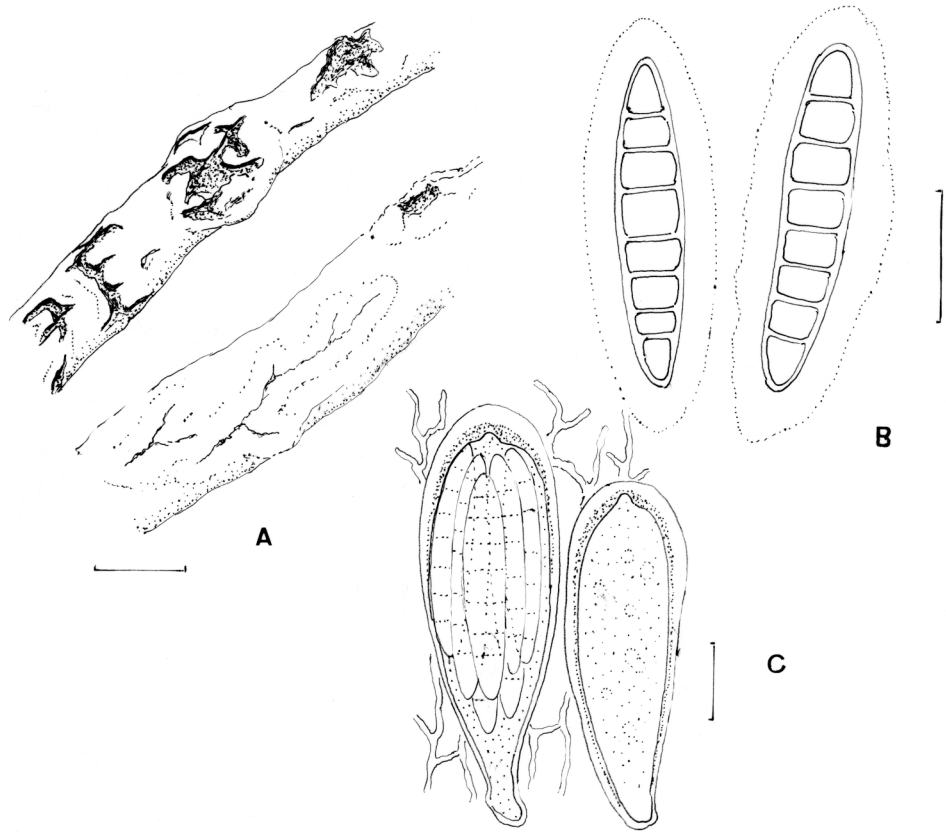

Fig. 3. *Lecanographa dialeuca* (Etayo 17756); A, habitus; B, ascospores with perispore; C, asci and interascal filaments. Scales: A = 1mm; B & C = 10 μm.

Loc. 9, on N facing volcanic outcrop, 25961 (hb. v.d. Boom); Loc. 20, on N facing volcanic rock, 26133 (hb. v.d. Boom); Loc. 24, on volcanic outcrop, 22073 (hb. Etayo).

(*)***Lecanographa grumulosa*** (Dufour) Egea & Torrente

We have found lichenicolous material (on *Roccella*) as well as autonomous growing specimens. Known from the Islands H, L, P and T and recorded recently from several localities on Fuerteventura by Hafellner (2005).

Loc. 9, on N facing cliff, on *Roccella* sp. 26202 (v.d. Boom); Loc. 29, on branches of shrubs, 22037 (TFC), 22038 (hb. Etayo); Loc. 34, on outcrops, 22013 (hb. Etayo).

(*)***Lecanographa dialeuca*** (Cromb.) Egea & Torrente – Fig. 3.

The Macaronesian saxicolous lichen *L. dialeuca* has characteristic microcephalic spores, 7-septate, with small thickenings at septa level. Some lichenicolous samples of a *Lecanographa* growing on *Roccella* species share this same feature. In a first moment we thought it must be a new species of a lichenicolous fungus. Comparision between lichenicolous and saxicolous Macaronesian samples

convinced us we treated with two morphs of the same species. Another *Lecanographa, L. grumulosa* is commonly found saxicolous as well as growing over other lichen species, including *Roccella*. However, this latter species maintains its own thallus and lives like a lichenicolous lichen, but in *L. dialeuca*, when growing on *Roccella*, no algae developing around the apothecia has been observed, being a typical lichenicolous fungus. We give here a description of this lichenicolous morph:

Lichenicolous fungus growing on the laciniate thallus of *Roccella tinctoria*. **Ascomata** solitary or aggregate, black, without pruina, from maculiform or stellate (until 0,75 × 0,6 mm diam.) to elongate and lirelliform (of 0,2-1 × 0,15-0,2 mm), more or less immersed in the host cortex at first, later weakly erumpent with expose disc; exciple blackish brown, laterally 30-70 µm in thickness, 30-150 µm below and very variable, K+ black-greenish, N+ orange-brown, covered by a white fungal zone orginate from the cortex of the host; epihymenium brown, K+ darkened, N+ orange-brown, irregular, mixed with old spores glued; hymenium of 80-90 µm thick, I+ reddish, KI+ red with blue tinge around the asci; subhymenium not distinct. **Interascal filaments** very abundant and strongly branched-anastomosed, of 1-1,5 µm thick, not capitate, somewhat conglutinate; asci broadly clavate, 4-8 spored, endoascus most probably *grumulosa*-type, 50-70 × 16-23 µm. **Ascospores** bi- or triseriate, hyaline when young, soon brownish (reacting with K and N like other zones of the ascomata), wall wrinkled, microcephalic, (4-)6-7-septate, with small thickenings at septa level, but not constricted, of 23-31 × 4-5,5 µm, perispore 2-3 µm wide, counting this structure, the spores arise to 29-37 × 10-11(-12) µm.

L. dialeuca was already known from the eastern part of the Canary Islands (C,L,T), except F.

Lichenicolous specimens examined: Fuerteventura, Jandía Parc Natural, Cuchillo del Ciervo, on N facing cliff, on *Roccella tinctoria*, 26205 (hb. v.d. Boom). La Gomera, riscos encima de Tagaluche, por pista encherada, 650 m, sobre *Roccella tinctoria*, 22 July 2000, J. Etayo 17756 & A. Fernández (hb. Etayo).

Saxicolous specimens examined: Loc. 2, open field with lava blocks, on N facing volcanic outcrop, 25711 (hb. v.d. Boom); Loc. 9, on N facing cliff, on volcanic outcrop, 25966 (hb. v.d. Boom).

Lecanora campestris (Schaer.) Hue (H-P 2001)

Lecanora aff. *dispersa* (Pers.) Sommerf.
L. dispersa as recorded from the Canary Islands included most probably heterogenous material. The collection recorded here is related to *L. flotoviana*, but the *L. dispersa* aggregate from the Canary Islands is not completely cleared at all.
Loc. 6, on low, E sloping outcrops, 25826 (hb. v.d. Boom).

