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New or Interesting Lichenicolous Heterobasidiomycetes

PAUL DIEDERICH[1]

ABSTRACT. – Three lichenicolous *Tremella* species are described as new: *T. nashii* (on *Usnea* from the USA and Norway), *T. nieblae* (on *Niebla* from Mexico and the USA) and *T. tuckerae* (on *Ramalina* from the USA and Ireland). A further new species on *Flavoparmelia* from the USA is left unnamed (as *Tremella* sp. 7). *Cystobasidium hypogymniicola* is recorded for the first time on *Cavernularia* (in Norway), and *Tremella caloplacae* for the first time on *Xanthoria* (in Canada and Greenland).

In my monograph of lichenicolous heterobasidiomycetes (Diederich 1996), I recognized and described one species of *Biatoropsis*, two of *Chionosphaera* (one tentatively named), two of *Cystobasidium*, three of *Syzygospora* (one only provisionally included there), and 46 of *Tremella*. Six species of *Tremella* were left unnamed (called *Tremella* sp. 1 to 6), as the available material was not sufficient for a type. Roberts (1997) added a further lichenicolous species of *Chionosphaera*, *C. coppinsii* Roberts. Diederich (2003) described the new *Tremella lethariae* Diederich for *Tremella* sp. 4, and Sérusiaux et al. (2003) published the new combination *T. caloplacae* (Zahlbr.) Diederich for *Tremella* sp. 1.

In the meantime, I have examined large numbers of additional *Tremella* specimens, many from unusual hosts, including a number of new species. This paper will deal with two species collected on new hosts, give descriptions of three new species, and briefly describe a further new species that will be left unnamed as *Tremella* sp. 7.

The methods of study are the same as in Diederich (1996). Macroscopical photographs were done using a Leica MZ 7.5 binocular microscope with a Nikon Coolpix 4500 digital camera.

THE SPECIES

1. *Cystobasidium hypogymniicola* Diederich (on *Cavernularia hultenii*), FIG. 1.

DESCRIPTION OF THE SPECIMENS ON *CAVERNULARIA*. - Basidiomata absent; fungus inducing the formation of pale, rarely brownish, strongly convex, sometimes irregular galls on the host thallus with a smooth surface, 0.1-1.2 mm diam. Probasidial initials ellipsoid, situated in or below the cortex of the galls. Context hyphae and fertile hyphae difficult to study, clamp connections and haustorial branches not observed. Probasidial initials sub-spherical to ellipsoid, thick-walled, basal clamp not observed; hyphidia and cystidia absent. Basidia, when mature, composed of an ellipsoid, thick-walled probasidium, 12-22 × 4-6.5 µm, and a cylindrical, generally bent, thin-walled, often deciduous, upper part (meiosporangium), at least 30 µm long and 3-5 µm diam.; upper part with up to 3 transverse septa, individual cells collapsing after spore production, each with one epibasidium; epibasidia more or less perpendicular to the basidium, subulate, 1-2 µm thick, at least 2 µm long, not or poorly refractive at the apex. Basidiospores ellipsoid to fusiform, more or less symmetrical, with a distinct, not or poorly refractive apiculus at the lower end, 7-9.5 × 4-7 µm. Anamorph not observed.

[1]PAUL DIEDERICH - Musée national d'histoire naturelle, 25 rue Munster, L-2160 Luxembourg.

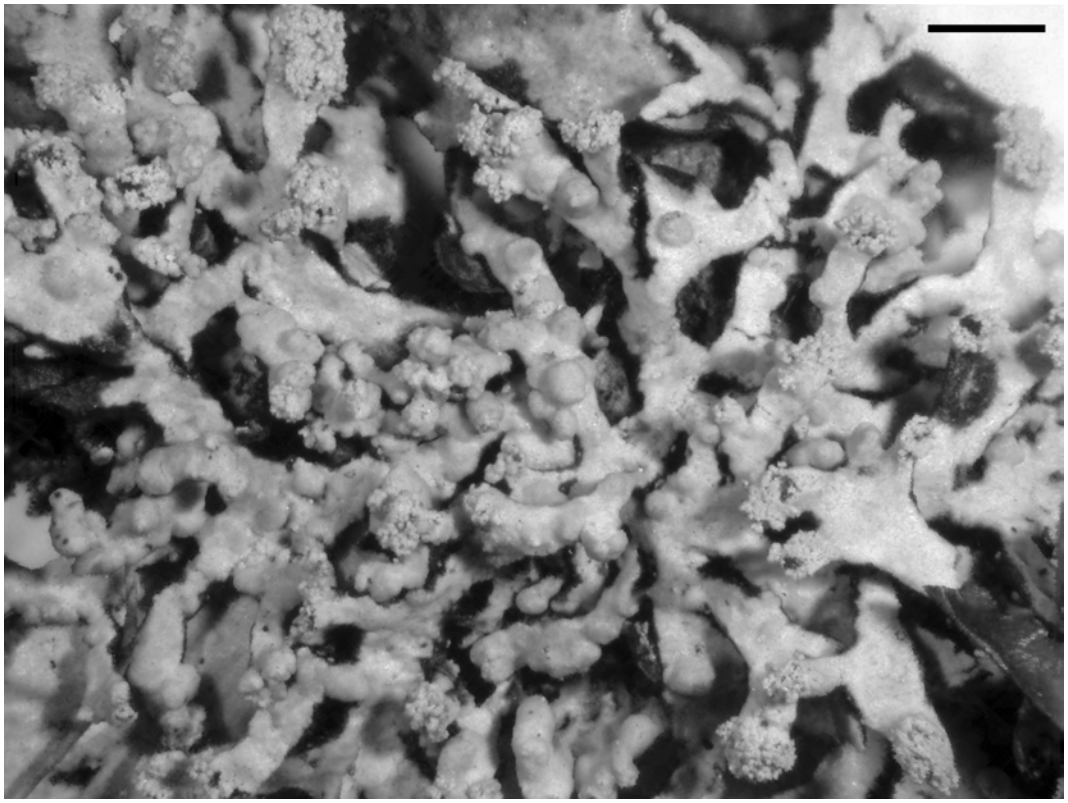

Fig. 1. *Cystobasidium hypogymniicola* on *Cavernularia hultenii* (*Tønsberg 30510*). Scale bar = 1 mm.

