The Portuguese crustose specimens of the *Physciaceae, Caliciaceae* excluded, (lichenized ascomycetes) in the PO herbarium

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A revision and nomenclatural update of 190 sheets of crustose specimens in the PO herbarium is reported. This revision identifies 8 genera and 57 species of *Physciaceae*, including one species not previously reported from the Iberian Peninsula, *Buellia excelsa,* and seven species not previously reported from Portugal: *Amandinea coniops, Rinodina boleana, R. cana, R. dubyana, R. euskadiensis, R. guzzinii,* and *R. pityrea*. The synonymies of *Rinodina lesdainii* with *R. cana,* and of *R. atrocinerella* var. *macrospora* with *R. occulta* are proposed. This revision also reports the chemistry of *Buellia hypophana* for the first time.

Keywords: lichens, Sampaio, *Buellia s.l., Rinodina s.l.*, Portugal

The lichen herbarium of the University of Oporto (PO) is one of the most important in the Iberian Peninsula. It comprises about 8500 catalogued specimens, mainly from Portugal and the former Portuguese colonies in Africa, is rich in type material of lichen names published by Gonçalo Sampaio (Paz-Bermúdez *et al.* 2002), and also holds type and other material of several other important European lichenologists: Julien H. Harmand, William Nylander, and Edvard A.Vainio. The herbarium also contains exsiccatae and other sheets from various European countries and the USA.

Interest in this collection has increased as a result of the taxonomic revisions carried out mainly on the Portuguese material, such as the description of new species (Paz-Bermúdez & Elix 2004, Paz-Bermúdez & Giralt 2009), the discovery of species hitherto unknown in continental Europe (Giralt *et al.* 2009b), new records for Portugal or the Iberian Peninsula (Paz-Bermúdez & Carballal 2005), and the solution of nomenclatural problems (Paz-Bermúdez & López de Silanes 2007).

In the present study we complete the revision of the family *Physciaceae* in PO (Giralt *et al*. 2009b, Paz-Bermúdez & Giralt 2009, Paz-Bermúdez & Carballal 2008) by presenting a review of the Portuguese crustose specimens of this family it contains.

Materials and methods

The specimens were identified with the aid of several general keys (Clauzade & Roux 1985, Fox & Purvis 1992, Orange *et al*. 1992, Wirth 1995a,b) and various monographs, and on the basis of anatomical, morphological, and chemical characteristics. Most specimens were analysed by thin-layer chromatography (TLC), following Culberson *et al*. (1981) and White & James (1985). In addition, four specimens (*Buellia indissimilis, B. hypophana, B*. cf. *triseptata,* and *Rinodina* cf. *mniaraea*) were analysed also by high performance liquid chromatography (HPLC) (Elix *et al*. 2003, Feige *et al*. 1993). Synonyms of old names were verified using various checklists (Hladun & Llimona 2002-2007, Nimis 1993) and Zahlbruckner (1921-1940). The terminology used for the apothecia, ascospores- and ontogeny-types follows Scheidegger (1993) and Giralt (2001), for ascus-types Rambold *et al*. (1994).

Results

At the beginning of the twentieth century, two clearly separated families were included in *Physciaceae* which were distinguished by growth habit (Zahlbruckner 1926): *Buelliaceae* comprised crustose taxa and the Physciaceae where mainly foliose species were included. The *Buelliaceae* comprised the genera *Buellia* and *Rinodina*, separated by the exciple type (lecideine vs. lecanorine) (Zahlbruckner 1926). In fact, almost all the specimens in PO reported on here were placed within one of these two genera; a single sheet was placed in *Leciographa*.

Subsequentlly, *Buelliaceae* was merged with *Physciaceae* by Poelt (1974), enlarging the concept of the latter family. According to Nordin & Mattsson (2001), *Physciaceae* sensu Poelt 1974 included 14 genera.

Since then the number of more or less accepted genera in *Physciaceae* has gradually increased, reaching 27 with various growth habitats at the beginning of this century (Eriksson *et al*. 2001). At this time, according to Helms *et al*. (2003), circumscription of the family was based on ascus and ascospore types; 20 types being recognized (Mayrhofer 1982; but see Matzer & Mayrhofer 1996). The main distinguishing characters used for the delimitation of the new genera described or resurrected over recent decades include thallus type, ascospore type, conidium shape and length, chemical products, and thallus attachment organs (Nordin & Mattsson 2001).

Now, the circumscription of the family has changed again (Lumbsch & Huhndorf 2007) in order to include the results of Miadlikowska *et al*. (2006), who confirmed by molecular studies previous results indicating that the family *Caliciaceae* is nested within *Physciaceae* (Helms *et al*. 2003, Wedin *et al*. 2002). At present, the family contains 40 accepted genera with very different morphologies of their members (Lumbsch & Huhndorf 2007).

Here we treat the crustose taxa of the family *Physciaceae* (calicioid genera excluded) in PO, basically following the scheme used by Rambold & Triebel (1996–2008). Additional crustose *Buellia*-like genera of *Physciaceae* (*Caliciaceae* excluded), established by Marbach (2000) are not accepted here, since its validity has not yet been tested by molecular phylogenetic methods. An exception is *Sculptolumina,* recently emended and well recircumscribed (Giralt *et al* 2009b). On the other hand, the concept of the genus *Buellia* adopted here is *Buellia* sensu lato, including the genus *Hafellia* (= *Buellia* sensu stricto), in accordance with the decision made by the Committee for Fungi (Gams 2004) to conserve *Buellia disciformis* as the type species of the genus *Buellia*. The genera *Diploicia* and *Diplotomma* are accepted as they are supported molecularly in several studies (Helms *et al*. 2003, Nordin & Tibell 2005), although they were considered synonymous by other studies (Molina *et al*. 2002). More controversial is a separation of the genus *Amandinea* from *Buellia* s.l., seeing that molecular analyses also provides contradictory results. Nevertheless, as the species of *Amandinea* studied here are commonly named *Amandinea* in the literature today, or were described in *Amandinea,* we also accept this genus.

For each species, we indicate synonyms used on some sheets and/or otherwise synonyms commonly used, and all the specimens studied together with transcription(s) of their original label identifications.

Almost all specimens were collected in northern Portugal, mostly by Sampaio; specimens collected or labelled by other researchers are indicated. For each taxon we indicate the main diagnostic characters, the principal differences from similar taxa present or not in PO, and, if the specimen(s) have been found to be misidentified, a short comment on the species to which it (they) were wrongly attributed is added.

Distribution data are provided only for those taxa with a scattered or restricted distribution in Europe, the Iberian Peninsula, or Portugal; these data were taken from Hladun & Llimona (2002–2007), Nimis (1993), and other more specific papers which are indicated under each taxon.

A key and illustrations are not provided because almost all of the taxa treated here are keyed and illustrated in Scheidegger (1993: saxicolous *Buellia* species), Giralt *et al*. (2000a: corticolous *Buellia* species), and Giralt (2001: *Rinodina* species).

The species

Amandinea coniops (Wahlenb) M. Choisy ex Scheid. & H. Mayrhofer, Lichenologist, 25(4): 342. 1993.

A saxicolous fungus characterized mainly by a areolate to bullate light brown thallus, rugulate ascospores of the *Physconia*-type, and filiform conidia. The PO sheet was not published by Sampaio, who labelled it as "*Buellia dendritica* Samp." a new name never published by this author.

According to Scheidegger (1993), this taxon is confined to granitic rocks in boreal to arctic sea coasts. In the Iberian Peninsula it is only known from the Galician coast (NW Spain); first record for Portugal.

See *Amandinea crassiuscula*.

Material examined. – Sub ***Buellia dendritica*** Samp.: Douro Litoral, Póvoa do Varzim, num muro á beira-mar, Feb 1920, (2355L).

Amandinea crassiuscula Giralt & Etayo, Lichenologist, 32(6): 522. 2000.

A corticolous fungus with a thick, subsquamulose, and ochraceous thallus; this feature, together with the large apothecia (0.3 mm – 0.8 mm), the strongly rugulate ascospores, and the filiform conidia are diagnostic. The epiphytic *Amandinea punctata* (also in PO) differs in the thickness of the thallus, and ascospore size and wall ornamentation. *Amandinea coniops* differs by its saxicolous coastal habitat.

One of the specimens was wrongly identified by Sampaio as *Buellia disciformis*, but it differs in the rimose, whitish thallus, the inspersed hymenium, and the large (16–21 × 8–11 µm) *Callispora*-type (or similar) ascospores, sometimes becoming triseptate. The probable identity of specimens 903L, 903xL and 1406L labelled as *Buellia subcinerascens* Samp. (a new combination based on *Lecidea subcinerascens* Nyl., not validly published by Sampaio (Paz-Bermúdez *et al*. 2002: 774) had previously been noted by Giralt *et al*. (2000b) on the basis of the description made by Sampaio (1917) from these specimens.

The species is known from several localities in Spain and one in southern Portugal (Giralt *et al*. 2000b).

Material examined. – Sub ***Buellia disciformis***: Minho, Póvoa de Lanhoso, Nasce, nos carvalhos, 29 Sep 1919, (1997L). – Sub ***Buellia subcinerascens*** Samp.: Beira Alta, Viseu, nos carvalhos, 15 Apr 1916, (903L). Idem (903xL). Algarve, Torrinha: entre Portimão e Monchique, na base das oliveiras velhas, 9 Apr 1917, (1406L). – Sub ***Buellia sp.***: Minho, Braga, Falperra, nos carvalhos velhos, 19 Jun 1920, (2697L).

Amandinea lecideina (H. Mayrhofer & Poelt) Scheid. & H. Mayrhofer, Lichenologist, 25(4): 342. 1993.

The thallus of the PO specimen is very thin and grey; the apothecia have a very prominent margin and the ascospores are of the *Physco-*

nia-type with microrugulate ornamentation. These, together with its filiform conidia, are the main characters to distinguish this saxicolous fungus from similar taxa.

This taxon was treated by Bungartz *et al*. (2004) as a synonym of *Buellia prospersa*. As the combination *Amandinea prospersa* was not made because those authors do not accept that genus as currently circumscribed, we prefer to treat it under the name *Amandinea lecideina* here.

