

Sclerococcum (Deuteromycotina) with black sporodochia in Spain

J. Etayo* & V. Calatayud**

Abstract

Five species of the lichenicolous fungi genus *Sclerococcum* (Deuteromycotina) with black sporodochia are reported from Spain. *S. montagnei* is recorded for the first time from the Iberian Peninsula and Tenerife Island. *S. tephromelarum*, a species growing on *Tephromela atra*, is described as new. A key for the known species of *Sclerococcum* with black sporodochia is added.

Key words: *Sclerococcum*, Deuteromycotina, Hyphomycetes, lichenicolous fungi; mycoflora of Spain.

Resumen

Se señalan en España cinco especies del género de hongos liquenícolas *Sclerococcum* (Deuteromycotina) con esporodoquios negros. *S. montagnei* se señala por primera vez para la Península y la isla de Tenerife. Se describe *S. tephromelarum* que vive sobre *Tephromela atra*. Se aporta también una clave general de las especies conocidas de *Sclerococcum* con esporodoquios negros.

Palabras Clave: *Sclerococcum*, Deuteromycotina, hifomicetes, hongos liquenícolas, micoflora española.

Introduction

The genus *Sclerococcum* was introduced for *S. sphaerale*, a fairly common lichenicolous fungus growing on the saxicolous *Pertusaria corallina* (HAWKSWORTH 1975). In recent years, some other species have been added to this genus, a compilation of which is given in HAFELLNER (1996). Two well delimited groups can be distinguished within *Sclerococcum*: species with grey or brownish-grey sporodochia, usually occurring on corticolous lichens and species with black sporodochia, which in general are restricted to saxicolous lichens and are quite host specific. Possibly these two groups are not congeneric, and then only the second would belong to *Sclerococcum* s.str. In this study, several species of *Sclerococcum* with black sporodochia are reported from Spain, including the Canary Islands. One of the species turned out to be new to science, and it is described below as *Sclerococcum tephromelarum* ETAYO & CALATAYUD.

Material and methods

Specimens from the herbaria VAB-lich. and herb. Etayo were investigated. The material was examined by means of conventional microscopic techniques. Drawings and measure-

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ments were made in water but, in some cases, the structure of the wall of the conidia was also examined after applying commercial bleach.

Abbreviations: sel. lit. = selected literature.

Key to the *Sclerococcum* species with black sporodochia

1	Conidia 1(-2) celled	2
1*	Conidia multicelled	3
2	Conidia with smooth wall, sporodochia 50 - 300 μm , on corticolous <i>Pertusaria</i> (sel. lit.: HAWKSWORTH 1979)	<i>S. simplex</i> D.HAWKSW.
2*	Conidia with verruculose wall, sporodochia up to 600 μm , on <i>Bellemeria diamarta</i> (sel. lit.: ALSTRUP 1993)	<i>S. verrucisporum</i> ALSTRUP
3	Wall of the conidia smooth	4
3*	Wall of the conidia ornamented	6
4	Conidia multi-celled, with 2 - 14 (- 20) cells, unevenly thickened and with darkened parts, sporodochia 60 - 180 μm , on <i>Parmelina tiliacea</i> and <i>P. pastillifera</i> (sel. lit.: BOQUERAS & DIEDERICH 1993)	<i>S. serusiauxii</i> BOQUERAS & DIEDERICH
4*	Conidia usually with 2 - 6 cells, cells \pm evenly thickened	5
5	Conidia with an easily broken wall, with fissures, sporodochia 200 - 300 μm , on <i>Lecanora rupicola</i> (sel. lit.: HAFELLNER 1996)	<i>S. montagnei</i> HAFELLNER
5*	Conidia with an even wall, without fissures or thickened parts, sporodochia 170 - 350 μm , on <i>Pertusaria corallina</i> (sel. lit.: HAWKSWORTH 1975)	<i>S. sphaerale</i> (ACH.) FR.
6	Conidia 10 - 15 x 7 - 13 μm , greenish brown, surface without fissures, sporodochia 100 - 400 μm , convex, on <i>Buellia aethalea</i> (sel. lit.: DIEDERICH & SCHOLZ 1995)	<i>S. leuckertii</i> DIEDERICH & SCHOLZ
6*	Conidia 11 - 21 x 8 - 15 μm , dark brown, surface with fissures, sporodochia 50 - 150 μm , finally concave, on <i>Tephromela atra</i> (sel. lit.: present paper)	<i>S. tephromelarum</i> ETAYO & CALATAYUD

Catalogue

Sclerococcum montagnei HAFELLNER

These records are the first of this species for the Iberian Peninsula and Tenerife Island. *Sclerococcum montagnei* was previously known from France, other islands (La Gomera and La Palma) of the Canarian Archipelago (HAFELLNER 1996) and Great Britain (COPPINS 1997). For further information about this species see HAFELLNER (op. cit.).

