

New records of *Sistotrema* species (*Basidiomycota*) from the Iberian Peninsula

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Three *Sistotrema* species new to the Iberian Peninsula, *S. alboluteum*, *S. porulosum* and *S. subtrigonospermum* are reported, described and illustrated. A key is provided to the 15 known *Sistotrema* species from the Iberian Peninsula.

Keywords: chorology, corticioid fungi, Spain.

The genus *Sistotrema* Fr. comprises resupinate to stipitate species with a smooth, grandinioid, odontoid, poroid to sublamellate hymenophore, a monomitic hyphal system with hyphae that are typically (but not always) clamped and have oily inclusions, basidia that are urniform with (2–4–) 6–8 sterigmata, and spores which are smooth, globose to allantoid, thin-walled, and neither amyloid nor dextrinoid (Eriksson *et al.* 1984, Hallenberg 1984). Molecular studies place *Sistotrema* in the cantharelloid clade together with genera such as *Cantharellus*, *Craterellus*, *Hydnum*, *Clavulina*, and *Botryobasidium* (Pine *et al.* 1999, Hibbet & Binder 2002, Larsson *et al.* 2004, Nilsson *et al.* 2006). A traditional saprobic nutritional mode is attributed to the genus even if mycorrhizal associations are indicated in *Sistotrema alboluteum* (Bourdot & Galzin) Bondartsev & Singer and *S. muscicola* (Pers.) S. Lundell (Nilsson *et al.* 2006). Almost 50 species are recognized in the genus (Parmasto *et al.* 2004), 15 of which are known to be present in the Iberian Peninsula (Dueñas & Tellería 1988, Tellería (ed.) 1993, Hernández Crespo 2006).

As result of a mycological study in the Natural Park and Biosphere Reserve of ‘Las Batuecas-Sierra de Francia’ three new records of *Sistotrema* species are added to the catalogue of Iberian and southern European fungi. The area studied is situated in the central and western part of the Iberian Peninsula and the nearest main for-

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est formations include: deciduous forests of *Quercus ilex* subsp. *bal-lota* (Desf.) Samp., *Q. suber* L., *Q. faginea* Lam., *Q. pyrenaica* Willd., *Q. robur* L., *Castanea sativa* Mill., *Arbutus unedo* L., and *Eucalyptus camaldulensis* Denhn.; coniferous forests of *Pinus pinaster* Aiton, *P. sylvestris* L., and *Juniperus oxycedrus* L., and riparian formations of *Alnus glutinosa* (L.) Gaertn., *Salix* spp and *Populus* spp, among others. The climate in the area is typically humid Mediterranean with slight Atlantic influence.

Materials and Methods

Samples were carefully collected in individual paper bags and taken to the laboratory for microscopical examination. A 3% KOH solution was used as a mounting medium using a Leica DMRD interference contrast microscope with Leica DC100 video camera and the image analysis program Leica Qwin; measurements and line drawings were made from microscopical sections mounted in the indicated medium. All the specimens are kept in SALA (duplicates also in GB).

Taxonomy

Sistotrema alboluteum (Bourdot & Galzin) Bondartsev & Singer, Ann. Mycol. 39(1): 47. 1941. – Fig. 1.

Basionym. – *Poria albolutea* Bourdot & Galzin, Bull. Soc. Mycol. France 41: 217. 1925.

Description. – Basidiome annual, resupinate, effused, fragile; hymenophore poroid with angular pores, 1–4 per mm, whitish to yellowish cream; subiculum thin, arachnoid. Hyphal system monomitic; hyphae clamped, thin-walled, 2–8 μm wide, more or less branched and filled with conspicuous and abundant oildrops. Cystidia absent. Basidia urniform, 20–30(35) $\times$ 6–10 μm , (2–) 4-sterigmate, with a basal clamp. Basidiospores globose, 4.5–6 μm , slightly thick-walled, hyaline, neither amyloid nor dextrinoid.

Substrate. – On very rotten wood of *Pinus sylvestris*.

Distribution. – This is a rare species with a scattered distribution in Europe (Ryvarden & Gilbertson 1994).

Sistotrema porulosum Hallenb., Mycotaxon 21: 407. 1984. – Fig. 2.

