

***Stromatopogon cladoniae* sp. nova, a remarkable new lichenicolous coelomycete from Belgium**

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Abstract: The new species *Stromatopogon cladoniae* sp. nova is distinguished from the type species of the genus by the overall smaller dimensions of galls, pycnidia, macroconidia and microconidia, and by a different host. It is known only from the type locality in the Belgian Ardenne where it grows over *Cladonia polydactyla*.

The genus *Stromatopogon* Zahlbr. was described for a fruticose lichen similar to *Usnea*, but with unusual fructifications, in which 1-septate, brown ascospores, multi-celled macroconidia and simple microconidia were produced (Zahlbruckner 1897). A re-examination of the type specimen revealed that it represents *Usnea rubicunda* with a gall-forming lichenicolous fungus, and the name *Stromatopogon baldwinii* Zahlbr. was subsequently typified on the macroconidial morph of this fungus (Diederich & Hawksworth, in Eriksson & Hawksworth 1991). A more detailed description was given later by Diederich (1992), who showed that the macroconidia and microconidia are both produced within the same conidioma, a situation otherwise unknown amongst lichenicolous fungi. Although we studied hundreds of *Usnea* specimens with lichenicolous fungi in the past, *S. baldwinii* was only detected in material from Tasmania and the Sandwich Islands, and it obviously does not appear to occur in Europe or North America.

During recent field studies in Belgium, one of us collected a lichenicolous coelomycete inducing the formation of galls on *Cladonia polydactyla*, which proved to be a second species of *Stromatopogon*. The collection is very similar to *S. baldwinii*, including the presence of both types of conidia within the same conidioma, but can easily be distinguished from that species by a number of differences. The specimen has been studied using the standard microscopical techniques, and all drawings and measurements were done with material mounted in water at a magnification of $\times 2000$, using a drawing tube and phase contrast.

Stromatopogon cladoniae Diederich & Sérus. sp. nova

(Figs. 1-2)

Fungus lichenicola in *Cladoniae* thallo vigens, a *Stromatopogone baldwinii* pycnidiis minoribus 50-100 μm , gallis minoribus 0.4-1.2 mm, macroconidiis plerumque tantum 2-4-cellulis et minoribus 8-15 x 4.5-8 μm , microconidiis minoribus 3.5-4.5 x 1-1.4 μm differt.

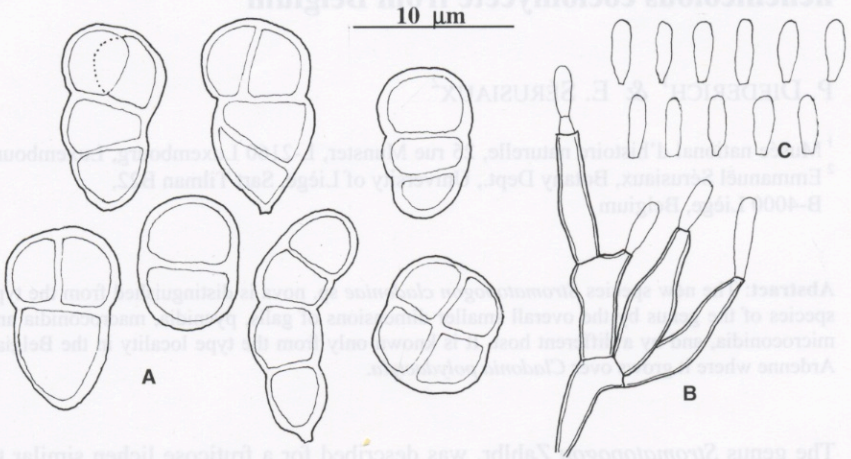


Fig. 1: *Stromatopogon cladoniae* (holotypus, examined in water). A, macroconidia; B, conidiophores and conidiogenous cells producing microconidia; C, microconidia.

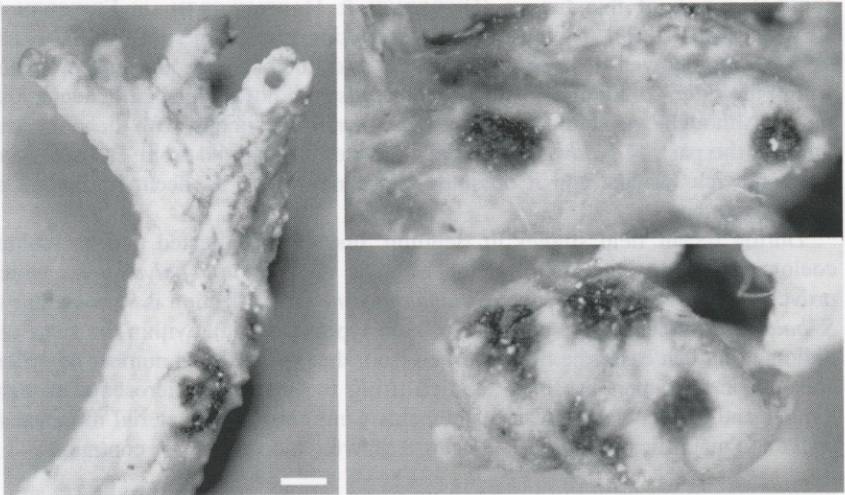


Fig. 2: *Stromatopogon cladoniae* (holotypus). Galls with immersed, black pycnidia over the thallus of *Cladonia polydactyla*. Scale bar = 250 μm .