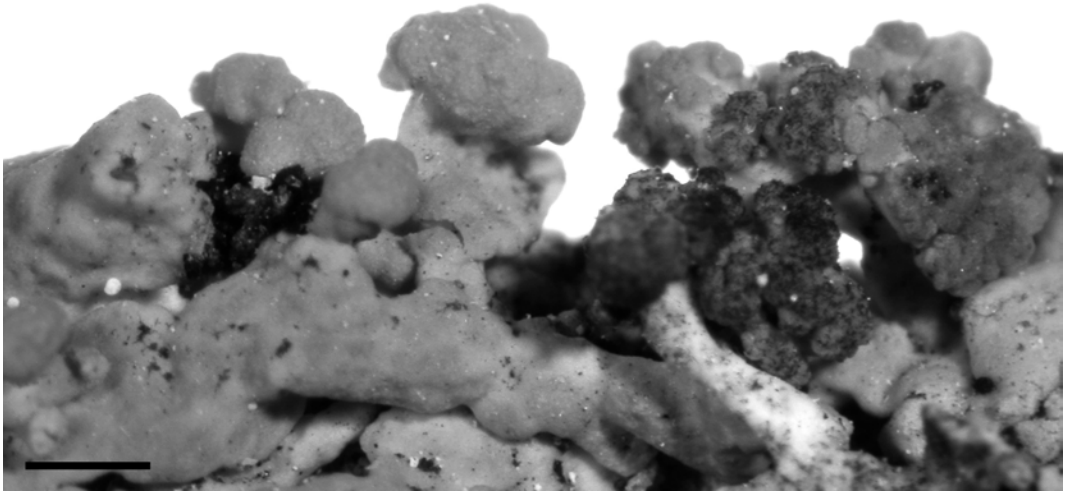

Fig. 2. *Tremella caloplacae* on *Xanthoria sorediata* (*Goward 01-168*). Scale bar = 0.5 mm.

Hosts. - *Cystobasidium hypogymniicola* was known from *Hypogymnia imshaugii*, *H. physodes* and *H. vittata*. Here I report it from a new host genus, *Cavernularia hultenii*, inducing the formation of convex galls, but otherwise not visibly damaging the host.

Distribution. - *Cystobasidium hypogymniicola* has been collected on *Hypogymnia* in North America (Canada and USA) and in Scandinavia (Finland and Norway) (Diederich 1996, 2003, Holien 2001). On *Cavernularia*, it is known from four localities in Norway.

Discussion. - The specimens on *Cavernularia hultenii* are microscopically very similar to *Cystobasidium hypogymniicola*. The basidia are slightly narrower (11-19 × 7-11 µm in the specimens on *Hypogymnia*), but this might just reflect the infraspecific variability and is certainly also a result of the difficulties to study these specimens microscopically. Macroscopically, the galls on *Hypogymnia* are much larger, often becoming bullate, and reach 17 mm diam. However, young galls on *Hypogymnia* are almost identical to those on *Cavernularia*. Without molecular data it is almost impossible to determine if the specimens on *Cavernularia* represent a distinct species, or if they belong to *C. hypogymniicola*, with smaller galls as an adaptation to a different host. As almost all lichenicolous heterobasidiomycetes appear to be strictly host specific (the only exception being species of *Chionosphaera*), and as both host genera *Cavernularia* and *Hypogymnia* group together in phylogenetic studies (e.g. Thell et al. 2004), it is reasonable to assume that the material on both host genera belongs to the same species.

Specimens Examined (all on *Cavernularia hultenii*). - **Norway**. Nord-trøndelag: Overhalla, farm Grande, along gravel road, 64°29'N, 12°00'E, 50 m, 2001, *T. Tønsberg 30510* (bg-l70660!); Snåsa, N of Jørstadmoen, W of Finnsås, Finnsåsmarka, 64°13'N, 12°13'E, 60 m, 2001, *T. Tønsberg 30481* (bg-l70643!); Meråker hd, Tevldalen, 1950, *R. Santesson s.n.* (ups!); Lånke hd, 1938, *S. Ahlner s.n.* (ups!).

2. *Tremella caloplacae* (Zahlbr.) Diederich (on *Xanthoria sorediata*), Fig. 2.

Hosts. - *Caloplaca* species (incl. *C. arenaria*, *C. arnoldii*, *C. aurantia*, *C. carphinea* and *C. saxicola*) (Sérusiaux et al. 2003), here newly reported from *Xanthoria sorediata*.

Distribution. - The species was known from several European countries (Sérusiaux et al. 2003) and is here reported as new for Canada (British Columbia) and Greenland.

Discussion. - *Tremella caloplacae* is known from several species of *Caloplaca*, on which it grows intrahymenially, without the formation of distinctive basidiomata. The two collections on *Xanthoria sorediata* are macroscopically very distinct, as the fungus induces the formation of conspicuous galls concolorous to the host thallus, up to 1 mm diam., but microscopically, it does not differ from material on *Caloplaca*. Morphological and anatomical characters do not allow identifying if all this material represents one or several species.

Recent phylogenetic studies (Gaya et al. 2003) suggest that neither *Caloplaca* nor *Xanthoria* are monophyletic. Instead, two distinct lineages are recognized by these authors. "Lineage 1" (that includes the type of *Xanthoria*) comprises several known hosts of *Tremella caloplacae* (*Caloplaca arnoldii*, *C. saxicola* and *Xanthoria sorediata*), whilst "lineage 2" (that includes the type of *Caloplaca*) comprises one known host (*C. aurantia*). As almost all known lichenicolous heterobasidiomycetes are strictly host-specific, the broad host-spectrum of *T. caloplacae* suggests that it may actually be made up of several cryptic species. As long as no molecular data of *Tremella* specimens from Teloschistaceae are available, however, I prefer to treat all these specimens as one species.