According to Scheidegger (1993), this fungus grows on siliceous rocks, mostly near the sea, from the Mediterranean to Western Europe. That author studied the only specimens known from Portugal to date. Bungartz *et al*. (2007) indicate its presumable cosmopolitan distribution but restricted to coastal areas. Indeed, apart from the present record, in the Iberian Peninsula it is only known from different coastal localities, one in Catalonia (NE Spain), and several in Galicia (NW Spain) (Hladun & Llimona 2002-2007).

Material examined. – Sub ***Buellia sp.***: Minho, Póvoa de Varzim, nas paredes do litoral, 17 Jan 1920, (2230L).

Amandinea punctata s.l. (Hoffm.) Coppins & Scheid., Lichenologist, 25(4): 343. 1993.
Syn: *Buellia myriocarpa* (DC.) De Not.

All the specimens in PO are corticolous, but this fungus can also be saxicolous.

The material placed under this name is possibly not homogeneous, as noted by several authors (Bungartz *et al*. 2004, Scheidegger 1993, Sheard & May 1997). The rimose thallus (whitish to greyish in PO specimens) lacking secondary lichen compounds and the *Buellia*-type ascospores (12.5–15 × 6.5–8.5 µm) are the more constant characters to distinguish this taxon. Our specimens have microrugulate or smooth ascospore walls, a fact that agrees with Sheard & May (1997) and Mayrhofer & Moberg (2002a) whilst, according to Scheidegger (1993), European specimens posses only unornamented ascospores (= psilate). The filiform conidia are also diagnostic, but are seldomly found.

Specimen 1681L was wrongly identified by Sampaio as *Rinodina exigua*, but the latter is clearly separated from *A. punctata* by the lecanorine apothecia, *Physcia*-type ascospores, and the presence of atranorin.

See *Amandinea crassiuscula* and *Buellia schaereri*.

Material examined. – ***Sub Buellia myriocarpa***: Minho, Póvoa de Lanhoso, S. Gens, 6 Sep 1919, (1930L). Idem (1931L). Minho, Póvoa de Lanhoso, S. Gens, 12 Aug 1919, (1920L). Douro Litoral, Porto, Areosa, Dec 1915, (1436L). Douro Litoral, Porto, Agramonte, May 1879, leg. I. Newton, det. W. Nylander, (2814L). – Sub ***Buellia myriocarpa*** var. ***chloropoliza***: Beira Litoral, Figueira da Foz, 12 Dec 1918, (1636L). Beira Alta, Viseu, 18 Apr 1916, (895L). – Sub ***Rinodina exigua***: Minho, Barca de Alva, nos zimbros, 12 Oct 1916, (1681L). – Sub ***Buellia sp.***: Minho, Póvoa de

Lanhoso, Igreja Nova, em madeira de carvalho, 8 Oct 1919, (1976L). Minho, Braga: Falpêrra, 19 Jun 1920, (2381L). Minho, Guimarães, Penha, nos carvalhos, 15 Oct 1919, (1980L). Douro Litoral, Porto: Hospital de Misericordia, árvores do jardim, 18 Aug 1919, (2194L).

Buellia aethalea (Ach.) Th. Fr., Lichenogr. Scand., 1: 604. 1874.

This saxicolous fungus is rather similar in habit to *Buellia spuria* and *B. stellulata*. All three have a whitish to grey, rimose to areolate thallus, a more or less well-developed prothallus often visible around the areoles, immersed to innate, rarely sessile apothecia with a poorly developed exciple, a green epihymenium, and *Buellia*-type ascospores. They are easily distinguished by their different chemistries (cf. Bungartz & Nash III 2004).

The thallus containing norstictic and connorstictic acids (K + red, PD + yellow), the pale hypothecium, and the rather large ascospores characterize *B. aethalea*.

See *Buellia spuria* and *B. stellulata*.

Material examined. – Sub ***Buellia aethalea***: Minho, Póvoa do Varzim, 3 Feb 1920, (2257L). Póvoa de Lanhoso, 3 Sep 1919, (2041L). Póvoa de Lanhoso: Igreja Nova, nas paredes, 8 Oct 1919, (1965L).

Buellia badia (Fr.) A. Massal., Memor. Lichenogr.: 124. 1853.

The PO specimens are saxicolous, growing directly on the substrate or on/among thalli of *Aspicilia* sp. or *Ephebe* sp. It is readily distinguishable by the brown thallus composed of convex squamules; the apothecia of 0.2 mm – 0.8 mm diam. with plane disc and thin and persistent proper margin, and the *Buellia*-type ascospores.

Material examined. – Sub ***Buellia badia***: Minho, Póvoa de Lanhoso: S. Gens, 22 Sep 1919, (1983L). Idem (1983aL). Minho, Póvoa de Lanhoso: Rendufinho, no alto de Sto. Tirso, sobre os musgos dos penedos (raro), 4 Oct 1919, (1919L). Idem (2000L). Minho, Póvoa do Varzim: entre Amorim e A-ver-o-mar, penedos, 20 Jan 1920, (2258L). – Sub ***Buellia badia*** β ***parasitica***: Minho, Guimarães, nas ameias do Castelo (sobre as Aspicilias), 15 Oct 1919, (2032L).

Buellia carballaliana Paz-Bermúdez & Giralt, Bryologist, 112: 845. 2009.

Species described by Paz-Bermúdez & Giralt (2009) on the basis of the PO specimen. This taxon is characterized by its thick, crustose to subsquamulose, milk-coffee colored thalli containing 5–*O*–methylhiascic acid, and small, non-ornamented *Buellia*-type ascospores (ca. 12 × 6.5 µm) with *Physconia*-type thickenings when young, eventually becoming microrugulate when overmature.

Morphologically *Buellia carballaliana* closely resembles *Amandinea crassiuscula* Giralt & Etayo by its similar habit. The latter is distinguished by the absence of secondary lichen compounds and much

larger ascospores [ca. 18.5 × 9.5 µm] which have a strongly rugulate ornamentation clearly visible at 400 X magnification at all ontogenic stages (Giralt *et al*. 2000b).

At present this species is only known from the type collection: Póvoa de Lanhoso, which is one of the two Portuguese locations, where *Erioderma mollisimum* (Samp.) DuRietz occurs in continental Europe (Carballal *et al*. 2007, Paz-Bermúdez *et al*. 2002) and is the only locality known for *Parmotrema sampaioi* Paz-Bermúdez & Elix (Paz-Bermúdez & Elix 2004).

Material examined. – Holotype, sub ***Buellia* sp**: Minho, Póvoa de Lanhoso, Igreja Nova, 8 Oct 1919, (1978L).

Buellia disciformis (Fr.) Mudd, Manual Brit. Lich.: 216. 1861.

Thallus rimose, whitish with a black prothallus, K+ yellow; apothecia sessile, disc flat and the true exciple persistent. One of the corticolous specimens in PO with the hymenium inspersed with oil droplets. This, together with the large *Callispora*-type (or similar) ascospores**,** sometimes becoming triseptate, and the content of atranorin, fulgidin, and fulgoicin, are diagnostic characters.

See *Buellia excelsa, B. leptoclinoides, B.* cf. *triseptata* and *Sculptolumina japonica*.

Material examined. – Sub ***Buellia disciformis***: Beira Alta, Viseu, 16 Apr 1916, (1250L, specimen B). Minho: S. Gens de Calvos, nos carvalhos, 1 Sep 1919, (8345L).

Buellia dispersa A. Massal., Schedul. Critic. 8: 150. 1856.
Syn: *Buellia duartei* Samp.

Two of the specimens studied represent type material of *Buellia duartei* Samp. (Sampaio 1920), a species synonymized with *Buellia dispersa* by Scheidegger (1993).

The thalli of the specimens in PO of this saxicolous species are whitish, rimose to bullate and variable in thickness. This variability was noted by Scheidegger (1993) and Bungartz *et al.* (2002). It is also characterized by sessile apothecia, 0.5 mm – 0.8 mm diam., *Physconia*-type ascospores, and its chemistry (atranorin and 2'-*O*-methylperlatolic acid). All the PO specimens lack confluentic acid, a compound present or not present in this fungus (Bungartz *et al*. 2002).

A comprehensive revision of the circumscription of this taxon is given in Bungartz *et al.* (2002). *Buellia stellulata*, with the same chemistry, is readily distinguished by smaller apothecia and *Buellia*-type ascospores.

See *Buellia stellulata*.

Material examined. – Sub ***Buellia duartei***: Minho, Póvoa de Lanhoso, S. Gens (Nasce, na Lage Longa), 29 Sep 1919, (Lectotype designated by Paz-Bermúdez

et al. 2002: 774, 1993L). Idem (Isolectotype 2054L). Minho, Póvoa de Lanhoso, S. Gens, Ribeiro da Cova, penedos, 29 Sep 1919, (5640L). Minho, Póvoa de Lanhoso, Castelo de Lanhoso, 9 Sep 1921, (5642L). Nasce, (5641L).

Buellia erubescens Arnold, Verhandl. zool.-bot. Gesellsch., 25: 493. 1875.
Syn: *Buellia jorgei* Samp.

Part of the studied material represents the type collections of *Buellia jorgei* Samp. (Sampaio 1924), a species synonymized with *Buellia erubescens* by Giralt *et al.* (2000a).

Two of the PO specimens under this name, however, were wrongly identified by Sampaio as *Buellia disciformis* and *B. subdisciformis*. Both taxa are clearly separated from the corticolous *B. erubescens* by different lichen compounds: atranorin, fulgidin, and fulgoicin in the former, and atranorin, norstictic, and connorstictic acids in the latter. Furthermore, *B. disciformis* has oil dropets in the hymenium, and *B. subdisciformis* is always saxicolous.-

All specimens of *B. erubescens* in PO belong to chemotype I (Giralt *et al.* 2000a), characterized by its content of atranorin and norstictic acid. The presence of this acid, the *Buellia*-type ascospores and the lack of hymenial oil droplets allow identifying this taxon easily.