Description. – Basidiome resupinate, effused, adnate; hymenophore smooth to porulose, white greyish, margin indeterminate, subiculum thin. Hyphal system monomitic; hyphae clamped, thin-walled, 2–4 μm wide, with oily contents. Cystidia absent. Basidia

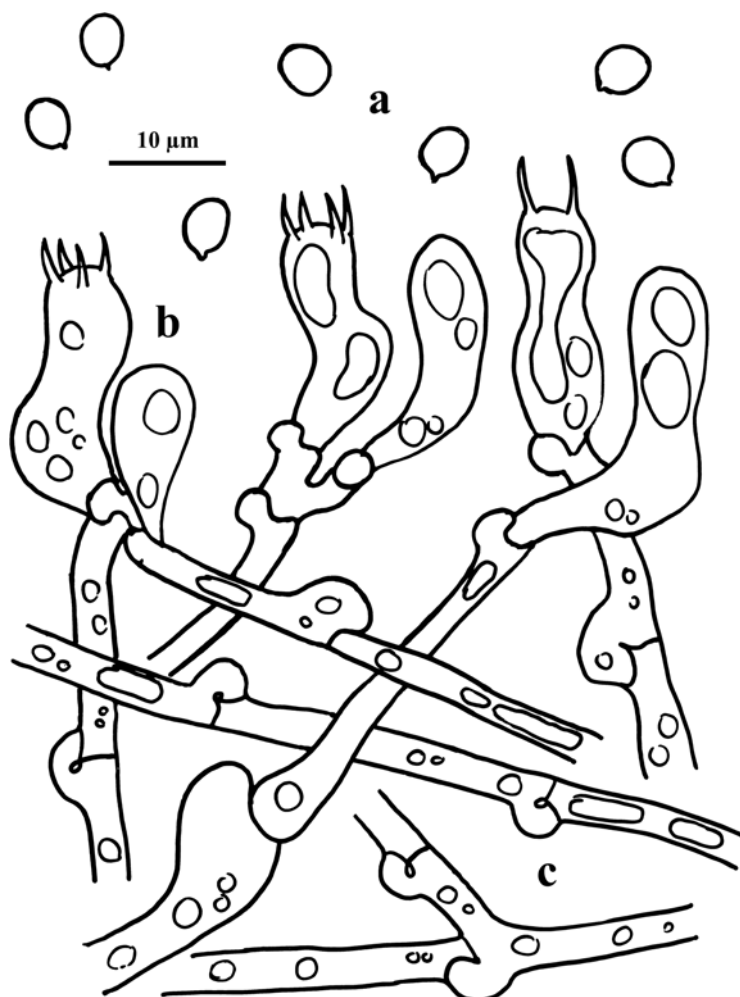


Fig. 1. Microscopic elements of *Sistotrema alboluteum* (SALA-Fungi 3722): **a.** Basidiospores. **b.** Basidia. **c.** Hyphae.

urniform, $10\text{--}20 \times 3\text{--}4\text{ }\mu\text{m}$, with 6 (–8) sterigmata and a basal clamp. Basidiospores narrowly ellipsoid, slightly curved, $3.5\text{--}4.5 \times 2\text{--}2.5\text{ }\mu\text{m}$, smooth, neither amyloid nor dextrinoid.

Substrate. – On wood of *Pinus pinaster*.

Distribution. – North America (Hallenberg 1984), Japan (Maekawa 1993), Argentina (Greslebin 2001) and Europe.

Remarks. – This is a little-known species separated from the *Sistotrema brinkmannii* (Bres.) J. Erikss. complex mainly by its hymenophore morphology and the shape and size of its spores (Hallenberg 1984).