Interestingly, this is the first record of a lichenicolous heterobasidiomycete from Greenland.

Specimens Examined. - Canada. British Columbia: Crown Lake, Marble Canyon Provincial Park, 25 km NE of Lillooet, 50°52'N, 121°41'W, 600 m, on *Xanthoria sorediata*, 2001, *T. Goward 01-168* (ubc!, hb. diederich!). **Greenland**. Qagssiarsuk: 61°8-10'N, 45°32-35'W, 0-250 m, on *X. sorediata*, 2005, *M. Kukwa 4385a* (ugda!, hb. diederich!).

Fig. 3. *Tremella nashii* (holotype). Scale bars: left = 1 mm, right = 250 µm.

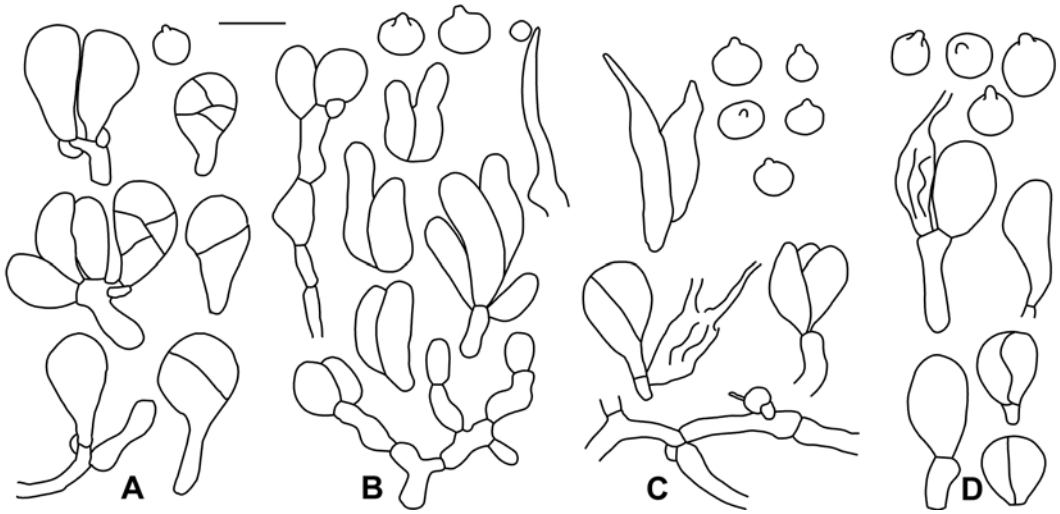

Fig. 4. *Tremella nashii*, basidia, basidiospores and hypha with haustorial branch (A – holotype, B – *Nash 42005*, C – *Nash 27172*, D – *Holien 7110*). Scale bar = 10 µm.

3. *Tremella nashii* Diederich sp. nov., FIGS. 3-4.

Basidiomata lichenicola in thallo *Usneae*, pallide ad atrobrunnea, convexa, subglobosa ad elongata, 0.3-2.5 × 0.2-0.7 mm. Hyphidia nulla. Basidia 2-4-cellularia, septis longitudinalibus vel obliquis, 8-20(-24) × 8.5-12 µm. Basidiosporae 5-8 × 4-6 µm. Conidia ignota.

TYPE: USA. ARIZONA. APACHE CO.: White Mountains, Apache National Forest, Mount Baldy Wilderness, near beginning of trail 94 along W fork of Little Colorado River at Sheep's Crossing, 33°58'N, 109°31'W, 2860 m, on *Usnea sorediifera*, 7.vi.1998, *T.H. Nash III 41941* (ASU!, holotype; HB. DIEDERICH!, isotype).

DESCRIPTION. - Basidiomata waxy-gelatinous, very pale to sometimes dark brown, convex, subspherical or more often elongate, often irregular in form, 0.3-2.5 × 0.2-0.7 mm; fertile hyphae thick-walled, 2.5-4 µm diam., at least some with clamp connections; haustorial branches present, with clamp connections, mother cell subspherical or ellipsoid, 3.5-4 µm diam., haustorial filament 0.5 µm thick, 1-3 µm long. Hymenium hyaline, containing numerous probasidia; probasidial initials ellipsoid, proliferations occurring through the basal clamp; hyphidia and cystidia absent. Basidia, when mature, 2-4-celled (in some specimens all 2-celled, in others all 4-celled), with longitudinal or oblique septa, subspherical to elongate, often distinctly stalked, 8-20(-24) × 8.5-12 µm; epibasidia subcylindrical, 2-4 µm thick, at least 30 µm long. Basidiospores subspherical to shortly ellipsoid, with a distinct lateral apiculus, 5-8 × 4-6 µm. Anamorph unknown.

ETYMOLOGY. - Named after Prof. Thomas H. Nash III, collector of all known American specimens of the new species, and main editor of the Sonoran lichen flora.

HOSTS. - On the thallus of *Usnea* species, especially *U. hirta* and *U. sorediifera*, commensalistic, frequently accompanied by *Biatoropsis usnearum* and *Lichenostigma maureri*.

DISTRIBUTION. - Known from Arizona in the USA, where the species appears to be quite common, and probably also from Norway (see below).

DISCUSSION. - This is the fifth species of heterobasidiomycetes known to grow on *Usnea*. *Cystobasidium usneicola* Diederich & Alstrup is easily distinguished by the very distinct basidia consisting of two parts, a lower, thick-walled probasidium and an upper, thin-walled, cylindrical meiosporangium, and basidiospores with a terminal, refractive apiculus. *Biatoropsis usnearum* Räsänen is distinguished by elongate-claviform basidia with transverse septa. *Tremella santessonii* Diederich has also basidia with one transverse septum. *Tremella stevensiana* Diederich was the only known species on *Usnea* with longitudinal basidial septa. That species is distinguished from *T. nashii* by constantly 2-celled basidia, much smaller, applanate to pulvinate basidiomata, 0.1-0.3(-0.5) mm diam., and especially by the presence of abundant conidiophores, located between the basidia, consisting of a 9-21 µm long conidiogenous cell, bearing in the upper part 5-30 ellipsoid conidia.