Lecanora galactiniza Nyl.
This must be an overlooked species on the Canary Islands. Recently there have been found large populations on other islands (to publish in future). New to the Canary Islands.
Loc. 7, on vertical W side of an outcrop, 25872 (hb. v.d. Boom); Loc. 14, on NE exposed volcanic outcrops, 26064 (hb. v.d. Boom).

Lecanora gangaleoides Nyl.
Previously known from all islands except C. From F it has recently been recorded by Hafellner (2005).
Loc. 5, on vertical facing rock, 25835 (hb. v.d. Boom); Loc. 6, N vertical low outcrop, 25817 (hb. v.d. Boom); Loc. 24, on rocks, 22058, 22067 (hb. Etayo); Loc. 27, on rocks in malpaís, 21997 (TFC); 21999 (hb. Etayo).

Lecanora hagenii (Ach.) Ach. s.l.
To ensure that the cortical Canarian sample belongs to *L. hagenii*, further taxonomic study is needed. This species is very common in continental Europe, but is was not reported from the Canary Islands before. The specimen recorded here is just a small one.
Loc. 13, on exposed roadside *Eucalyptus* trees, 26031 (hb. v.d. Boom).

Lecanora hybocarpa (Tuck.) Brodo
An extensive population of *L. hybocarpa* was found on several *Eucalyptus* trees along the road. New to the Canary Islands.
Loc. 13, on trunk and branches of exposed roadside *Eucalyptus* trees, 26026 (hb. v.d. Boom).

Lecanora praepostera Nyl.
This *Lecanora* is most probably a synonym of *L. schistina*. This species is known from all islands except F under the name *L. schistina* (Nyl.) Arnold by Hernandez-Padrón (2001). Specimens recorded here contain norstictic acid.
Loc. 2, on vertical shaded rock, 25718 (hb. v.d. Boom); Loc. 7, on exposed rock, 25881 (hb. v.d. Boom).

Lecanora sulphurella Hepp (H-P 2001)
This species is very common on Fuerteventura, probably the most common lichen species. It is rather variable in habitus and would merit a detailed study of the Canarian populations. Thallus colour varies from yellow to white or grey and apothecia varies from totally immersed to sessile. We have found thallus of *L. sulphurella* parasited at time by four species: *Lichenodiplis lecanorae*, *Lichenostigma episulphurella*, *Rinodina canariensis* and *Toninia subfuscae*.
Loc. 2, on N facing vertical outcrop, 25704 (hb. v.d. Boom); Loc. 7, on exposed outcrops among shrubs, 25881 (hb. v.d. Boom); Loc. 9, on N facing cliff of mountain-ridge, 25925 (hb. v.d. Boom); Loc. 10, on E facing cliff, 25975, 25978, 25982 (hb. v.d. Boom); Loc. 24, on rocks, 22055, 22072 (hb. Etayo); Loc. 25, on rocks, 22006 (TFC); Loc. 27, on rocks in malpaís, 21992 (hb. Etayo); 21997 (TFC); Loc. 28, common in malpaís, 22026 (hb. Etayo); Loc. 33, on rocks in malpaís, 21977, 21986 (hb. Etayo), Ibid., 21981 (TFC); Loc. 34, on rocks in malpaís, 22018 (hb. Etayo).

Lecidella asema (Nyl.) Knoph & Hertel
Although this species seems to be common on the island, is was know only from L, P and T.
Loc. 2, on E vertical rock, 25695 (hb. v.d. Boom); Loc. 6, on E vertical boulder, 25813 (hb. v.d. Boom); Loc. 7, on exposed volcanic rock, 25875, (hb. v.d. Boom); Loc. 24, on rocks, 22062 (hb. Etayo); Loc. 33, on rocks in malpaís, 21979 (hb. Etayo).

Lecidella elaeochromoides (Nyl.) Knoph & Hertel (H-P 2001)
Loc. 34, on rocks in malpaís, 22018 (hb. Etayo).

Lecidella scabra (Taylor) Hertel & Leuckert
Recorded recently by Hafellner (2005) from several localities on Fuerteventura.

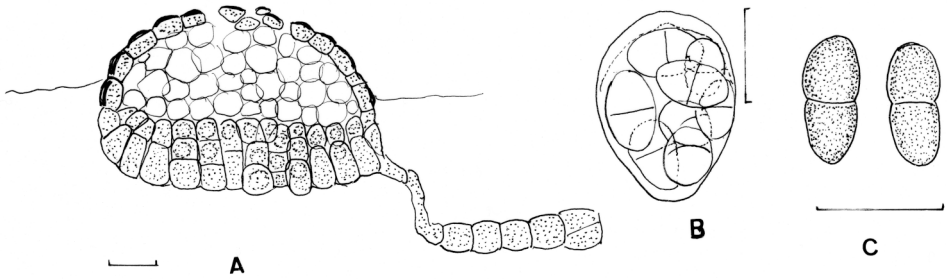

Fig. 4. *Lichenostigma canariense* (holotype); A, ascoma and vegetative hyphae; B, ascus with immature ascospores; C, mature ascospores. Scales: A, B & C = 10 µm.

Lecidella stigmatea (Ach.) Hertel & Leuckert (H-P 2001)
Loc. 10, on E slope, N side of boulder, 25970 (hb. v.d. Boom).

Lepraria nivalis J.R. Laundon
This *Lepraria* species seems to be common in the Canary Islands. All specimens recorded below were growing terricolous among outcrops and stones.
Loc. 5, 25773 (hb. v.d. Boom); Loc. 6, 25793 (hb. v.d. Boom); Loc.14, 26060 (hb. v.d. Boom); Loc. 20, 26153 (hb. v.d. Boom).

Leprocaulon microscopicum (Vill.) Gams
Known from all Canary Islands. From Fuerteventura recorded recently by Hafellner (2005).
Loc. 6, terricolous along N side of boulder, 25784 (hb. v.d. Boom).

****Lichenodiplis lecanorae*** (Vouaux) Dyko et D. Hawksw.
This species was known from G, L and T. *L. lecanorae* is known from a wide range of hosts. Specimens growing on *C. aurantiellina* are very diminute, we have find dozens of them on the disc of the small apothecia of that host.
Loc. 10, on E exposed volcanic outcrops, on *Lecanora sulphurella,* 26199 (hb. v.d. Boom); Loc. 25, on *Caloplaca aurantiellina* on shrub, 22005 (hb. Etayo); Loc. 34, on *Caloplaca aurantiellina* on branches of shrubs in malpaís, 22016 (hb. Etayo).

****Lichenostigma canariense*** Etayo & van den Boom sp. nov. – Fig. 4.

Diagnose latine – *Ascomata semiimmersia, stromatoidea, subglobosa, dispersa vel laxe aggregata, nigra, minuta, 25-80 µm in diam., cellulis subglobosis composita, base cellulis elongatis composita. Filamenta interascalia nulla. Asci subglobosi, bitunicati, octospori, iodo non reagentes. Ascosporae 8,5-10,5 × 5-6 µm, uniseptatae, fuscae, non ornamentatae.*

Type: SPAIN, Canary Islands, Fuerteventura, road from Lajares to playa de Majamano, malpaís, on *Aspicilia calcarea* in malpaís, 140 m, 28R0604103, 3175124, 21 July 2004, J. Etayo 21976 & E. Ros. (TFC-holotypus, hb. Etayo isotypus, hb. Etayo 21982-topotypus).

