Sebacina concrescens and *S. sparassoidea*: two conspicuous but neglected North American *Sebacina* species

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Two North American heterobasidiomycetes, *Tremella concrescens* and *T. reticulata*, both forming whitish, erect or encrusting, terrestrial basidiomes, are recombined respectively as *Sebacina concrescens* and *S. sparassoidea*. The latter combination is based on the synonymous *Tremella sparassoidea*, to avoid creating a later homonym of the unrelated *Sebacina reticulata* Pat.

Keywords: *Tremella*, basidiomycetes, ectomycorrhiza.

Whilst investigating species of *Sebacina* Tul. & C. Tul. from Central and South America, a number of North American taxa have been re-examined. As a result, two conspicuous ground-dwelling species, both currently misplaced in the genus *Tremella* Pers., are here recombined into *Sebacina*.

The two genera are not closely related (Weiss & Oberwinkler, 2001). Species of *Tremella* are parasitic on other fungi, typically on wood-inhabiting basidiomycetes and ascomycetes, including lichens. Microscopically, they are distinguished by producing basidiospores which germinate by budding (to produce yeast anamorphs) and by interacting with their hosts through haustorial cells on their (typically clamped) hyphae. At the ultrastucture level, *Tremella* species are characterized by having dolipore septa with cupulate parenthesomes, a feature unique to the order *Tremellales*.

In contrast, some and possibly all species of *Sebacina*, including the type, *S. incrustans* (Pers.) Tul. & C. Tul., are ectomycorrhizal (Urban & al., 2003), growing in soil or detritus. Microscopically, they produce basidiospores which never germinate by budding (they do not produce yeast anamorphs) and their consistently clampless hyphae never have haustorial cells. At the ultrastucture level, *Sebacina* species are characterized by having dolipore septa with con-

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tinuous parenthesomes, a feature found in the *Exidiales* (or *Auriculariales*) but not the *Tremellales*.

Differentiating taxa within *Sebacina* is something of a problem, since most are very similar microscopically in terms of hyphal structure, basidia, hyphidia, and basidiospores. The majority of 'species' are therefore differentiated on macroscopic characters, though these can be variable. Molecular studies may be of help in the future, but as yet few taxa have been investigated.

Sebacina concrescens (Schwein.) P. Roberts, **comb. nov.** – Fig. 1.

≡ *Peziza concrescens* Schwein. in Schrift. Naturf. Ges. Leipzig 1: 118. 1822 (Basionym).
≡ *Tremella concrescens* (Schwein.) Burt in Ann. Missouri Bot. Gard. 8: 362. 1921.
= *Corticium tremellinum* Berk. & Rav. in Grevillea 1: 180. 1873.
= *Terana tremellina* (Berk. & Rav.) O. Kuntze in Rev. Gen. 2: 873. 1891.

Basidiomes terrestrial, firm- to soft-gelatinous, encrusting and supported by seedlings, dead and living stems, and other plant parts, gradually developing lobes and coalescing to form an irregular, lobate, encrusting mass. Compound basidiomes up to 250 mm across, whitish to cream when fresh, drying brown to reddish-brown. – Hyphae hyaline, in a weakly gelatinized context, 2.5–4 µm wide, thin-walled, lacking clamp-connexions. – Hyphidia simple, nodulose, or weakly branched, present in the hymenium, but inconspicuous. – Basidia tremelloid, 4-celled, subglobose to ellipsoid, 15–18 × 10–12 µm, unstalked to short-stalked. – Basidiospores variable within the same collection, ellipsoid to oblong, some ventrally depressed (Q = 1.6–2.0), 8–11.5 (–13.5) × 5–6.5 µm.

Specimens examined. – USA: Florida, Tallahassee, Wakulla Springs, encrusting litter, 13 Jul. 2002, S. E. Evans, K(M) 112411; Georgia, Cotoosa Springs, undated, H. W. Ravenel 1754 (ex herb. M. J. Berkeley), as *Corticium tremellinum*, syntype, K(M) 36452; same details, syntype, K(M) 36453; Maryland, Herrington Manor State Park, encrusting grass and twigs, 1 Sep. 1985, R. Phillips 2921, as *Sebacina incrustans*, K(M) 110298; Michigan, Berry Creek, Wolverine, in litter, 31 Jul. 1961, D. A. Reid, K(M) 36399; New England (unlocalized), running over stems and leaves, undated, Murray (M. A. Curtis 5658, ex herb. M. J. Berkeley), as *Tremella vesicaria*, K(M) 110305; Pennsylvania, Bethlehem, encrusting plants, undated, L. D. von Schweinitz (ex herb. M. J. Berkeley), as *Peziza concrescens*, isotype, K(M) 36400; same location, in grass, undated, L. D. von Schweinitz (ex herb. M. J. Berkeley), as *Tremella vesicaria* and *Guepinia helvelloidea*, K(M) 110310; South Carolina, unlocalized, on ground in litter, undated, H. W. Ravenel 1649 (ex herb. M. J. Berkeley), as *Corticium tremellinum*, syntype, K(M) 36450; same details, syntype, K(M) 36451.

