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NOTES ON *STILBUM VULGARE* AND *FIBULOSTILBUM PHYLACICOLA* GEN. ET SP. NOV. *(ATRACTIELLALES)*

By KEITH A. SEIFERT[1], F. OBERWINKLER[2] and R. BANDONI[3]

Summary *Notes on* Stilbum vulgare *and* Fibulostilbum phylacicola *gen. et sp. nov.* (Atractiellales). Nomenclature, distribution and biology of *Stilbum vulgare* Tode: Fr. are discussed and a neotype is designated. A new genus, *Fibulostilbum* Seifert et Oberw. *sp. nov.*, is proposed for *F. phylacicola* Seifert et Bandoni, a taxon with superficially similar basidiocarps, but with clamp connections and Chionosphaeriaceous basidia. *Fibulostilbum phylacicola* occurs on stromata of *Phylacia poculiformis* in Brazil, Colombia and Venezuela.

INTRODUCTION

In a preliminary survey of gasteroid auricularioid heterobasidiomycetes (Oberwinkler and Bandoni, 1982), taxa with synnema-like basidiocarps were placed in a new order, the Atractiellales, and were described and illustrated. The taxa included all known species of *Agaricostilbum* Wright, *Atractiella* Sacc., *Chionosphaera* Cox, *Phleogena* Link, *Stilbum* Tode: Fr. sensu Juel, and *Pachnocybe* Berk., the last-named then of uncertain disposition. Detailed cytological studies of some species of the group have now resulted in extensive reclassification (Oberwinkler and Bauer, 1989). Yet, apart from *Agaricostilbum* spp., which are common on dead palm parts in many tropical and subtropical areas, taxa in the Atractiellales are infrequently collected and their biology remains poorly known. In this paper, a neotype is designated for the lectotype species of *Stilbum, S. vulgare* Tode: Fr.; additional information is presented on its synonymy, distribution and habitats. A new genus *Fibulostilbum* Seifert et Oberw. is proposed for the single species, *Fibulostilbum phylacicola* Seifert et Bandoni. *F. phylacicola,* which occurs on stromata of *Phylacia poculiformis* in the neotropics, is also described.

Stilbum vulgare Tode: Fr.

The genus *Stilbum* was described by Tode (1790) and included six original species with *S. vulgare* Tode listed first. *Stilbum* was considered hyphomycetous until Juel (1898) designated *S. vulgare* as the lectotype and demonstrated that the species was a basidiomycete. None of Tode's collections are known to exist, and Juel's interpretation has been controversial. Benjamin (1968) and Seifert (1985) have discussed the nomenclatural problems that developed from Juel's lectotypification. Oberwinkler and Bandoni (1982) accepted Juel's interpretation of *S. vulgare,* including the taxon in the *Chionosphaeraceae (Atractiellales).* To date, however, no type specimen has been designated. Seifert (1985) transferred many anamorphic species from *Stilbum* to *Stilbella* Lindau, selected a neotype for *Stilbella erythrocephalum* (Ditm.) Lindau, the lectotype species of that genus (Clements and Shear, 1931), and unearthed additional synonyms of *S. vulgare* sensu Juel.

Seifert's study indicated that *S. vulgare* is a relatively common fungus in Europe, one that conceivably could have been collected by Tode in Mecklenburg. Juel's interpretation is therefore accepted, and use of the name *Stilbum* for a basidiomycetous teleomorph is reaffirmed below by the formal designation of a neotype specimen for *S. vulgare* Tode: Fr. Several specimens were considered as a possible neotype. A specimen labelled *Stilbum vulgare* in herb. Fries (UPS, "Sur vieux bois de chêne, leg. Fautrey") is identical with *Doratomyces stemonitis* (Pers.: Fr.) Morton & G. Smith, a fungus that does not conform in any way with Tode's protologue for *S. vulgare.* We have also examined Juel's ethanol-preserved material (UPS), but it is in poor condition and no recognizable basidiomes remain. *S. vulgare* material distributed as Nº 2302 in "Fungi Rhenani" would constitute a choice with the advantage of automatically creat-

[1] Biosystematics Research Centre, William Saunders Bldg. Agriculture Canada, C.E.F., Ottawa, Canada K1A 0C6.