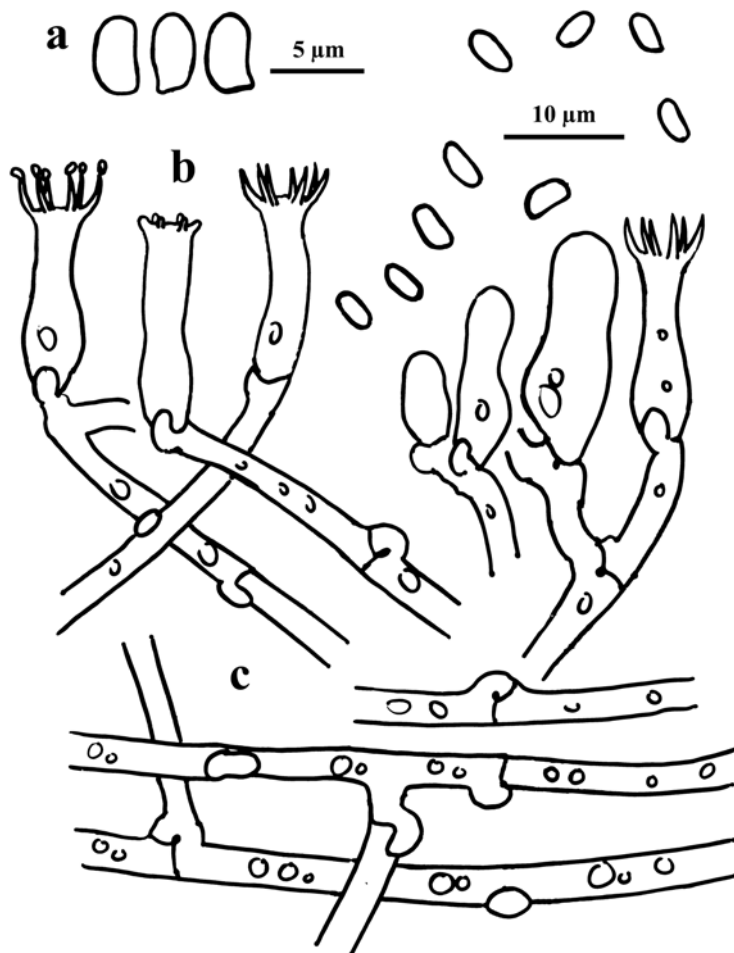


Fig. 2. Microscopic elements of *Sistotrema porulosum* (SALA-Fungi 3735): **a.** Basidiospores. **b.** Basidia. **c.** Hyphae.

Sistotrema subtrigonospermum D.P. Rogers, Iowa St. Coll. J. Sci. 17(1): 22. 1935. – Fig. 3.

Description. – Basidiome resupinate, adnate, inconspicuous; hymenophore smooth, whitish-greyish, margin not differentiated. Hyphal system monomitic; hyphae clamped, 2.5–4.5 µm wide, thin-walled, with abundant oily contents. Cystidia absent. Basidia urniform, basally widened, 15–20 × 4–6 µm, 6–8 sterigmate, with a basal clamp. Basidiospores tetrahedral, lobed, 4–5 × 3–4.5 µm, smooth, thin-walled, non amyloid, non dextrinoid.

Substrate. – On wood of *Quercus suber*.

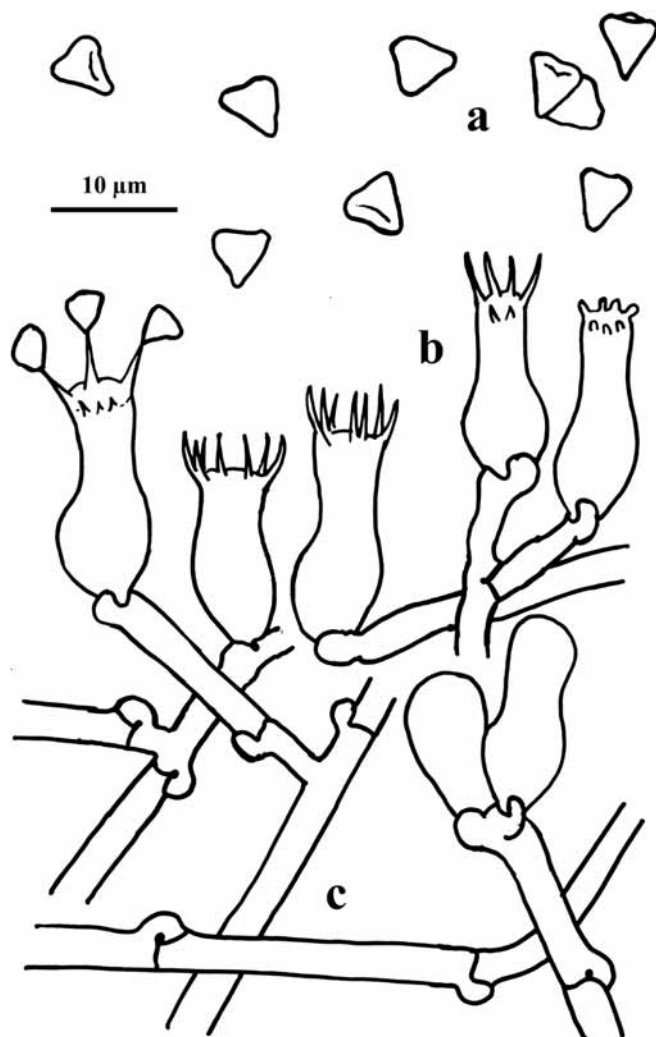


Fig. 3. Microscopic elements of *Sistotrema subtrigonospermum* (SALA-Fungi 3736): **a.** Basidiospores. **b.** Basidia. **c.** Hyphae.