Sebacina concrescens is an encrusting species, using dead or living stems and other low-growing plant material to form semi-erect basidiomes which are typically gelatinous, semi-lobate, and

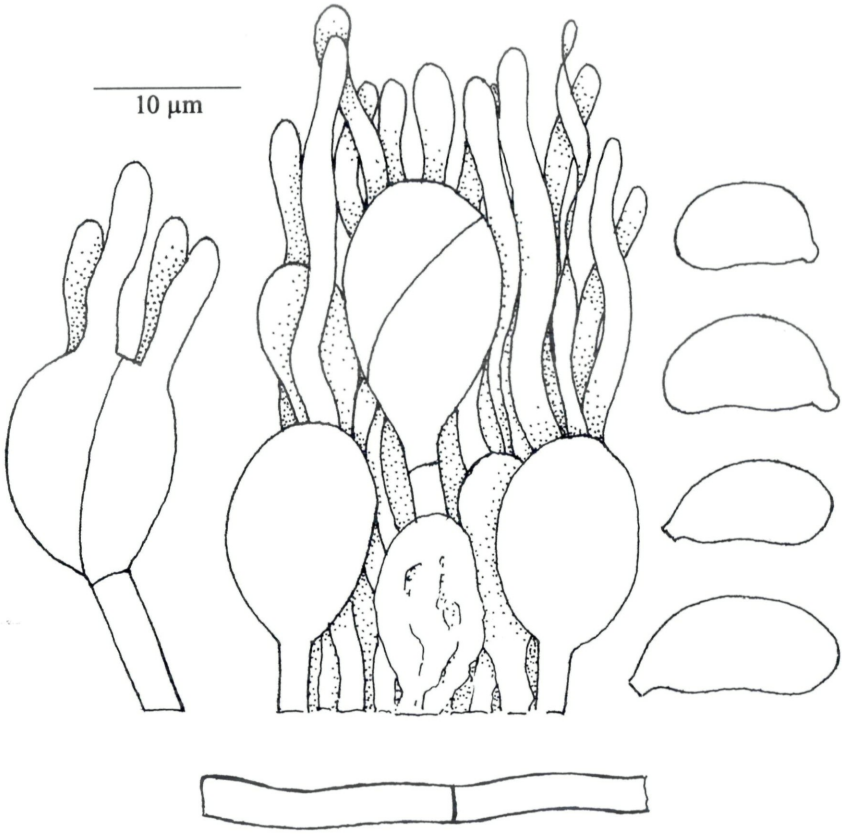

Fig. 1. *Sebacina concrescens*, K(M) 36399. – Basidium; section of hymenium showing immature basidia and simple hyphidia; basidiospores; unclamped context hypha.

white, turning brown in herbarium material. *Sebacina incrustans* has a similar habit, but is less gelatinous (it would never be mistaken for a *Tremella* species), more closely attached, non-lobate, and typically cream to ochraceous. Burt (1921) noted that *Tremella concrescens* "is so soft that it may possibly be confused ... with the white plasmodium of a myxomycete." The difference in texture is reflected microscopically in the thicker-walled hyphae of *S. incrustans*, though this is not a clear-cut character.

Corticium tremellinum is a synonym of *Sebacina concrescens*, as already noted by Burt (1921) and subsequent authors. Berkeley (1873) described his species as "on the ground running over whatever it meets with. Dirty-white gelatinous tremelloid; rufous, hard and horny when dry". Colour photographs of *S. concrescens* have been published by Courtenay & Burdsall (1982) and Weber & Smith

(1985). The species appears to be widespread in the central, north eastern, and south eastern United States and was reported from Brazil by Lowy (1971), though this requires confirmation.

Sebacina sparassoidea (Lloyd) P. Roberts, **comb. nov.** – Fig. 2.