Type: Belgium, Ardenne district, Achouffe (flanc S du plateau des Tailles, au NW de Houffalize), Ruisseau de Martin Moulin, en aval de la route Diné-Wibrin, rive gauche, juste en amont de la confluence avec le Ruisseau du Pont du Mont (coord. IFBL: J7.16), alt. 360-380 m, futaie claire de *Quercus*, sur pente rocheuse, sur base de tronc de *Quercus*, sur *Cladonia polydactyla*, 4.2000, E. Sérusiaux s. n. (LG – holotypus: macroconidial morph; hb. Diederich – isotypus).

Conidiomata pycnidial, immersed in 0.4-1.2 mm large galls with a flattened or slightly concave, discoloured center and an often distinctly raised margin, up to 30 per gall, dark brown to black, 50-100 μm diam., subspherical, ostiole absent, the conidiomata opening irregularly by the breaking of the upper part of the wall. Wall 11-18 μm thick, dark brown, composed of *textura angularis*, individual cells 4-7 μm , dark brown; the inner layer formed by pale brown cells, with a distinctively verrucose outer wall, producing two kinds of conidia within the same conidioma. Macroconidial morph often abundant, but sometimes absent in young conidiomata; conidiophores absent; conidiogenous cells lining the conidiomatal cavity, ampulliform to short cylindrical, pale brown, with a verrucose outer wall; conidia holoblastic, arising singly, not catenate, often filling the conidiomatal cavity, composed of (1-)2-4(-5) cells, variable in form, spherical, elongate ellipsoid or obpyriform, apically rounded, basally rounded or pointed, hyaline, thick-walled, smooth, 8-15 x 4.5-8 μm . Microconidial morph generally present; conidiophores arising from cells that are identical to the conidiogenous cells of macroconidia, simple or branched, often septate, arranged more or less parallel to one another, hyaline, 11-26 x 1.5-3.5 μm ; conidiogenous cells terminal, lateral or intercalary, indistinguishable from the conidiophores except in the absence of septa, slightly tapered towards the apex, sometimes with one annelation, hyaline, smooth, 7-11 x 2-3.5 μm ; conidia holoblastic, arising singly, not catenate, sub-cylindrical, the apex rounded, distinctly truncate at the base, simple, hyaline, smooth, thin-walled, 3.5-4.5 x 1-1.4 μm .

Amongst the lichenicolous coelomycetes with hyaline conidia confined to *Cladonia*, no species has conidia similar to the macroconidia of the new fungus. However, several species with aseptate conidia are known (HAWKSWORTH 1981), and must consequently be compared with the microconidial morph of *Stromatopogon cladoniae*. *Bachmanniomyces uncialicola* (Zopf) D. Hawksw. is distinguished by lens-shaped conidia and the absence of conidiophores. *Lichenosticta alccicornaria* (Linds.) D. Hawksw. has lacrimiform conidia produced on acropleurogenous conidiogenous cells. The three known species of *Epycladonia* D. Hawksw. have no conidiophores, and much larger conidia, at least 7.5 x 2.5 μm . The poorly known *Spilomium epycladonia* H. Olivier differs by larger conidia, 6-8 x 3-4 μm . An undescribed species of *Phoma*, which we know from many different *Cladonia* species, has slightly larger conidia, short ampulliform conidiogenous cells and no conidiophores.

Verrucaster lichenicola Tobler was described as forming gall-like deformations on the podetia of *Cladonia bacillaris*, on which superficial, waxy pycnidia with an irregular opening develop, the conidiogenous cells are elongate and arise over short conidiophores, and the conidia are aseptate, hyaline, 2-guttulate, narrowly ellipsoid, 3.6-7.6 x 0.8-1.6 μm (HAWKSWORTH 1981). Although a part of the conidia observed by Tobler are longer than those seen by us, the dimensions of the conidia and also the characters of the conidiophores, conidiogenous cells and the formation of galls are in agreement with our description of the microco-

nidial morph. The only differences between both descriptions are the pycnidia, which are immersed and blackish in our specimen, but superficial and waxy in the collection studied by Tobler. HAWKSWORTH (1981) did not succeed to locate the type specimen of *V. lichenicola*, and the true identity of this name remains therefore unclear. However, even if *Verrucaster lichenicola* proved to be identical with the microconidial morph of *Stromatopogon cladoniae*, this would be no problem, as the ICBN allows different morphs to have different names. *Stromatopogon baldwinii* and *S. cladoniae* are both clearly typified on the macroconidial morph, and thus *Verrucaster lichenicola* might just be a synanamorph of *S. cladoniae* with microconidia.

In the original description of *Stromatopogon baldwinii* (Zahlbruckner 1897), the author described *Polycoccum*-like ascomata with brown, 1-septate ascospores, and pycnidia with macroconidia and microconidia. An examination of the type specimen by DIEDERICH & HAWKSWORTH (in ERIKSSON & HAWKSWORTH 1991) revealed that no perithecia could be observed, and the name was subsequently lectotypified on the macroconidial morph. We should nevertheless keep in mind that teleomorphs of *Stromatopogon* species are likely to belong to *Polycoccum* or a similar genus. Two species of *Polycoccum* are known from *Cladonia* thalli: *Polycoccum cladoniae* DIEDERICH & HAWKSWORTH. does not induce the formation of galls (HAWKSWORTH & DIEDERICH 1988), whilst *P. microcarpum* DIEDERICH & ETAYO is gall-forming (ETAYO & DIEDERICH 1998). In none of these two species pycnidia have been observed, but it cannot be excluded that *P. microcarpum* does represent the teleomorph of *S. cladoniae*.

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