Byssoloma llimonae sp nov., from continental Spain, Madeira and the Canary Islands

E. SÉRUSIAUX, A. GÓMEZ-BOLEA, A. LONGÁN and R. LÜCKING

Abstract: Byssoloma llimonae, a new species described from NE Spain, Madeira and the Canary Islands (Gomera, La Palma and Tenerife), is a mostly corticolous species, closely related to the more widespread and usually foliicolous Bapalmua kakouettæ (= Byssoloma aptrooii). The generic position of this group of species within the Pilocarpaceae is still unclear. The new combination Byssoloma kakouettæ (Sérus.) R. Lücking & Sérus. is introduced.

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Introduction

In a preliminary study of the taxonomy of foliicolous lichens in Western Europe and Macaronesia, Sérusiaux (1993) described the new genus Bapalmua based on a very typical group of tropical foliicolous species around Bacidia palnularis (Müll. Arg.) Zahlbr. and included in it the new species, Bapalmua kakouettæ (described from leaves and twigs of Buxus semperviresens in the gorges of Kakouetta in SW France). He also described the foliicolous Byssoloma aptrooii from the Canary Islands (Tenerife) and Madeira.

The abundant material now available clearly indicates that Byssoloma aptrooii is merely a form (probably neotenic) of Balpalmua kakouettæ. In their recent world-wide revision of the genus Bapalmua, Kalb et al. (2000) concluded that a single taxon is involved and furthermore, on the basis of its excipular structure and shape of conidia, excluded it from typical Bapalmua. They did not transfer the species to another genus but suggested that other representatives of the Pilocarpaceae, such as Byssoloma syzygii Vézda & Vivant and Felharana pilomarginata Lücking, might be related, as well as two corticolous or saxicolous (especially at water level by streams) species of Bacidia from Western Europe, viz. Bacidia carneoglaucua (Nyl.) A. L. Sm. and B. viridifarinosa Coppins & P. James. The original intention was to describe a new genus within the Pilocarpaceae to accommodate the two Bacidia species, Bapalmua kakouettæ and possibly several other tropical species. However, closer examination of the material revealed several features that clearly separate Bapalmua kakouettæ from the two Bacidia species mentioned above, especially the shape of their conidia and the presence of secondary compounds (xanthones).

Meanwhile, the study of corticolous Bacidia s. lat. from the laurisilva of Macaronesia continued and a further species quite close to Bapalmua kakouettæ but differing mainly by the size and septation of
its ascospores has been found. During their work on the lichen flora of Catalunya, A. Gómez-Bolea and A. Longán collected the same species from NE Spain. The species had previously been collected by A. Gómez-Bolea, and also by P. Diederich and J. Etayo in the same region (near Otx) from a site rich in foliicolous lichens growing on Buxus sempervirens. As no epithet appears available for it, this species is described as new to science in this paper, and is named after our friend and colleague Prof. Xavier Llimona in recognition of his remarkable contribution to knowledge of the Spanish lichen flora. However, no final decision has been taken regarding its generic position but its closest relative Bapalmia kakouettae is here transferred to Byssoloma.

**Byssoloma llimonae Sérus., Gómez-Bolea, Longán & Lücking**

**sp. nov.**

A specie Byssoloma kakouettae sporis 3–5(–7)–septatis et (13–)15–25 × (3–)4–5 μm magnis differt. 


(Fig. 1)

**Thallus** crustose, yellowish green when fresh, pale greenish when dry, with a slightly farinose appearance, usually continuous, up to 100 μm thick; cortex thin and irregular, formed by transverse hyphae, covering an irregular layer of algal cells which sometimes forms small granules similar to goniocysts, 20–30 μm diam., comprising 10–15 algal cells surrounded by short-celled hyphae; occasionally, some thalli are entirely composed of these granules. TLC: no compounds detected. **Photobiont**, spherical, green cells, 5–10 μm diam., probably belonging to the Chlorococcales.