Distribution. – A very rare species but probably overlooked; originally described from North America (Rogers 1935) and collected a few times in continental Europe (Denmark, Norway, Sweden, Balearic Islands [Eriksson *et al.* 1984]), Japan (Maekawa 1993), Britain (Roberts 1996), Ethiopia (Hjortstam & Ryvardeen 1996), Arizona (Gilbertson & Bigelow 1998), Australia (Lepp 2004) and Italy (Bernicchia *et al.* 2008).

Remarks. – A species easily distinguished by its characteristic tetrahedral basidiospores.

Material examined. – ***Sistotrema alboluteum***: SPAIN, Castilla y León, Salamanca, La Alberca, 29TQE4385, 1250 m, on wood of *Pinus sylvestris*, 16 Nov. 2007, leg. S. Pérez Gorjón, det. S. Pérez Gorjón (SALA-Fungi 3722), conf. N. Hallenberg; SPAIN, Castilla y León, Salamanca, El Maíllo, 29TQE3692, 1150 m, on wood of *Pinus sylvestris*, 2 Dic. 2007, leg. S. Pérez Gorjón, det. S. Pérez Gorjón (SALA-Fungi 4097); ***Sistotrema porulosum***: SPAIN, Castilla y León, Salamanca, Miranda del Castañar, 30TTK4886, 650 m, on wood of *Pinus pinaster*, 25 Nov. 2007, leg. S. Pérez Gorjón, det. N. Hallenberg (SALA-Fungi 3735); ***Sistotrema subtrigonospermum***: SPAIN, Castilla y León, Salamanca, La Alberca, 29TQE4183, 650 m, on wood of *Quercus suber*, 29 Dec. 2007, leg. S. Pérez Gorjón, det. S. Pérez Gorjón (SALA-Fungi 3736), conf. N. Hallenberg.

Key to the known *Sistotrema* species in the Iberian Peninsula

1. Basidiome stipitate ***S. confluens*** Pers.
- 1*. Basidiome resupinate 2
2. Hymenophore poroid or hydroid 3
- 2*. Hymenophore smooth, porulose or grandinoid 4
3. Basidia 2–4 sterigmate, basidiospores globose
. ***S. alboluteum*** (Bourdot & Galzin) Bondartsev & Singer
- 3*. Basidia 6–8 sterigmate, basidiospores broadly ovoid
. ***S. muscicola*** (Pers.) S. Lundell
4. Hyphae without clamps ***S. efibulatum*** (J. Erikss.) Hjortstam
- 4*. Hyphae with clamps 5
5. Cystidia or gloecystidia present 6
- 5*. Cystidia absent 9
6. With projecting, capitate cystidia ***S. pistilliferum*** Hauerslev
- 6*. With enclosed gloecystidia 7
7. Basidia with (1–2)–4 sterigmata ***S. sernanderi*** (Litsch.) Donk
- 7*. Basidia with (4)–6–8 sterigmata 8
8. Hymenophore smooth, white; gloecystidia colourless
. ***S. coroniferum*** (Höhn. & Litsch.) Donk
- 8*. Hymenophore tuberculate to grandinoid, cream;
gloecystidia yellow-brown ***S. resinicystidium*** Hallenb.
9. Basidiospores tetrahedral ***S. subtrigonospermum*** D.P. Rogers
- 9*. Basidiospores different 10
10. Hymenophore grandinoid 11
- 10*. Hymenophore smooth to porulose 12
11. Basidia 4-sterigmate, basidiospores 5.5–8 × 3–4 µm
. ***S. hispanicum*** M. Dueñas, Ryvarden & Tellería
- 11*. Basidia 6–8 sterigmate, basidiospores smaller
. ***S. brinkmannii*** (Bres.) J. Erikss.
12. Basidiospores < 2 µm wide
. ***S. oblongisporum*** M.P. Christ. & Hauerslev
- 12*. Basidiospores > 2 µm wide 13
13. Basidiospores subglobose to ovoid, 3–3.5 µm wide
. ***S. diademiferum*** (Bourdot & Galzin) Donk

- 13*. Basidiospores ellipsoid to subcylindrical or subballantoid,
 < 3 µm wide 14
 14. Basidiospores 3.5–4.5 × 2–2.5 µm **S. porulosum** Hallenb.
 14*. Basidiospores 4.5–6 × 2.5–3 µm
 **S. octosporum** (J. Schröt. ex Höhn. & Litsch.) Hallenb.

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