Vegetative hyphae immersed, rare, sometimes connecting two ascomata, formed by simple or ramified chains of cells of 4-7 µm diam. **Ascomata** black, semiimmersed, elipsoidal or subglobose, numerous but dispersed on the thallus of the host, of 25-80 µm diam. Structure paraplectenchymatic, stromatic, composed by ± spherical cells, subhyaline in the interior and brown externally, with the wall especially thickened in more exposed cells, which are also covered by a granular pigment, and 4-7 µm diam. Basal part of ascomata composed of a layer of elongated dark brown, 7-20 µm long and 3,5-5 µm wide cells in 1-4 rows, centrum I-, KI-; asci 1-3 per ascoma, when mature near of the upper surface, subglobose, 4-8-spored, 22 × 16 µm. **Ascospores** 1-septate, ellipsoid, brown since young and without ornamentation, slightly constricted at the septum, 8,5-10,5 × 5-6 µm; old spores frequently broken. Anamorph unknown.

Notes: Only the areoles, not the discs of the host are covered by ascomata of *Lichenostigma*. *Lichenostigma canariense* is very common in Fuerteventura on a brownish *Aspicilia* similar to *A. calcarea*. Three further species of *Lichenostigma* are known to live on the genus *Aspicilia*: *L. elongata* Nav.-Ros. & Hafellner (Navarro-Rosinés & Hafellner, 1996), *L. radicans* Calat. & Barreno (Calatayud & Barreno, 2003) and *L. supertegentis* Ihlen & R. Sant. (Ihlen, 2004). From them only *L. canariense* and *L. radicans* do not belong to the subgen. *Lichenogramma* Nav.-Ros. & Hafellner but to subgen. *Lichenostigma*, with cushion-like ascomata not connected to superficial hyphal strands. *L. radicans* is known from Iberian "paramerae" on vagrant *Aspicilia* (*A. fruticulosa* f. *taurica* and *A. hispida*) and differs from *L. canariense* especially in its brown vegetative hyphae arising from the lower part of ascomata, without basal layer of ordened cell rows but also in the larger ascomata (90-170 µm wide) and larger spores of 9-14 × 5-7,5 µm. The common *Lichenostigma elongata* is much different at a medium magnification and can not be confused with *L. canariense*. It has larger elongate ascomata (50-200 × 30-60 µm) connected by plurihyphal strands, which are 200-500 µm long and 8-20 µm thick. The ascospores are also larger, of 9-13 × 6-8,5 µm (Navarro-Rosinés & Hafellner, 1996). *L. elongata* is widespread in Europe and known also from Africa, Asia, North America and Australia (Navarro-Rosinés & Hafellner, 1996). Recently it has been recorded from Fuerteventura and Lanzarote by Hafellner (2005).

Additional specimens examined: Loc. 11, volcanic stones in open field, on *Aspicilia calcarea*, 26001 (hb. v.d. Boom); Loc. 12, open field with large lava boulders, on *A. calcarea*, 26009 (hb. v.d. Boom); Loc. 28, on *A. calcarea* in malpaís, 22026, 22031 (hb. Etayo).

Lichenostigma episulphurella Etayo & van den Boom sp. nov. – Fig. 5.

Diagnose latine – *Similis Lichenostigmate cosmopolitae, a quo differt estructurae vetetativae submurales, 10-20(-26) × 7-10(-15) µm et hospite Lecanora sulphurella.*

Type: SPAIN, Canary Islands, Fuerteventura, road from Antigua to Betancuria, Mirador de Morrovelosa, mountain ridge with rocks and shrubs, on *L. sulphurella* on outcrops, 585 m, 28R 0592647, 3146560, 17 July 2004 J. Etayo 22055 & E. Ros (TFC-holotypus, hb. Etayo-isotypus).

Hyphal strands present (subgen. *Lichenogramma*), superficial, of 20-150 µm long, simple or sparsely branched, formed by a single row of 5-10 × 5-6 µm cells slightly

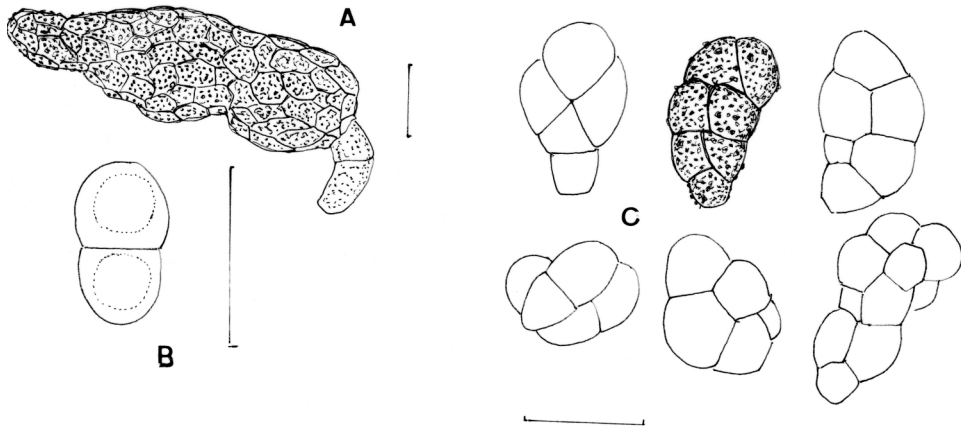

Fig. 5. *Lichenostigma episulphurella* (holotype); A, ascoma; B, ascospore with guttules; C, vegetative reproductive structures. Scales: A, B & C = 10 µm.

constricted at the septa, with areolate surface; at some points of the host thallus the hyphal strands dissapear and form small, appressed or erected structures which act probably as reproductive bodies when dispersed; these sub- to murale structures are 10-20(-26) × 7-10(-15) µm. **Ascomata** rare, black, superficial, subglobose, emerging from radial disposed hyphae to which they are connected, 40-60 µm diam., paraplectenchymatous, with ± sphaerical cells of 4-5 µm diam.; asci very rare, subglobose, 8-spored, arising within the pseudoparenchyma. **Ascospores** uniseptate, ellipsoid, hyaline when young, with a thick perispore, with one large guttule per cell, not ornamented, brown when overmature, 9-10 × 4,5-5 µm.

Notes: Recently, another species of the genus has been described growing on a species of *Lecanora*: *L. lecanorae* Calat. & Nav.-Ros. (Calatayud *et al*., 2004), which is known from the Sonoran region only where it grows on *Lecanora farinacea*. *L. episulphurella* of subgenus *Lichenostigma* does not produce hyphal strands, the ascomata are of large size (120-300 × 120-200 µm). Furthermore, spores are soon brown, with a granular surface and are larger, 10-15 × 6-9 µm.
Another species with small ascomata, one cell wide strands and hyaline spores of small size is *L. cosmopolites* Hafellner & Calat., a species growing on *Xanthoparmelia* spp. This species however lacks the characteristic vegetative reproductive structures of *L. episulphurella* that are common on many zones of the host thallus. These structures are here recorded for the first time in the genus and seem like primordia of ascomata. Real ascomata however are very rare in *L. episulphurella* and when apparently, well developed asci and spores are very rare. This new species is really very common in the Canary Islands and we have hardly seen any thallus of the host without the infection by this *Lichenostigma*.