Material examined. – Sub ***Buellia disciformis***: Beira Alta, Viseu, 16 Apr 1916, (1250L, specimen A). – Sub ***Buellia jorgei***: Minho, Ponte de Lima, Sá, nas macieiras, 7 Mar 1919, (Lectotype designated by Paz-Bermúdez et al. 2002: 774, 2150L). Minho, Paredes de Coura, nos carvalhos, 28 Sep 1915, (Syntype 2580L). Minho, Gerês: Cha de carvalho, nos carvalhos, 22 Sep 1916, (1800L). Minho, Castro – Laboreiro, 22 Aug 1915, (486bL). – Sub ***Buellia subdisciformis***: Beira Litoral, Coimbra, Baleia, nas oliveiras, Apr 1879, leg. A. Moller, det. G. Sampaio, (2815L).

Buellia excelsa (Leight.) A.L. Smith, Monogr. Brit. Lich., 2: 174. 1911.

A saxicolous taxon characterized by whitish, rimose, and K+ yellow (atranorin) thalli, sessile apothecia (0.3 mm – 0.8 mm) with flat to slightly convex discs, hymenium inspersed with oil droplets, and the *Physconia*-type ascospores.

One of the specimens studied (1646L) was wrongly identified as *Buellia punctiformis* var. *aequata*, a synonym of *Amandinea punctata*. Members of this species lack hymenial droplets, have *Buellia*-type ascospores, and filiform conidia.

Buellia disciformis, B. leptoclinoides, and *Sculptolumina japonica*, also with hymenial oil droplets, are distinguished by their different chemistries and ascospore-types.

It has a scattered distribution, and is only known from the British Islands and Sardinia (Scheidegger 1993). According to this author, *B. excelsa* also occurs in Denmark, but this record is not included in Foucard *et al.* (2002); first record for the Iberian Peninsula.

See *Buellia disciformis, B. leptoclinoides,* and *Sculptolumina japonica*.

Material examined. – Sub ***Buellia punctiformis*** var. ***aequata***: Trás-os-Montes e Alto Douro, Carviçais, Moncorvo, 14 Oct 1916, (1646L). – Sub ***Buellia* sp.**: Minho, Póvoa de Varzim, nos muros da estrada de Vila do Conde, 1 Feb 1920, (2243L).

Buellia hyperbolica Bagl., Nuov. Giorn. Botan. Ital., 3: 266. 1871.

Thallus whitish, granulose, K± yellowish-brown, and PD+ orange-red (atranorin and fumarprotocetraric acid chemosyndrome). The chemistry, together with the small, immarginate apothecia, lack of hymenial oil droplets, and large (20–23 × 8–9 µm), rugulate, *Physconia*-type ascospores, are diagnostic characters. This is the only species treated here that contains fumarprotocetraric acid.

This corticolous fungus has been reported from a few and scattered localities in Italy, the Iberian Peninsula (Giralt *et al*. 2000a), and the U.K. (Coppins 2002).

Material examined. – Sub ***Buellia* sp.**: Minho: Póvoa de Lanhoso, S. Gens, num pinheiro manso, 29 Sep 1919, (2107L). Idem, Igreja Nova, nos carvalhos, 1920, *leg*. G. Sampaio & J. Sampaio, *det*. G. Sampaio, (2698L).

Buellia hypophana (Nyl.) Zahlbr., Cat. Lich. Univ., 7: 367. 1931.

The PO specimen comprises several thalli, some terricolous and others growing amongst mosses. All are composed of small, whitish to dull brown squamules, which are more or less verrucose. Additional distinguishing features are the large apothecia (0.5 mm – 1.5 mm) with a flat to slightly convex disc and persistent true exciple, with an almost hyaline inner part and a dark rim; absence of hymenial oil droplets, dark brown hypothecium, plenty of orange drops reacting K+ purple-red; and the large uniseptate ascospores, (17–)20–22(–26) × (6.5–)7–8 (–10) µm, often showing a pseudoseptum in each cell.

Thallus K+ yellowish, C+, and KC+ orange. By HPLC arthothelin (major) and 6-*0*-methylarthothelin (major) have been detected. The apothecia also contain cinnamomeic acid B, an antraquinone of unknown structure which is probably responsible for the K+ purple-red reaction of the hypothecium (Elix, pers. comm.). The chemistry of this species is reported here for the first time.

This species was identified as *Buellia insignis*, a terricolous-muscicolus species containing the same xanthones (Giralt *et al*. 2000a). The absence of the K+ purple-red pigment in the hypothecium, and the ascospores lacking pseudosepta, avoid any confusion.

It was recorded from Portugal by Boom (2003) and Boom & Jansen (2002). It is also known from France (Clauzade & Roux 1985), Spain (Hladun & Llimona 2002–2007), Austria (Türk & Hafellner 1999), and Madeira (Hafellner 1995).

Material examined. – Sub ***Buellia insignis*** var. ***geophila***: Minho, Castro Laboreiro, musgos do penedo no castelo, 22 Aug 1915, (487L).

Buellia indissimilis (Nyl.) B. de Lesd., Lich. Mexique: 26. 1914.

Buellia indissimilis is mainly characterized by the presence of norstictic acid in addition to several xanthones (thallus UV+ orange); the amyloid medulla, I+ blue; the plane apothecia rather persistently surrounded by a white thalline veil; the brown epihymenium; and the small, non-ornamented *Buellia*-type ascospores (when young briefly grading into the *Physconia*-type).

It is similar in habit to B. spuria, but that taxon lacks xanthones, possesses larger ascospores, up to 15 µm in length, and has a green to olivaceous (N+ red violet) epihymenium and a dark brown hypothecium.

This exceptional fungus is currently only known from the Douro Litoral province in Portugal. Up to now, all known specimens were collected on rock by Isaac Newton in 1880 or by Sampaio in 1920, and are kept in PO and H-Nyl.

See *Buellia spuria*.

Material examined. – Sub ***Buellia indissimilis***: Douro Litoral, Póvoa do Varzim, entre Amorim e Abremár, nos penedos, 1920, (2227L). Type: Douro Litoral, Porto, Lavadores, 1880, leg. I. Newton, det. W. Nylander (Lectotype H-Nyl 9310 "n.v.", Isolectotype H-Nyl 10658 "n.v.", Isolectotype PO 2832L).

Buellia leptoclinoides (Nyl.) J. Steiner, Verhandl. zool.-bot. Gesellsch. 57: 357. 1907.

One of the two specimens in PO is saxicolous, and the other corticolous. This species is characterized by thick, whitish or yellowish, K+ yellow thalli (atranorin and placodiolic acid); sessile apothecia, which are often crowded; a hymenium inspersed with oil droplets; and *Callispora*-type ascospores. As already noted in Giralt *et al*. (2000a), the only difference between saxicolous and corticolous material is in the ascospore-wall ornamentation, which is absent in the saxicolous specimens and weak in the corticolous ones. The presence of placodiolic acid clearly separates *B. leptoclinoides* from *B. disciformis, B. excelsa,* and *Sculptolumina japonica*, also with hymenial droplets.

As a corticolous taxon, the species is only known from Portugal (Giralt *et al*. 2000a), the Eastern Pyrenees, and North Africa (Burgaz *et al*. 2002).

See *Buellia disciformis, B. excelsa,* and *Sculptolumina japonica*.

Material examined. – Sub ***Buellia disciformis*** var. ***rugulosa***: Algarve, Portimão, nas figueiras, 6 Apr 1917, (1399L). – Sub ***Buellia*** sp.: Estremadura, Berlengas, Jun 1924, *leg*. R. Palhinha & J.M. Barros, *det*. G. Sampaio, (5590L).

Buellia mediterranea Giralt, Mycotaxon, 75: 189. 2000.

This corticolous taxon was described in Giralt & Llimona (2000), and is characterized by the thin, rimose and greyish thallus reacting

K+ yellow (atranorin); the small apothecia (0.2 mm – 0.3mm) with a persistent true exciple; the absence of hymenial oil droplets; and the small ascospores with tendencies to the *Callispora*-type when young, but of *Buellia*-type when mature.

This, the only specimen of the species in PO, was wrongly identified under a synonym of *Amandinea punctata*, a fungus with typical *Buellia*-type ascospores, lack of secondary lichen substances, and filiform conidia.

It is only known from the Iberian Peninsula, where it is widely distributed in Mediterranean regions, including southern Portugal (Giralt & Llimona 2000).

Material examined. – Sub ***Buellia myriocarpa***: Estremadura, Mafra, tapada, Mar 1918, *leg*. A. R. Jorge, *det*. G. Sampaio, (1844L).

Buellia ocellata (Flot.) Körb., Syst. Lich. German.: 224. 1855.
Syn: *Buellia verruculosa* auct. non (Sm.) Mudd

A saxicolous species easily recognized by the yellowish thallus reacting C+ orange (xanthones), the small, cryptolecanorine apothecia with a poorly developed true exciple, the greenish epihymenium (N+ red violet), and the rather large (12–18 × 8–11 µm), rugulate, *Buellia*-type ascospores.

According to Scheidegger (1993), it grows on siliceous rocks from sea level to the subalpine zone in the Mediterranean region and central Europe. In the Iberian Peninsula its distribution is scattered: it is only known from the Galician coast (NW Spain) and from the Portuguese specimens reported here. The record from central Spain in Scheidegger (1993, compiled in Hladun & Llimona 2002–2007) is erroneous; the material (GZU) proved to be *B. aethalea* when re-examined by one of us (M. Giralt).

Material examined. – Sub ***Buellia verruculosa***: Minho, Póvoa de Lanhoso, entre S. Gens e S. Roque, 29 Aug 1919 (1950L). Idem, entre Barreiro e Rendufinho, 4 Oct 1919 (2368L). Douro Litoral, Vila do Conde: nos penedos, 20 May 1920, (2356L).

Buellia cf. ***sardiniensis*** J. Steiner, Verhandl. zool.-bot. Gesellsch., 57: 348. 1907.
Syn: *Buellia leptocline* var. *minor* Bagl.

