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Type studies of corticioid Hymenomycetes described by Bresadola

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Abstract – Twenty-six type specimens of corticioid basidiomycetes in the genera *Corticium, Cytidia, Grandinia, Hydnum, Kneiffia, Merulius, Odontia, Peniophora* and *Radulum* described by Bresadola, alone or with others, were examined. The new taxon, *Phlebia cryptocystidiata*, is described and illustrated, and an epitype for *Hydnum flavicans* is designated. Ten new combinations are proposed: *Cristinia eichleri, Dendrothele crustulina, Hyphoderma crustulinum, Hyphodermella rosae, Kneiffiella stereicola, Odonticium flavicans, Phanerochaete queletii, Resupinatus stictoideus, Scytinostroma quintasianum*, and *Thujacorticium zurhausenii.* The following thirteen taxa were found to be synonyms: *Corticium aureolum* (= *Cerocorticium molle*), *Corticium leprosum* (= *Ramaricium polyporoideum*), *Corticium lloydii* (= *Phanerochaete burtii*), *Corticium luteum* (= *Gloeocystidiellum luridum*), *Cytidia wettsteinii* (= *R. stictoideus*) *Grandinia bondarzewii* (= *Intextomyces contiguus*), *Grandinia schweinitzii* (= *Radulomyces cremoricolor*), *Kneiffia frangulae* (= *Cylindrobasidium evolvens*), *Odontia brassicicola* (= *Sistotrema brinkmannii*), *Odontia cremorina* (= *Hyphodontia bugellensis*), *Odontia pannosa* (= *Hyphodermella corrugata*), *Odontia torrendii* (= *Dentipellis leptodon*), and *Peniophora subcremea* (= *Hypochnicium cremicolor*). Four taxa could not be identified to species: *Hydnum ochroleucum* (= *Mycorrhaphium sp.*), *Merulius fuscescens*, *Merulius tessellatus* (Sclerodermatineae or Paxillineae), and *Odontia lilacina* (= *Grammothele sp*).

Corticium crustulinum / Corticium queletii / Corticium quintasianum / Corticium zurhausenii / Cyphella stictoidea / Hyphodontia orasinusensis / Odontia rosae / Odontia stereicola / Odonticium monfraguense / Phanerochaete jose-ferreirae / Radulum crustulinum / Radulum eichleri / Thujacorticium mirabile

Résumé – Vingt-six spécimens types de basidiomycetes corticioid dans les genres *Corticium, Cytidia, Grandinia, Hydnum, Kneiffia, Merulius, Odontia, Peniophora et Radulum* décrits par Bresadola, seul ou comme co-auteur, ont été examinés. Le nouveau taxon, *Phlebia cryptocystidiata*, est décrit et illustré, et un epitype pour *Hydnum flavicans* est indiqué. On propose dix nouvelles combinaisons. *Cristinia eichleri, Dendrothele crustulina, Hyphoderma crustulinum, Hyphodermella rosae, Kneiffiella stereicola, Odonticium flavicans, Phanerochaete queletii, Resupinatus stictoideus, Scytinostroma quintasianum*, et *Thujacorticium zurhausenii.* Les treize taxa suivants se sont avérés des synonymes : *Corticium aureolum* (= *Cerocorticium molle*), *Corticium leprosum* (= *Ramaricium polyporoideum*), *Corticium lloydii* (= *Phanerochaete burtii*), *Corticium luteum* (= *Gloeocystidiellum luridum*), *Cytidia wettsteinii* (= *R. stictoideus*) *Grandinia bondarzewii* (= *Intextomyces contiguus*), *Grandinia schweinitzii* (= *Radulomyces cremoricolor*), *Kneiffia frangulae* (= *Cylindrobasidium evolvens*), *Odontia brassicicola* (= *Sistotrema brinkmannii*), *Odontia cremorina* (= *Hyphodontia bugellensis*), *Odontia pannosa* (= *Hyphodermella corrugata*), *Odontia torrendii* (= *Dentipellis leptodon*), et *Peniophora subcremea* (= *Hypochnicium cremicolor*). Quatre taxa n'ont pas pu être

identifiés au niveau spécifique : *Hydnum ochroleucum* (= *Mycorrhaphium sp.*), *Merulius fuscescens*, *Merulius tessellatus* (Sclerodermatineae ou Paxillineae), et *Odontia lilacina* (= *Grammothele sp*).

Corticium crustulinum / Corticium queletii / Corticium quintasianum / Corticium zurhausenii / Cyphella stictoidea / Hyphodontia orasinusensis / Odontia rosae / Odontia stereicola / Odonticium monfraguense / Phanerochaete jose-ferreirae / Radulum crustulinum / Radulum eichleri / Thujacorticium mirabile

INTRODUCTION

Giacomo Bresadola (1847-1929) was an Italian clergyman and a prolific and influential mycologist based in Trento, Italy. He described many resupinate, wood-decay, corticoid basidiomycetes that are still recognized today. A few corticoid species, however, have escaped modern taxonomic review. In this study, type specimens of 25 species of *Corticium, Cytidia, Grandinia, Hydnum, Kneiffia, Merulius, Odontia, Peniophora* and *Radulum* described by Bresadola alone and a species of *Corticium* described together with C. Roumeguère were examined.

MATERIALS AND METHODS

The bulk of Bresadola's type specimens are housed in Stockholm (S), Beltsville (BPI), and Trento (TR). Bresadola received specimens from many individuals, and an effort was made to locate and examine the original specimens. Specimens denoted as holotype and isotype were carefully considered. Typically, the holotype is easily recognized for it was often the largest specimen with the complete protologue written on the packet in Bresadola's hand. Often, critical information such as location, date, and collector were also found on the holotype packet but missing on the isotype. Types of the following taxa could not be located: *Corticium flavissimum* Bres. in Bourdot & Galzin, *Corticium gilvidum* Bres., and *Kneiffia avellanea* Bres.

Thin, freehand sections from basidiomes were mounted in aqueous potassium hydroxide (2% weight/volume) and aqueous phloxine (1% w/v) and Melzer's reagent (Kirk *et al.*, 2001) and examined under an Olympus BH2 compound microscope. Cyanophily of basidiospore and hyphal walls were observed in a solution of cotton blue (0.1% w/v in 60% lactic acid). Drawings were made with a camera lucida attachment. Q values were obtained from dividing average basidiospore length by width (Kirk *et al.*, 2001). Q values are approximate since the basidiospore sample size is small, usually less than 20 spores. Because of the condition and precious nature of the type specimens, it was often not possible to measure 30 or more spores. Color names are from Kornerup and Wanscher (1978) or, if capitalized, from Ridgway (1912). Herbarium designations follow that of Holmgren *et al.* (1990). CortBase (Parmasto *et al.*, 2004) and the Aphyllophorales database at CBS (www.cbs.knaw.nl/databases/index.htm) were consulted frequently throughout this study.

Literature citations follow Stafleu & Cowan (1976-1988) for books and Bridson (2004) for journals with one exception. During this study, a problem arose with the proper citation of species described in the 1926 paper published in Studi Trentini. After some investigation, I am inclined to follow Zambotto (2003) who summarized the publication history of the periodical Studi Trentini from 1926 to 2003. Accordingly, the correct citation for Bresadola's 1926 publication "Selecta Mycologica II" is Studi Trentini, Classe II, Scienze Naturali Economiche, volume 7, issue 1, pages 51-81.

DESCRIPTION OF SPECIES

***Corticium aureolum* Bres.**, Ann. Mycol. 9: 272. 1911.

= *Cerocorticium molle* (Berk. & M.A. Curtis) Jülich

Type specimens: Congo, (Kisantu), ad corticem, Vanderyst (holotype: S F10839; isotype: S F74166).

Basidiome fragmented into several small pieces, easily detached from substrate, effuse, up to 650 µm thick, smooth, ceraceous, light orange (5A4, 6A5) to brownish orange (6C7), context white to cream-colored, felty; margin not observed. *Hyphal system* monomitic with nodose-septate generative hyphae. Subiculum up to 350 µm thick, a moderately dense tissue of distinct, not agglutinated hyphae; subicular hyphae 2-5.5 µm diam, nodose septate, moderately branched, contents cyanophilous, walls thin to slightly thickened, hyaline, smooth, acyanophilous. Subhymenium up to 70 µm thick, a dense tissue of vertically arranged, agglutinated hyphae; subhymenial hyphae 4-5.5 µm diam, clamped, frequently branched, walls thin, hyaline, smooth, agglutinated. Hymenium a dense palisade of hyphidia, mature and developing basidia. Hyphidia rare, cylindrical with slight constrictions, tapering slightly at apex, 45 × 4 µm, clamped at base, walls thin, hyaline, smooth. Basidia clavate, length unknown, 9-11 µm wide, 4-sterigmate, sterigmata up to 10 × 2 µm. Basidiospores cylindrical, (13-)14-16 × 5-6 µm, Q = 2.7, contents cyanophilous, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

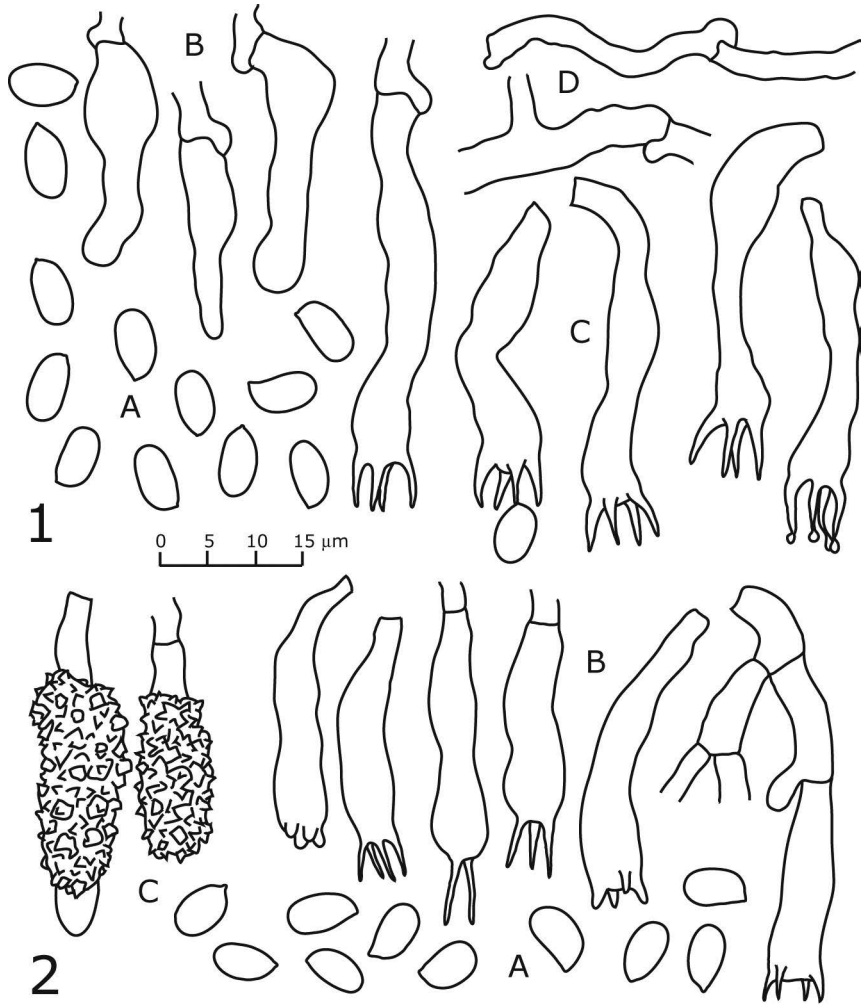
Although hyphidia are rare, *C. aureolum* is conspecific with *C. molle*, a pantropical species. Entire basidia were not observed because of the agglutinated hymenium, but in the protologue their size is reported as 50-55 × 8-10 µm.

***Corticium crustulinum* Bres.**, Ann. Mycol. 18: 47. 1920, non Burt 1926. Fig. 1

≡ *Dendrothele crustulina* (Bres.) Nakasone, *comb. nov.*

Holotype: Portugal, S. Fiel, ad ramos Quercus, Torrend 448 (S F10939).