Additional specimens examined: Loc. 17, on N exposed vertical rock-face, on apothecia of *Lecanora sulphurella,* P. & B. v.d. Boom 26105 (hb. v.d. Boom); Loc. 5, on *Lecanora praepostera*, 26210 (hb v.d. Boom); Loc. 33, on *L. sulphurella* (thallus) in malpaís, 21977 (hb. Etayo).

Other localities: All specimens are from *L. episulphurella*; **La Palma:** Fuencaliente, bajando a la costa por pista, NE exposed, 480 m, 14 August 1995, 13981, 16900 (hb. Etayo); 1.5 km WSW of Tijarife, small road to Cayado Nuevo, open field with volcanic outcrops along cleft, on N exposed vertical rock, 300 m, 2 May 1999, 22171 (hb. v.d. Boom); 2.1 km NE of Barlovento, E side of Punta del Corcho, near swimming pool, on E exposed volcanic rocks on seashore, 50 m, 6 May 1999, 22581 (hb. v.d. Boom). **La Gomera:** carretera Degollada de Peraza a S. Sebastián, km 14, rocas grandes y sueltas, 7 August 1994, 13881 (hb. Etayo); Ibid., riscos encima de Tagaluche, por pista encherada, 650 m, 22 July 2000, 17737 (hb. Etayo); Ibid., riscos encima de Tagaluche, por pista encherada, 650 m, 22 July 2000, 17765 (hb. Etayo). **Gran Canaria:** NNW of Maspalomas, along road GC-503, near mirador, N slope of mountain with altitude 623 m, on N vertical rock, 570 m, 7 Februari 2005, 34236 (hb v.d. Boom).

Lichenostigma semiimmersa Hafellner

This characteristic species has been found on thallus of *Buellia zoharyi*. The semimmersed vegetative hyphae are mainly situated around the apothecia, however the material is rather scanty. This species is widely distributed in the northern hemispherica and in Europe known from Austria and Spain.

Loc. 5, on soil in crevices of N exposed outcrop, 26211 (hb. v.d. Boom).

Lichina confinis (O. F. Müll.) C. Agardh. (H-P 2001)

Lichinella iodopulchra (Croz) P. Moreno & Egea (H-P 2001)

Lichinella stipatula Nyl.

So far known from L and T.

Loc. 34, directly on rock, 22079 (hb. Etayo).

Lobothallia radiosa (Hoffm.) Hafellner

Previously, this species was only known from T and L.

Loc. 6, on N side of boulder, 25797 (hb. v.d. Boom); Loc. 18, on E vertical outcrop, 26117 (hb. v.d. Boom).

****"Melaspilea" canariensis*** D. Hawksw.

Already published from G, H and T. Recently Hafellner (2005) has recorded this from Fuerteventura and Lanzarote from several localities.

Loc. 2, on lava stone in open field, on *Pertusaria* sp. (sterile), 25689 (hb. v.d. Boom); Loc. 10, on exposed top of mountain-ridge, on *Pertusaria* sp. (sterile), 26201 (hb. v.d. Boom); Loc. 24, on *Pertusaria pluripuncta* on rocks, 22058 (hb. Etayo); Loc. 31, on *P. pluripuncta* on outcrops, 22021 (hb. Etayo).

****Minutoexcipula mariana*** V. Atienza

Although *M. mariana* has been described only from corticolous *Pertusaria heterochroa* (Atienza, 2002), our samples on saxicolous *P. pluripuncta* are very similar but with slightly smaller conidia of 5,5-6,5 × 2,5-3,5 µm. *M. mariana* was only known from Spain, USA, Mexico and New Caledonia (Diederich, 2003). Beside that, this species is recorded from the Azores (Diederich, 2003) instead of the Canary Islands as stated in Hafellner (2005). New to the Canary Islands.

Loc. 24, on *Pertusaria pluripuncta* on rocks, 22061 (hb. Etayo).

****Muellerella pygmaea*** (Körb.) D. Hawksw. var. ***athallina*** (Müll. Arg.) Triebel
M. pygmaea s.s. has been mentioned from G (Hernández-Padrón, 2001).
Loc. 2, on low calcareous outcrops, on *Aspicilia* sp., 25678 (hb. v.d. Boom); Loc. 2, on *A. contorta*, 22056 (hb. Etayo).

Neofuscelia glabrans (Nyl.) Essl.
All the samples are UV+ blue-white. It is possible that records of *N. pulla* from Fuerteventura (Hernández-Padrón, 2001) belong to this species.
Loc. 24, outcrops, 22070 (TFC); Loc. 25, on rocks, 22003 (hb. Etayo); Loc. 34, outcrops in malpaís, 22014 (hb. Etayo).

Ochrolechia parella (L.) A. Massal. (H-P 2001)
This species is known from all islands, however it doesn't appear to be common to the island Fuerteventura.
Loc. 2, on N facing vertical outcrop, 25702, (hb. v.d. Boom); Loc. 9, on N facing cliff, 25934 (hb. v.d. Boom).

Opegrapha physciaria (Nyl.) D. Hawksw. & Coppins
Recorded recently from F and L by Hafellner (2005). The sample from Fuerteventura was living on *Xanthoria calcicola*.

Opegrapha calcarea Turner ex Sm.
Known only from L before.
Loc. 6, on N exposed vertical outcrop, 25805 (hb. v.d. Boom).

Opegrapha varia Pers.
Known already from G, H and T.
Loc. 8, on *Lycium intricatum*, 25901, 25906 (hb. v.d. Boom); Loc. 29, on branches of shrubs, 22037, 22038 (TFC, hb. Etayo).

Parmotrema subtinctorium (Zahlbr.) Hale (H-P 2001)
Recorded by Østhagen & Krog (1976) from two localities among 500-700 m.
Loc. 12, on outcrops, 22013 (hb. Etayo).

Parmotrema tinctorum (Nyl.) Hale
Loc. 2, on vertical shaded volcanic rock, 25694 (hb. v.d. Boom); Loc. 14, on sheltered horizontal volcanic outcrops, 26050 (hb. v.d. Boom).

Peltula africana (Jatta) Swinscow & Krog (H-P 2001)

Peltula euploca (Ach.) Poelt in Pisút
It seems to be a common species in the Canary Islands, previously known from all islands. From Fuerteventura it has been recorded recently by Hafellner (2005).
Loc. 12, on rocks in malpaís, 22080 (hb. Etayo).

Peltula obscurans (Nyl.) Gyeln.
This species is widely distributed world-wide (Egea, 1989), it is not rare in some localities in the Canary Islands. Fisrt recorded here from F.
Loc. 6, outcrops in malpaís, 22033 (hb. Etayo).