≡ *Tremella sparassoidea* Lloyd in Mycol. Notes 61: 894. 1919 (Basionym).
= *Corticium tremellinum* var. *reticulatum* Berk. in Grevillea 1: 180. 1873.
= *Corticium reticulatum* (Berk.) Cooke in Grevillea 20: 13. 1891. [nom. illeg.]
= *Tremella clavarioides* Lloyd ('McGinty') in Mycol. Notes, Old Species Series 1: 10. 1908. [nom. inval., nom. illeg.]
= *Corticioides reticulatum* Lloyd ('McGinty') in Mycol. Notes, Old Species Series 1: 10. 1908. [nom. inval., nom. illeg.]
= *Tremella reticulata* (Berk.) Farlow in Rhodora 10: 12. 1908.
= *Tremella incisa* Lloyd in Mycol. Writ. 7: 1274. 1924.

Basidiomes terrestrial, firm-gelatinous, composed of multiple, erect, hollow lobes or branches arising from a single base, the branches gradually coalescing to form a compound, coralloid fruitbody. Branch tips are variously cristate to rounded and gaps are frequently left between the coalesced branches, so that the whole basidiome may appear reticulate. Compound basidiomes are typically 30–100 mm tall and of similar diameter, whitish to cream when fresh, drying brown to reddish-brown. – Hyphae hyaline, in a weakly gelatinized context, 1.5–3.5 µm wide, thin-walled, lacking clamp-connexions. – Hyphidia simple, nodulose, or weakly branched, present in the hymenium, but inconspicuous. – Basidia tremelloid, 4-celled, subglobose to ellipsoid, 14–18 × 11–12 µm, unstalked to short-stalked. – Basidiospores variable within the same collection, ellipsoid to oblong, some ventrally depressed (Q = 1.3–2.0), 9–13 × 6–7 µm.

Specimens examined. – USA: Iowa, West Okoboji, Miller's Bay, on ground in grass, 8 Aug. 1933, A .M. Looney & D. P. Rogers, as *T. reticulata*, K(M) 110198; New York, Ithaca, Coy Glen, on soil, 18 Aug. 1926, E. M. Wakefield, as *T. reticulata*, K(M) 110209; New York, Sixmile Creek, on soil, 16 Sep. 1926, (ex herb. C. Rea), as *T. reticulata*, K(M) 110208; Pennsylvania, unlocalized, undated, Dr Michener 3901 (ex herb. C.E. Broome), as *T. vesicaria*, K(M) 110214; same details, Dr Michener ex M. A. Curtis (ex herb. H. W. Ravenel), as *T. vesicaria*, K(M) 110215; same details, Dr Michener 3981 & 3984 (ex herb. M. J. Berkeley), as *T. vesicaria*, K(M) 110304; same details, on soil, Dr Michener 3942 (ex herb. M. J. Berkeley), as *Corticium reticulatum*, holotype, K(M) 110197.

Sebacina sparassoidea can be recognized by its erect, coralloid habit with branches white, wide, and firm-gelatinous, often anastomosing to produce compound basidiomes. The specimens examined (together with published descriptions and photographs) suggest that *Sebacina sparassoidea* should be quite easily distinguished from tougher, narrowly branched *Tremellodendron* species and from non-

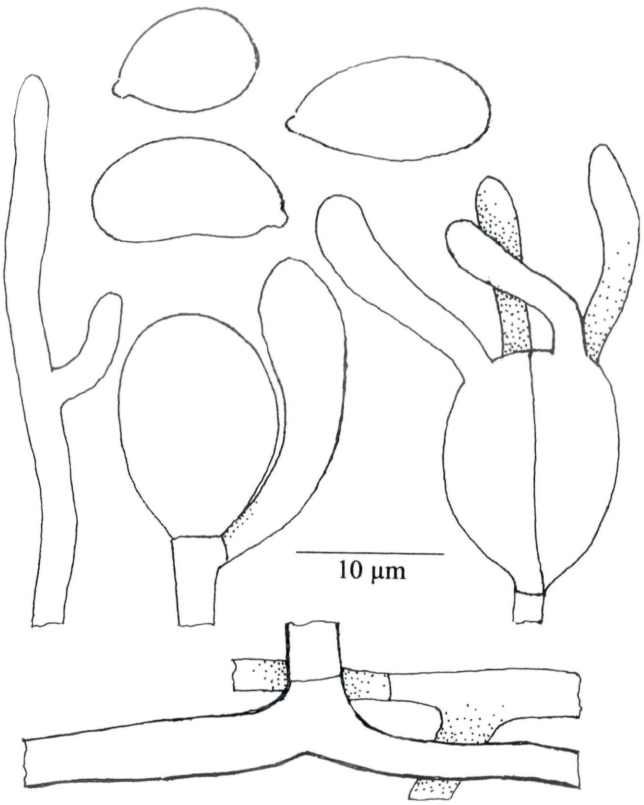

Fig. 2. *Sebacina sparassoidea*, K(M) 110209. – Basidiospores; weakly branched hyphidium; immature and mature basidia; unclamped context hyphae.