Buellia sardiniensis is saxicolous and closely related to *B. saxorum* and *B. subdisciformis*. All of them are characterized by thick, verrucose thalli, containing atranorin (K+ yellow), large and prominent apothecia, the absence of hymenial oil droplets, and *Physconia*-type ascospores. *Buellia sardinensis* and *B. saxorum,* however, contain also gyrophoric acid (C+ rose) and have an amyloid medulla (I+ blue). *Buellia subdisciformis* does not give these spot test reactions, but contains

norstictic acid (K+ yellow, then red) as does *B. sardinensis*, a secondary substance which is absent in *B. saxorum*.

The present specimen is identified only tentatively as it lacked gyrophoric acid: TLC revealed only atranorin and norstictic acid.

The specimen in PO was originally identified as *B. leptocline*, which is primarily distinguished by the different chemistry, the absence of both gyrophoric and norstictic acids; *B. leptocline* only has atranorin.

Material examined. – Sub ***Buellia leptocline***: Algarve, Serra da Foia, nos penedos, 10 Apr 1917, (1397L).

Buellia saxorum A. Massal., Ricerch. Auton. Lich.: 82. 1852.
Syn: *Buellia superans* (Nyl.) Mong.

TLC reveals atranorin and gyrophoric acid (thallus K+ yellow, C+ rose), and the medulla reacted I+ blue. As noted under *B.* cf. *sardiniensis*, only the lack of norstictic acid separates these two saxicolous taxa.

See *Buellia* cf. *sardiniensis* and *B. subdisciformis*.

Material examined. – Sub ***Buellia superans***: Minho, Póvoa de Lanhoso, Rendufinho, monte de Sto. Tirso, nos penedos, 4 Oct 1919, (1969L). Póvoa de Lanhoso, nas rochas do castelo, 4 Sep 1919, (1939L). Douro Litoral, Pinhão, S. Cristovão, Jun 1880, *leg.* I. Newton, *det.* W. Nylander, (2812L). – Sub ***Buellia leptocline***: Douro Litoral, Leça da Palmeira, nas paredes dos campos, no litoral, 17 Jan 1917, (1265aL, 1265bL).

Buellia schaereri De Not., G. bot. ital., 2: 199. 1846.

A corticolous or lignicolous fungus readily distinguishable by its inconspicuous to very thin, greyish thallus, with all spot tests negative (lacking characteristic lichen substances), small apothecia (0.2 mm – 0.3 mm), and small, pale brown, and thin-walled *Buellia*-type ascospores (6–9 × 2.5–3.5 µm).

Apart from the longer and curved conidia, unfortunately too often absent, *Amandinea punctata* is mainly distiguished by larger and darker ascospores.

Material examined. – Sub ***Buellia schaereri***: Beira Alta, Viseu, nos pinheiros, 18 Apr 1916, (900L). Estremadura, Cintra, Estefânia, nos pinheiros, 10 Mar 1918, *leg.* A. R. Jorge, *det.* G. Sampaio, (1845L). Beira Litoral, Pampilhosa, nas oliveiras, 5 Aug 1916, (1070L).

Buellia sequax (Nyl.) Zahlbr., Cat. Lich. Univ. 7: 410. 1931.

All the specimens of this saxicolous fungus in PO totally agree with the specific concept of *Buellia abstracta* given in Orange *et al.* (1992): *"thallus immersed and insconpicuous, medulla I-. Apothecia 0.1–0.2 mm diam … often forming lines o irregular clusters …; margin*

… thin, raised and wavy crenulated … Ascospores 11–13 × 4.5–5.5 µm ... (of *Buellia*-type)". "*Resembles* Lecidea (Polysporina) sarcogynoides *in habit*". The conspecificity of *B. abstracta* and *B. sequax* was established by Scheidegger (1993), who was followed by Bungartz *et al.* (2004). We consider, however, that such a typical and constant morphology would merit recognition at least as an infraspecific taxon. Nevertheless, we have not studied enough material to exclude the possibility of intermediate forms and so we cannot confirm or reject with confidence their conspecificity**.**

All the specimens in PO had been misidentified as *B. punctiformis* var. *aequata*, a synonym of *Amandinea punctata*, a species with a better developed thallus and filiform conidia.

Material examined. – Sub ***Buellia punctiformis*** var. ***aequata***: Minho, Póvoa do Lanhoso: Rendufinho, 12 Sep 1919, (2019L). Póvoa de Varzim, Feb 1920, (2282L). Douro Litoral, Leça, perto da Boa-Nova, 22 Jan 1917, (1281L). Beira Litoral, Figueira da Foz, 12 Feb 1918, (1644L).

Buellia spuria (Schaer.) Anzi, Cat. Lich. Sondr.: 87. 1860.
Syn: *Buellia lactea* (A. Massal.) Körb.

A saxicolous fungus characterized by its rather thick, areolate, whitish thallus, containing atranorin and norstictic acid (K+ yellow then red), and an amyloid medulla (I+ violet). *Buellia stellulata* is mainly distinguished by smaller areoles (≤ 1 mm) and apothecia (0.2 mm – 0.5mm), the lack of a medullar reaction with iodine, and a thallus containing norstictic acid, confluentic, and 2'-0-methylperlatolic acids.

See *Buellia aethalea* and *B. indissimilis*.

Material examined. – Sub ***Buellia lactea***: Minho, Ponte de Lima, Vale de Pereiras, penedos, 17 Aug 1915, (450L). Minho, Póvoa de Varzim, Jan 1920, (2252L). – Sub ***Buellia*** sp.: Minho, Póvoa de Lanhoso, Porto de Bois, 3 Sep 1919, (8346L).

Buellia stellulata (Taylor) Mudd, Manual Brit. Lich.: 216. 1861.

It is readily distinguishable by the thin, rimose, whitish thallus (1-2 cm diam), an inamyloid (I-) medulla, and the presence of atranorin (K+ yellow), and confluentic and 2'-*0*-methylperlatolic acids.

See *Buellia aethalea*, *B. dispersa,* and *B. spuria*.

Material examined. – Sub ***Buellia stellulata***: Douro Litoral, Vila Nova de Gaia, Cabedelo, May 1880, leg. I. Newton, det. W. Nylander, (2810L). Douro Litoral, Valongo, *leg*. I. Newton, *det*. W. Nylander, (2809L). Douro Litoral, Leça da Palmeira, 22 Jan 1917, (1279L). Leça, perto da Boa Nova, 22 Jan 1917, (1277L). – Sub ***Buellia lactea***: Estremadura, Cintra, Castelo dos Mouros, 23 Aug 1916, (1072L).

Buellia subdisciformis (Leight.) Vain., Etud. Lich. Brésil, 7: 167. 1890.

The absence of a medullary reaction with iodine (I-), and lack of gyrophoric acid in the thallus separates this saxicolous fungus from

the closely related *B. sardiniensis* and *B. saxorum*. The thalline reactions are: K+ yellow to red, PD+ orange, and C- (atranorin, norstictic and connorstictic acids).

See *Buellia* cf. *sardiniensis* and *B. saxorum*.

Material examined. – Sub ***Buellia subdisciformis***: Minho, Póvoa de Varzim, nos penêdos maritimos, 18 Jan 1920, (2234L). Douro Litoral, Leça da Palmeira, nos rochedos marítimos, 17 Jan 1917, (1255L). Douro Litoral, Boa Nova, 19 Sep 1880, *leg.* I. Newton, *det.* W. Nylander, (2811L). Douro Litoral, Vila do Conde, beira – mar, 4 Mar 1920, (2297L).

Buellia subsquamosa J. Steiner, Verhandl. zool.-bot. Gesellsch., 57: 360. 1907.

A saxicolous fungus, easily recognized by the thick, whitish thallus containing atranorin and psoromic acid (PD+ strong lemon yellow); the slightly amyloid medulla (I+ pale violet; evident in a section on a microscope slide!); the rather large lecideine and sessile apothecia (0.5mm – 0.9 mm) with a thick and prominent margin; the green, N+ red-violet epihymenium; and the rather large and strongly ornamented *Buellia*-type ascospores.

The two PO specimens were originally identified as *B. impressa,* a synonym of *B. aethalea*, that species that contains norstictic and connorstictic acids, and apothecia with a poorly developed true exciple.

According to Scheidegger (1993), it grows in xerothermic habitats from the inner alpine valleys to the Mediterranean region; he also reported specimens from Portugal.

Material examined. – Sub ***Buellia impressula***: Minho, Póvoa do Varzim, 19 Jan 1920, (2237L). Baixo Alentejo, Mértola, 26 Apr 1925, (2641L).

Buellia cf. ***triseptata*** A. Nordin, Bryologist, 102(2): 260. 1999.

Buellia triseptata is a corticolous or lignicolous species mainly characterized by a thallus containing only atranorin; small, adnate to sessile lecideine apothecia with a reddish brown pigmented exciple; an hymenium lacking oil droplets; triseptate, weakly ornamented ascospores measuring 14–22 × 5.5–9 µm (mean 17.5 × 7 µm), which when young are uniseptate, with callisporoid thickenings; and bacilliform conidia, of 4–6 × 1 µm. Further, the ascospores develop by an ontogeny of type A (Giralt & Nordin 2002), and have a thick true wall and a thin and irregularly cracked perispore.

The two specimens studied here differ from *B. triseptata* s.s. in the presence of several xanthones of the 2,5,7-trichloro-3-*O*-methylnorlichexanthone chemosyndrome, in addition to atranorin (HPLC). It is because of this chemistry that they are tentatively referred to this species here.

Additional material of *B.* cf. *triseptata* is needed to determine (1) the appropriate taxonomic rank (i.e., as a new species, as an infraspe-

cific taxon within *B. triseptata,* or part of the variation within *B. triseptata*); and (2) the generic position, since all features characterizing *B.* cf. *triseptata* agree with those which are given as diagnostic for the genus *Tetramelas*.

Buellia triphragmia (Nyl.) Arnold and *B. triphragmia* auct. are taxonomic synonyms of *B. geophila* and *B. disciformis,* respectively (Nordin 1996, Foucard *et al.* 2002). The mainly artic-alpine *B. geophila* grows on mosses over calcareous rocks, has ascospores of 24-38 x 6-13 µm and contains 6-*O*-methylarthothelin; whereas *B. disciformis* contains atranorin, fulgidin and fulgoicin, and further possesses hymenial oil droplets and *Callispora*-type ascospores.