Peltula patellata (Bagl.) Swinscow & Krog (H-P 2001)

Peltula placodizans (Zahlbr.) Wetmore (H-P 2001)

Pertusaria excludens Nyl. (H-P 2001)
Previously recorded from F, P and T. Several times recorded from Portugal and continental Spain (Llimona & Hladun, 2001).
Loc. 2, on N facing, vertical rock, 25684 (hb. v.d. Boom).

Pertusaria leucosora Nyl.
Not recorded from Macaronesia before but common in mediterranean regions in continental Eurpoe. It has a grey thallus with white, granulose soralia, P+ yellow-orange. Our sample is coincident with material from Spain. It is possible that material of this species from T, is recorded as *P. dealbata* (Ach.) Cromb. (H-P 2001). Probably these two species, belong to *P. aspergilla* (Ach.) J. R. Laundon.
Loc. 24, on rocks, 22057 (hb. Etayo); Loc. 33, on outcrops in malpaís, 21978 (hb. Etayo).

Pertusaria pluripuncta Nyl. (H-P 2001)
Loc. 2, on small volcanic boulders in open field, 25687 (hb. v.d. Boom); Loc. 20, on N facing volcanic rock, 26134 (hb. v.d. Boom); Loc. 22, on N facing volcanic outcrop, 26179 (hb. v.d. Boom); Loc. 24, on rocks, 22058, 22061 (hb. Etayo); 22065 (TFC); Loc. 31, on rocks, 22021, 22022, 22023, 22024 (hb. Etayo).

Physciella cloantha (Ach.) Essl.
This record is rather scanty and because of the possibility to confuse this with *Phaeophyscia nigricans* we include it here with somewhat doubt. The sample is compared with material from continental Spain.
Loc. 18, on E facing vertical outcrop, 26119 (hb. v.d. Boom).

Phaeophyscia hirsuta (Mereschk.) Essl.
This species is recorded only from T. *Phaeophyscia cernohorskyi* (Nadv.) Essl. is also recorded from T, however recently *P. cernohorskyi* is regarded as a synonym by Esslinger (2004).
Loc. 6, on N side of boulder, on vertical facing volcanic rock, 25804 (hb. v.d. Boom); Loc. 20, at underside of slightly overhanging volcanic rock, 26151 (hb. v.d. Boom); Loc. 33, small thallus without soralia on rocks in malpaís, 21983 (hb. Etayo); Loc. 34, on rocks in malpaís, 22014 (hb. Etayo).

Physcia adscendens (Fr.) H. Olivier (H-P 2001)
We have seen this species several times in the field as well as accompanying material in some of our specimens, e.g. Loc. 2, growing on other lichens like *Ramalina* or directly on stones.

Physcia tribacia (Ach.) Nyl.
Previously this species was known only from T.
Loc. 18, on E vertical volcanic rock-face, 26113, 26121 (hb. v.d. Boom).

Placidium lachneum (Ach.) B. de Lesd. (H-P 2001)

Placidium laciniatulum (Ach.) Breuss
This species was already recorded from C and T before.
Loc. 21, terricolous, along N side of boulder, 26171 (hb. v.d. Boom).

Placidium pilosellum (Breuss) Breuss
It was already known from P and T.
Loc. 14, terricolous along NE side of rock, 26053 (hb. v.d. Boom); Loc. 20, terricolous along N side of outcrop, 26145 (hb. v.d. Boom).

Placidium semaforonense (Breuss) Breuss
Previously it was known from P and T.
Loc. 6, terricolous among boulders and outcrops, 25815 (hb. v.d. Boom); Loc. 14, E vertical rock-face, 26059 (hb. v.d. Boom).

Placynthium tremniacum (A. Massal.) Jatta
P. tremniacum closely resembles *P. nigrum.* At this locality it was growing abundantly.
Loc. 17, on N facing, strong sloping volcanic outcrop, 26108 (hb. v.d. Boom).

Protoparmelia montagnei (Fr.) Poelt & Nimis
It was known from P and T.
Loc. 14, on E exposed vertical rock-face, 26047, 26054 (hb. v.d. Boom).

Psora crenata (Tayl.) Reinke
It was known only from T before.
Loc. 2, terricolous among outcrops, 25701 (hb. v.d. Boom).

Psora decipiens (Hedw.) Hoffm.
Recorded recently by Hafellner (2005) from Fuerteventura.

Pyxine coccoes (Sw.) Nyl.
Recorded from Fuerteventura by Østhagen & Krog (1976), from one locality at 550-690 m.

Ramalina bourgeana Mont. ex Nyl. s.l. (H-P 2001)
This species is very common on Fuerteventura, probably the most common species of the genus.
Loc. 24, on rocks, 22050 (hb. Etayo); Loc. 25, on rocks with *Xanthoria resendei*, 22006 (hb. Etayo, TFC), 22007 (TFC); Loc. 31, on rocks, 22022 (hb. Etayo); Loc. 33, on rocks, 21974 (hb. Etayo); Ibid., 21984 (TFC); Loc. 34, on rocks, 22010 (hb. Etayo).

Ramalina crispatula Despr. ex Nyl.
In Krog & Østhagen (1980), this species was recorded from all islands except La Palma. Our specimen contains salazinic acid and is compared with exsiccata 147 (Vězda).
Loc. 22, on volcanic outcrops on a rocky splope, 26188 (hb. v.d. Boom).

Ramalina cupularis Krog & P. James (H-P 2001)
Loc. 2, on exposed volcanic outcrop, 25722 (hb. v.d. Boom).

Ramalina chondrina J. Steiner (H-P 2001)
Recorded by Østhagen & Krog (1976) from one locality at 400-685 m.

Ramalina decipiens Mont.
In Krog & Østhagen (1980) *R. decipiens* is recorded from all the Canary Islands.
Loc. 24, outcrops, 22068 (TFC); Loc. 29, very abundant in wind exposed outcrops, 22034 (TFC, hb. Etayo); Loc. 33, outcrops in malpaís, 21985, 21988 (TFC); Ibid., 21986 (hb. Etayo).

Ramalina farinacea (L.) Ach. (H-P 2001)

Ramalina hamulosa Krog & Østh.
Although Krog & Østhagen (1980) studied the *Ramalina* of the Canary Island thoroughly, *R. hamulosa* have not been recorded from Fuerteventura before.
Loc. 5, on N vertical outcrop, 25836, 25846 (hb. v.d. Boom); Loc. 9, on N facing cliff, 25918, 25948 (hb. v.d. Boom). Usnic acid, salazinic acid, trace of protocetraric have been found by TLC.

Ramalina lacera (With.) Laundon
[= *R. duriaei* (de Not.) Bagl., *R. evernioides* Nyl.]
Recorded by Pitard & Harmand (1911) from Puerto de Cabras (Fuerteventura) and by Krog & Østhagen (1980) from all the Canary Islands excepting T and G. It seems to be rather common on Fuerteventura.
Loc. 24, on shrubs, 22042 (hb. Etayo, TFC); Loc. 31, on branches of shrubs, 22025 (TFC); Loc. 33, on branches of shrubs, 21975 (hb. Etayo); Ibid., on outcrops, 21987 (TFC); Loc. 34, on branches of shrubs, 22016 (hb. Etayo).