Basidiome in several pieces, largest pieces 9 × 7 and 6 × 6 mm, up to 300 µm thick, smooth to slightly uneven, ceraceous to brittle, with numerous and deep cracks, brown (7E4) to dark brown (6F6) overlaid with a thin, grayish brown pruinose layer; margin not observed. *Hyphal system* monomitic with nodose-septate generative hyphae. Subiculum an agglutinated tissue of compact, indistinct hyphae with abundant, embedded coarse hyaline crystals, sometimes crystals in clusters up to 20 µm diam; subicular hyphae 2-6 µm diam, nodose septate, moderately branched, walls thin, hyaline, smooth. Subhymenium not observed. Hymenium a dense palisade of immature and some mature basidia. Basidia clavate or occasionally obclavate, often constricted, 28-40 × 6-7 µm, tapering to



Figs 1-2. Camera lucida drawings of microscopic elements from basidiomes. **1.** *Corticium crustulinum* (Torrend 448, holotype), **A.** basidiospores; **B.** immature basidia; **C.** mature basidia; **D.** subicular hyphae. **2.** *Phanerochaete cryptocystidiata* (S F11283, holotype), **A.** basidiospores; **B.** basidia; **C.** cystidia.

2.5-4.5 µm diam at base, with a basal clamp connection, walls thin, hyaline, smooth, 4-sterigmate, sterigmata 5-6 µm long. Basidiospores broadly cylindrical, 6.5-8 × 3.5-4.3 µm, Q = 1.8, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Corticium crustulinum is difficult to classify. Although lacking dendrohyphidia, the transfer to *Dendrothele* is proposed because of the basidia size and shape. The newly described *D. minima* Duhem from France and Switzerland also lacks dendrohyphidia but has slightly larger basidiospores, 7.6-8.5 × 4.8-5.3 µm, Q = 1.6-1.7 (Duhem & Michel, 2007). Hjortstam (1987), however, considered *C. crustulinum* to be a species of *Phlebia*.

***Corticium leprosum* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 61. 1926.

= ***Ramaricium polyporoideum* (Berk. & M.A. Curtis) Ginns**

Type specimens: (United States), Ohio, Cincinnati, 1899, C.G. Lloyd 4525 (holotype: BPI US0282000; isotype: TR B/4287).

Basidiome effuse, small colonies coalescing, up to 6 × 5 cm, soft, fragile, smooth, greyish orange [5B(3-4)], with numerous hyphal strands; margin abrupt, irregular, with pale orange white (5A2) strands. Hyphal system monomitic with nodose-septate generative hyphae. Subicular hyphae 2-3 µm diam, nodose septate, occasionally branched, even, straight, walls thin to slightly thickened, hyaline, smooth or with tiny spines. Hymenium a dense palisade of immature and mature basidia. Basidia clavate, up to 60 × 9 µm, with a basal clamp connection, collapsing after maturity, walls thin, hyaline, smooth, 4-sterigmate. Basidiospores abundant, ellipsoid, 7-8 × 4-5.8 µm, Q = 1.50, walls slightly thickened, hyaline to pale yellow, finely warted, with cyanophilous walls and warts, not reacting in Melzer's reagent.

Corticium leprosum is conspecific with *Ramaricium polyporoideum.* The holotype and isotype agree with the protologue in all respects except for the basidiospore size which is given as 4.5 × 3-3.5 µm.

***Corticium lloydii* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 61. 1926, non Bourdot & Galzin 1928.

= ***Phanerochaete burtii* (Romell) Parmasto**

Type specimens: (United States), Ohio, C.G. Lloyd 3823 (holotype: BPI US0282147; isotypes: TR B/4289, B/3697).

Basidiome resupinate, effuse, 85 × 15 mm, up to 430 µm thick, smooth, subceraceous to membranous, light orange (5A4) to greyish orange (5B4), extensively cracked to reveal white context; margin with loosely attached hyphal strands up to 20 mm long, occasionally branched, pale orange to light orange [5A(3-5)]. *Hyphal system* monomitic with simple-septate generative hyphae and rare clamp connections. Subicular hyphae 3.5-7.5 µm diam, simple septate with rare, single or multiple clamp connections, occasionally to moderately branched, walls thin to slightly thickened, hyaline, sometimes encrusted with a thin layer of small, hyaline crystals. Subhymenium up to 40 µm thick, composed of vertically arranged hyphae in a moderately dense tissue; subhymenial hyphae 2.5-7 µm diam, frequently branched, short-celled, walls thin, hyaline, smooth. Hymenium a dense palisade of cystidia and basidia. Cystidia rare, extending up to 15 µm beyond hymenium, subulate, 42-48 × 4 µm, tapering to 2-3 µm diam at base, simple septate at base, walls thin, hyaline, smooth. Basidia cylindrical to narrowly clavate, 25-28 × 4-4.5 µm, simple septate at base, walls thin, hyaline, smooth, 4-sterigmate. Basidiospores cylindrical 4.3-5.1 × 2.0-2.5 µm, Q = 2.3, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Corticium lloydii is conspecific with *Phanerochaete burtii.* Interestingly, the type of *C. lloydii* and *Peniophora burtii* Romell in Burt is the same specimen, Lloyd 3823. Both taxa were introduced in 1926; *P. burtii* was published on February 18 (Burt, 1926) and *C. lloydii* on May 1.

***Corticium luteum* Bres.**, Fung. trident. 2 (11/13): 58. 1898.

≡ *Gloeocystidium luteum* (Bres.) Höhn. & Litsch., Sitzungsber. Kaiserl. Akad. Wiss., Wien, Math.-Naturwiss. Cl., Abt. 1, 117: 1085. 1908.

= ***Gloeocystidiellum luridum* (Bres.) Boidin**

Lectotype, designated here: Italy, Firenze, sur lecci (on corticate branch), Viale del Poggio Imperiale, Febbraio 1892, U. Martelli (FI).

Basidiome resupinate, effuse, thin, ceraceous, smooth, greyish orange (5B4) to brownish orange (5C4), thinning out toward margin. *Hyphal system* monomitic with nodose-septate generative hyphae. Subicular and subhymenial hyphae 2-3 µm diam, clamped, walls thin, hyaline, smooth. Hymenium a dense palisade of gloeocystidia and basidia. Gloeocystidia numerous, fragile, cylindrical to clavate, 35 × 11 µm, tapering to 4 µm diam at base, clamped at base, filled with granular or solid, yellowish material, walls thin, hyaline, smooth. Basidia clavate to obclavate, 32 × 5 µm, tapering to 2-3 µm diam at base, clamped at base, 4-sterigmate. Basidiospores cylindrical to ellipsoid, 10-11 × (4.3-)5-6 µm, Q = 2, walls thin, hyaline, smooth, acyanophilous, amyloid.

Corticium luteum is conspecific with *G. luridum* as first recognized by Höhnel and Litschauer (1908). The lectotype appears to be a young, developing basidiome for the basidia and gloeocystidia observed were shorter than typical for *G. luridum*. Although gloeocystidia were not mentioned in the protologue, they are numerous in the hymenium.

In the protologue, Bresadola referred to two specimens – one from Germany on *Euonymus* collected by P.H. Magnus and the other from Italy collected by U. Martelli. The Italian specimen is at FI and has basidia and basidiospores similar to that given in the protologue. Thus, the Italian specimen is designated the lectotype of *C. luteum*. The German specimens at S and FH have simple-septate hyphae and basidiospores, (6-)6.5-7.5(-8) × (3.2-)3.9-4.2 µm, that are significantly smaller than reported in the protologue, 9-12 × 4.5-6.5 µm. The illustration of basidia referenced in the protologue lack clamp connections, thus, may be that of the German specimens. The German specimens represent an undescribed taxon and are designated the types of the new species described below.

The specimen examined by Höhnel and Litschauer (1908) may have been a mixed collection for they described small basidiospores, 6-8 × 3-3.5 µm, as found in the German specimens, but gloeocystidia and clamp connections that are present in the Italian specimen.

Phanerochaete cryptocystidiata* Nakasone, *sp. nov. Fig. 2

Basidioma resupinatum, membranaceum vel subceraceum, laeve, aurantiacum vel cinereo-aurantiacum, verrucis sparsis humilibus irregularibus. Systema hyphale monomiticum, hyphis efibulatis. Cystidia inclusa cylindrica, 22-36 × 7-8 µm, crystallis hyalinis. Basidia clavata vel cylindrica, 21-36 × 5-6 µm, (2-)4- sterigmatibus. Basidiosporae ellipsoideae, (6-)6.5-7.5(-8) × (3.2-)3.9-4.2 µm, Q = 1.7, parietibus tenuibus, hyalinis, laevibus, acyanophilis, inamyloideis. Type specimens: (Germany), Berlin, ad ramos Euonymi japonica (corticate), leg Magnus, as *Corticium luteum* (holotype: S F11283; isotype: FH). No date is given on the holotype packet, but the year 1893 is written on the isotype packet.

Basidiome resupinate, effuse, adnate, beginning as small circular colonies, then confluent, up to 11 × 8 mm, mostly broken into smaller pieces, 200-450 µm thick, membranaceous to subceraceous, smooth with scattered, low, irregular warts, at first orange white (5A2) or pale orange (5A3), then greyish orange [5B(4-5)], developing scattered, deep cracks; margin thinning out, adnate, fibrillose. *Hyphal system* monomitic with simple-septate generative hyphae. Subiculum a moderately dense tissue arranged more or less parallel to substrate, not agglutinated, with abundant, embedded, coarse, hyaline crystals; subicular hyphae 3.5-6 µm diam, simple septate, moderately branched, walls thin, hyaline, smooth, occasional segments heavily encrusted. Subhymenium up to 20 µm thick,

hyphae arranged vertically, not agglutinated; subhymenial hyphae 2.5-4.5 µm diam, simple septate, short-celled, frequently branched, walls thin, hyaline, smooth. Hymenium composed of cystidia and basidia. Cystidia scattered, embedded, cylindrical, 22-36 × 7-8 µm, simple septate at base, walls thin, hyaline, heavily encrusted with fused hyaline crystals that readily break apart in squash mounts. Basidia clavate to cylindrical, occasionally constricted, 21-36 × 5-6 µm, simple septate at base, walls thin, hyaline, smooth, (2-)4-sterigmate, sterigmata up to 6 µm long. Basidiospores ellipsoid, (6-)6.5-7.5(-8) _ (3.2-)3.9-4.2 µm, Q = 1.7, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Phanerochaete cryptocystidiata is characterized by thin-walled, simple-septate hyphae, enclosed, heavily encrusted, thin-walled cystidia, and ellipsoid basidiospores. The cystidia are easily overlooked because they are embedded and break-up easily in squash mounts. The sterigmata of mature basidia are noticeably long. Except for its clamped hyphae, *Hyphoderma rimulosum* S.H. Wu is somewhat similar to *P. cryptocystidiata* microscopically whereas *Phanerochaete incrustans* (Speg.) Rajchenberg & Wright has emergent, thick-walled cystidia and smaller basidiospores (6-6.5 × 3-4 µm).

***Corticium queletii* Bres.**, Nuovo Giorn. Bot. Ital., n.s., 8(2): 170. 1901. Fig. 3

≡ ***Phanerochaete queletii* (Bres.) Nakasone, *comb. nov.***

Type specimens: Italy, Vallombrosa, ad ramos corticatis Abietis pectinata, Novembre 1899, Martelli (holotype: BPI US0282568; isotypes: FI 4881, S F11364).