Spain: Huesca: Campo de Troyas, pista del corral de las Mulas, on *Lecanora rupicola*, 2150 m, 4.8.1993, J. Etayo 11919, 11942 [herb. Etayo]. - Canary Islands: Tenerife, Altos de Arafo, on sterile ?*Lecanora rupicola* var. *efflorens*, on volcanic rocks, 1700 m, 23.4.1987, E. Barreno & A. Santos 7831 [VAB-lich.].

Sclerococcum serusiauxii BOQUERAS & DIEDERICH

This species was known in Spain from Cataluña and Navarra (BOQUERAS & DIEDERICH, 1993), and has been also reported from Corsica (HAFELLNER 1994) and Austria (HAFELLNER, pers. comm.).

Spain: Navarra: Isaba, valle del Roncal, Rincón de Belagua, on *Parmelina tiliacea* on *Fagus sylvatica* L., J. Etayo 1458 [herb. Etayo]. - La Rioja, Tierra de Cameros, Gallinero de Cameros, on *P. quercina*, 1000 m, 1.4.1997, J. Etayo 14290 [herb. Etayo].

***Sclerococcum simplex* D.HAWKSW.**

This species has recently been reported by ETAYO & DIEDERICH (1996) from France and Spain. It is also known from Austria (BOOM et al. 1996), Greenland (ALSTRUP & HAWKSWORTH 1990, see discussion in ETAYO & DIEDERICH op. cit.) and Scotland (HAWKSWORTH 1979).

***Sclerococcum sphaerale* (ACH.) FR.**

A well known species, reported several times in the Iberian Peninsula (e.g. HAFELLNER & SANCHO 1990, ETAYO & BREUSS 1996).

Spain: Asturias: Puerto de Ventana, on *Pertusaria corallina*, on siliceous rocks, c. 1400 m, 9 February 1979, E. Barreno 7832 [VAB-lich.] - Navarra: Olalde, on *Pertusaria corallina*, J. Etayo 10145 [herb. Etayo]. - Narbarte, pared orientada al N., on *Pertusaria corallina*, 3 September 1991, J. Etayo 11014, 11101 [herb. Etayo]. - Valle del Baztaín, puerto de Izpegui on *Pertusaria corallina*, 700 m, 11. January 1998, J. Etayo 14242 [herb. Etayo]. - Ibidem, Legate, peña de Aracán, on *Pertusaria corallina*, 21. July 1993, J. Etayo 14384 & O. Breuss [herb. Etayo] - Lanz, Peña Arriba, on *Pertusaria corallina*, 22 October 1987, J. Etayo 10754 [herb. Etayo]. - Aragón: Huesca, ascensión Baños de Panticosa a arista y picos de Brazato, on a non isidiate *Pertusaria* species, c. 2500 m, September 1994, J. Etayo 12926 [herb. Etayo].

***Sclerococcum tephromelarum* ETAYO & CALATAYUD sp.n.**

Fungus lichenicola in thallis *Tephromela atra* vigens. Species *Sclerococco montagnei* similis, a quo sporodochiis minoribus et concavis, conidiis atrofuscis et pariete incrassato et fissurato differt.

Typus: Spain, Valencian Community, València province, Vilamarxant, La Rodana, U.T.M. 30SYJ0479, on *Tephromela atra*, on sandstones, 340 m, 13.6.1993, V. Calatayud 7532 (VAB-lich. - holotypus).

Colonies lichenicolous on *Tephromela atra*, forming at first convex but finally concave sporodochia, black, rounded or slightly elongated, 0.05 - 0.15 mm in diam., frequently crateriform, not confluent, growing on bleached areas of the host thallus. Vegetative hyphae hyaline or slightly brownish. Conidiophores agglomerated in dense sporodochia, rendering difficult the appreciation of the conidiogenesis. Conidiogenous cells terminal, integrate, of the same colour as the conidia. Conidia of variable shape, dark brown, 2 - 4-celled, 11 - 21 x 8 - 15 μm , with a very thick wall, with a roughly lacerate-granulose ornamentation.