Buellia triseptata is known from southwestern Europe, including one locality from Portugal (Giralt & Nordin 2002), North Africa (Burgaz *et al.* 2002), and western North America (Bungartz *et al.* 2007).

See *Buellia disciformis*.

Material examined. – Sub ***Buellia triphragmia***: Trás-os-Montes e Alto Douro, Bragança, nos cilantros, 9 Sep 1915, (522aL, 522bL).

Coscinocladium gaditanum (Clemente) A. Crespo, Llimona & D. Hawksw., Taxon, 53(2): 409. 2004.
Syn. *Lecanora lisbonensis* Samp.

A sterile placodioid crustose whitish grey to almost white lichen forming rosettes, with discrete and sometimes somewhat brownish soredia formed in discrete soralia in the centre, the lobes covered in dense pruina, with all spot tests negative. This monotypic genus occurs on coastal rocks around the Mediterranean, and also on the Atlantic coasts of Morocco, Portugal, S France, and southern Spain (Crespo *et al.* 2004). It has some superficial similarity to *Diploicia canescens*, but the latter has better developed marginal lobes which are more greenish grey, coalesscing soralia, and is K+ yellow.

Ascomata are unknown, but its position in the *Physciaceae* was established by molecular phylogenetic methods (Crespo *et al.* 2004). These authors showed that it was a member of the *Physcia* clade in the family, and closest to *Rinodina* amongst the crustose genera in the family, though actually more related to some foliose and fruticose species.

Material examined. – Sub ***Lecanora lisbonensis*** Samp.: Estremadura, S. Martinho do Porto, rochedos marítimos, *leg.* A. Ricardo 12 Oct. 1917, *det.* G. Sampaio (Lectotype designated by Crespo *et al.* 2004: 409, 1567L). Algarve, Praia das Maçãs, 23 Sep 1918, (Syntype! 991L). Algarve, Portimão: Praia da Rocha, 1916, (Syntype! 1563L). Beira Alta, Viseu, nos sucalcos, 16 Apr 1916, (991aL). Idem, penedos, 16 Apr 1916, (Syntype! 991bL). Beira Litoral, Buarcos, nas muralhas velhas do jardim, 13 Feb 1918, (Syntype! 1817L). Douro Litoral, Póvoa de Varzim, estrada de Vila do Conde, muros, 4 Mar 1920, (Syntype! 2317L). – Sub ***Psoroma lisbonense*** Samp. (nom. nud. *Lecanora lisbonensis* Samp., Paz-Bermúdez et al., 2002: 781). Estremadura, in Sampaio: Lich. Portugal nº 85, *leg.* R. Jorge, Jan 1922, *det.* G. Sampaio (5607L).

Dimelaena oreina (Ach.) Norman, Nytt Mag. Natur., 7: 231. 1853 [1852].
Syn: *Rinodina oreina* (Ach.) A. Massal.

Dimelaena is a genus segregated in *Physciaceae* to include those members of *Rinodina* with placodioid thalli and unthickened spore walls (Sheard 1974). *Dimelaena oreina* is a saxicolous species occurring on siliceous rocks, characterized by a yellow-green thallus and lecanorine apothecia. The spot test reactions of the PO specimen are C-, K+ yellow and PD+ orange. TLC was not carried out on the specimen, but the reactions suggest the presence of usnic and stictic acids. This indicates that it belongs to the chemotype V, which is the most common and widespread in the Iberian Peninsula (Calatayud & Rico 1999).

Material examined. – Sub ***Rinodina oreina***: Trás-os-Montes e Alto Douro, Moncorvo, *leg*. J. Santos Júnior, *det*. G. Sampaio, (2572L).

Diploicia canescens (Dicks.) A. Massal., Ricerch. Auton. Lich.: 86. 1852.
Syn: *Buellia canescens* (Dicks.) De Not.

All the specimens in PO are corticolous, although this species can also be saxicolous. It is characterized by the whitish grey, densely pruinose placodioid thallus that reacts K+ yellow (atranorin and diploicin), and bears irregular, whitish to bluish convex soralia, which at first are well delimited, but coalesce with age to almost entirely cover the central parts of the thalli.

Material examined. – Sub ***Buellia canescens***: Douro Litoral, Póvoa do Varzim, junto ao cemitério, Feb 1920, (2274L). Estremadura, Lisboa, Alfeite, 26 Aug 1916, (1333L). Idem, *leg*. Dr. A.R. Jorge Mar 1923, *det*. G. Sampaio, (7062L), nº 185 exsiccata "Lichenes de Portugal". Baixo Alentejo, Odemira, Sep 1905, (108L). Algarve, Portimão, figueiras, 8 Apr 1917, (7061L).

Diploicia subcanescens (Werner) Hafellner & Poelt, Herzogia, 5: 59. 1979.

It recalls a fertile morph of *D. canescens*. The specimen in PO is corticolous, although this taxon is usually saxicolous. In contrast, the sorediate *D. subcanescens* regularly forms apothecia (as the PO specimen), lacks typical soralia, and contains, in addition to atranorin and diploicin, gyrophoric acid (Elix & Jenkins 1988).

The conspecificity between *D. canescens* and *D. subcanescens* was proposed by Molina *et al*. (2002). These authors also proposed the inclusion of *Diploicia* within the earlier *Diplotomma,* but this has not been confirmed by some subsequent molecular data (Helms *et al*. 2003); studies using more genes are required to address this question conclusively.

This taxon occurs along the western and southern Mediterranean coast, and is also known along the southern Atlantic coast of Europe, and from North Africa and Macaronesia (Nimis 1993).

Material examined. – Sub ***Buellia canescens***: Estremadura, Lisboa: Campolide, nas oliveiras, 28 Apr 1916, (933L).

Diplotomma ambiguum (Ach.) Flagey, Mémoir. Soc. d'Émulat. Doubs., ser. 6, 8: 84. 1884.

This species was synonymized with *Buellia alboatra* by Nordin (2000), who included several *Diplotomma* species under this name (e.g., *D. alboatrum, D. chlorophaeum, D. epipolum*). Later, on the basis of molecular data, Nordin & Tibell (2005) found the segregation of *Diplotomma* from *Buellia* to be well-supported, as had Molina *et al.* (2002), but the relationships among species of the *Diplotomma* group were difficult to resolve. Nordin & Tibell (2005) decided to distinguish three groups: *D. alboatrum* 1, with norstictic acid (= *D. chlorophaeum*?), and *D. alboatrum* 2 and 3, both lacking this substance but growing on siliceous rocks and bark, respectively.

We agree that there is a need of in-depth molecular analyses of the *Diplotomma* group, but in the interim we identify the PO specimen as *D. ambiguum*. The absence of lichen substances is one of the characters shared by *D. ambiguum* and *D. alboatrum* 2, but the saxicolous coastal habitat, the thick thallus and the pruinose apothecia are the main characters to distinguish *D. ambiguum* (Clauzade & Roux 1985).

Material examined. – Sub ***Leciographa fragosoi*** Samp.: Douro Litoral, Vila do Conde, nun muro, junto ao Castelo (litoral), 4 Mar 1920, (Lectotype designated by Paz-Bermúdez *et al.* 2002: 779, 2298L). Douro Litoral, Porto: Castelo do Queijo, nos penedos do mar, 1 Jan 1921, (Syntype 2454L).

Rinodina aspersa (Borrer) J.R. Laundon, Lichenologist, 18(2): 175. 1986.

This saxicolous fungus is characterized by a sterile thallus composed of whitish, dispersed and mostly sorediate areoles over a black prothallus.

It is very similar to *R. atrocinerea* (see below) and has been considered a sorediate version of that (Giralt 2001); both taxa have an identical chemistry (see below).

According to Mayrhofer & Moberg (2002b), this is a rare fungus distributed from temperate Europe to southern Portugal, Corsica, and Sardinia; Giralt (2001) recorded the species from several localities in Portugal and from one location at the Mediterranean coast of Catalonia (NE Spain).

See *Rinodina atrocinerea*.

Material examined. – Sub ***Rinodina atrocinerea***: Douro Litoral, Valongo, 11 Apr 1880, *leg.* I. Newton, *det.* W. Nylander, (5379L).

Rinodina atrocinerea (Hook.) Körb., Syst. Lich. Germ.: 125. 1855.
Syn: *Rinodina plumbella* (Borrer) H. Olivier

A saxicolous fungus characterized by a thallus composed of whitish, more or less contiguous, flat to subconvex areoles, delimited by a black prothallus; *Pachysporaria*-type ascospores with protrusions towards the spore ends; and in the thallus reacting K+ yellow, PD+ faintly yellow (atranorin), and C+ red (gyrophoric acid chemosyndrome), and the medulla not being amyloid (I-).

Material examined. – Sub ***Rinodina atrocinerea***: Minho, Ponte de Lima: Sá, 10 Sep 1916, (1114L). Idem, Santo Ovidio, 11 Sep 1916, (5380L). Minho, Póvoa de Lanhoso: S. Gens, Jan 1903, (339L). – Sub ***Rinodina atrocinerea*** var. ***plumbella***: Minho, Ponte de Lima: Sá, 14 Aug 1915, (434L). – Sub ***Rinodina atrocinerea*** var. ***subcinerea***: Minho: Gerês: Río das Caldas, 21 Aug 1916, (1113L). – Sub ***Rinodina atrocinerea*** β ***subplumbella***: Beira Litoral: Buçaco, 10 Jan 1916, (747L). – Sub ***Rinodina plumbella***: Minho, Serra da Foia, 10 Apr 1917, (1385L). – Sub ***Rinodina*** sp.: Minho, Póvoa de Varzim, nos penêdos, 19 Jan 1920, (2338L). Baixo Alentejo, Mértola, 26 Apr 1925, (2649L). Idem (2679L).

Rinodina beccariana Bagl. var. ***beccariana***, Giorn. Bot. Ital., 3: 239. 1871.

A saxicolous fungus characterized by a continuous thallus, composed of granulose to verrucose areoles which contains atranorin (K+ yellow), and the *Pachysporaria*-type ascospores. Often identified as *Rinodina confragosa* (as it was in PO), which is similar in habit but with *Physcia*-type ascospores.