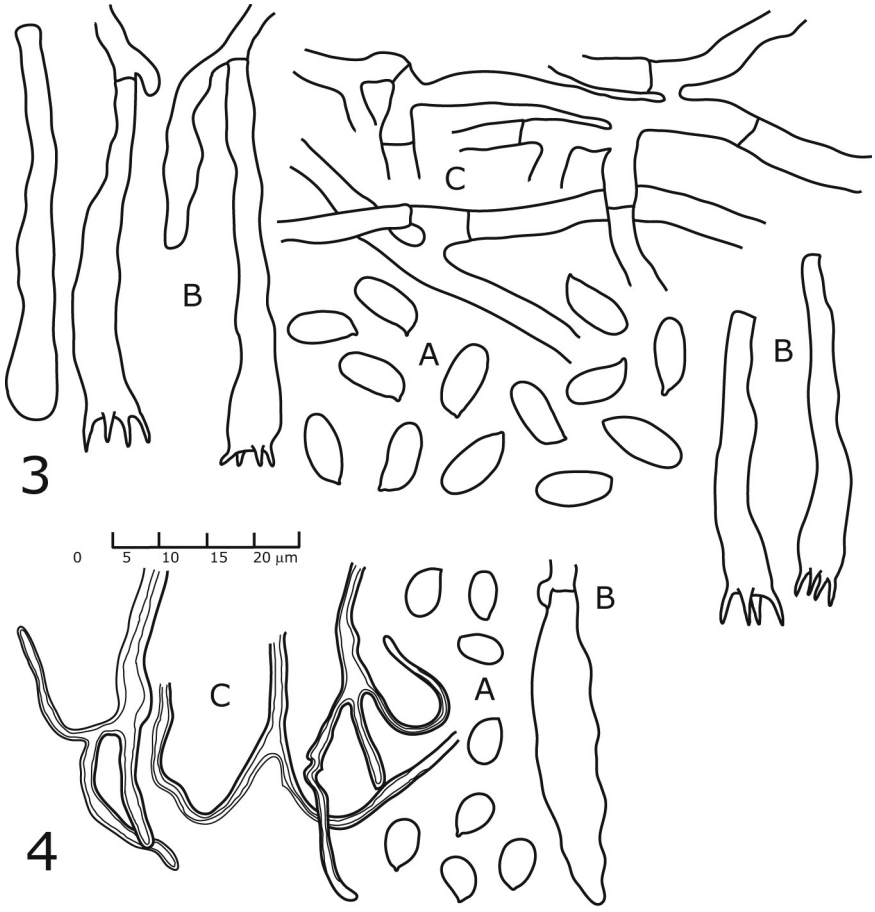
Basidiomes effuse, adnate, colonies orbicular then coalescing, up to 50 × 18 mm (holotype), 250-500 µm thick, subceraceous to membranous, smooth with scattered, irregular tubercules, yellowish white (4A2), pale orange (5A3), light orange (5A4), or greyish orange [5B(4-5)], tubercules brownish orange (6C6), with scattered or numerous, short, deep, scattered cracks exposing a fibrous, white context; margin abrupt, distinct, adnate at first, then partially detached, at edges thin, fibrillose, orange white (5A2). *Hyphal system* monomitic with simple-septate generative hyphae. Subiculum often obscured by large, coarse, hyaline crystals, up to 350 µm thick, hyphae forming a dense layer parallel to substrate, partially agglutinated, sometimes collapsed; subicular hyphae 2-6 µm diam, simple septate, often branched at right angles and forming H-connections, walls thin, hyaline, smooth. Subhymenium up to 90 µm thick, a dense, partially agglutinated tissue of vertically arranged hyphae; subhymenial hyphae 3-5 µm, simple septate, short-celled, frequently branched, walls thin, hyaline, smooth. Hymenium a dense palisade of basidia. Cystidia none. Basidia clavate, slender, (26-)35-45 × 4-6 µm, tapering to 2-2.5 µm diam at base, simple septate at base, 4-sterigmate, walls thin, hyaline, smooth; apex and sterigmata collapsed after spore discharge. Basidiospores cylindrical, sometimes slightly pinched or tapered toward apiculus, (7-)8-9 × 3-4 µm, Q = 2.2-2.5, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Habitat. On wood and bark of gymnospermous and angiospermous twigs.

Distribution. Italy, France, Switzerland, Austria.

Additional specimens examined. (Switzerland), Courchavon, sapin, 31 Mai 1882, Quélet (S F58853); Jura, ad corticem Abietis pectinatae, no date, Quélet (FH Herb. Burt sheet 523). Austria, Steiermark Grazer Bergland, N Graz, 14 Mar 1981, W. Maurer and J. Riedl, as *Phanerochaete jose-ferreirae* (TAA 98677).

Phanerochaete queletii is characterized by moderately thick, orbicular, rimose basidiomes with distinct, slightly detached margins, simple-septate hyphae, slender clavate basidia, and cylindrical basidiospores. The description above is



Figs 3-4. Camera lucida drawings of microscopic elements from basidiomes. **3.** *Corticium queletii* (US0282568, holotype), **A.** basidiospores; **B.** basidia; **C.** subicular hyphae. **4.** *Corticium quintasianum* (Quintas 24, holotype), **A.** basidiospores; **B.** gloeocystidium; **C.** skeletal hyphae.

based on all four specimens examined. The Austrian specimen (TAA 98677) is unusual for its paler basidiome color and rare, slightly differentiated hyphidia found in the hymenium; its basidia and basidiospores, however, are typical for *P. queletii*. *Phanerochaete queletii* is most similar to *Phanerochaete cremeo-ochracea* (Bourdot & Galzin) Parm. and *P. jose-ferreirae* (Reid) Reid. *Phanerochaete jose-ferreirae* has darker colored basidiomes, an agglutinated subiculum, and narrowly cylindrical basidiospores, (7-)8-10 × (2.5-)3-3.6 µm, Q = 2.5-2.7. In contrast, *P. cremeo-ochracea* often has finely encrusted subicular hyphae as well as shorter basidia, 22-36 × 3-5.8 µm, and basidiospores, 5-6 (-6.5) × 2.3-3 (-3.2) µm, Q = 1.9-2.3. Burt (1931) erroneously placed *C. queletii* in synonymy with *Corticium hydnans* (Schwein.) Burt (= *Basidioradulum radula* (Fr.: Fr.) Nobles).

The specimen from BPI is the holotype because it was examined by Bresadola and the information on the packet, written in his hand, agrees completely with the protologue. The isotype at FI, from Martelli's herbarium, is

the largest and most well-developed specimen, whereas the isotype at S, F11364, is the smallest, only 9 × 9 mm. The isotype at S has Quélet's name on the packet although it is clearly a part of the holotype that was collected by Martelli.

Besides the two collections of *C. queletii* cited above from the Stockholm herbarium, I examined five additional collections. Specimens F53855, F 53856 and F 53858 appear to be from the same gathering and were collected by P. Strasser on pear on 5 Feb 1901; however, only F53855 has basidiospores. These specimens are conspecific with *P. jose-ferreirae*. The fourth specimen, F53587 from Poland on *Salix* and collected by Eichler, is probably the collection cited by Bresadola (1903); it lacks basidiospores but may be conspecific with *P. jose-ferreirae* also. The fifth specimen, F53854 collected by Bataille from France, has nodose-septate hyphae and is similar to *Phlebia nitidula* (P. Karst.) Ryvarden.

***Corticium quintasianum* Bres. & Roum.**, Rev. Mycol. (Toulouse) 12(45): 36. 1890. Fig. 4

≡ *Stereum quintasianum* (Bres. & Roum.) Höhn. & Litsch., Sitzungsber. Kaiserl. Akad. Wiss., Wien, Math.-Naturwiss. Cl., Abt. 1, 116: 746. 1907.

≡ ***Scytinostroma quintasianum* (Bres. & Roum.) Nakasone, *comb. nov.***

= *Scytinostroma africanogalactinum* Boidin, Lanquetin, & Gilles, Biblioth. Mycol. 114: 55. 1987.

Type specimens: (Säo Tomé), Ins. St. Thomae Afric. Occid., Quintas 24 (holotype: S F15024; isotype: S F74185).

Basidiome resupinate, widely effuse, up to 2 mm thick, tough, coriaceous, smooth with scattered, rounded tubercules, stratose with up to three layers, yellowish white (4A2), pale yellow (4A3), or greyish orange (between (5B[3-4]); cracks absent; context concolorous with hymenophore; margin abrupt, thinning out. *Hyphal system* dimitic with nodose-septate generative and nonseptate skeletal hyphae. Subiculum composed primarily of densely intertwined skeletal hyphae; subicular hyphae difficult to observe, 2.5-5 µm diam clamped, walls thin, hyaline, smooth; skeletal hyphae 1-3 µm diam, nonseptate, moderately branched, walls thickened, hyaline, smooth, acyanophilous, in hymenium only becoming dextrinoid. Gloeocystidia difficult to isolate, broadly fusiform, 35 × 6 µm, clamped at base, walls thin, hyaline, smooth. Basidia rare, clavate, 40 × 5 µm, clamped at base, 4-sterigmate. Basidiospores broadly ellipsoid, (3.8-)4.5-5(-5.7) × 2.9-3.5 (-4) µm, Q = 1.5, often agglutinated in groups of four, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Specimens examined (as *Scytinostroma africanogalactinum*). Gabon, Makokou, sur *Plagiostyles africana* Prain ex DeWild., 20 Mai 1976, J. Boidin, LY 7908 (holotype of *S. africanogalactinum*: LY). Ivory Coast, Abidjan, forêt du Banco, sur souche en forêt ombrophile, 22 Jun 1974, G. Gilles 234, LY 7363 (LY); 17 Dec 1972, G. Gilles 166, LY 7083 (LY).

This species is characterized by a thick, cream-colored, coriaceous basidiome, dimitic hyphal system with clamped generative hyphae, gloeocystidia, and small, ellipsoid basidiospores. Hymenial elements and generative hyphae are difficult to observe because of the dense network of skeletal hyphae. *Scytinostroma africanogalactinum* is conspecific with *C. quintasianum* for morphologically they are similar and hail from the same general area of West Africa. However, the basidiospores are slightly larger in *C. quintasianum* (average size of 23 spores, 4.93 ± 0.40 × 3.29 ± 0.36 µm) and completely inamyloid whereas those of *S. africanogalactinum* are slightly shorter (4.3 ± 0.37 × 3.25 ± 0.26 µm) and often possess a small, adaxial amyloid patch (Boidin & Lanquetin, 1987).

***Corticium zurhausenii* Bres.** in Rick, Oesterr. Bot. Z. 48: 136. 1898. Fig. 5

≡ ***Thujacorticium zurhausenii* (Bres.) Nakasone, *comb. nov.***

= *Thujacorticium mirabile* Ginns, Mycologia 80(1): 69. 1988.

Holotype: (Austria), Saminathal pr., Feldkirch, ad truncos mucidos Fagi, Jan. 1898, leg. Rick (S F14602).

Basidiome broken into many small pieces, effuse, adnate, pulvinate, soft to subceraceous, up to 2 mm thick, orange white (5A2) to pale orange (5A3), finely stratose, hymenophore smooth with scattered tubercules and deep cracks; context pale cream-colored, dense, somewhat soft but brittle; margin abrupt, distinct, adnate. *Hyphal system* monomitic with nodose-septate generative hyphae. Subiculum thick, lacunose, composed of collapsed, agglutinated hyphae; subicular hyphae 2.5-5 µm diam, inflating up to 12 µm diam especially at branch nodes, clamped, walls thin, hyaline, smooth. Subhymenium up to 40 µm thick, composed of indistinct, collapsed, agglutinated hyphae; subhymenial hyphae 2.5-3.5 µm, often inflated up to 10 µm diam, clamped, short-celled, frequently branched, walls thin, hyaline, smooth. Hymenium a dense palisade composed of cystidioles and basidia with large, embedded hyaline crystals. Cystidioles rare, cylindrical to narrowly clavate or subulate, often tapered toward apex, 20-42 × 4-6 µm, clamped at base, walls thin, hyaline, smooth. Basidia clavate, sometimes constricted, often stalked, 27-30 × 5-8 µm, clamped at base, walls thin, hyaline, smooth, 2-3(-4)-sterigmate. Basidiospores broadly cylindrical, 7-8(-9) × 3-4 µm, Q = 2.2, walls thin to slightly thickened, hyaline, smooth, faintly cyanophilous, not reacting in Melzer's reagent.