**Apothecia** rounded, 0·2–0·5(–0·6) mm diam., sometimes proliferating from old apothecia and thus forming clusters up to 0·8 mm diam.; disc plane in young apothecia, soon becoming convex in old ones, variable in colour, usually bluish grey to blackish when young, becoming brown or greenish grey when mature, sometimes with a piebald mixture of these colours (a single individual may show apothecia with different colours), rarely slightly pruinose; margin at first distinct and rather thick (and sometimes slightly prominent), becoming thin or excluded in old apothecia, usually paler than the disc in old apothecia (sometimes almost white), but usually dark bluish or bluish grey in young apothecia, smooth or shortly hyssoid and sometimes with anchoring hyphae, especially in young apothecia. **Excipulum** 50–65(–80) μm thick at the margins but composed of short hyphae with elongate or globose cells which can be separated from one another and thus form the minutely hyssoid margin seen under the dissecting microscope; inner part up to 75 μm thick, usually typically paraphylactenomatous, composed of rather polyhedral brown cells (with cells reaching sometimes 6–8 μm across), KOH+ purple-brown, ± arranged in radiating rows. **Hypothecium** 100–150 μm thick, orange to reddish brown, sometimes almost brown, KOH+ usually darker reddish brown. **Hymenium** hyaline or yellowish, 60–75 μm thick. **Paraphyses** rather coherent, slightly branched and anastomosing especially in the upper part, 1–1·5 μm thick, with irregularly inflated apices, up to 3 μm wide. **Asci** clavate, of the Byssoloma-type (Hafellner 1984). **Ascospores** 8 per ascus, hyaline, narrowly ellipsoid to fusiform, sometimes slightly tapering towards the proximal end, 3–5(–7) septate, clearly constricted at the septa, (13–)15–25 × (3–)4–5 μm.

**Conidiomata** abundant, flask-shaped, whitish to bluish grey or black, 0·1–0·15 mm diam, usually with a very wide ostiole. **Conidia** usually bicaulve to obpyriform, sometimes almost bacilliform, 3–4(–5) × c. 1 μm.

**Discussion.** Byssoloma llimonae has a very similar thallus, apothecia (incl. the colour variation) and pycnidia to Bapalmia kakouettae but differs in its habitat (mainly corticolous for llimonae vs mainly foliicolous for
Fig. 1. *Byssoloma llimonae* (type collection). A, exciple; B, ascus (in Lugol); C, paraphyses; D, ascospores. Scales: A=30 μm; B-D=10 μm.
kakouettae) and the septation and size of ascospores [3–5(–7) septate and (13–)15–25 × (3–)4–5 μm for llimonae vs 12–19(–23) septate and 40–67 × (3–)4–6 μm for kakouettae]. They also share the same excipulum type with a shortly byssoid margin and anchoring hyphae on young apothecia, and the rather coherent, slightly branched and anastomosing paraphyses with slightly inflated ends. These features, as well as the ascus and ascospore types, resemble those of the group formed by Bacidia carneoglauc a and B. viridifarinos a (Bricaud & Roux 1993), and we had initially considered describing a new genus to accommodate these four species. However, we have postponed such a decision for two main reasons.

First, the generic delimitation within the Pilocarpaceae is still in a state of flux as only four genera appear to be well-circumscribed (Badimia Vézda, Bapalmnia Sérus., Byssolecania Vain. and Fellhaneropsis Sérus. & Copp ins) while two further genera are to be established based on several species currently assigned to Bacidia de Not. and Lopadium Körb., and the two larger genera (Byssoloma Trevis. and Fellhanera Vézda) still require further studies. Moreover, the relationships of the pairs of species dealt with here (kakouettae-llimonae on one hand and carneoglauc a-viridifarinos a on the other) and several tropical species have not yet been studied in detail.

Secondly, two sets of characters clearly separate the two groups. In the first (kakouettae-llimonae), conidia are almost always pyriform or at least bifusiform and no secondary compounds have been detected by TLC, while in the second (carneoglauc a-viridifarinos a), conidia are oblong, with a slight but distinct median constriction and a short peduncule (see Coppins et al. 1992, 354, fig. 2; and Bricaud & Roux 1993: 115, fig. 6) and xanthones are easily detected by TLC. The shape of conidia and production of secondary compounds play an important role in lichen taxonomy and the Pilocarpaceae are no exception. Quite interestingly however, heterogeneity regarding these two sets of characters occurs in both the large genera, Byssoloma and Fellhanera, as currently circumscribed (Lücking et al. 1994; Elix et al. 1995).

Occurrence of transitional forms between otherwise clearly defined genera such as Byssoloma and Fellhanera, and the variation of characters such as conidial shape within a single genus do not necessarily mean that new generic concepts are needed. Indeed, evolutionary trends postulate such a variation in plesiomorphic taxa and currently Fellhanera has such a position in the Pilocarpaceae (Lücking 1997). However, we are well aware that a genotype-based phylogenetic background is needed in this family to obtain a sound framework for appropriate placement of intermediate species like those discussed in this paper.