Three Norwegian specimens appear to be the same species. The basidia are typically tremelloid, with at least one longitudinal septum, 10-16 × 8.5-9.5 µm, and the basidiospores measure 5-8.5 × 5-8 µm. The basidiomata are mainly dark brown and convex with a constricted base. No anamorph has been observed. These specimens are in a relatively poor condition, and I was not able to study the microscopical characters carefully. I include these specimens provisionally within *Tremella nashii*, awaiting the discovery of better developed Scandinavian specimens.

ADDITIONAL SPECIMENS EXAMINED. - USA. ARIZONA. APACHE CO.: same locality as type, on *Usnea hirta*, 1998, *T.H. Nash III 41940* (ASU!, HB. DIEDERICH!); ibid., 33°57'N, 109°31'30"W, 2900 m, on *U. hirta*, 1994, *T.H. Nash III 34936* (ASU!); ibid., first drainage W of the Little Colorado River Valley, 33°58'N, 109°32'W, 2900 m, on *U. hirta*, 1994, *T.H. Nash III 34721* (ASU!); ibid., trail from Phelp's cabin along E fork of the Little Colorado River, 109°30'W, 33°56'N, 2900 m, on *U. hirta*, 1990, *B.D. Ryan & T.H. Nash III 27172* (ASU!). COCONINO CO.: upper part of the W fork of Oak Creek, canyon in the vicinity of West Buzzard Point, 35°01'15"N, 11°50'15"W, 1950 m, on *U. hirta*, 1994, *T.H. Nash III 35351* (ASU!). GILA CO.: Gila

National Forest, upper end of Pine Canyon adjacent Coconino Co. border, 34°26'N, 111°24'W, 2235 m, on *U. hirta*, 1998, *T.H. Nash III 42005* (ASU!). GREENLEE CO.: Apache National Forest, Bear Wallow Wilderness, along trail 63, 33°36'N, 109°25'W, 2640 m, on *U. sorediifera*, 1998, *T.H. Nash III 41847* (ASU!); ibid., on *Usnea*, *Nash* 41861 (ASU!); ibid., on *U. hirta*, *T.H. Nash III 41885* (ASU!, HB. DIEDERICH!). **NORWAY**. S-TRØNDELAG: Overhalla, W of Foss in a ravine, on *Usnea*, 1997, *H. Holien 7110* (TRH!, HB. DIEDERICH!); Afjord, N-facing slope along river Skjerva, on *Usnea*, 1997, *H. Holien 7223* (TRH!); Trondheim, Byneset, E of Berg, on *Usnea*, 1997, *H. Holien 7227* (TRH!, HB. DIEDERICH!).

4. *Tremella nieblae* Diederich & van den Boom sp. nov., FIGS. 5-6.

Basidiomata lichenicola in thallo et apotheciorum margine *Nieblae*, gallas brunneas superficiales ad 10 mm diam. efficientia. Hyphidia nulla. Basidia 4-cellularia, septis longitudinalibus vel interdum obliquis, 11-28 × 8.5-15 µm. Basidiosporae 4-5.5(-6.5) × 4-5.5(-6) µm. Conidia ignota.

TYPE: USA. CALIFORNIA. MONTEREY CO.: SSW of Carmel, Point Lobos State Reserve, Bird Island Trail, 121°56'W, 36°28'N, 25 m, on *Niebla cephalota*, 23.vii.2002, *P. van den Boom 29018* (BR!, holotype; HB. DIEDERICH!, HB. VAN DEN BOOM! isotypes).

DESCRIPTION. - Basidiomata indistinct, inducing the formation of large, convex, subspherical or elongate to bullate galls on the host thallus, mostly 0.8-10 mm diam.; gall surface similar to that of the host, but frequently more intensively pigmented, either darker or more orange brown; fertile hyphae 2-4 µm diam., with clamp connections; haustorial branches not observed. Hymenium hyaline, containing numerous probasidia; probasidial initials subspherical, ellipsoid or pyriform, proliferations occurring through the basal clamp; hyphidia and cystidia absent. Basidia, when mature, 4-celled, with longitudinal or rarely oblique septa, some not stalked, others slightly or distinctly stalked, 11-28 × 8.5-15 µm; epibasidia subcylindrical, 2.5-4.5 µm thick, up to at least 30 µm long. Basidiospores subspherical to shortly ellipsoid, with a distinct apiculus, 4-5.5(-6.5) × 4-5.5(-6) µm. Anamorph unknown.

ETYMOLOGY. - Growing on *Niebla*.

HOSTS. - Thallus and apothecial margin of *Niebla* (= *Vermilacinia*) *cephalota* and *N. homalea*, inducing the formation of distinct, relatively large, subspherical or elongate, on *N. homalea* frequently bullate galls, concolorous to the host thallus or slightly darker and more orange brown, otherwise not damaging the host.

DISTRIBUTION. - Obviously very common in California (USA) and in Baja California (Mexico), probably widespread and common in regions where the host genus is common.

DISCUSSION. - Basidiomata of the new species are indistinct, and basidia are immersed and intermixed with host and photobiont hyphae in the cortical layer of strongly convex galls. Young, shiny galls usually contain a small number of basidia that are therefore difficult to observe. Older galls with a roughened surface contain a larger number of mature basidia. Basidiospores are extremely rare in the examined material and only in the type specimen could several spores be observed; the variation of their dimensions should be re-evaluated when more specimens become available. The basidial base is rather variable: in some specimens, most basidia are subspherical, without elongated base, and microscopically they are frequently seen from above with cruciate septa. In other specimens, some or even most basidia have a short to more or less elongate, narrow stalk, and they are generally observed from the side in microscopical preparations. In lateral view, frequently only two cells can be observed, whilst in apical view, almost all basidia are clearly 4-celled.