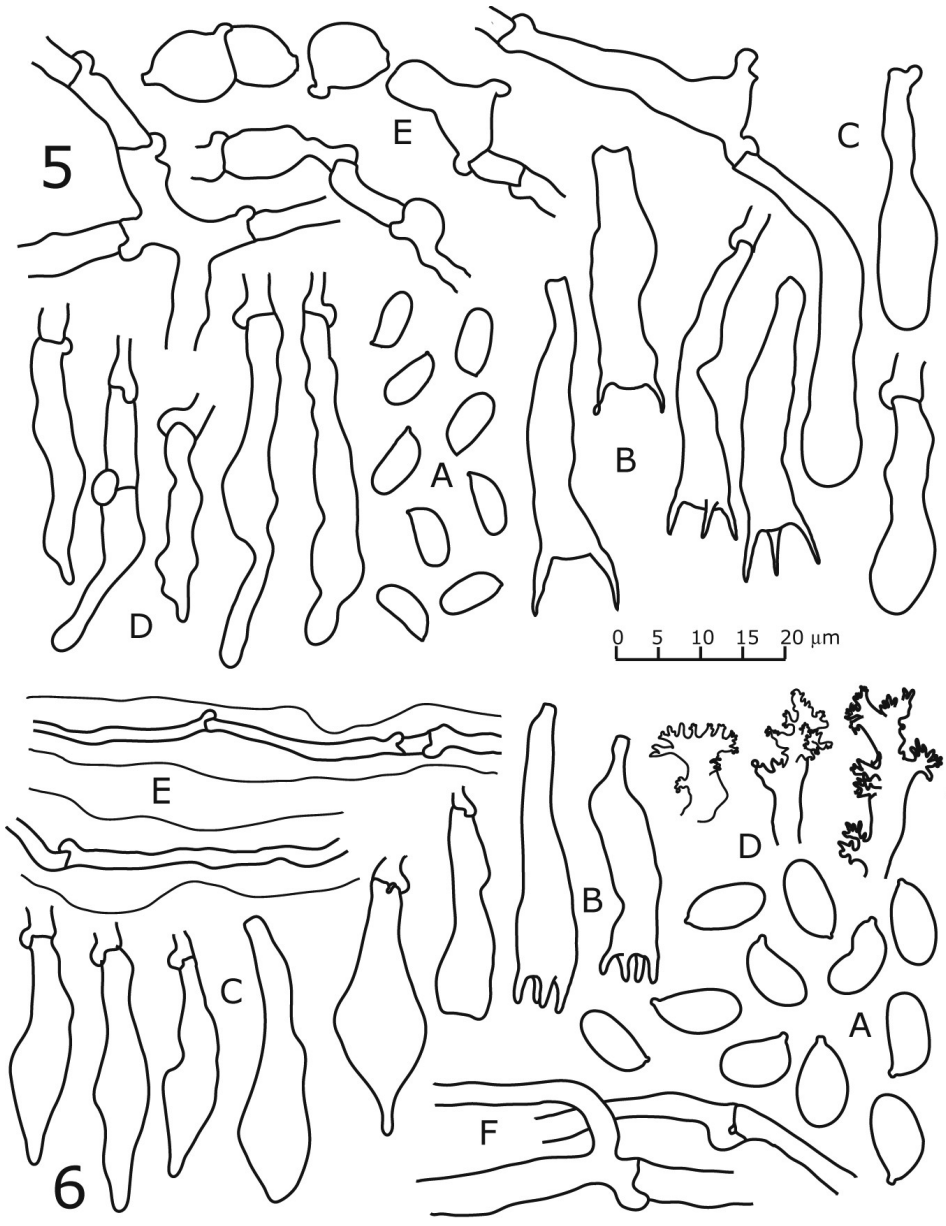
Habitat. On wood of *Abies, Taxus, Thuja*, and *Fagus*.

Distribution. Canada (British Columbia), Austria, Switzerland.

Additional specimens examined. Austria, Tirol, Mutterer-Alpe bei Innsbruch, auf morschem Coniferenholz (Abietis excelsae), 27 Aug 1922, V. Litschauer, as *C. zurhausenii* (S F53851, FH); Feldkirch, ad truncos Fagi silv., Jan 1898, Zurhausen, as *C. zurhausenii* (S F14603, FH); Feldkirch, ad ligna mucidos Fagi, Dec 1899, J. Rick, as *C. zurhausenii* (BPI US0283367). Canada, British Columbia, Vancouver Island, Little Qualicum Falls Provincial Park, on (decorticate) old log of conifer, 11 Sep 1967, J. Ginns, B. and J. Eriksson 7918 (DAOM 143342, isotype of *T. mirabile*); Franklin River, on *Thuja plicata* Donn ex D. Don, 8 Jul 1946, P.J. Salisbury, as *T. mirabile* (DAOM 17018). Queen Charlotte Islands, Skidegate, on *T. plicata*, 22 Aug 1944, R.E. Foster, as *T. mirabile*, (DAOM 16186) and R.E. Foster and P.J. Salisbury (DAOM 180962). Switzerland, Neuchâtel, ad truncos *Taxi baccatae* L., S. Mortier, as *C. zurhausenii* (S F53850).

Corticium zurhausenii is conspecific with *Thujacorticium mirabile*; therefore, the transfer to *Thujacorticium* is proposed. The rather thick, finely stratose basidiomes, stalked basidia, and broadly cylindrical, nonamyloid basidiospores combine to distinguish this species. Cystidioles and inflated subicular and subhymenial hyphae are described for the first time. Interestingly, basidia in the European collections often have 2 or 3 sterigmata whereas those from Canada are primarily 4-sterigmate. Consult Ginns (1988) and Dämon (2000) for additional descriptions and illustrations.

The description above is based solely on the holotype specimen of *C. zurhausenii* which has on its label all the information given in the protologue. The basidiospores were sometimes faintly cyanophilous and slightly smaller than described in the protologue of *C. zurhausenii* (8-10 × 4-5 µm) but similar to that reported for *T. mirabile* (Ginns 1988). Mature basidia and basidiospores were scarce in most specimens of *C. zurhausenii* examined. The basidiospores ranged from 6.5-9.5 × 3.3-5 µm, Q = 1.9-2.0.



Figs 5-6. Camera lucida drawings of microscopic elements from basidiomes. **5.** *Corticium zurhausenii* (S F14602, holotype), A. basidiospores; B. basidia; C, immature basidia; **D.** cystidioles; **E.** regular and inflated subhymenial hyphae. **6.** *Cytidia wettsteinii* (S F14701, holotype), **A.** basidiospores; **B.** basidia; **C.** cystidia; **D.** coralloid-diverticulate hyphae from pileipellis; **E.** subicular hyphae with gelatinized walls; **F.** subicular hyphae after hydration.

***Cytidia wettsteinii* Bres.** in Höhnel, Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl. 83: 6. 1907. Fig. 6

≡ *Corticium wettsteinii* (Bres.) Sacc. & Trotter, Syll.. fung. 21: 400. 1912.
= *Cyphella stictoidea* Speg., Anales Soc. Ci. Argent. 17: 80. 1884.
≡ ***Resupinatus stictoideus* (Speg.) Nakasone, *comb. nov.***

Type specimens: Brasilia (Prov. São Paulo, prope "Fazenda bella vista" in districtu urbis S. Cruz ad flumen Rio Pardo, ca. 500 m. s. m., VII 1901), in Bambusa, leg. Wettstein & Schiffner 62a, 24 (holotype: S F14701; isotypes: FH 258371, FH 258369).

Basidiome more or less discoid, up to 2 mm diam, often fusing together, up to 10 × 2 mm, brownish orange [5C(4-5)], sessile, shallowly embedded in substrate in small, ovoid areas up to 1.5 × 0.75 mm, up to 150 µm thick, ceraceous to brittle in the dried state, when hydrated becoming firm, ceraceous; hymenial surface smooth; margin entire. *Hyphal system* monomitic with nodose-septate generative hyphae. Pileipellis a thin, sparse, trichoderm of coralloid-diverticulate hyphae with a robust stalk and numerous short, knobby branches. Trama a gelatinous matrix with a sparse network of hyphae; tramal hyphae 2-3.5 µm diam, clamped, sparsely branched, walls 2-5 µm thick, hyaline, gelatinous, acyanophilous. Subhymenium up to 10 µm thick, a dense, agglutinated tissue. Hymenium a dense palisade of cystidia and basidia. Cystidia broadly fusiform 20-30 × 5-9 µm, clamped at base, walls thin, hyaline, smooth. Basidia clavate, 23-30 × 5-6 µm, clamped at base, 4-sterigmate, walls thin, hyaline, smooth. Basidiospores broadly ellipsoid, 7.5-9(-10) × 4-5(-5.5) µm, Q = 1.8, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Additional specimens examined: Brazil, ad Bambusa, J. Rick 210, as *Cyphella stictoidea* (BPI 292988). Paraguay, arroyo Guazu, bambase, 17 Janu 1882, Balansa 3506 (isotype of *Cyphella stictoidea*: NY).

The discoid basidiome, gelatinous trama, trichoderm of coralloid hyphae, fusoid cystidia, and ellipsoid basidiospores are characters that distinguish this species. When hydrated, the individual, gelatinized walls of the tramal hyphae melds into a clear, gelatinized matrix. The above description is based solely on the holotype specimen. The holotype is a small specimen with inwardly curled margins on collapsed basidiomes and is quite different from the protologue description "cupulaeformis vel denum pendulo-campanulata." In addition, the basidiospores observed are significantly smaller than that described in the protologue, 9-11 × 6-8 µm. Reid (1961) described *Calyptella capula* (Holmsk.: Pers.) Quél. from Venezuela which may be *R. stictoidea* instead.

Comparison of type specimens of *C. wettsteinii* and *C. stictoidea* confirms that they are conspecific as proposed by Donk (1959). *Cytidia wettsteinii*, however, is not conspecific with *Cytidia pezizoidea* (Pat.) Pat. as suggested by Cooke (1951). Although the basidiome shape and color is not typical of *Resupinatus* as defined by Thorn *et al*. (2005), the other characters of *C. stictoidea* are similar so the transfer is proposed. The genus *Calyptella* Quél. was also considered because the basidia and basidiospores of some species resemble those of *C. wettsteinii*. However, species of *Calyptella* have stalked basidiomes and lack gelatinized hyphae, thus, arguing against the transfer of *C. wettsteinii* into *Calyptella*.

***Grandinia bondarzewii* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 60. 1926, '*bonderzewii*'.

= ***Intextomyces contiguus* (P. Karst.) J. Erikss. & Ryvarden**

Type specimens: (Russia), pr. Leningrad, ad truncos putrido Betulae, IX 1924, leg. Bondarzew (holotype: TR B/3797; isotype: TR B/3547).

Basidiome resupinate, effuse, ceraceous, smooth with small to large, rounded tubercules, yellowish white, pale yellow or light yellow [4A(2-4)], with small cracks; margin rapidly thinning out. *Hyphal system* monomitic with nodose-septate generative hyphae. Subiculum a dense tissue of agglutinated hyphae and embedded, coarse, hyaline crystals; subicular hyphae 1.8-4.5 µm diam, clamped, fused together, walls thin, hyaline, smooth. Basidia clavate to suburniform often distinctly stalked, 14-24 × 5-6 µm, presumably clamped at base, walls thin, hyaline, smooth, 4-sterigmate, sterigmata up to 7 × 1.2 µm. Basidiospores ellipsoid to ovoid, 5.5-6.5 × 3.5-5 µm, Q = 1.4, walls noticeably thickened, up to 0.5 µm thick, hyaline, smooth, cyanophilous, not reacting in Melzer's reagent.

There is no doubt that *G. bondarzewii* is conspecific with *I. contiguus*, a well-characterized taxon common in north Europe. The two specimens of *G. bondarzewii* in Bresadola's herbarium at TR are in good condition and appear to be from the same gathering. Specimen B/3797 is recognized as the holotype for its packet has the protologue written in Bresadola's hand which is lacking on the isotype packet.