[2] Lehrstuhl Spezielle Botanik und Mykologie, Universität Tübingen, Auf der Morgenstelle 1, D-7400 Tübingen 1, Germany.

[3] Department of Botany, University of British Columbia, Vancouver, British Columbia, Canada V6T 1Z4.

ing a number of isoneotypes, but the copies we have seen are of variable quality. In particular, the material was probably overmature when collected. We have therefore selected a collection on wood of a *Betula* in Sweden (UPS) with abundant basidiomes in excellent condition.

Synonymy

Stilbum vulgare Tode: Fr., *Syst. Mycol.* 3: 305. 1829.

Stilbum vulgare Tode, *Fungi Mecklenburgensis* 1: 10. 1790.

Botryonipha vulgaris (Tode) O. Kuntze, *Rev. Gen. Pl.* 2: 845. 1891.

Stilbella vulgaris (Tode) Ferraris, *Fl. ital. crypt.* 1: Fasc. 6: 139. 1910.

Stilbum byssinum Pers., *Syn. meth. fung.* p. 683. 1881.

Stilbum byssinum Pers.: Fr., *Syst. Mycol.* 3: 304. 1832.

Botryonipha byssina (Pers.) O. Kuntze, *Rev. Gen. Pl.* 2: 845. 1891.

Stilbella byssina (Pers.) Lindau, *Rabenhorst's Kryptogamenflora Pilze* 9: 301. 1910.

Stilbum trichopodum E. Nylander, apud W. Nyl. & A. T. Saelan, *Herb. Musei Fennici, Helsinki*, p. 112. 1859.

Description of Neotype Specimen:

Basidiomes (Fig. 1A) synnema-like, crowded, the stipe unbranched or with 2-4 branches near its midpoint, stipes 20-60 μm wide, straw colored, translucent, smooth, glassy when dry, cylindrical. Capitulum opaque, white when dry, milky when soaked, 50-150 μm wide. Basidia (Fig. 1B, C, D) 7-22 μm long, with a single transverse septum, clavate and 4-5 μm in diam. at the widest point, 1.5-2 μm wide at the base; sterigmata 2, up to 3 μm long, 0.5-1 μm wide, the lower one tending to be longer and narrower. Basidiospores (Fig. 1E) 6.5-9 x 4-6 μm, subglobose to ellipsoidal with smooth walls up to 1 μm thick.

EUROPE: *Sweden*, Uppland, Bondkyrka Parish, s:n Vårdsätra, leg. S. Lundell, on wood of *Betula* sp., 19 Jan. 1934 (UPS). Neotype (here designated).

Habitat: Angiosperm wood, recorded on *Betula*, *Populus* and *Tilia* spp. in northern Europe, on bark in Massachusetts, on mushroom basidiocarps in New York State and Québec, on weathered inflorescences of *Yucca brevifolia* Engelm. in California and Nevada, and on dead inflorescence branches of *Archontophoenix cunnighamiana* Wendl. et Drude in Australia.

Distribution: Europe (Finland, Germany, Russia, Sweden), Australia (New South Wales), North America (California, Nevada, New York, Québec).