Specimens with bullate galls are macroscopically similar to *Tremella everniae* Diederich. The new species is distinguished by more elongate, sometimes obliquely septate mature basidia. As furthermore both species have different hosts that are phylogenetically not closely related, it is unlikely that the material on both hosts represents a single variable species. The species is macroscopically and microscopically distinct from both known *Tremella* species confined to *Ramalina*, *T. ramalinae* Diederich and *T. tuckerae*. *Tremella ramalinae* has distinct basidiocarps and basidia are very different (Diederich 1996), although specimens have been observed with a certain number of atypical basidia. *T. tuckerae* (described below) also has distinct basidiocarps, a different type of basidia and much larger basidiospores.

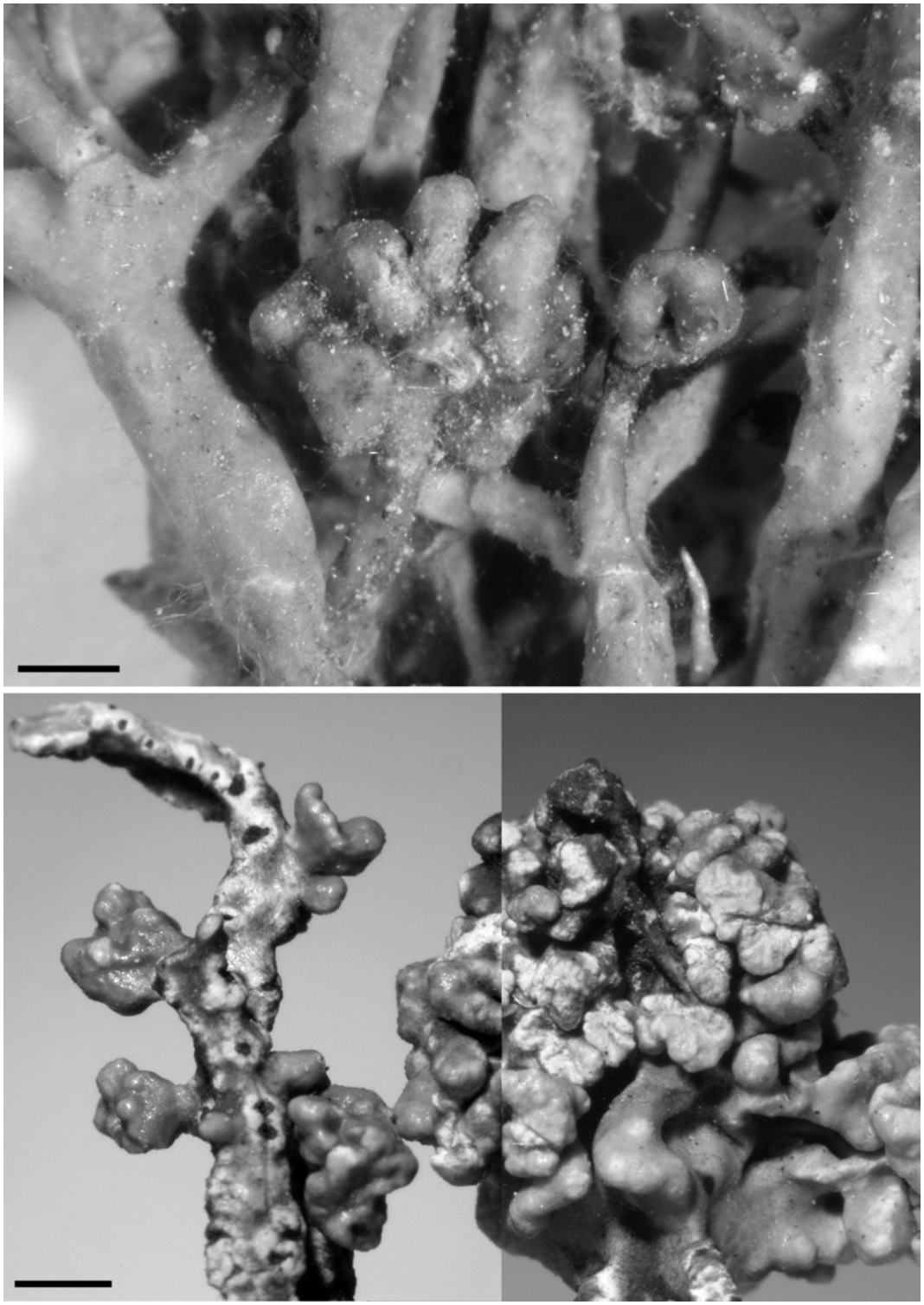

Fig. 5. *Tremella nieblae* (top – holotype, bottom – *Robertson 6545*). Scale bars = 1 mm.

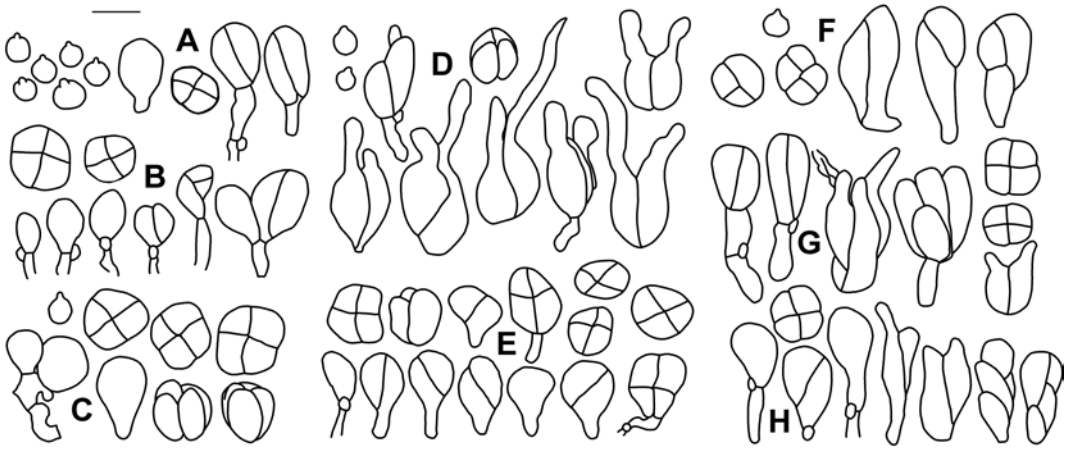

Fig. 6. *Tremella nieblae*, basidia and basidiospores (A – holotype, B – *Cole 7909F*, C – *Tucker 34216B*, D – *Cole 7909*, E – *Wetmore 75724a*, F – *van den Boom 29229*, G – *van den Boom 29474*, H – *van den Boom 29214*). Scale bar = 10 µm.