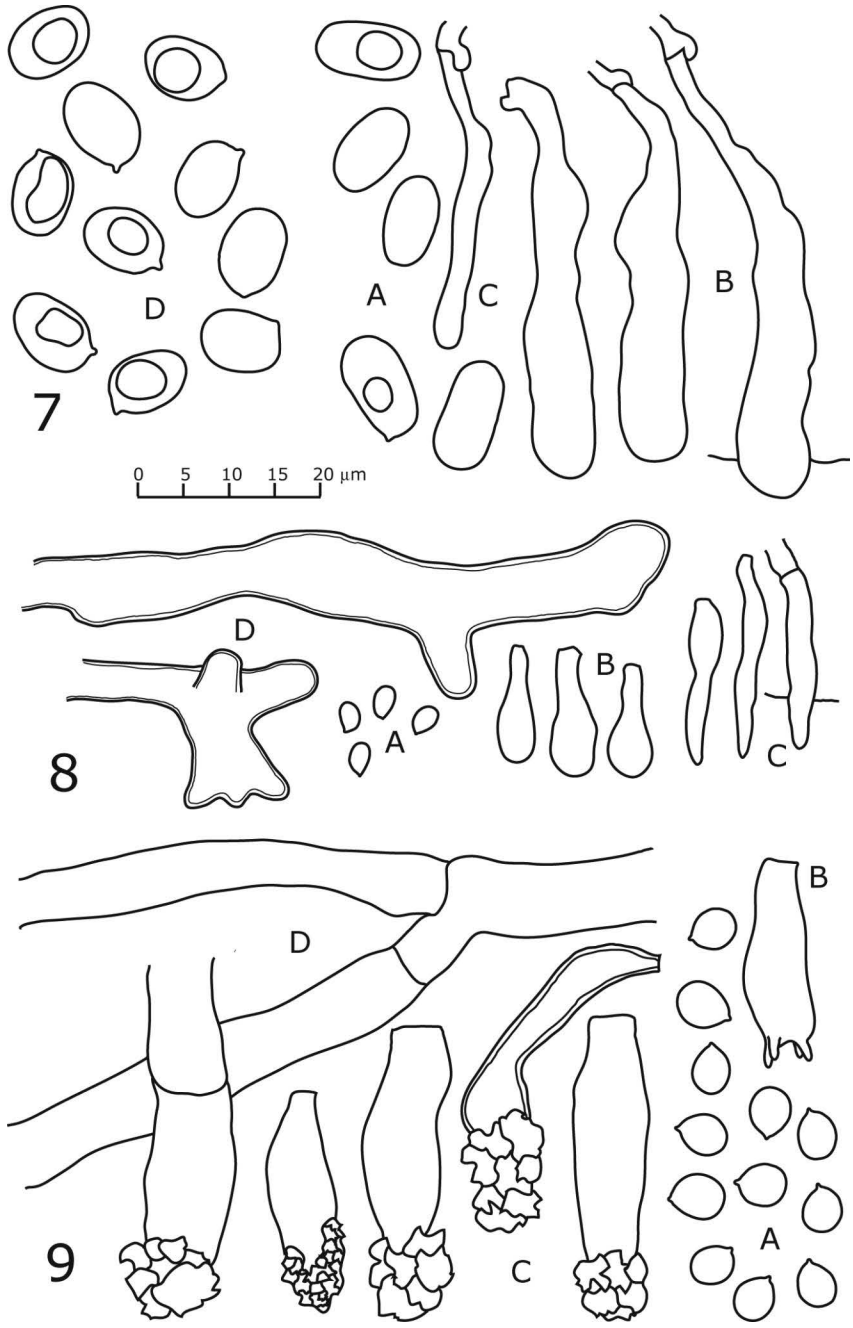
***Grandinia schweinitzii* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 60. 1926. Fig. 7

= ***Radulomyces cremoricolor* (Berk. & M.A. Curtis) Ginns & Lefebvre**

Type specimens: (United States), Ohio, Cincinnati, (on corticate branch of *Betula*, season of 1898), C.G. Lloyd 3821 (holotype: TR B/3803; isotypes: TR B/3554, and FH, BPI US0281018 as *Corticium cremoricolor*).

Basidiome widely effuse, up to 5 × 4.5 cm, adnate, up to 500 µm thick, smooth with scattered to numerous tubercules, tubercules aggregated, pale orange (5A3), greyish orange (5B4), Light Ochraceous-Salmon, Cinnamon-Buff to Pinkish Buff; with deep cracks in older parts to expose white to cream context; margin distinct, abrupt, adnate, fibrillose. *Hyphal system* monomitic with nodose-septate generative hyphae. Subiculum up to 350 µm thick, a dense, tissue of non-agglutinated hyphae arranged in parallel to substrate; subicular hyphae 2-4 µm diam, nodose septate, sparingly branched, walls thin, hyaline, smooth. Subhymenium up to 55 µm thick, a compact tissue of vertically arranged hyphae, not agglutinated; subhymenial hyphae 3-4 µm diam, nodose septate, much branched, walls thin, hyaline, smooth. Hymenium a dense palisade of hyphidia and basidia. Hyphidia cylindrical, simple or branched, 25-40 × 2-2.5 µm, with a basal clamp connection, walls thin, hyaline, smooth. Basidia clavate, 35-75 × 8-11 µm, tapering gradually toward base, 2.5-3 µm diam, with a basal clamp connection, walls thin, hyaline, smooth, 4-sterigmate. Basidiospores cylindrical to broadly cylindrical, (8.8-)9.5-11.5(-12) × (5-)5.5-6.5(-7) µm, Q = 1.4-1.9, walls thin to slightly thickened, hyaline, smooth, weakly cyanophilous, not reacting in Melzer's reagent.

Grandinia schweinitzii is conspecific with *R. cremoricolor*. It can be distinguished from the closely related *Radulomyces confluens* (Fr.) M.P. Christ. and *R. rickii* (Bres.) M.P. Christ. by the size and shape of the basidiospores which are ellipsoid and subglobose, respectively (Ghobad-Nejhad & Kotiranta, 2007). The specimen from Bresadola's herbarium at TR, B/3803, is the holotype. The isotype, B/3554, is clearly a duplicate of the holotype although only the binominal name is written on its packet. The isotypes at FH and BPI are labeled *Corticium cremoricolor* for Burt (1926) listed C.G. Lloyd 3821 as a voucher specimen under *C. cremoricolor*. *Radulomyces cremoricolor* has often been misidentified as *R. confluens* in North America, e.g., Nakasone (1990).



Figs 7-9. Camera lucida drawings of microscopic elements from basidiomes. **7.** *Grandinia schweinitzii* (TR B/3803, holotype), **A.** basidiospores; **B.** immature basidia; **C.** hyphidium; **D.** basidiospores from US0281018, isotype. **8.** *Hydnum flavicans* (S F15531, epitype), **A.** basidiospores; **B.** immature basidia; **C.** cystidia; **D.** inflated subicular hyphae. **9.** *Merulius fuscescens* (S F15943, isotype), **A.** basidospores; **B.** basidium; **C.** cystidia; **D.** subicular hypha.

***Hydnum flavicans* Bres.**, Atti Imp. Regia Accad. Sci., Roveretana ser. 3, 3(1): 95. 1897. Fig. 8

≡ ***Odonticium flavicans* (Bres.) Nakasone*, comb. nov.***

= *Odonticium monfraguense* Blanco, Moreno & Manjón, Cryptog. Mycol. 10(2): 137. 1989.

Type specimens: (Slovakia), Prenčow "na háj.," subter corticeum *Quercus* putr., 2 Decem 1890, legit Andr. Kmet', Fungi schemnitzienses (lectotype: S F15525; isolectotype: BPI US0259203).

Epitype, designated here: Hungaria, ad corticem *Quercus*, Kmet', Herb. Mycolog. Lars Romell (S F15531, isoepitype F15528).

Basidiome widely effuse, 20-30 mm, adnate, thin, hydnaceous, firm to tough, pale yellow (4A3) to pale orange (5A3) at first, at maturity brownish orange (6C6) to light brown (6D6) or Cinnamon to Cinnamon-Buff; aculei up to 4 mm long, 3-4 aculei per mm, smooth, single or fused, terete or compressed, gradually tapering to an acute apex; margin thinning out, adnate with short aculei. *Hyphal system* monomitic with simple-septate generative hyphae. Aculei composed of a dense column of straight, not agglutinated, rarely branched tramal hyphae surrounded by thin subhymenial and hymenial layers, at apex hyphae obtuse, not differentiated; tramal hyphae 3.5-5 µm diam, simple septate, sparingly branched, walls thin to 1.5 µm thick, hyaline, smooth. Subiculum a thin layer, composed subicular hyphae 2-5.5 µm diam, occasionally inflated up to 10 µm diam, simple septate, moderately branched, walls thin to 1.5 µm thick, hyaline, smooth or rarely with encrusted segments. Subhymenial hyphae 2.5-5 µm diam, simple septate, moderately branched, short-celled, walls thin, hyaline, smooth. Hymenium a dense palisade of cystidia and basidia. Cystidia scattered to rare, subulate, 18-26 × 2.5-3.5 µm, simple septate at base, walls thin, hyaline, smooth. Mature basidia not observed. Basidiospores rare, ellipsoid, 2.9-3.6 × 2-2.2 µm, Q = 1.5-1.6, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Habitat. On bark and wood of *Quercus*, especially *Q. suber* L., cork oak.

Distribution. Portugal, Spain, France, Slovakia.

Additional specimens examined (as *H. flavicans* except as noted). France, Var, Pignans, sur chêne liège pourri, 21 Mai 1925, A. de Crozals no. 55, Bourdot 39099 and 27 May 1925, Bourdot 39103, as *Acia squalina* (PC). Hungary, in ligno quercino, no date, Kmet' (NY 00776184); no location given, Flora exsiccate Austro-Hungarica, no. 3151, Kmet' (NY 00834174, BRA 8921). Slovakia, Prenčow, Stankojovršok, supter corticem trunci Querc. emort, 3 Apr 1891, A. Kmet' (S F15523, F15526; BRA 8922, 8923); Prenčow, na haj, in truncos *Quercus*, 2 Dec 1891, A. Kmet' (S F15524). Spain, Caceres, Parque Natural de Monfrague, finca de las Cansinas, on *Q. suber*, Blanco, Majon, & Moreno HAH10374 (MA-Fungi 24111, isotype of *O. monfraguense*).

There is no doubt that *H. flavicans* and *O. monfraguense* are conspecific. The isotype of *O. monfraguense* is in fine condition with abundant basidia and basidiospores. Its cystidia, measuring 35-40 × 4-5 µm, are numerous and larger than in the epitype of *H. flavicans*. Although *Odonticium flavicans* is known only from scattered locations in southern Europe, it probably occurs throughout the region on cork oak. Bourdot & Galzin (1928) reported this species as *Acia squalina* (Fr.) Bourdot & Galzin (Michel & Duhem, 2003), but this combination was made earlier by Karsten (1879), although the epithet was misspelled '*squalida.*' See Manjón *et al.* (1989), Melo and Tellería (1997b), and Michel and Duhem (2003) for excellent illustrations and detailed descriptions of *O. monfraguense*.

In 1897 when Bresadola described *H. flavicans*, he did not designate a type specimen. Maas Geesteranus (1974) chose specimen F15525 from Bresadola's herbarium at S as the holotype, but it is more properly the lectotype. Unfortunately, this specimen and the isolectotype at BPI are sterile; thus, the fertile specimens at S, F25531 and F15528, are designated the epitype and the isoepitype, respectively. The description above is based on the epitype and isoepitype specimens alone.

Thirteen specimens of *Hydnum flavicans* were examined from BRA, S, NY and BPI; all were collected by A. Kmet'. Many specimen labels provided little or conflicting data. From a direct morphological comparison of the specimens, it appears that F15523 and F15526 from S and NY00776185 are from the same gathering, and all are sterile. In addition, specimens BRA 8922 and 8923 may also be from that same gathering, although only BRA 8922 is fertile.

***Hydnum ochroleucum* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 59. 1926, non Pers. 1825.

= ***Mycorrhaphium* sp.**

Holotype: Ins(ula) Marianas, Saipan, 1913, Höfer no. 48 (BPI US0259728).

Basidiome dimidiate, sessile, 40 × 30 mm, up to 3 mm thick, thinning to 1 mm at margin, coriaceous, tough; pileus surface felty, with many small, irregular warts near attachment area, then faintly zonate toward the margin, greyish orange (5B5) to brownish orange (5C6); hymenophore spinose, aculei slender, up to 3.5 mm long × 300 μm diam, decreasing in size toward the margin, 3-4 aculei per mm, terete with acute, entire apices, brown (7E7) in upper half, then pale orange (5A3) toward the base; context homogeneous, dense, firm, light orange (5A4); margin smooth, bruising brown (7E7) at edges. *Hyphal system* dimitic with nodose-septate generative hyphae and thick-walled skeletal hyphae. Pileus trama a dense tissue composed of hyphae 2.5-3 μm diam, nodose septate, moderately branched, walls thick, hyaline, smooth. Aculei composed of skeletal hyphae in parallel enclosed by thin subhymenial and hymenial layers; skeletal hyphae 2.2-5 μm diam, aseptate, unbranched, walls up to 1.8 μm thick, hyaline, smooth; generative hyphae 2-3 μm diam, clamped, moderately branched, walls thin, hyaline, smooth. Hymenium a dense palisade of cystidia and immature basidia. Cystidia cylindrical, sometimes appearing to curve into hymenium, up to 36 × 4 μm, clamped at base, walls thin, hyaline, smooth. Mature basidia and basidiospores not observed.

Because *H. ochroleucum* lacks basidia and basidiospores, it cannot be firmly identified. It may be a *Mycorrhaphium* species because skeletal hyphae are found only in the aculei.

***Kneiffia frangulae* Bres.**, Ann. Mycol. 1(2): 101. 1903.

≡ *Peniophora frangulae* (Bres.) Bourdot & Galzin, Hymenomyc. France p. 310. 1928.