Ramalina maciformis (Delile) Bory (H-P 2001)
Recorded for Fuerteventura by Krog & Østhagen (1980).
Loc. 4, on low stones, 25758 (hb. v.d. Boom); Loc. 34, on rocks with *R. bourgaeana*, 22010 (hb. Etayo).

Ramalina maderensis Motyka (H-P 2001)

Ramalina mollis Krog & Østh. (H-P 2001)
Recorded by Krog & Østhagen (1978) from two localities among 500-690 m.
Loc. 13, on roadside *Eucalyptus* trees, 26034 (hb. v.d. Boom); Loc. 24, saxicolous (very laciniate thallus), 22054 (hb. Etayo).

Ramalina nodosa Krog & Østh. (H-P 2001)
Recorded by Krog & Østhagen (1978) from two localities among 500-700 m.

Ramalina parva Krog & Østh. (H-P 2001)
Recorded by Krog & Østhagen (1978) from two localities among 400-690 m.

Ramalina pitardii Hue (H-P 2001)
Recorded by Østhagen & Krog (1976) from two localities among 400-700 m.

Ramalina pluviariae Krog & Østh. (H-P 2001)
Described by Østhagen & Krog (1976) from several localities among 90-685 m. At locality 24 it is frequently covered by an steril, filamentous lichenicolous fungi probably belonging to *Sphaerellothecium* or *Stigmidium* that turns black the thallus and especially the apothecia.
Loc. 2, on N facing, vertical rock, 25727 (hb. v.d. Boom); Loc. 5, top of boulder, on horizontal surface, 25845 (hb. v.d. Boom); Loc. 22, on weakly sloping ourcrop, 26176 (hb. v.d. Boom); Loc. 24, on rocks, 22067 (hb. Etayo); Loc. 33, on rocks in malpaís, 21981, 21986 (hb. Etayo).

Ramalina requienii (De Not.) Jatta (H-P 2001)
Recorded by Østhagen & Krog (1976) from one locality among 550-690 m.
Loc. 24, outcrops, 22053 (hb. Etayo).

Ramalina webbii Mont. (H-P 2001)
This is not a rare species in the Canary Island, it is recorded from C, F, H, L and T.

Rhizocarpon lusitanicum (Nyl.) Arnold
Our sample is similar to the description of *R. lusitanicum* (Poelt & Hafellner, 1982) but differs in some features such as whithish thallus and the absence of black granules in the epihymenium. It has recently been recorded from L by Hafellner (2005).
Loc. 24, on *Pertusaria* on rocks, 22055 (hb. Etayo).

Rhizocarpon viridiatrum (Wulfen) Körb.
We have found autonomous material as well as lichenicolous.
Loc. 2, on N vertical rock, 25709 (hb. v.d. Boom); Loc. 31, on exposed outcrops directly on rock or over *Pertusaria pluripuncta*, 22019, 22023 (hb. Etayo).

****Rhymbocarpus cruciatus*** (Sherwood, D. Hawksw. & Coppins) Etayo & Diederich
R. cruciatus was recorded from El Hierro and is futhermore also known from Great Britain, Ireland and Morocco (Diederich & Etayo 2000).
Loc. 24, on *Diploicia canescens* on shrubs, 22046 (hb. Etayo).

Rimelia reticulata (Tayl.) Hale & A. Fletcher (H-P. 2001)

Rinodina atrocinerea (Hook.) Körb.
This species has been recorded from Macaronesia, including P and T, by Matzer *et al*. (1994).
Loc. 34, on rocks in malpaís, 22014 (hb. Etayo).

Rinodina beccariana Bagl. var. ***lavicola*** (J. Steiner) Matzer & Mayrh.
This taxon is featured by its K+ yellow thallus and lecideine apothecia. It is known from Macaronesia, Portugal and a few localities in western Mediterranean areas. In the Canary Islands it was recorded from C, P, T (Mayrhofer *et al*., 1993).
Loc. 10, on E facing volcanic cliff, 25972 (hb. v.d. Boom); Loc. 24, on rocks, 22059, 22062 (hb. Etayo).

Rinodina canariensis Matzer, Mayrh. & Clerc
This *Rinodina* species is remarkable because of its parasitic habitus, growing on several unrelated crustaceous taxa from genera such as *Acarospora*, *Buellia*, *Caloplaca, Lecanora, Ochrolechia, Pertusaria* and *Rinodina* (Matzer *et al*., 1994). It was previously known from most of the Canary Islands, except F and H.
Loc. 11, on volcanic stones in open field, on *Lecanora sulphurella* 25986 (hb. v.d. Boom); Loc. 24, on *L. sulphurella*, on rocks, 22055 (hb. Etayo); Loc. 28, on *L. sulphurella* in malpaís, 22026 (hb. Etayo); Loc. 33, on *Pertusaria* sp. in malpaís, 21978 (hb. Etayo); Ibid., on *L. sulphurella* in malpaís, 21981, 21986 (hb. Etayo); Loc. 34, on *L. sulphurella*, on rocks in malpaís, 22018 (hb. Etayo).

Rinodina pruinella Bagl.
Recorded by Giralt & Mayrhofer (1994) from Fuerteventura (Montaña de la Burra). *R. pruinella* is very characteristic by its pruinose apothecia and the P+ orange reaction of the thallus.
Loc. 13, on branches of roadside *Eucalyptus*, 26027 (hb. v.d. Boom); Loc. 24, on twigs of a shrub, 22052 (hb. Etayo).

Roccella canariensis Darbysh. (H-P 2001)
These and the following *Roccella* specimens are identified or checked, mainly by Anders Tehler.
Loc. 9, on N facing cliff, 25909, 25910, 25911, 25914 (hb v.d. Boom); Loc. 14, on volcanic outcrops, 26046, 26051 (hb. v.d. Boom); Loc. 34, on rocks, 22012 (hb. Etayo).

Roccella fuciformis (L.) DC. (H-P 2001)
Loc. 2, on E vertical outcrops, 25697, 25707 (hb. v.d. Boom); Loc. 10, on N facing vertical outcrop in cleft, 26142 (hb. v.d. Boom).

Roccella phycopsis (Ach.) Ach.
Loc. 9, on N exposed rock on top of mountain-ridge, 25941, 26198 (hb. v.d. Boom).

Roccella tinctoria DC.
In the recent treatment of the genus *Roccella* (Tehler *et al.,* 2004), *R. boergesenii* Vain is regarded as a synonym of *R. tinctoria*. Specimen 25943 is of interest because it carries both apothecia and soralia. This species was known from C, H, P and T.
Loc. 9, on N facing cliff, 25907, 25908, 25912, 25931, 25943 (fertile!), 25946 (hb. v.d. Boom); Loc. 27, on volcanic rock in malpaís, 21990, 21998 (hb. Etayo); Loc. 29, on wind exposed rocks, 22035 (hb. Etayo); Loc. 34, on rocks, 22011 (hb. Etayo).