Diederich (2004) reported *Tremella ramalinae* from California and Baja California on *Ramalina* and *Vermilacinia* species and mentioned the existence of specimens with atypical basidia in which only longitudinal septa occur. The genus *Vermilacinia* is now considered as a synonym of *Niebla* (Bowler & Marsh 2004). These specimens with atypical basidia are all on *Niebla* species and belong to the new *Tremella nieblae*. The genuine *T. ramalinae* on *Ramalina* also exists in California[2] and in Baja California (type specimen).

Additional Specimens Examined. – Mexico. Baja California: Punta Santo Tomas SW of Ensenada, on N point along ridge, 31°33'N, 116°41'W, 50 m, on *Niebla cephalota*, 1995, *C.M. Wetmore 75724a* (GZU!). **USA**. California. Humboldt Co.: Clam Beach State Park, Clam Beach, 14 m, on *N. cephalota*, 2002, *T. Carlberg 569a* (HB. DIEDERICH!); Big Lagoon State Park, N end of Big Lagoon, 39 m, on *N. cephalota*, 2001, *T. Carlberg 531a* (HB. DIEDERICH!). Marin Co.: Golden Gate National Recreation Area, Fort Cronkhite, rocks in open above Rodeo Beach, 37°50'N, 122°32'W, 33 m, on *N. homalea*, 2001, *M. Cole 7909 & 7909F* (WIS!; HB. DIEDERICH!). Monterey Co.: Pacific Grove, S of Ocean View Blvd., near lighthouse and at El Carmelo Cemetery, 121°56'W, 36°38'N, 10 m, on *N. cephalota*, 2002, *P. van den Boom 29229* (herb. van den Boom); ibid., on *N. cephalota*, *P. van den Boom 29211*, *29214* (HB. VAN DEN BOOM!, HB. DIEDERICH!); Point sur State Park, Sur School, 44 m, on *N. cephalota*, 2003, *T. Carlberg 934* (HB. DIEDERICH!). San Luis Obispo Co.: coastal rock outcrops and sea cliffs, near Point Bouchon, Diablo Canyon Power Plant (Pacific Gas & Electric Co.) property, Avila beach, on *N. homalea*, 1995, *S. Tucker 34216B* (SBBG!); S of Morro Bay, State Park road, N of Museum of Natural History, 120°51'W, 35°21'N, 2 m, on *N. cephalota*, 2002, *P. van den Boom 29474* (HB. VAN DEN BOOM!, HB. DIEDERICH!). Sonoma Co.: Chancelor Wetlands, behind stable area, greenstone outcrop in coastal prairie, 38°21'N, 123°03'W, 30 m, on *N. homalea*, 2001, *J. & R. Robertson 6545* (SBBG!, HB. DIEDERICH!).

5. *Tremella tuckerae* Diederich sp. nov., Figs. 7-8.

Basidiomata lichenicola in thallo *Ramalinae*, gallas brunneas superficiales ad 2 mm diam. efficientia. Hyphidia nulla. Basidia 2-cellularia, septo longitudinali, 12-17 × 10.5-15.5 µm, cellulis maturitate elongatis ad 30 µm longis. Basidiosporae 7.5-9 × 6.5-8 µm. Conidia ignota.

Type: USA. New Mexico. Bernalillo Co.: Sandia Mountains E of Albuquerque along NM route 536, Cibola National Forest, at Sandia Crest, along the North Crest trail No. 130N, 35°12'39"N, 106°26'57"W, 3250 m, on conifers in spruce-fir forest, on *Ramalina sinensis*, 12.viii.2001, *S. Tucker 37335* (SBBG!, holotype; HB. DIEDERICH!, isotype).

[2] *Tremella ramalinae* Diederich - **USA**. California. Monterey Co.: Pacific Grove, S of Ocean View Blvd., near lighthouse and at El Carmelo Cemetery, 121°56'W, 36°38'N, 10 m, on *Ramalina* sp., 2002, *P. van den Boom 29231* (HB. VAN DEN BOOM!, HB. DIEDERICH!). See also two specimens reported by Diederich (2003).