= ***Cylindrobasidium evolvens* (Fr.: Fr.) Jülich**

Holotype: (Poland), ad Frangulam alnum, Oktober, as *Peniophora frangulae* (S F15897).

Basidiome 40 × 12 mm, resupinate, effuse, soft, fragile, membranous, smooth to pulverulent, orange white (5A2), pale orange (5A3), to light orange (5A4); margin thinning out, fibrillose. *Hyphal system* monomitic with nodose-septate generative hyphae. Subicular hyphae 2.5-5 μm diam, clamped, moderately

branched, walls thin, hyaline, smooth. Cystidia fusiform, 32-53 × 5-7 µm, clamped at base, walls thin, hyaline, smooth. Basidia clavate to cylindrical, 38-43 × 6-7 µm, clamped at base, walls thin, hyaline, smooth, 4-stergimate, sterigmata collapsed after maturity. Basidiospores lacrymoid to ellipsoid, (7.5-)8-9(-10) × 5-5.5 (-5.8) µm, Q = 1.6, often clumped together in groups of 3-4, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Although *Kneiffia frangulae* lacks characteristic oil-like droplets in the hyphae, it is conspecific with *Cylindrobasidium evolvens*. Bresadola (1903) observed that *K. frangulae* was similar to *Thelephora laxa* Pers., which is a synonym of *C. evolvens*.

***Merulius fuscescens* Bres.**, Ann. Mycol 18: 41. 1920. Fig. 9

≡ *Serpula fuscescensis* (Bres.) W.B. Cooke, Mycologia 49: 219. 1957.

Type specimens: Brasilia, Bahia, 1914, Torrend 65 (holotype: BPI US0265851; isotype: S F15943).

Basidiome resupinate, effuse, thin, fragile, loosely attached, spinose, plicate to shallowly and irregularly reticulate, light brown (6D5); aculei up to 1 mm long, 1-3 aculei per mm, at first single, terete with acute apices, then compressed, laterally fused, sometimes interconnected to form shallow, irregular pits, 1-2 pores per mm; context brown; margin not observed. Hyphal system monomitic with simple-septate generative hyphae. Subiculum comprised of hyphae arranged parallel to substrate, often collapsed, not agglutinated; subicular hyphae 4.5-10(-14) µm diam, simple septate, with rare single clamps, sparingly to moderately branched, not rigid, sometimes slightly inflated, walls thin or occasionally up to 1 µm thick, hyaline to pale yellow, smooth, cyanophilous. Subhymenium collapsed, indistinct. Hymenium indistinct, degraded, composed of cystidia and basidia. Cystidia scattered, embedded, subclavate to cylindrical, encrusted with coarse crystals at apex only, 25-35 × 8-9 µm, simple septate at base, often curving into hymenium, often only crystal clusters observed, walls thin, hyaline to pale yellow, smooth except at apex. Basidia rare, fragile, broadly clavate, 20 × 7 µm, [24-26 × 6-7 µm from protologue, 15-20 × 6-8 µm (Ginns, 1971)], tapering to 4 µm diam at base, simple septate at base, walls thin, hyaline, smooth, 4-sterigmate. Basidiospores subglobose to ovoid, (4.5-)5-6 × 4-5 µm, Q = 1.2-1.3, contents cyanophilous, walls thin to slightly thickened, hyaline, smooth, cyanophilous, not reacting in Melzer's reagent.

This unique species is characterized by a soft, fragile, brown basidiome with flattened aculei that fuse to form shallow pits, broad, simple-septate hyphae that are cyanophilous, apically encrusted cystidia with thin walls, and cyanophilous, subglobose basidiospores. Ginns (1971) suggested that *M. fuscescens* may be related to corticioid fungi with aculei, but an obvious generic placement for this taxon is not possible at this time. Although sharing some traits found in species of *Candelabrochaete* Boidin, *Botryodontia* Hjortstam & Ryvarden, and *Botryobasidium* Donk, none of these genera are satisfactory. It may be appropriate to establish a new genus for *M. fuscescens* once additional collections are available for study.

The specimen at BPI is recognized as the holotype because the packet information includes, in Bresadola's hand, the protologue information as well as the year and number of the collection which are lacking on the isotype packet at S.

***Merulius tessellatus* Bres.**, Bull. Soc. Mycol. France 6: 47. 1890.

Isotype: (Sudan), Afric. centr., Wau (S F15936).

Basidiome partially degraded, pileate, sessile, pileus surface with abundant, low, rounded warts, brownish orange to light brown [5(C-D)4]; hymenophore poroid to merulioid, tubes up to 4 mm long, greyish brown to brown [7E(3-4)] or dark brown (7F4); margin not observed. *Hyphal system* monomitic with nodose-septate generative hyphae. Context comprised primarily of degraded generative hyphae with thin, hyaline, smooth walls; occasionally scattered in pileus trama hyphae up to 10 µm diam, containing opaque, solid-appearing material. Basidia not observed. Basidiospores abundant, ellipsoid, 7.2-9 × 5.4-6.5 µm, Q = 1.3, walls slightly thickened, brownish yellow, smooth, weakly cyanophilous, negative in Melzer's reagent.

The hymenophore is not well-preserved, so it is not possible to identify this specimen. From Bresadola's description and illustration, it appears that *M. tessellatus* is fleshy and large, 14-18 × 7-8 cm, with pores up to 1 mm diam. Although no basidia were observed, Ginns (1971) described stout, clavate basidia, 22-27 × 9-11 µm, with 4 sterigmata. Microscopically, *M. tessellatus* has basidiospores and hyphae that are strikingly similar to those observed in *Hydnomerulius pinastri* (Fr.: Fr.) Jarosch & Besl and *Boletinellus merulioides* (Schwein.) Murrill. Thus, *M. tessellatus* probably belongs in the Sclerodermatineae or Paxillineae of the Boletales.

***Odontia brassicicola* Bres.**, Atti Imp. Regia Accad. Roveretana, ser. 3, 8(2): 131. 1902. Fig. 10

≡ *Grandinia brassicicola* (Bres.) Bourdot & Galzin, Hymenomyc. France p. 410. 1928.

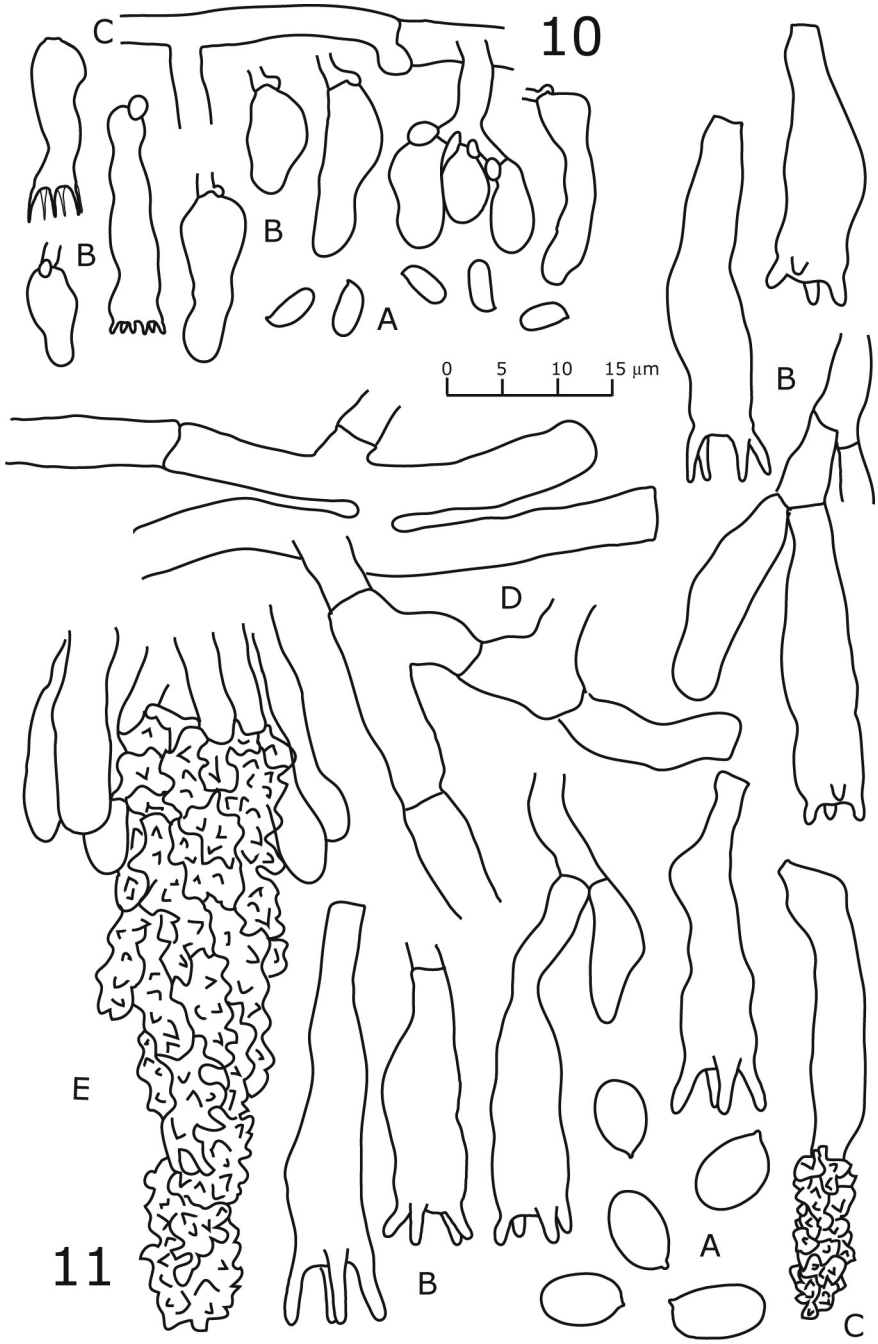
≡ *Trechispora brassicicola* (Bres.) Melo & Tellería, Portugaliae Acta Biol., Sér. B., Sist. 17: 146. 1997.

= ***Sistotrema brinkmannii* (Bres.) J. Erikss.**

Holotype: (Portugal), Lusitanici, Setubal, Dec. 1901, ad caule Brassicae oleraceae, Torrend 266 (S).

Basidiome fragmented into small pieces, effused, with soft tubercules, verrucose, off-white to light cream, fragile; margin not observed. *Hyphal system* monomitic, with nodose-septate generative hyphae. Subiculum thoroughly filled with coarse hyaline crystals that obscure its structure; subicular hyphae 1.8-4 µm diam, nodose septate, walls thin, hyaline, smooth. Subhymenium mostly obscured by crystals; subhymenial hyphae 3.2 µm diam, short-celled, much branched, walls thin, hyaline, smooth. Cystidia absent. Basidia ovoid at first then obclavate, finally urniform at maturity, sometimes cylindrical with a median constriction, 6(-8)-sterigmate. Basidiospores cylindrical, sometimes slightly concave on adaxial side, 4.3-5 × (1.5-)2-2.2 µm, Q = 2.3, walls thin, hyaline, smooth, acyanophilous, not reacting to Melzer's reagent.

Odontia brassicicola is conspecific with *Sistotrema brinkmannii*. Although mature basidia are scarce, immature basidia are plentiful and clearly obclavate. Melo and Tellería (1997b) transferred *O. brassicicola* to *Trechispora* based on a specimen of Torrend deposited at COI. The species they illustrate is clearly different from the holotype specimen with regard to basidia shape and number of sterigmata. Although *O. brassicicola* has priority over *S. brinkmannii* (described in 1903), it is desirable for nomenclatural stability to conserve the latter name.



Figs 10-11. Camera lucida drawings of microscopic elements from basidiomes. **10.** *Odontia brassicicola* (Torrend 266, holotype), **A.** basidiospores; **B.** basidia; **C.** subicular hypha. **11.** *Odontia rosae* (TR B/3785, holotype), **A.** basidiospores; **B.** basidia; **C.** cystidium; D. subicular hyphae; E. encrusted aculeus.

***Odontia cremorina* Bres.** in P.A. Saccardo, Malpighia 5: 275. 1891.

= ***Hyphodontia bugellensis* (Ces.) J. Erikss.**

Type specimens: (Eritrea), Monte Dongolla, pr. Ghinda, Mar 9 (holotype: PAD; isotypes: S, BPI US0326440).