Observations: This species differs from the other species of the genus occurring on saxicolous host lichens by its very small sporodochia finally becoming concave and, particularly, by its thick conidial wall, fissured and with irregular excrescences. Another interesting feature of the new species is that, unlike other species of the genus, no hyaline conidiogenous cells are visible, so only brown cells can be observed in transversal sections. *S. montagnei* is similar in some aspects, but differs in the mentioned characters and occurs on a different host species, *Lecanora rupicola*. Another *Sclerococcum* with ornamented conidial wall is *S. leuckertii*, but the greenish colour of



Fig. 1: Conidia of *Sclerococcum tephromelarum*. A, in water. B, decoloured in bleach, showing the structure of the wall. Scale bar = 10 μ m.

its conidia and its larger sporodochia are diagnostic characters with regard to *S. tephromelarum*. LINDSAY (1869) mentions already a collection of *Conothecium lichenicoloum* on *Lecanora atra* from Scotland, which could well be the same as the newly described *S. tephromelarum*.

Host: On *Tephromela atra* thalli. The parts of the thallus infected by this lichenicolous fungus, usually near the border, become bleached, so *S. tephromelarum* can be considered a parasitic rather than a commensalistic fungus.

Distribution: Up to now, this fungus is known only from two localities from the Valencian Community (eastern Spain) and one from Navarra (northern Spain).

Studied material: Spain: Valencian Community: Castelló province, El Toro, Corral del Rodeno, U.T.M. 30SXK8924, on *Tephromela atra*, on sandstones, 1160 m, 15.9.1996, V. Calatayud 7702 [VAB-lich.]. - Navarra: Valle del Roncal, Isaba, cliffs some 100 m from the refuge, c. 1460 m, 24.9.1995, J. Etayo s.n. [herb. Etayo]

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References

- ALSTRUP, V. 1993: News on lichens and lichenicolous fungi from the Nordic countries. – *Graphis Scripta* 5: 96-104.
- ALSTRUP, V., HAWKSWORTH, D.L. 1990: The lichenicolous fungi of Greenland. – *Meddel. Grønland, Biosci.* 31: 1-90.
- BOOM, P. v. D., BREUSS O., SPIER, L., BRAND, A. 1996: Beitrag zur Flechtenflora Kärntens. Ergebnisse der Feldtagung der bryologischen und lichenologischen Arbeitsgruppe der KNNV in Weissbriach. – *Linzer Biol. Beitr.* 28: 619-654.
- BOQUERAS, M., DIEDERICH, P. 1993: New or interesting lichenicolous fungi. 3. *Karsteniomyces llimonae* sp. nov. and *Sclerococcum serusiauxii* sp. nov. (Deuteromycotina). – *Mycotaxon* 47: 425-431.
- COPPINS, B. 1997: New, rare and interesting British lichen and lichenicolous fungus records. – *Br. Lichen. Soc. Bull.* 81: 32-37.
- DIEDERICH, P., SCHOLZ, P. 1995: New or interesting lichenicolous fungi. 5. *Sclerococcum leuckertii* sp. nova (Deuteromycotina). – *Bibl. Lichenol.* 57: 113-116.
- ETAYO, J., BREUSS, O. 1996: Líquenes y hongos liquenícolas de los Pirineos occidentales y norte de la Península Ibérica. – *Cryptog. Bryol. Lichénol.* 17: 213-230.
- ETAYO, J., DIEDERICH, P. 1996: Lichenicolous fungi from the Western Pyrenees, France and Spain. II. More Deuteromycetes. – *Mycotaxon* 60: 415-428.
- HAFELLNER, J. 1994: Über Funde lichenicoler Pilze und Flechten auf Korsika (Frankreich). – *Bull. Soc. Linn. Provence* 44: 219-234.
- HAFELLNER, J. 1996: Bemerkenswerte Funde von Flechten und lichenicolen Pilzen auf makaronesischen Inseln V. Über einige Neufunde und zwei neue Arten. – *Herzogia* 12: 133-145.
- HAFELLNER, J., SANCHO, L.G. 1990: Über einige lichenicole Pilze und Flechten aus den Gebirgen Zentralspaniens und den Ostalpen. – *Herzogia* 8: 363-382.
- HAWKSWORTH, D.L. 1975: A revision of the lichenicolous fungi accepted by Keissler in *Coniothecium*. – *Trans. Br. Mycol. Soc.* 65: 219-222
- HAWKSWORTH, D.L. 1979: The lichenicolous hyphomycetes. – *Bull. Br. Mus. (Nat. Hist.), Bot.* 6: 1-300.
- LINDSAY, W.L. 1869: Observations on new lichenicolous micro-fungi. – *Trans. Roy. Soc. Edinburgh* 25: 513-555., tab.