erect, effused or encrusting *Sebacina* species. Burt (1921) noted that the species was "distinguished by its rising from the ground as a white, self-supporting, coralloid mass so firm and elastic that it can be bent, twisted, or compressed and the parts spring back into their original position." It is not clear, however, whether *Tremella reticulata sensu auct.* (*Sebacina sparassoidea* as conceived here) is a single taxon, or several. Superficially, at least, coralloid, branched, cristate forms look rather different from anastomosing reticulate forms, but this may be a matter of age or humidity.

Sebacina sparassoidea has sometimes been referred to *Tremella vesicaria* Bull., an old European name of uncertain application. The American species, however, was first definitively described as a variety (*reticulata*) of *Corticium tremellinum*, now considered synonymous with *Sebacina concrescens* (as noted above). Berkeley (1873) described the variety as "forming erect fucoid tufts, reticulated below". It was subsequently raised to species level by Cooke as

Corticium reticulatum, but this name is doubly illegitimate as a later homonym of both *C. reticulatum* Berk. & Broome, 1873, and *C. reticulatum* (Fr.) Fr., 1874. Subsequently, the species was transferred to *Tremella* by Farlow (1908), where it has since remained.

A straightforward transfer of the epithet to the genus *Sebacina* is prevented by the existence of an earlier *Sebacina reticulata* Pat., 1895, which is an entirely separate and unrelated species. The combination in *Sebacina* therefore needs to be made using the first available synonym of *Tremella reticulata*.

The earliest appears to be *Tremella clavarioides* published by Lloyd (1908), together with a brief description and black and white photograph (Lloyd, 1908, Fig. 224). This shows a specimen with three to four thickset branches and multiple spiculate processes, rather resembling the common European species *Clavulina cristata* (Holmsk.) J. Schröt. It was described as being pure white and firm gelatinous. The name *Tremella clavarioides* is, however, invalid (Art. 34: 1) since Lloyd ascribed it to his alter ego 'Prof. McGinty', a fictitious and pedantic creator of superfluous names in which Lloyd did not believe. The name is also illegitimate (Art. 52.1) since Lloyd noted that it was the same as Berkeley's original *Corticium tremellinum* var. *reticulatum*, but rejected Berkeley's name as "absurd, and unjust" since the specimens Lloyd examined (from Ohio and Minnesota) were neither corticioid nor reticulate. In a footnote, Lloyd also suggested that 'Prof. McGinty' might place the taxon in a new genus as *Corticioides reticulatum*, an equally invalid and illegitimate name.

Lloyd (1919) provided a third synonym with *Tremella sparassoidea*, described as being white, composed of hollow, confluent lobes, and having a surface "something like a coral". The accompanying black and white photograph (Lloyd, 1919, Fig. 1562) shows a compact specimen in which all branches appear to have anastomosed, leaving a single fused clump with an irregularly tuberculate or coralloid surface. Technically the name *Tremella sparassoidea* is not illegitimate, since although Lloyd suggested it "may be the same species as" his earlier *Tremella clavarioides* and Berkeley's original *Corticium tremellinum* var. *reticulatum*, he did not definitely include the type of either taxon in his description (Art. 52.1). Bandoni (1958) later noted that the type of *Tremella sparassoidea* (USA, Minnesota, Minneapolis, M. S. Whetstone, Lloyd 9860, BPI) was indeed conspecific with *T. reticulata*. *Tremella sparassoidea* is therefore here taken as the basionym for the new combination proposed above.

Based on an accompanying black and white photograph (Lloyd, 1924, Fig. 2819), *Tremella incisa* is a fourth Lloyd synonym for the species, as already noted by Bandoni (1958).

Colour photographs of *Sebacina sparassoidea* have been published (as *Tremella reticulata*) by Courtenay & Burdsall (1982), Phillips (1991), and Bessette & al. (1995). Black and white photographs were published by Lloyd (as noted above), Martin (1952), and Smith (1963). The species appears to be widespread in the north central and north eastern United States.

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