See *Rinodina santorinensis* var. *olivieri*.

Material examined. – Sub ***Rinodina confragosa***: Douro Litoral, Lavadores, Oct 1880, *leg.* I. Newton, det. W. Nylander, (5381L).

Rinodina bischoffii (Hepp.) A. Massal., Fram. lich.: 26. 1855.

It has a hymenium inspersed with abundant oil droplets, and the diagnostic *Bischoffii*-type ascospores.

Rinodina bischoffi is characteristic of hard calcareous rocks, especially limestones, and is widespread in Europe. In Portugal it is only known from the province Trás-os-Montes e Alto Douro, where the specimen studied here was collected; another one was collected by Tavares (Giralt 2001).

See *Rinodina guzzinii*.

Material examined. – Sub ***Rinodina bischoffii* var. *confragosa***: Trás-os-Montes e Alto Douro, Bragança, Panacal, nas rochas calcáreas, 19 Oct 1921, (2505L).

Rinodina boleana Giralt & H. Mayrhofer, Mycotaxon, 40: 435. 1991.

A corticolous species characterized by a thin greyish thallus, with all spot tests negative, and small *Pachysporaria*-type ascospores (11–

15 × 5–7.5 µm) with ontogeny of type B (Giralt 2001). *Rinodina pyrina* (Ach.) Arnold (not in PO) is distinguished by the *Physconia*-type ascospores with ontogeny type A. Other corticolous species in PO with *Pachysporaria*-type ascospores are *R. dolichospora, R. isidioides,* and *R. roboris*. All three are readily distinguished by their clearly larger ascospores which further follow a type A ontogeny. Moreover, *R. isidioides* is isidiate. *Rinodina boleana* is more similar to *R. oleae,* which differs exclusively in having *Dirinaria*-type ascospores.

It is scattered in the Mediterranean region, and was previously known from Croatia, Italy, and Spain (Giralt & Mayrhofer 1995); first record for Portugal.

See *Rinodina dolichospora, R. isidioides, R. oleae,* and *R. roboris*.

Material examined. – Sub ***Rinodina pyrina***: Beira Litoral, Coimbra, Sto. Antonio dos Olivais, nos carvalhos, 6 Jan 1916, (715L).

Rinodina cana (Arnold) Arnold, Verh. zool.-bot. Ges. Wien, 30: 125. 1880.
New synonym: *Rinodina lesdainii* Samp., Bol. Soc. Brot., ser. 2, 2: 175. 1924.

Our study of the abundant type material of *R. lesdainii* in PO has enabled us to confirm that it is conspecific with *R. cana,* as already suspected by Navarro-Rosinés *et al.* (1996). This saxicolous species is mainly characterized by the lack of secondary lichen substances, and *Milvina*-type ascospores, grading into the *Pachysporaria*-type when mature which has a thick intermediate spore wall layer (see Fig. 2A in Giralt & Llimona 1997).

All specimens studied are parasitized by *Wernerella maheui* (Werner) Nav-Ros., Roux & Giralt, a lichenicolous fungus that has been found growing on the apothecia of two species of *Rinodina: R. cana* (typical host) and *R. atrocinerea* (Navarro-Rosinés *et al.* 1998).

This species has previously been collected in the Alps, eastern Pyrénées (Nimis 1993), and eastern Spain (Giralt 2001); first record for Portugal.

Material examined. – Sub ***Rinodina lesdainii***: Minho, Póvoa de Lanhoso: S. Gens, nas lages das paredes, 28 Mar 1923, (Lectotype designated by Paz-Bermúdez *et al.* 2002: 782, 2635L). Idem (Isolectotypes 5550L, 5550aL, 5550bL, 5550cL, 5550dL, 5550eL, 5550fL).

Rinodina dolichospora Malme, Bihang K. Svenska Vet.-Akad. Handl. 28 (III/1):30. 1902.
Syn: Rinodina confinis Samp.

A corticolous species described as new by Sampaio (1924) under the name *R. confinis,* which has recently been synonymized with *R. dolichospora* (Giralt *et al.* 2009a). *Rinodina dolichospora* is characterized by the ochraceous, subsquamulose thallus, lack of lichen com-

pounds, and the large *Pachysporaria*-type ascospores (22-32 x 12-17 µm) with minute droplet-like inclusions within the spore wall. In our opinion the presence of the same type of inclusions in the wall of the submuriform ascospores of *R. intermedia* indicates that these two taxa may be closely related. Sampaio (1924) also noted this relationship, but on the basis of two additional lumina sometimes being present in overmature ascospores of *R. dolichospora*

Its distribution is clearly oceanic, and it is known from several localities on the Atlantic coast of the Iberian Peninsula and Italy (Liguria), in Europe (Giralt & Mayrhofer 1995, as *R. confinis*), and also from Sardinia and Macaronesia (Nimis 1993).

See *Rinodina boleana* and *R. intermedia*.

Material examined. – Sub ***Rinodina confinis***: Beira Litoral, Coimbra, Sto. Antonio dos Olivais, nas oliveiras, 6 Jan 1916, (Lectotype designated by Paz-Bermúdez et al. 2002: 782, 710L). Minho, Póvoa de Lanhoso, S. Gens, nos carvalhos, 2 Sep 1919, (Syntype! 1917L). Idem, nas oliveiras, 10 Sep 1919, (Syntype 1915L). Minho, Ponte de Lima: Sá, troncos velhos de uma oliveira, 15 Sep 1915, (661L).

Rinodina dubyana (Hepp) J. Steiner, Verh. zool.-bot. Ges. Wien, 69: 60. 1919.

The indistinct thallus together with the apothecia immersed in depressions of the calcareous rock substratum, and the *Physconia*-type ascospores, distinguish this taxon from all others treated here. *Rinodina immersa* (Körb.) Arnold (not in PO) with a similar habit is separated by its *Bischoffii*-type ascospores.

It is frequent in submediterranean and Mediterranean areas in Europe, with scattered outliers northwards to southern Scandinavia (Nimis 1993). There are several records from Spain (Giralt 2001), but it has not previously been reported from Portugal.

See *Rinodina guzzinii*.

Material examined. – Sub ***Rinodina bischoffii* var. *immersa***: Estremadura, Cai-Água, 7 Dec 1918, (2373L).

Rinodina euskadiensis A. Crespo & M.B. Aguirre, Munibe, 38: 135. 1984.

The only corticolous member of the *R. oxydata*-group, characterized by the thin, whitish thallus containing traces of atranorin (K+ yellow), and large (20–25 × 10–12 µm) *Mischoblastia*-type ascospores.

Only known from a few localities in N and NE Spain (Giralt 2001); first record for Portugal.

See *Rinodina oxydata*.

Material examined. – Sub ***Rinodina maculiformis***: Beira Alta, Viseu, carvalhos, 15 Apr 1916, (941L). Beira Litoral, Buçaco, madeira de um banco, 9 Jan 1916, (728L).

Rinodina gennarii Bagl., Comment. Soc. Critt. Ital., 1: 17. 1861.
Syn: *Rinodina demissa* auct.

It is characterized by the usually poorly developed thallus lacking secondary lichen substances, abundant and small apothecia (0.3 mm – 0.5 mm), and *Dirinaria*-type ascospores. It appears to be a saxicolous counterpart of the corticolous *R. oleae,* with identical diagnostic characters, and the two taxa have recently been considered conspecific, (Kaschik 2006).

It has not been recorded from Portugal since the date of Sampaio´s collections.

Material examined. – Sub ***Rinodina demissa***: Minho, Póvoa de Lanhoso, S. Gens, 10 Sep 1919, (1926L). Idem, Rendufinho, Monte de Sto. Tirso, 1919, (1962L). Estremadura, Lisboa, Benfica, 24 Sep 1918, (1761L). Baixo Alentejo, Beja, 14 Apr 1917, (1426L). – Sub ***Rinodina demissa* var. *inundata***: Beira Alta, Barca d'Alva, 12 Oct 1916, (1199L).

Rinodina guzzinii Jatta, Nuovo Giorn. Not. Ital., 23: 354. 1891.

The PO specimen has a cracked-areolate, pale grey thallus and *Bischoffii*-type ascospores (17–20 × 11–12 µm) but with a poorly developed dark band around the septum, a feature which seems to be quite common in this saxicolous species (Giralt 2001). The lack of hymenial oil droplets, and the indistinct thallus with apothecia immersed in the substratum, separate this taxon from *R. bischoffii* and *R. dubyana*, respectively.

Rinodina teichophila (Nyl.) Arnold (not in PO) is separated by, amongst other features, the larger (18–28 × 10–15 µm; Giralt 2001) *Mischoblastia*-type ascospores.

Known from southern Europe and the Near East (Mayrhofer 1984); in Spain it has a scattered distribution (Giralt 2001); first record for Portugal.

See *Rinodina bischoffii* and *R. dubyana*.

Material examined. – Sub ***Rinodina teichophila***: Estremadura, Setubal, Monte de S. Luiz, Mar 1904, *leg.* P. Valerio Cordeiro, *det.* G. Sampaio, (1682L).

Rinodina intermedia Bagl., Comm. Soc. Critt. Ital., 1: 313. 1863.

This is the only *Rinodina* species in PO with submuriform ascospores (with 6–10 internal cells at maturity). This feature and its terricolous or muscicolous habit are diagnostic.

This species has a southern and western distribution in Europe (Nimis 1993). According to Giralt (2001), it is quite rare in the Iberian Peninsula, being known only from Portugal and Catalonia (NE Spain).

See *Rinodina dolichospora*.

Material examined. – Sub ***Rinodina intermedia***: Minho, Póvoa de Lanhoso, S. Gens de Calvos, na terra das paredes, 10 Dec 1919, (2341L). – Sub ***Rinodina***

conimbricensis Samp.: Beira Litoral, Coimbra, Sto. Antonio dos Olivais, no grez (Lectotype designated by Paz-Bermúdez *et al.* 2002: 782, 741L) Beira Alta, Viseu, paredes, sobre os musgos, 18 Apr 1916, (Syntype! 894L). – Sub ***Rinodina conimbricensis*** **var.** ***tumidula*** Samp.: Beira Litoral, Coimbra, Sto. Antonio dos Olivais, terra e musgos, 6 Jan 1916, (Holotype 712L).