Roccella tuberculata Vain. (H-P 2001)
Loc. 9, on N facing cliff, 25930, 26198 (hb. v.d. Boom).

Seirophora scorigena (Mont.) Frödén (H-P 2001)
In (H-P 2001), this taxon was mentioned as *Teloschistes scorigenus* (Mont.) Vain. This species is rather common especially in the eastern part of the Canary Islands. Recorded by Pitard & Harmand (1911) as *Placodium scorigenum* Nyl., from Puerto de Cabras (Fuerteventura).
Loc. 2, on N vertical volcanic outcrop, 25708 (hb. v.d. Boom); Loc. 11, on low volcanic outcrops in open field, 25983 (hb. v.d. Boom); Loc. 27, malpaís, 21993 (hb. Etayo); Loc. 33, on rocks in malpaís, 21980, 21982, 21983 (hb. Etayo), Ibid., 21995, 21997 (TFC).

Seirophora villosa (Ach.) Frödén (H-P 2001)
In (H-P 2001) this taxon was mentiond as *Teloschistes villosus* (Ach.) Norman.
Loc. 5, on *Lycium*, 25779 (hb. v.d. Boom); Loc. 9, on N facing cliff, 25933 (hb. v.d. Boom); Loc. 19, on N vertical rock, 26130 (hb. v.d. Boom); Loc. 24, very common on shrubs, 22042, 22043, 22048 (hb. Etayo, TFC); Loc. 34, on branches of a shrub in malpaís, 22015 (hb. Etayo).

Solenopsora cesatii (A. Massal.) Zahlbr.
Previously only recorded from T.
Loc. 2, on low calcareous outcrops, 25677 (hb. v.d. Boom); Loc. 22, on N facing outcrop, 26204 (hb. v.d. Boom).

Solenopsora holophaea (Mont.) Samp.
It has recently been recorded from F and L by Hafellner (2005).

****Sphinctrina leucopoda*** Nyl.
Previously known only from the smaller islands H and G. Hafellner (2005) recorded this from L as well.
Loc. 22, on a saxicolous steril crustose lichen, 26174 (hb. v.d. Boom); Loc. 31, on a saxicolous lichen on exposed outcrops, 22019 (hb. Etayo).

Squamarina cartilaginea (With.) P. James (H-P 2001)
This *Squamarina* species seems to be rare on Fuerteventura. However, previously it was known from all Canary Islands.
Loc. 2, terricolous among volcanic boulders, 25732 (hb. v.d. Boom).

Squamarina concrescens (Müll. Arg.) Poelt
This species is rather common on Fuerteventura, it was also collected as a companying specimen in several other specimens. Often it was growing close to *Cladonia foliacea*, sometimes in rather large populations. It has recently been recorded from Fuerteventura by Hafellner (2005).
Loc. 5, on N exposed rock, in crevices, 25771 (hb. v.d. Boom); Loc. 6, terricolous along N facing outcrops, 25791, 25812 (hb. v.d. Boom).

****Stigmidium epixanthum*** Hafellner
Recently described by Hafellner *et al.* (2002) and recorded from Africa, Australia, Macaronesia, North America and South America. In the Canary Islands it has already been recorded from C, F, G, H, L and T.
Loc. 12, sheltered volcanic rock under overhang, on *A. lavicola*, 26018 (hb. v.d. Boom); Loc. 15, on small boulders and stones in an open area, on *A. lavicola*, 26075 (hb. v.d. Boom); Loc. 28, on *A. lavicola* in malpaís, 22026, 22032 (hb. Etayo).

****Stigmidium ramalinae*** (Müll. Arg.) Etayo & Diederich
[= *S. epiramalina* (Vouaux) Hafellner]
The samples agree well with this species restudied in Etayo & Osorio (2004) and this species seems to be common in the Canary Islands.
Loc. 5, on *Ramalina pluviariae*, 25842 (hb. v.d. Boom); Loc. 9, on *Ramalina* sp., ascospores are 10-11 × 3-5 µm, 25719, 25935 (hb. v.d. Boom).

****Stigmidium tabacinae*** (Arnold) Triebel
It was known from most of the islands, except F and H.
Loc. 22, among a SW exposed outcrop, on *Toninia sedifolia*, 26184 (hb. v.d. Boom).

Synalissa symphorea (Ach.) Nyl.
Previously recorded only from T.
Loc. 34, on rocks in malpaís, 22014 (hb. Etayo).

Syncesia myrticola (Fée) Tehler
This species was known from G, H and T.
Loc. 9, on N facing rock above path, 25963 (hb. v.d. Boom).

Teloschistes flavicans (Sw.) Norman (H-P 2001)

Tephromela atra (Huds.) Hafellner (H-P 2001)
This is a common species in the Canary Islands and known from all islands except G.
Loc. 11, on volcanic stones in open field, 25999 (hb. v.d. Boom); Loc. 24, on rocks, 22062 (hb. Etayo).

Thelenella melanospora Etayo & H. Mayrhofer
This is the first record in Macaronesia of this species which was recently described. It is widely distributed in the Mediterranean area (Etayo & Mayrhofer, 2003). This species was encountered abundantly on several trunks of *Eucalyptus* trees and exposed shrubs. *T. melanospora* is very inconspicuous and it grows in small parts between other lichens.The sample 22015 is also infected by a lichenicolous fungus.
Loc. 13, on exposed roadside *Eucalyptus* trees, 26037 (hb. v.d. Boom); Loc. 34, on exposed shrubs, 22015 (hb. Etayo).

Thelomma mammosum (Hepp) A. Massal. (H-P 2001)
Previously, this saxicolous species was known from H, F, L, P and T. However it seems to be rare on Fuerteventura.
Loc. 24, rare on rocks, 22047 (hb. Etayo).

Thelopsis isiaca Stizenb.
Recently this species has been recorded from Fuerteventura by Hafellner (2005) and was already known from H, P and T.
Loc. 3, on *Lycium intricatum*, 25751 (hb. v.d. Boom); Loc. 8, on *L. intricatum*, 25902 (hb. v.d. Boom); Loc. 11, on N vertical rock, 25989 (hb. v.d. Boom); Loc. 12, on shaded side of boulder, 26008 (hb. v.d. Boom); Loc. 18, on E vertical rock-face, 26118 (hb. v.d. Boom); Loc. 23, on *Cupressus* in hermitage, 22000, 22001 (hb. Etayo).

Thyrea pitardi (Harm.) Zahlbr. (H-P 2001)
[= *Omphalaria pitardi* Harmand]
Described by Pitard & Harmand (1911) from Puerto de Cabras (Fuerteventura), type-locality.
Loc. 34, on rocks in malpaís, 22014, 22080 (hb. Etayo).

Tomasellia lactea (Ach.) R.C. Harris
T. lactea has only been recorded from G before.
Loc. 8, on *Lycium intricatum*, 25903 (hb. v.d. Boom).