Basidiome broken into small pieces, 50 × 12 mm (holotype), 9-14 × 7-8 mm (isotypes), resupinate, effuse, adnate, up to 350 µm thick, soft, woolly to subceraceous, finely aculeate, yellowish white (4A2), pale yellow (4A3), pale orange (5A3) or greyish orange (5B4); aculei sterile, up to 90 × 70 µm, 5-6(-10) aculei per mm; no cracks; margin not observed. *Hyphal system* monomitic with nodose-septate generative hyphae. Aculei composed of terminal hyphal ends tapering slightly toward an obtuse apex, 50-70 × 2-3 µm diam, with a basal clamp connection, walls thin to slightly thickened, hyaline, smooth or encrusted with small cubical, hyaline crystals. Subiculum a loose trama of intertwined hyphae and abundant, coarse, hyaline crystals; subicular hyphae 2-3 µm diam, nodose septate, even, moderately branched, walls thin to slightly thickened, rarely up to 1.2 µm thick, hyaline, smooth or encrusted with hyaline crystals, faintly cyanophilous. Hymenium a dense palisade of cystidia and basidia. Cystidia rare, obclavate to cylindrical, even or constricted, tapering slightly to an obtuse apex, 24-33 × 4-4.5 µm, with a basal clamp connection, walls thin or slightly thickened, hyaline, smooth. Basidia more or less clavate, often with one or more slight constrictions, 22-26(-32) × 4-6 µm, clamped at base, walls thin, hyaline, smooth, faintly cyanophilous, 4-sterigmate. Basidiospores ellipsoid, 5-6.5(-7) × 3.5-4(-4.3) µm, Q = 1.4-1.5, often clumped together, walls thin to slightly thickened, hyaline, smooth, cyanophilous, not reacting in Melzer's reagent.

Additional specimens examined (as *Odontia bugellensis*). France, Strasbourg, no. 1615, L. Maire (BPI US0265352). Italy, Rome, Cesati, Lloyd 29180 (BPI US0326421); Piedmont, Bugellae, Castanea trunci, Sept 1855, Cesati, Rabenhorst–Klotzschii – Herbarium vivum mycologicum edition nova, Centurea III 1856 no. 210 (BPI US0265353). Portugal, Setubal, ad ligne deciduas, XI 1907, C. Torrend, Mycotheca Lusitanica no. 37 (BPI US0266172); ad ramos Arbuti, Torrend (BPI US0265351); Sao Fiel, ad truncos Oleae, Torrend (BPI US0265355).

Odontia cremorina is conspecific with *Hyphodontia bugellensis* which is considered distinct from *Hyphodontia pruni* (Lasch) J. Erikss. & Hjortstam (Hjortstam, 1991; Melo & Tellería, 1997a). *Odontia cremorina* is characterized by a soft, woolly basidiome with minute aculei and abundant crystals in the subiculum, rare obclavate or subulate cystidia, and ellipsoid, slightly thick-walled, cyanophilous basidiospores. The description above is based on the holotype and isotype specimens of *O. cremorina* which appear to be a young, developing basidiome for well-developed specimens of *H. bugellensis* are thicker with a denser, tougher texture and basidia with thickened walls (Melo & Tellería, 1997a).

The isotypes are small fragments with incomplete data on the packet. For example, the isotype at BPI has only "Herb. Sacc." written on the packet, but nonetheless appears to be a duplicate of the larger PAD collection when the specimens are directly compared.

***Odontia lilacina* Bres.**, Hedwigia 32(3): 118. 1893.

= ***Grammothele* sp.**

Holotype: Australia, New South Wales, Richmond River, no. 10 (S).

Basidiome a small rectangular piece, 22 × 7 mm, up to 210 µm thick, finely spinose, pale pinkish, orange grey (6B2) to reddish grey (7B2); aculei abundant, cylindrical, sterile, with rounded apices and a dark brown central core,

up to 6 aculei per mm, up to 0.3 mm long, area between aculei smooth but extensively cracked; margin not observed. *Hyphal system* dimitic with nodose-septate generative hyphae and aseptate skeletal hyphae. Subiculum a dense, partially agglutinated tissue composed primarily of skeletal hyphae next to substrate, then upper subiculum intermixed with skeletal and generative hyphae; subicular hyphae 2-4 µm diam, nodose septate, walls thin, hyaline, smooth; skeletal hyphae 2-4 µm diam, aseptate, moderately branched, walls thick, hyaline to light yellow, smooth. Aculei sterile, a fascicle of tightly agglutinated skeletal hyphae similar to that found in subiculum except sparingly branched and with dextrinoid, honey-yellow colored walls; at apex numerous dendrohyphidia developed. Hymenium degraded, with dendrohyphidia and cylindrical elements (possibly immature basidia) tapered toward base. No basidia or basidiospores observed.

Odontia lilacina is probably a species of *Grammothele*, but the degraded hymenium and absence of basidiospores precludes its identification to species. Since *O. lilacina* is characterized by individual aculei, it may represent a young developmental stage that hasn't yet developed a poroid hymenophore.

***Odontia pannosa* Bres.**, Atti Imp. Regia Accad. Roveretana, ser. 3, 3(1): 98. 1897.

= ***Hyphodermella corrugata* (Fr.) J. Erikss. & Ryvarden**

Holotype: (Slovakia), Prenčov, in cortice aceris camp., "na haj", 18 Nov 1891, leg. A. Kmet' (S).

Basidiome effuse, 15 × 10 mm, crustaceous, tubercules small with apical bristles, light orange to greyish orange [5(A-B)5]; margin appressed, fimbriate, thinning out. *Hyphal system* monomitic with simple-septate generative hyphae. Aculei composed of encrusted hyphae in fascicles protruding though the hymenium. Subiculum with large masses of yellowish brown mucilaginous materials intermixed with hyphae; subicular hyphae 3-4 µm diam, simple septate, sparingly to moderately branched, walls thin, hyaline, smooth. Basidia clavate with stalk, 39-40 × 6-7 µm, simple septate at base, 4-sterigmate. Basidiospores broadly ellipsoid, 7.5-9 × 5-5.5(-6) µm, Q = 1.5, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Odontia pannosa is conspecific with *Hyphodermella corrugata.* In 1979, Kurt Hjortstam also identified this specimen as *H. corrugata* as indicated on a slip of paper included in the packet.

***Odontia rosae* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 60. 1926. Fig. 11

≡ ***Hyphodermella rosae* (Bres.) Nakasone, *comb. nov.***

Type specimens: (Italy), prope Trento, ad ramos Rosae sp., Dec. 1924, leg. Remis (holotype: TR B/3785; isotype: TR B/3601).

Basidiome resupinate, effuse, adnate, 40-110 µm thick, odontoid with smooth continuous areas between aculei, subceraceous to crustaceous, Light Buff at first, then darkening to Buckthorn Brown, Tawny Olive, or Sayal Brown; aculei up to 150 × 100 µm, up to 5 aculei per mm, at first with fine bristly hairs protruding from apices, later aculei smooth; margin thinning out, adnate, fimbriate, concolorous with hymenium. Hyphal system monomitic with simple-septate generative hyphae. Aculei with a central fascicle of encrusted terminal hyphae that often protrudes through apex, these terminal hyphae up to 50 µm long, 4-5 µm diam, simple septate at base, walls thin, hyaline, at first lightly encrusted at apex then heavily encrusted throughout length with coarse, hyaline crystals. Subiculum a dense, compact tissue of partially agglutinated hyphae; subicular

hyphae 4-6 µm diam, simple septate, moderately to frequently branched, walls thin, hyaline, smooth. Subhymenium up to 30 µm thick, composed of vertically arranged, short-celled, non-agglutinated hyphae; subhymenial hyphae 3-4 µm diam, simple septate, frequently branched, walls thin, hyaline, smooth. Basidia clavate, sometimes with a distinct stalk, 24-35(-40) × 6-8 µm, simple septate at base, walls thin, hyaline, smooth, 4-sterigmate. Basidiospores ellipsoid, 6-8 (-8.5) × 4.3-5 (-5.5) µm, Q = 1.5-1.6, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Hyphodermella rosae is characterized by tiny aculei of encrusted fascicles with simple-septate hyphae, stalked, clavate basidia, and ellipsoid basidiospores. It is most similar to *H. corrugata* (Fr.) J. Erikss. & Ryvarden which has a less dense basidiome, significantly longer basidia (35-50 × 6-7 µm), and larger basidiospores (7-10 × 4-6 µm) (Eriksson & Ryvarden, 1976). Two other species of *Hyphodermella*, *H. densa* Melo & Hjortstam (Melo & Hjortstam, 2003) and *H. maunakeaensis* Gilb. & Hemmes (Gilbertson *et al.*, 2001) have smaller basidia and basidiospores than *H. rosae*. Moreover, basidia in *H. densa* are urniform to clavate in shape and hyphoid cystidia are produced in *H. maunakeaensis*.

Two specimens of *Odontia rosae* in Bresadola's herbarium at TR are from the same gathering. The holotype is the larger specimen with the complete protologue written on the packet in Bresadola's hand, including the collector's name, Rensi.

***Odontia stereicola* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 60. 1926.

≡ ***Kneiffiella stereicola* (Bres.) Nakasone*, comb. nov.***

= *Odontia crassa* Rick, Egatea 17: 279. 1932.

≡ *Kneiffiella crassa* (Rick) Hjortstam & Ryvarden, Syn. Fungorum 15: 14. 2002.

= *Hyphodontia orasinusensis* Gilb. & M. Blackw., Mycotaxon 33: 382. 1988.

Holotype: Brasilia, ad Sterea, leg. Rick (BPI US0264649).

Basidiome resupinate, effuse, hydnaceous, soft, cream-colored; aculei fuzzy with fimbriate apices, 720 × 210-330 µm, up to 4 aculei per mm, terete. *Hyphal system* monomitic with simple-septate in basal subiculum and aculeus core and nodose-septate hyphae in upper subiculum, subhymenium and hymenium. Aculei composed of a core of tramal hyphae with tubular cystidia protruding through apex and extending into the hymenium; tramal hyphae 3.5-5 µm diam, simple septate, unbranched, straight, even, walls thin to thickening, hyaline, smooth. Subicular hyphae 3-5 µm diam, simple septate with scattered clamp connections, walls thin to 1 µm thick, hyaline, smooth. Subhymenial hyphae 3-3.5 µm diam, regularly nodose septate, short-celled, walls thin, hyaline, smooth. Cystidia abundant, arising from subiculum and aculeus trama, cylindrical with an obtuse, rounded apex, up to 120 × 5-8 µm, tapering to 4 µm diam at base, simple septate at base, with secondary septa, walls up to 1.5 µm thick, then thinning at apex, hyaline, smooth. Basidia (immature) clamped at base. Basidiospores ellipsoid to subglobose, 3.7-5 × 2.5-3.5 µm, Q = 1.6, walls thin, hyaline, smooth.

Habitat. On wood of angiosperms, rarely gymnosperms, and leathery basidiomes.

Distribution. Brazil, Venezuela, Colombia, French Guiana, United States (Louisiana).

Additional specimens examined (all as *H. orasinusensis*). United States, Louisiana, East Baton Rouge Parish, Baton Rouge, Burden Farm backwoods, on *Celtis laevigata* Willd., 20 Oct 1983, M. Blackwell 2141 (BPI US1103133, holotype of

H. orasinusensis; ARIZ AN002098, isotype) and M. Blackwell 2139 (ARIZ AN004011); Calcasieu Parish, South Westlake, Calcasieu River, on (decorticate) *Quercus nigra* L., 6 Sep 1984, M. Blackwell 1993 (ARIZ AN007054); Orleans Parish, New Orleans, New Orleans City Park, Rose Garden, on *Ailanthus altissima* (Mill.) W.T. Swingle, 5 Aug 1983, M. Blackwell 1526 (ARIZ AN009194); St. Tammany Parish, Fontainebleau State Park, on *Pinus taeda* L., 4 July 1983, R.L. Gilbertson 14733 (ARIZ AN002099).

There is no doubt that *O. stereicola* is conspecific with *H. orasinusensis*. Hjortstam & Ryvarden (2002) synonymized *H. orasinusensis* under *O. crassa*, but *O. stereicola* has priority. This striking species is easily identified because of the prominent tramal cystidia and presence of simple-septate hyphae in the subiculum and nodose-septate hyphae in the hymenium. The description above is based solely on the holotype. Hjortstam & Ryvarden (2002) reintroduced the genus *Kneiffiella* for *Hyphodontia* species with large, thick-walled, tubular cystidia arising from the subiculum and subglobose to ellipsoid basidiospores; thus, the new combination in *Kneiffiella* is made. See Langer (1994) and Gilbertson and Blackwell (1988) for additional descriptions and illustrations (as *H. orasinusensis*).