Rinodina isidioides (Borrer) H. Olivier, Mem. Soc. Sci. Nat. Cherbourg, 37: 186. 1909.

This distinctive corticolous taxon cannot be confused with any other treated here because it is the only one with an isidiate thallus. Further diagnostic features are the presence of atranorin (K+ yellow), and the large (22–32 × 12–17 µm) *Pachysporaria*-type ascospores.

It has a subatlantic range, and is present from the UK south to Portugal, where it grows in ancient forests (Nimis 1993); in fact and according to Rose (1976) it is an indicator of ecological continuity. Giralt (2001) indicates that it has an oceanic distribution in the Iberian Peninsula, where it occurs along the Atlantic façade and the Cantabric Region.

Material examined. – Sub ***Rinodina isidioides***: Minho, Póvoa de Lanhoso, Hôrto, nos carvalhos, 28 Jun 1920, leg. J. Sampaio, det. G. Sampaio, (2414L). Minho, Ponte de Lima: Moreira, num carvalho, 19 Sep 1920, (2419L). Minho, Braga, Falperra, nos carvalhos, 19 Jun 1920, (2377L).

Rinodina luridescens (Anzi) Arnold, Flora 55: 39. 1872.
Syn: *Rinodina coniopta* (Nyl.) Hav.

The thick, grey-brown thallus, containing gyrophoric acid (C+ red), together with the subimmersed, pseudolecanorine apothecia, brownish hypothecium, and *Physcia*-type ascospores when young, and *Milvina*- or *Physconia*-type when mature, clearly separate this saxicolous taxon from all others treated here.

It has a subatlantic distribution, and is most frequent in Western Europe and along the Mediterranean coast, extending as far as the Black Sea (Nimis 1993). In the Iberian Peninsula, it is known only from NW Spain and Portugal (Giralt 2001).

Material examined. – Sub ***Rinodina coniopta***: Douro Litoral, Leça da Palmeira: beira mar, nas paredes dos campos, 17 Jan 1917, (1813L). Douro Litoral, Vila do Conde, penedos na beira mar, 9 Feb 1920, (2265L).

Rinodina milvina (Wahlenb. apud Ach.) Th. Fr., Nova Acta reg. Soc. Scient. Upsala, ser. 3, 3: 224. 1861.

The cracked-areolate, reddish brown thallus formed on a well developed, black prothallus, lack of secondary lichen compounds, and *Milvina*-type ascospores (14–20 × 7–12 µm) are diagnostic of this species and the corticolous *R. sophodes,* but the latter has smaller ascospores (13–16 × 7–8.5 µm).

Known from Portugal through the specimen studied here, and also from Serra da Estrela in the province Beira Alta (Boom & Jansen 2002).

See *Rinodina sophodes*.

Material examined. – Sub ***Rinodina milvina***: Trás-os-Montes e Alto Douro, Vila Real, penedos lavados do río Corgo, Sep 1917, (1588L).

Rinodina* cf. *mniaraea var. ***mniaraeiza*** (Nyl.) H. Magn., Acta Horti Gothob., 17: 256. 1947.

Rinodina mniaraea is muscicolous, characterized by a smooth to verrucose pale brown to reddish brown thallus, the large apothecia (0.4–1.5 mm diam) which soon become convex, the absence of a cortex of the thalline exciple, and the large *Physcia*-type ascospores (20–34 × 9–15 µm). Further, the type variety is found in artic-alpine habitats of North America and Europe (Fox & Purvis 1992, Sheard 2004), where it occurs mainly in Scandinavia and the Alps (Giralt 2001), but is common in the whole Arctic (E. Parmasto *in litt*. 2010).

Three varieties of this species were recognized by Mayrhofer & Moberg (2002b), primarily distinguished by the chemical products: var. *mniarae*a, ± variolaric acid; var. *mniaraeiza*, atranorin and ± variolaric acid; and var. *cinnamomea,* an orange to yellow pigment in the medulla reacting K+ violet to purple. Because of the chemistry, the PO specimen agrees best with var. *mniaraeiza* as it contains atranorin (with chloroatranorin by HPLC) and lacks the orange to yellow medullary pigment. Nevertheless, it is identified only tentatively here because of the *Physcia*-type ascospores grading into the *Milvina*-type, and the habitat (collected at ± 325 m altitude). In contrast, *R. miniaraea* has typical *Physcia*-type ascospores, and occurs in arctic-alpine areas.

It had also been previously collected by the Portuguese Jesuit V.A. Cordeiro during 1903–1904 in Setúbal (close to Lisbon). He sent specimens to Harmand, who published the results of his identifications in different works. In Harmand (1909: 84) a Portuguese specimen of *Lecanora mniaraeiza* Nyl. (Syn. = *Rinodima mniaraea* var. *mniaraeiza*) was published, but this record is uncertain according to Magnusson (1947). We have not located and re-examined Cordeiro's material.

It has not been recorded in Portugal since Sampaio's collection, in 1917.

Material examined. – Sub ***Rinodina mniaraea***: Trás-os-Montes e Alto Douro, Seixal, nas paredes, 28 Sep 1917, (1467L).

Rinodina occulta (Körb.) Sheard, Lichenologist, 3(3): 349. 1967.
New synonym: *Rinodina atrocinerella* var. *macrospora* Samp., Ann. Sci. Acad. Polytechn. Porto 13(1): 30. 1918.

Sampaio described this specimen as a new variety: *R. atrocinerella* var. *macrospora*. However, *Rinodina atrocinerella* is a synonym of

the saxicolous *Buellia atrocinerella* (Nyl.) Scheid., which is characterized by biatorine apothecia and the presence of norstictic and connorstictic acids. The PO specimen clearly belongs not to that species but to *R. occulta*, a saxicolous species characterized by the thin, K+ yellow (atranorin) thallus, small apothecia, and *Physcia*-type ascospores.

Material examined. – Sub ***Rinodina atrocinerella* var. *macrospora***: Trás-os-Montes e Alto Douro, Foz-Tua, 11 Oct 1916, (Holotype 1223L).

Rinodina oleae Bagl., Mem. Acc. Sci. Torino, ser 2, 17: 403. 1858.

The four collections in PO are very variable in thallus morphology, from white and well-developed, to greenish grey and minutely verrucose. The absence of lichen substances and the *Dirinaria*-type ascospores (type B ontogeny) are diagnostic for this corticolous taxon.

The confusion of this species with *R. pyrina* and *R. exigua* (not represented in PO) is quite common (Giralt & Mayrhofer 1995, Giralt 2001). The former has smaller, *Physconia*-type ascospores and the latter *Physcia*-type ascospores and contains atranorin.

See *Rinodina boleana* and *R. gennarii*.

Material examined. – Sub ***Rinodina exigua***: Minho, Póvoa de Lanhoso, S. Gens, no peitoril de uma janela, 7 Oct 1919, (1968L). Minho, Braga: Carvalheiras, num acer, 26 Sep 1919, (2174L). – Sub ***Rinodina pyrina***: Minho, Póvoa de Varzim, nos choupos, Feb 1920, (2272L). – Sub ***Rinodina* sp.**: Estremadura, Lisboa, Benfica na estrada de Algér, nas árvores, 24 Sep 1918, (1783L).

Rinodina oxydata (A. Massal.) A. Massal., Geneac. Lich.: 19. 1854.
Syn: *Rinodina candida* (Schaer.) Arnold, *Rinodina discolor* (Hepp) Arnold

The thin and smooth thallus containing atranorin (K+ yellow), the large *Mischoblastia*-type ascospores (18–24 × 10–13 µm), the pseudolecanorine apothecia (lecideine in aspect but always containing at least some algal cells) with a brown disc and darker true exciple which is greenish black (N+ red-violet, on a microscope slide!), clearly distinguish this saxicolous taxon. The same characters are diagnostic for the corticolous *R. euskadiensis*.

See *Rinodina euskadiensis* and *R. trachytica*.

Material examined. – Sub ***Rinodina candida***: Douro Litoral, Porto, Gramide, penedos da margem do Douro, 9 Jan 1921, (2459L). – Sub ***Rinodina discolor***: Minho, Póvoa de Lanhoso, S. Gens, 6 Sep 1912, (2406L). Idem, Frades, 11 Sep 1919, (1927L). Minho, Ponte de Lima: Sá, em Anho Bom, 13 Nov 1920, (2405L). Idem (2404L).

Rinodina pityrea Ropin & H. Mayrhofer, Bibl. Lichenol., 58: 374 (1995).

Unlike any other in PO, it is characterized in having a blue-grey pigment which reacts K+, N+ and C+ violet, a blastidiate thallus, and

Tunicata-type ascospores which are strongly warted. *Rinodina colobina* (Ach.) Th.Fr. (not in PO), is also blue-grey pigmented, and mainly separated by the smooth, and not ornamented, *Mischoblastia*-type ascospores.

This corticolous taxon occurs mainly in central and Western Europe (Ropin & Mayrhofer 1995). In the Iberian Peninsula it was previously known only from one locality in Navarra, northern Spain (Giralt 2001); first record for Portugal.

Material examined. – Sub ***Rinodina colobina***: Alto Alentejo, Elvas, 13 May 1917, (1366L).

Rinodina pruinella Bagl., Nuovo Giorn. Not. Ital., 11: 79. 1879.

Among the species treated here, only this corticolous taxon and the saxicolous *R. santorinensis* contain pannarin (PD+ orange). In *R. pruinella*, this substance is located only in the epihymenium, where, when applying PD, it forms orange acicular crystals (on a microscope slide!). Additional diagnostic features are the K+ yellow thallus (atranorin), the often pruinose apothecia, and the *Dirinaria*-type ascospores of type B ontogeny.

See *Rinodina santorinensis* var. *olivieri*.