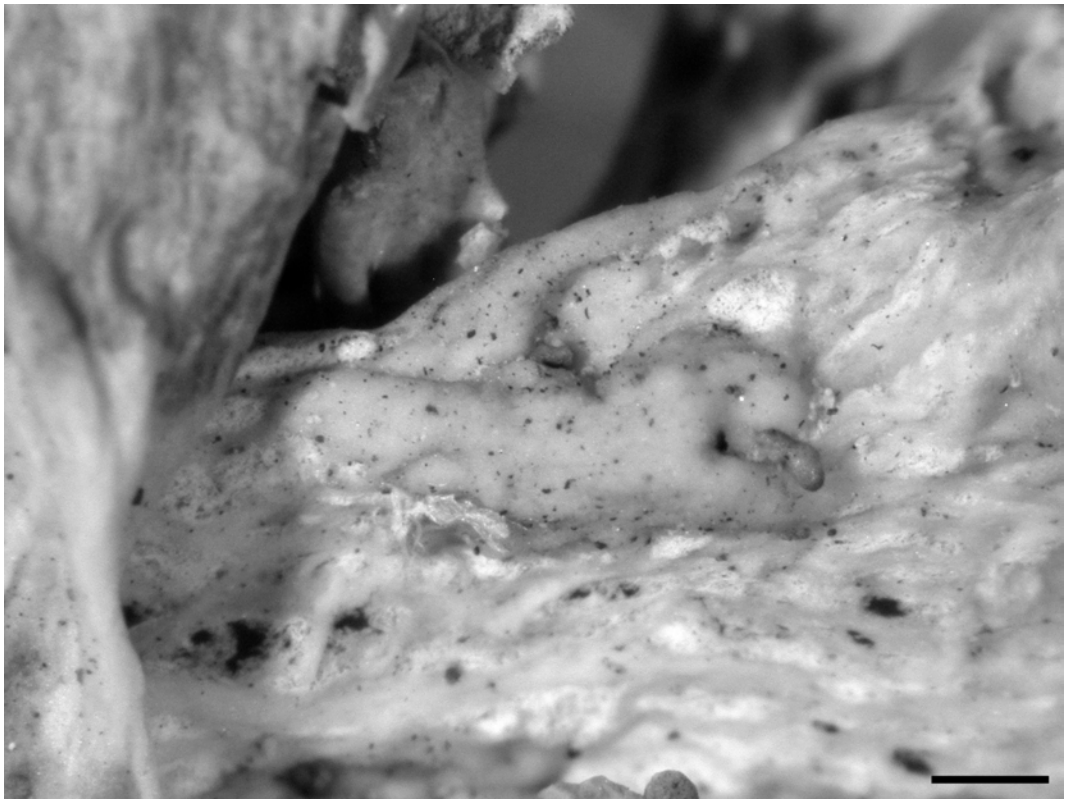

Fig. 7. *Tremella tuckerae* (holotype). Scale bar = 0.5 mm.

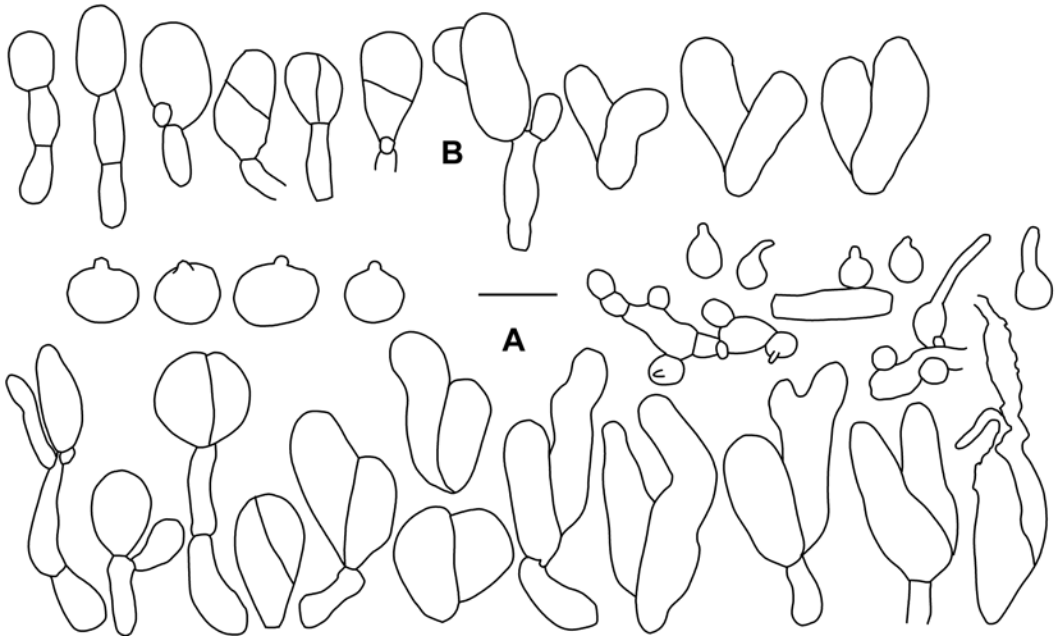

Fig. 8. *Tremella tuckerae*, basidia, basidiospores and hyphae with haustorial branches (A – holotype, B – *O'Dare s.n.*). Scale bar = 10 μm.

Description. - Basidiomata resupinate over thin or thick, often irregular, frequently poor delimited gall-like swellings of the host thallus, waxy-gelatinous, pale brown (more orange brown than the host thallus and therefore easily distinguishable) to blackish (in *R. cuspidata*), 0.3-2 mm diam.; fertile hyphae thick-walled, 2.5-5 µm diam., at least some with clamp connections; haustorial branches present, with clamp connections, mother cell subspherical or ellipsoid, 3.5-5.5 µm diam., haustorial filament 1-1.5 µm thick, up to at least 11 µm long. Hymenium hyaline, containing numerous probasidia; probasidial initials ellipsoid, proliferations occurring through the basal clamp; hyphidia and cystidia absent. Basidia, when mature, 2-celled, with one longitudinal or rarely oblique septum, 10.5-15.5 µm diam., near the septum 12-17 µm long, both cells elongating at maturity, up to 30 µm long (epibasidium not included), in the upper part 4.5-7 µm diam.; epibasidia shrunken in herbarium material, probably subcylindrical and 2-4 µm thick, at least 30 µm long. Basidiospores subspherical to shortly ellipsoid, with a distinct lateral apiculus, (5.5)7.5-9(-11) × (4-)6.5-8 µm. Anamorph unknown.

Etymology. - Named after Prof. Shirley Tucker, collector of the type specimen of the new species.

Hosts. - On the thallus of *Ramalina sinensis*, inducing the formation of flattened to indistinctly cerebriform galls, commensalistic, and at the base of the thallus of *R. cuspidata*, inducing irregular, convex, pale to blackish galls.

Distribution. - So far known from the type locality in New Mexico (USA) and from Ireland.

Discussion. - This species is remarkable by the longitudinally 1-septate basidia in which each cell elongates when mature and becomes much longer than the septum. Two lichenicolous species with similar basidia are known. Basidiomata of *Tremella christiansenii* Diederich induce the formation of brown to dark brown, convex, irregular, often tuberculate or cerebriform galls on the thallus or apothecia of *Physcia* species; basidiospores are distinctly larger, 9-12 × 8.5-10.5 µm, and haustorial cells smaller, 2.5-3 µm diam. *T. hypocenomycis* Diederich has black, irregular, often tuberculate or cerebriform basidiomata, smaller basidiospores, 5.5-6.5 µm diam., and a different host, *Hypocenomyce scalaris*.
The new species is readily distinguished from *Tremella ramalinae*, known from the same host genus, which typically has pyriform, (3-)4-celled basidia with two transverse septa, the upper third divided by one longitudinal septum. Atypical specimens of *T. ramalinae* with many longitudinally septate basidia differ from *T. tuckerae* by the 4-celled basidia of which the individual cells do not elongate at maturity.