It is therefore wise at present not to erect a new genus for these species. The new species is described here in Byssoloma because its byssoid margin makes it the best choice so far and a new combination in Byssoloma is introduced for Bapalmnia kakouettae to address its currently accepted position.

Minor variation occurs between the populations referred to Byssoloma llimonae as spores are mainly 3(–5) septate, except in the type collection in which spores with up to 7 septa are not rare. Furthermore, clusters of small apothecia arising from old ones are not seen in all populations and seem to be restricted to ageing thalli.

Punttolo et al. (2000) have summarized the remaining problems regarding the taxonomy of foliolecolous lichens in Western Europe; they drew attention to ‘a puzzling and most probably undescribed species of Fellhanera’ from Catalunya and added that ‘it may be identical with populations identified as Bacidia buxi by Vézda (1983) in the Western Caucasus’. The species from Catalunya belongs to Byssoloma llimonae described in this paper but the Caucasian populations represent a further species which will be dealt with elsewhere.

Ecology and distribution. This new species is so far known from several islands in Macaronesia and NE Spain. In the type locality in NE Spain, it was found in a very
humid and warm Quercus ilex forest at mid elevation (700 m), probably a well-preserved stand of Mediterranean sclerophyllous forest. It was growing on the base of trees, together with Dimerella pineti, Porina borleri and Porina leptalea; higher up on the trunks, Anisomeridium polypori, Bacidia laurocerasi, Bactrospora patellarioides var. convexa, Graphis scripta, Hyperphyscia adglutinata, Macentia dictyospora, Opegrapha atrata, O. varia, O. viridis, Phlyctis agelaeae, Ramonia subspheeroides, Schismatoma decolorans and Zamenhofia hibernica were present. The second locality in Catalonia has the same type of forest but Buxus sempervirens is quite abundant in the understorey near a small river; several foliicolous lichens have been detected there, including Bacidia chloroticula, Byssoloma subdiscordans (with the lichenicolous hyphomycete Ampullifera folicola), Felplanera bouteillei, Gyalectidium punctillotis, Porina hoehneliana, P. oxneri, Strigula minor, S. smaragdula together with Anisomeridium polypori and Bacidia arceutina, both being more common on young twigs than on leaves.

In Madeira and the Canary Islands, the species has been found in well-preserved stands of the laurisilva or at higher elevations in the ‘Fayal-Brezal’. The evergreen sub-tropical cloud forest of these islands is well-known for its rich lichen flora, and the complete list of the taxa which favour this habitat is still far from complete. Byssoloma limonae is a small and rather inconspicuous species that seems to be quite rare but this might be an artefact due to the abundance of macrolichens and pleurocarpous mosses which attract the attention of cryptogamic botanists.


Byssoloma kakouettae (Sérus.) R. Lücking & Sérus. comb. nov.


Ecology and distribution. Bapalmuia kakouettae has been reported from several localities on the northern side of the Pyrenees in France (from the gorges S of Mauléon-Licharre to the Lourdes area), in Campania/Italy (Puntillo et al. 2000) and in Macaronesia. In continental Europe, it is restricted to shaded and very humid valleys where it grows on twigs and on leaves of Buxus sempervirens. It is locally abundant in suitable localities such as those sampled in 2000 near St-Pé de Bigorre in the central parts of the Pyrenees in France; it forms a typical community with other rarities such as Bacidia colchica and the recently described Gyalectidium punctillotis (Ferraro et al. 2001). In Macaronesia, the species is known from Madeira and three of the Canary Islands (Gomera, La Palma and Tenerife), which support extensive and rather well-preserved stands of the laurisilva. It is common on living leaves, mainly those of the Lauraceae, but can also be found on the chlorophyllous stems of Smilax canariensis, and very rarely on the bark of laurel trees.

Selected specimens examined. See Sérusiaux (1993: 451 & 454, under Bapalmuia kakouettae and Byssoloma aprontii) for earlier reports from France (Dept. Pyrénées-Atlantiques), Madeira and the Canary Islands (Tenerife).—Italy: Campania: valley of the Bussento river at Cilento, Salerno, on leaves of Buxus sempervirens, 1997, D. Puntillo 10391 (CLU, LG).—France: Dept. Hautes-Pyrénées: forêt de St-Pé-de-Bigorre, vallée de Génie Longue, fourrés de Buxus et Corylus en fond

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References


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