Material examined. – Sub ***Rinodina pruinella***: Estremadura, Sintra, árvores entre a estação ferroviária e a vila, 23 Aug 1916, (1307L). Estremadura, Caldas da Rainha, nos plátanos, 11 Oct 1917, *leg.* A. Ricardo Jorge, *det.* G. Sampaio, (5378L). Idem (1549L). Estremadura, Leiria, avenida Marginal, 6 Sep 1918, *leg.* A. Ricardo Jorge, *det.* G. Sampaio, (1908L). Algarve, Portimão, na alfarrobeira, 7 Apr 1917, (1393L). – Sub ***Rinodina cintrana*** Samp.: Estremadura, Sintra, 27 Apr 1916, (Holotype 919L). Algarve, Portimão, nas figueiras, 6 Apr 1917, (1394L).

Rinodina roboris (Dufour ex Nyl.) Arnold, Flora Regensburg, 64: 197. 1881.

This is a corticolous species characterized by its large (18–21 × 9–11 µm) *Pachysporaria*-type ascospores, and the whitish, K+ yellow thallus (atranorin). In the PO specimens, some variability in the thickness and roughness of the thallus is evident. In *R. exigua* (Ach.) Gray (not in PO) the ascospores are smaller and belong to the *Physcia*-type.

Material examined. – Sub ***Rinodina roboris***: Minho, Ponte de Lima: Sá, 15 oct 1915, (804L). Idem, Santa Comba, Oct 1915, (598L). Minho, Guimarães: Penha, nos carvalhos, 15 Oct 1919, (2450L). Idem, (2109L). Douro Litoral, Requesende, May 1879, *leg.* I. Newton, *det.* W. Nylander, (5384L). – Sub ***Rinodina exigua***: Estremadura, Lisboa, Benfica, nos cedros, 25 Sep 1918, (1734L). – Sub ***Rinodina* sp.**: Minho, Penêda, nas árvores, 21 Aug 1915, (498L). Minho, Braga: Bom Jesus, 6 Sep 1915, (565L). Douro Litoral, Porto, Paranhos, nos sobreiros, 19 Dec 1915, (597L). Estremadura, Lisboa: Benfica, nos cedros, 24 Sep 1918, (1739L). Idem, Lumiar, na quinta do Duque de Palmela, 22 Sep 1918, (1784L).

Rinodina santorinensis var. ***olivieri*** (Samp.) H. Mayrhofer & Sattler, Nova Hedwigia, 57(3–4): 301. 1993.
Syn: *Rinodina confragosa* var. *olivieri* Samp.

This saxicolous taxon is similar in habit to *R. beccariana* var. *beccariana,* but the latter differs in the PD+ orange reaction (pannarin) of both the thallus and the thalline exciple.

The fungus has an oceanic distribution, and is known from Portugal, Galicia (NW Spain), and Macaronesia (Giralt 2001).

See *Rinodina beccariana* var. *beccariana* and *R. pruinella*.

Material examined. – Sub Rinodina confragosa: Douro Litoral, Leça da Palmeira: Boa Nova, 19 Aug 1880, leg. I. Newton, det. W. Nylander, (5382L). Douro Litoral, Vila do Conde, paredes do litoral, 9 Feb 1920, (2268L). – Sub ***Rinodina confragosa*** **var.** ***olivieri*** Samp.: Minho, Póvoa de Lanhoso, nos rochedos do castelo, 7 Nov 1921 (Holotype 2490L).

Rinodina sophodes (Ach.) A. Massal., Rich. Lich. Crost.: 14. 1852.

The cracked-areolate, reddish brown thallus with a black prothallus, the thick, amyloid cortex (I+ blue) of the thalline exciple of the apothecia and the *Milvina*-type ascospores are diagnostic for this corticolous species.

See *Rinodina milvina*.

Material examined. – Sub ***Rinodina sophodes***: Beira Alta, Serra da Estrela, 6 Aug 1916, (1025L). Idem (1025aL). Idem, proximo ao sanatorio de Manteigas, nos vidoeiros, Aug 1919, *leg.* A. Ricardo Jorge, *det*. G. Sampaio, (5593L). – Sub ***Rinodina*** **sp.**: Minho, Póvoa de Lanhoso, S. Gens, 12 Sep 1919, (1924L).

Rinodina trachytica (A. Massal.) Bagl. & Carestia, Atti Soc. Critt. Ital., 2: 209. 1880.

The PO specimens are characterized by a grey thallus, composed of thick areoles and cryptolecanorine apothecia, and a habit which resembles that of *Aspicilia cinerea*. The presence of atranorin, 2'-*O*-methylperlatolic, and confluentic acid, as well as the *Mischoblastia*-type ascospores, however, readily distinguishes this saxicolous species. *Rinodina oxydata,* with the same ascospore-type, contains only atranorin.

One specimen in PO (5383L) under this name was re-identified as a synonym of *R. lecanorina* (A. Massal.) A. Massal., a species separated in having *Bicincta*-type ascospores and zeorin. This specimen is parasited by *Wernerella mahuei,* one of the typical hosts of this lichenicolous fungus (Navarro-Rosinés *et al*. 1996).

Material examined. – Sub ***Rinodina ocellata***: Trás-os-Montes e Alto Douro, Moncorvo: Carviçais, May 1922, leg. J. Santos Júnior, det. G. Sampaio, (5383L). – Sub ***Rinodina*** **sp.**: Algarve, Caldas de Monchique, 21 Apr 1925, (2643L).

Sculptolumina japonica (Tuck.) Marbach, Bibl. Lichenol., 74: 297. 2000.

A peculiar and very distinctive species, characterized by lecideine apothecia with a poorly developed true exciple, inspersed hymenium, brown hypothecium, large *Mischoblastia*-type ascospores (Marbach 2000) with type-B ontogeny (18–)19–25(–31) × 9–13 µm in PO specimen), a crustose thallus which is minutely orange-spotted (quinones and anthraquinones), *Bacidia*-type asci, and filiform conidia (Giralt *et al.* 2009b).

It is widely distributed in subtropical and tropical areas of Africa, South America, Asia, and Australia, and is also reported from a single locality in North America (Sheard *et al.* 2008) and one in the Canary Islands (Giralt *et al.* 2009b). So far, in continental Europe, this lichen is only known from this Portuguese locality.

The only other corticolous specimens in PO with *Mischoblastia*-type ascospores belong to *R. euskadiensis*. But the ascospore development of the latter is of ontogeny A, and the thinner thallus contains atranorin only. Other corticolous specimens in PO with the hymenium inspersed with oil droplets are *B. disciformis* and *B. leptoclinoides,* but both have *Callispora*-type ascospores. Further, in contrast to *S. japonica,* the conidia of these three taxa are bacilliform and not filiform.

Material examined. – Sub ***Buellia disciformis:*** Minho, Ponte de Lima: Sta. Comba, carvalhos velhos, 11 Oct 1917, (1472L).

Addenda

The following specimens were wrongly identified as belonging to the *Physciaceae* or under names that do not belong to this family now:

Buellia pseudosaxatilis Samp., Ann. Sci. Acad. Polytechn. Porto, 12(1): 49. 1917.

Known only from the type specimen mentioned above, and consisting of a sterile thallus (probably of a *Pertusaria* species) parasited by a very poorly developed, unidentified lichenicolous ascomycete.

Material examined. – Sub ***Buellia pseudosaxatilis***: Estremadura, Sintra: Castelo dos Mouros, 23 Aug 1916, (Holotype 1132L).

Caloplaca demissa (Körb.) Arup & Grube, Lichenologist, 31(5): 428. 1999.
Syn: *Rinodina castanoplaca* H. Olivier

Material examined. – Sub ***Rinodina castanoplaca***: Minho, Póvoa de Lanhoso, Nasce, 29 Sep 1919, (2003L). Idem, 20 Sep 1921, (2478L).

Caloplaca obscurella (Lahm ex Körber) Zahlbr, Lich. Scand. (Uppsala), 1: 182. 1871.

Material examined. – Sub ***Buellia myriocarpa***: Estremadura, Colares, 23 Sep 1918, (1742L).

Orphniospora moriopsis (A. Massal.) D. Hawksw., Lichenologist, 14(2): 135. 1982.
Syn: *Buellia atrata* (Sm.) Anzi

Material examined. – Sub ***Buellia atrata***: Beira Alta, Serra da Estrela, *leg.* J. Henriques, Aug 1881, *det.* G. Sampaio (945L).

Discussion

We have studied a total of 191 crustose thalli of the collection kept in the PO herbarium. We conclude that the collection contains Portuguese material of 186 specimens of the family *Physciaceae* belonging to eight genera and 57 species; 89 specimens have been re-identified and the nomenclature of 42 was updated. These specimens were originally grouped in five genera and 66 taxa; mainly included in *Buellia* and *Rinodina,* the other three genera, *Lecanora, Leciographa,* and *Psoroma,* were represented by just with one species each.

This study revealed that the PO collection contains: the type specimen of *Buellia carballaliana,* one species not previously reported from Europe (*Sculptolumina japonica*), one species rarely recorded in Europe and not previously known from the Iberian Peninsula: *Buellia excelsa*, and seven species not previously reported from Portugal: *Amandinea coniops, Rinodina boleana, R. cana, R. dubyana, R. euskadiensis, R guzzinii,* and *R. pityrea*. In addition, our revision confirms that *Buellia indissimilis,* last collected roughly 100 years ago, *R. gennarii* and *R. mniaraea,* are known in Portugal only from the PO collections.

We also propose the synonymy of *Rinodina lesdainii* with *R. cana,* and of *Rinodina atrocinerella* var. *macrospora* with *R. occulta*.

The information on the distribution and ecology of some taxa presented here maybe of interest for conservtional purposes; because of restricted distribution or ecologic peculiarities, possible candidates for a future Red Data List for Portugal might be: *Buellia hypophana*, *B. indissimilis*, *Coscinocladium gaditanum, Rinodina aspersa*, *R. euskadiensis, R. miniaraea,* or *Sculptolumina japonica*. Some of these species have already been included in different Red Lists: *Buellia hypophana* is categorised as "rare" (the term does not correspond to a formal IUCN category) in Austria by Türk & Hafellner (1999), and *Rinodina mniaraea* as vulnerable in the UK (Church *et al.* 1996).

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