Toninia albilabra (Dufour) H. Olivier
After Lanzarote, this is the second island of which it is recorded.
Loc. 2, terricolous, sheltered along a boulder 25720 (hb. v.d. Boom); Loc. 16, on N vertical rock-face, 26089 (hb. v.d. Boom); Loc. 19, on N vertical rock-face, 26089 (hb. v.d. Boom).

Toninia aromatica (Sm.) A. Massal.
This is a very common species on the study island and previously known from all islands except F and H.
Loc. 3, on top of exposed outcrops, 25742 (hb. v.d. Boom); Loc. 7, on W exposed rock, 25874 (hb. v.d. Boom); Loc. 11, on volcanic stones in a field, 25998 (hb. v.d. Boom); Loc. 12, N exposed vertical boulder, 26016 (hb. v.d. Boom); Loc. 15, on stones and boulders in a coastal plane, 26069 (hb. v.d. Boom); Loc. 17, on N facing outcrop, 26103 (hb. v.d. Boom); Loc. 20, on SW sloping rock, 26148 (hb. v.d. Boom); Loc. 27, in malpaís, growing with *Lecanora gangaleoides*, 21999 (hb. Etayo); Loc. 24, on rocks and argillous soil, 22071 (hb. Etayo).

Toninia candida (Weber) Th. Fr. (H-P 2001)
Recorded by Pitard & Harmand (1911) as *Lecidea candida* Ach. from Puerto de Cabras (Fuerteventura).

****Toninia episema*** (Nyl.) Timdal
This lichenicolous fungus is specialized on *Aspicilia calcarea*. This host species regards the brownish colored form. New to Canary Islands.
Loc. 11, on volcanic stones in field, on *Aspicilia calcarea*, 26000 (hb. v.d. Boom).

Toninia sedifolia (Scop.) Timdal (H-P 2001)
Loc. 22, terricolous among outcrops and stones, 26183, 26196 (hb. v.d. Boom).

****Toninia subfuscae*** (Arnold) Timdal
According to Timdal (1991), the host's range of *T. subfuscae* was restricted to *Lecanora* and *Lecidella*, but here we found it also growing on *Lobothallia*. Previously it was only known from G.

Loc. 18, on E vertical outcrop, on *Lobothallia radiosa,* 26112 (hb. v.d. Boom); Loc. 24, on *Lecanora sulphurella* on rocks, 22055 (hb. Etayo); Loc. 33, on an indeterminate crustose lichen, on rocks in malpaís, 21983 (hb. Etayo).

Toninia toepferii (Stein.) Navás (H-P 2001)

Toninia tristis (Th. Fr.) Th. Fr. ssp. ***pseudotabacina*** Timdal
This taxon is known from most of the islands (C, G, L, P, T), however it seems to be a common species locally on Fuerteventura.
Loc. 2, terricolous among outcrops, 25698 (hb. v.d. Boom); Loc. 5, along N side of boulder, 25767 (hb. v.d. Boom); Loc. 6, terricolous along N side of boulder, 25780, 25808 (hb. v.d. Boom).

Tornabea scutellifera (With.) J. R. Laundon (H-P 2001)
In some localities, this species has been found in extensive populations and abundantly fertile, terricolous, saxicolous, as well as corticolous.
Loc. 5, along low outcrops, 25847 (hb. v.d. Boom); Loc. 9, on N facing cliff, abundantly fertile, 25949 (hb. v.d. Boom); Loc. 13, on trunks and branches of *Eucalyptus* trees, 26030 (hb. v.d. Boom); Loc. 24, common on shrubs, with many apothecia, rarer and smaller on rocks, 22043, 22045, 22049, 22065 (hb. Etayo, TFC).

****Tremella ramalinae*** Diederich
This species has a widely distribution in the northern hemispherical, but it has only been recorded a few times by Diederich (1996) and v.d. Boom & Breuss (2002). In Spain it has been collected at several localities by the second author. New to the Canary Islands.
Loc. 13, some grouped trees along road, on *Eucalyptus* sp. on *Ramalina lacera*, 26036 (hb. v.d. Boom).

Verrucaria fuscula Nyl.
According to Hernández-Padrón (2001), no specimens of the genus had been recorded from Fuerteventura before.
Loc. 28, on *Aspicilia calcarea* in malpaís, 22033 (hb. Etayo).

Xanthoparmelia tinctina (Maheu & A. Gillet) Hale
Recently it has been recorded from Fuerteventura by Hafellner (2005).

Xanthoria calcicola Oxner (H-P 2001)
This species seems to be rather common in the Canary Islands and is recorded from all islands.
Loc. 27, in malpaís, 21994 (hb. Etayo).

Xanthoria domogledensis Vězda (H-P 2001)

Xanthoria elegans (Link) Th. Fr. (H-P 2001)
Recorded by Pitard & Harmand (1911) from Puerto de Cabras (Fuerteventura).
Loc. 27, malpaís, 21991, 21993 (hb. Etayo).

Xanthoria isidioidea (Beltr.) Reichst. & Galun (H-P 2001)
Recorded by Østhagen & Krog (1976) from three Fuerteventura localities. They found it with *X. parietina* and *X. resendei*. It has been found growing over other lichens such as *S. scorigenus*.
Loc. 33, on rocks in malpaís, 21982 (hb. Etayo).

Xanthoria parietina (L.) Th. Fr. (H-P 2001)
Xanthoria parietina f. *papillosa* was recorded by Pitard & Harmand (1911) from Puerto de Cabras (Fuerteventura). Furthermore, from *X. parietina* has been recorded the ssp. *ectanea* (Ach.) Clauzade & Roux (Hernández-Padrón 2001).
Loc. 24, on shrubs, 22042, 22049 (hb. Etayo, TFC); Loc. 24, on rocks, 22057 (hb. Etayo); Loc. 28, on rocks in malpaís, 22029 (hb. Etayo); Loc. 33, on rocks in malpaís, 21985 (TFC); Ibid., 21989 (hb. Etayo); Loc. 34, on rocks in malpaís, 22014 (hb. Etayo); Ibid., on branches of shrubs, 22016 (hb. Etayo).

Xanthoria resendei Poelt & Tav. (H-P 2001)
Recorded by Østhagen & Krog (1976) from two localities among 500-685 m. This species is known from all Canary Islands and it seems to be a very common species.
Loc. 25, on rocks with *R. bourgeana*, 22006 (hb. Etayo, TFC); Loc. 26, on basalt, 22075 (hb. Etayo); Loc. 28, in malpaís, 22029 (hb. Etayo).

Acknowledgements. We are grateful to the following lichenologist for the help with identification of some selected specimens, Dr. Othmar Breuss (*Catapyrenium* s.l.), Dr. Frank Bungartz (*Buellia*), Dr. Jose Mª Egea (*Lecanactis*), Prof. Dr. Jack Elix (chemistry), Dr. Hiro Kashiwadani (*Ramalina*), Prof. Dr. Helmut Mayrhofer (*Dimelaena*), Dr. Thorsten Lumbsch (*Lecanora*), Dr. Harrie Sipman (revision of some parts of the text, including Latin diagnose), Prof. Dr. Anders Tehler (*Roccella*) and Prof. Dr. Tor Tønsberg (*Lepraria*).

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