***Odontia torrendii* Bres.**, Ann. Mycol. 18: 43. 1920.

= ***Dentipellis leptodon* (Mont.) Maas Geest.**

Type specimens: (Brazil), Rio de Janeiro, 1914, Torrend 57 (holotype: S F15214; isotype: BPI US0266289).

Basidiomes resupinate, widely effuse, adnate, soft, fragile, hydnoid, orange white (5A2), pale orange (5A3), greyish orange (5B4), or brownish orange (5C4), bruised areas light brown (6D6); aculei slender, 4-6 mm long, 2-5 aculei per mm, partially fused at the base, gradually tapering to an acute, smooth apex, brittle with many tips broken off; margin not observed. *Hyphal system* dimitic with nodose-septate generative and gloeoperous hyphae. Aculei composed of generative and gloeoperous hyphae in the trama with the gloeoperous hyphae bending into, but not protruding beyond, the hymenium; gloeoperous hyphae 2.5-6 µm diam, nodose septate, sparsely branched, apices obtuse, acute, or occasionally papillate, containing highly refractive, oil-like materials, walls thin, hyaline, smooth. Subiculum composed of generative hyphae in a moderately loose trama; subicular hyphae 2-3.5 µm diam, nodose septate, moderately branched, walls thin to slightly thickened, hyaline, smooth. Hymenium a palisade of gloeocystidia and basidia. Gloeocystidia cylindrical, slightly enlarged just below apex, then tapered to apex, about 56 × 5 µm, tapering to 2 µm at base, with a basal clamp, filled with refractive, oil-like contents. Basidia scarce, cylindrical to clavate, 18-20 × 4-4.5 µm, tapering to 2-3 µm diam at base, with a basal clamp, walls, thin, hyaline, smooth, 4-sterigmate. Basidiospores ellipsoid, 3.5-4 × 2.5-2.9 µm, Q = 1.4-1.5, walls slightly thickened, hyaline, minutely roughened but appearing smooth, amyloid.

Additional specimens examined. Brazil, Rio de Janeiro, 1914, Torrend (S F15215, F15216).

Except for its shorter basidia, *Odontia torrendii* agrees with the description of *D. leptodon* in Ginns (1986). This is a widespread species reported from Australia, India, Japan, Canada, United States, and Chile (Ginns, 1986). The description above is based on all four specimens examined.

***Peniophora subcremea* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 62. 1926, non Höhn. & Litsch. 1906.

= ***Hypochnicium cremicolor* (Bres.) H. Nilsson & Hallenb.**

Type specimens: (Italy, pr. Trento), ad truncos Alni glutinosae, 1924, leg. Rensi (holotype: BPI US0285861; isotype: TR B/4028).

Basidiome resupinate, small, 25 × 10 mm, effuse, adnate, thin, soft, pruinose to porose at first, then thicker, smooth with scattered warts, pale yellow to light yellow [4A(3-4)] or pale orange (5A3); margin thinning out. *Hyphal system* monomitic with nodose-septate generative hyphae. Subicular hyphae 3-7 µm diam, nodose-septate, moderately branched, walls thin to slightly thickened, hyaline, smooth, cyanophilous. Subhymenium and hymenium not observed. Cystidia numerous, clavate or cylindrical, tapering gradually to apex, 68-100 × 7-8 µm, clamped at base, contents homogeneous, walls thin, hyaline, smooth. Basidia not observed. Basidiospores abundant, ovoid to broadly ellipsoid, 6-7.2(-8) × (4.7-)5-5(-6) µm, Q = 1.3, walls slightly thick to thick, hyaline, finely verrucose, occasionally smooth, cyanophilous, not reacting in Melzer's reagent.

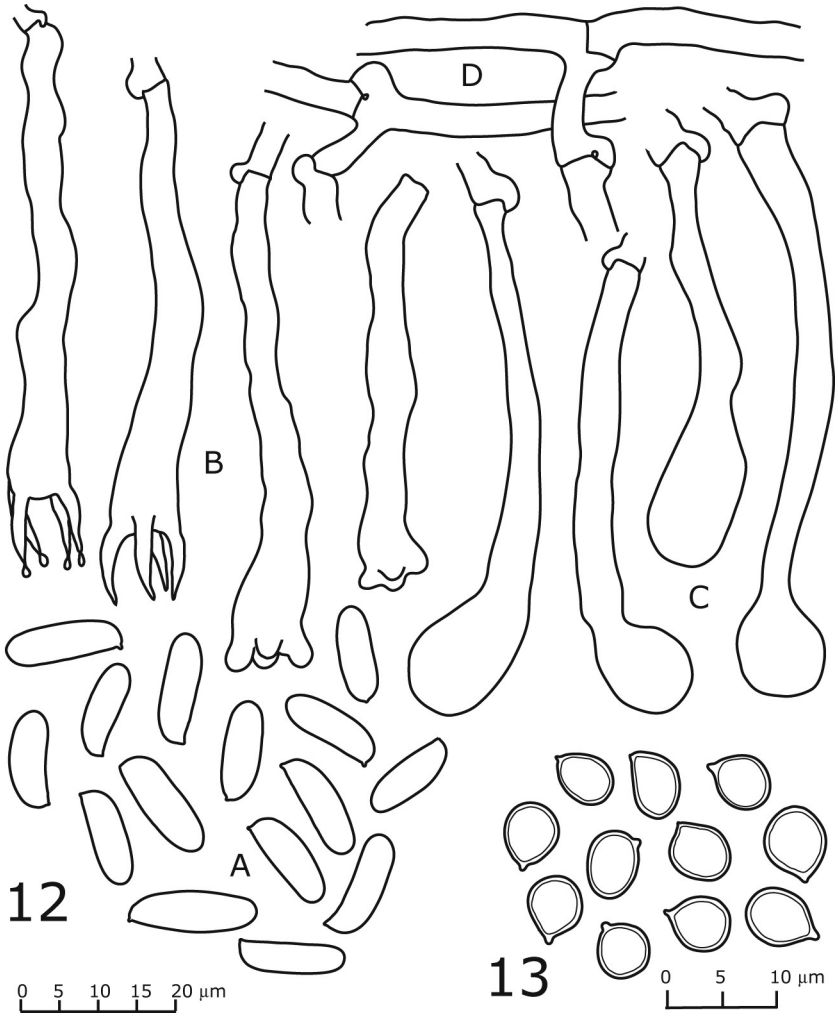
Peniophora subcremea is conspecific with *Hypochnicium cremicolor* based on basidiospore size and lack of thick-walled subicular hyphae. Its average basidiospore size, n = 36, 6.36 ± 0.47 × 5.10 ± 0.28 µm, is comparable to that of other *H. cremicolor* specimens (Nilsson & Hallenberg, 2003). The types are in good condition with numerous clamp connections although the protologue describes the hyphae as septate with rare clamps.

***Radulum crustulinum* Bres.**, Stud. Trent., Classe II, Sci. Nat. Econ. 7(1): 59. 1926. Fig. 12

≡ ***Hyphoderma crustulinum* (Bres.) Nakasone, *comb. nov.***

Holotype: (Italy, Appiano), ad truncos Cytisi (non *Fagus*), 11 Nov 1924, Prof. Schmoranzer, no. 7168 (M 0127911).

Basidiome resupinate, effuse, adnate, beginning as irregular circular colonies that coalesce together, up to 65 × 40 mm, up to 1.5 mm thick, subceraceous to membranous, at center of each colony with aggregated, rounded tubercules, becoming smooth or indistinctly plicate toward margin with scattered blunt aculei, when two colonies meet, aculei formed at margins pushed vertically, brownish orange (6C4) to light brown (6D4) in center of colonies then light orange (5A4) to greyish orange (5B4) toward margins; cracks short, deep, exposing fibrous white context; aculei up to 2 × 0.5 mm, 2-4 aculei per mm, single or fused at base, terete, smooth, aggregated at center of colonies and near margins, with blunt, rounded apices; margins with appressed, adnate, white, fimbriate, fibrillose to silky mycelium developed underneath raised, blunt aculei. *Hyphal system* monomitic with nodose-septate generative hyphae. Subiculum up to 1300 µm thick, composed of distinct hyphae, arranged in parallel, not agglutinated; subicular hyphae 3-6 µm diam, nodose septate, moderately branched, walls thin to slightly thickened, hyaline, smooth or sometimes encrusted with tiny, loosely adhering crystals. Subhymenium 50-60 µm thick, composed of vertically arranged, non-agglutinated hyphae; subhymenial hyphae 3-5 µm diam, nodose septate, frequently branched, short-celled, frequently branched, walls thin, hyaline, smooth. Hymenium 70-100 µm thick, composed of embedded vesicles and basidia. Vesicles irregularly distributed, locally abundant, embedded in subhymenium and hymenium, sphaeropedunculate, 30-80 × 10-13 µm, with a cylindrical stalk, 3-5 µm diam, clamped at base, walls thin, hyaline, smooth. Basidia clavate, 50-65 × 7-9 µm, tapering to 3-4 µm diam at base, clamped at base,



Figs 12-13. Camera lucida drawings of microscopic elements from basidiomes. **12.** *Radulum crustulinum* (M 0127911, holotype), **A.** basidiospores; **B.** basidia; **C.** vesicles; **D.** subicular hyphae. **13.** *Radulum eichleri* (S F15749, holotype), basidiospores.

walls thin, hyaline, smooth, 4-sterigmate, sterigmata 9-12 × 2.5-3 µm. Basidiospores narrowly cylindrical to allantoid, sometimes slightly tapered at apex, occasionally slightly sigmoid, 13-15.5 × 4-5 (-5.5) µm, Q = 3.0, walls thin, hyaline, smooth, acyanophilous, not reacting in Melzer's reagent.

Additional specimen examined. (France), Alpes Daphinois, ad cortices salicum, H. Mortellet (TR B/3806).

Radulum crustulinum is characterized by blunt, aggregated aculei, large basidia with prominent sterigmata, and large, narrowly cylindrical to allantoid basidiospores. The transfer into *Hyphoderma* is made because of its many similarities to *Hyphoderma mutatum* (Peck) Donk, especially regarding the

thickness and texture of the basidiomes. *Hyphoderma crustulinum*, however, lacks cystidia and has broader basidiospores than *H. mutatum*.

***Radulum eichleri* Bres.**, Ann. Mycol. 1(1): 89. 1903, 'eichlerii'. Fig. 13

≡ ***Cristinia eichleri* (Bres.) Nakasone, *comb nov.***

= *Radulum gallicum* Pilát, Mykologia 2: 54. 1925.

≡ *Cristinia gallica* (Pilát) Jülich, Persoonia 8(3): 298. 1975.

= *Radulum mucidum* Bourdot & Galzin, Bull. Soc. Mycol. France 30: 247. 1914.

≡ *Cristinia mucidum* (Bourdot & Galzin) J.Erikss. & Ryvarden, Corticiaceae North Europe 3: 311. 1975.

Holotype: (Poland), auf Corylus, Eichler no. 31 (S F15749).

Basidiome fragmented, degraded, subceraceous to brittle, thin, yellow to dark brown, smooth or with blunt, cylindrical spines, with hyphal strands at margin. *Hyphal system* monomitic with nodose-septate generative hyphae. Subiculum indistinct, fragile, fragmented, agglutinated; subicular hyphae 4-7 µm diam, clamped, walls thin, hyaline, smooth, cyanophilous. Hymenium and basidia not observed. Basidiospores abundant, subglobose to broadly ellipsoid, (4.5-)5-6(-7) × 4-5(-5.5) µm, Q = 1.2, walls slightly thickened, dark yellow, smooth, cyanophilous, not reacting in Melzer's reagent.

The holotype specimen is not in good condition for it lacks hymenia and basidia. By combining the protologue information with the distinctive basidiospores, it is apparent that this taxon is conspecific with *Cristinia gallica*. *Radulum eichleri* has priority, and so the new combination is proposed. Because of the poor condition of the holotype, it is desirable to designate an epitype, preferably one of Bourdot and Galzin's collections of *Radulum mucidum* Pers. or a collection from Poland or Germany.

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