Additional Specimen Examined. - Ireland: VC H1, South Kerry, Skellig Michael, on *Ramalina cuspidata*, 1988, *O'Dare s.n.* (E!).

6. *Tremella* sp. 7 (on *Flavoparmelia caperata*), Figs. 9-10.

Description. - *Basidiomata* absent; fungus inducing the formation of brownish, strongly convex and bullate galls on the host thallus with a smooth surface, up to 5 mm diam. Probasidial initials ellipsoid, situated in the cortex of the galls. Basidia, when mature, with at least 1 longitudinal septum, some at least 3-celled, c. 14-21(-26) × 10-13 µm. *Basidiospores* with a distinct apiculus, subspherical, c. 4 × 4 µm (one old spore observed). Anamorph unknown.

Host. - *Flavoparmelia caperata*, inducing large galls, but otherwise not damaging the host thallus.

Distribution. - Known from two localities in the USA (North Carolina).

Discussion. - Both collections are relatively rich, but immature. Many young basidia without or with one longitudinal septum have been observed, but they were difficult to study, as they were always obscured by too many surrounding host hyphae. Only one old basidiospore has been seen. For these reasons, the species is left unnamed until better material becomes available. The galls induced by this fungus resemble those of *Tremella everniae*, a species assumed to be confined to *Evernia mesomorpha*.

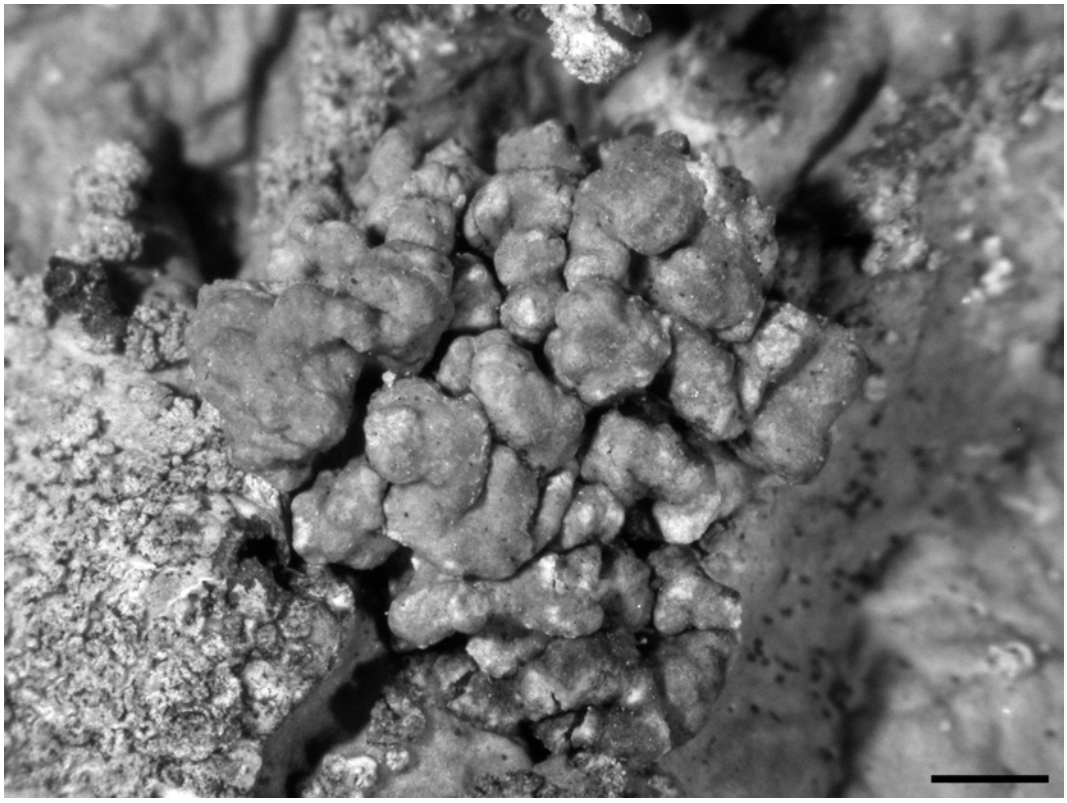

Fig. 9. *Tremella* sp. 7 on *Flavoparmelia caperata* (*Reed 143781A*). Scale bar = 1 mm.

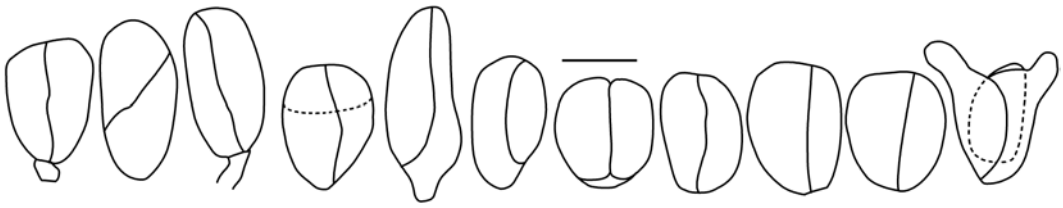

Fig. 10. *Tremella* sp. 7 on *Flavoparmelia caperata*, basidia (*Reed 143781A*). Scale bar = 10 µm.

Specimens Examined. – USA. North Carolina. Ashe Co.: Blue Ridge Parkway, mile 261 just N of Rte 16, Horse Gap, on *Flavoparmelia caperata*, 1982, *C.F. Reed 143781A* (NY!, HB. DIEDERICH!). Jackson Co.: Nantahala National Forest, S slope of Piney Ridge Knob, along Forest Service road extension of Moses Creek Road, 11.2 mi ENE of Moses Creek Missionary Baptist Church, 35°21'N, 83°06'W, 1325 m, on *F. caperata*, 1998, *W.R. Buck 34936* (NY!, HB. DIEDERICH!).

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