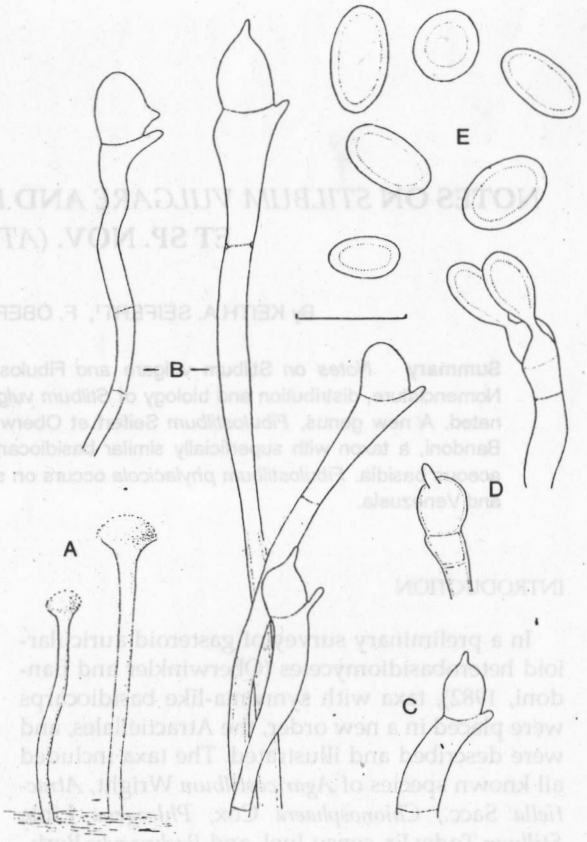

Fig. 1.-- *Stilbum vulgare* (from the Neotype). A, Habit sketch of two basidiocarps (not to scale). B, mature basidia; C, D, fertile cells, the latter with sterigmata bearing mature basidiospores. E, mature basidiospores. (All figures del. K. A. S.; Bar for B - E = 10 μm).

Collections examined

EUROPE: *Stilbum byssinum* Pers., holotype, "Fries in herb. Pers." (L910. 294-634). *Stilbum pellucidum* (sic), *Finland*, Aboe, Runsala, on wood of *Tilia* sp., 5 May 1861, herb. P. A. Karsten 2479 (H); *Stilbum trichopodum*, holotype, *Finland*, Karelia Australis, Hogland, E. Nylander, 1851 (H). *Stilbum vulgare. Sweden*, Uppsala, leg. C. Juel, "på murken bark", 1897 (UPS); Uppland, Bondkyrka Parish, Noşten, S. of Läbyvad, leg. S. Lundell, on wood of *Populus* sp., 30 April 1934 (UPS). *Germany*, Hieme, Hallgarten, on wood of *Betula* sp., Fuckel's Fungi Rhenani 2302 (L. herb. Oudemans, M, NY, UPS).

AUSTRALIA: *New South Wales*, Wauchope District, Wilson River Reserve, alt. 250 m, 18 Aug. 1981, on dead inflorescence parts of *Archontophoenix cunninghamiana*, F. Oberwinkler 32291; same locality, margin of Wilson River Reserve, on attached inflorescence on standing *Archontophoenix cunninghamiana*, 19 Aug. 1981, R. J. Bandoni 6852-B-1 (DAOM, UBC).

CANADA: Québec, Gatineau Park, Black Lake Trail, on old basidiocarp of a *Lactarius* sp., 19 July 1987, leg. K. A. Seifert.

UNITED STATES: *Stilbum gelatinosum* (sic), Massachusetts, Salem, Syn. 2714, herb. Schw. (PH). New York, Delaware County, Oneonta Vleit, 22 Sept. 1963, leg. C. T. Rogerson (NY). California, Los Angeles County, 10 mi. E of Gorman, on weathered inflorescence of *Yucca brevifolia*, 2 Mar. 1989, A.-A. & R. J. Bandoni #8197-C (DAOM, UBC). Nevada: Esmeralda County, about 10 mi. S of Goldfield, on weathered inflorescence parts of *Yucca brevifolia*, 1 Oct. 1989, A.-A. & R. J. Bandoni 8718-B (DAOM, UBC).

Obs. Oberwinkler and Bandoni (1982) reported a single collection of this species from North America (C. T. Rogerson, NY), but they had reservations concerning the identity. We have now seen additional material from North America on old basidiomes of *Lactarius* sp. (DAOM), on bark, and on weathered inflorescences of *Yucca brevifolia* (UBC and DAOM). Although there are differences among collections from different continents and different substrates, particularly in the dimensions of the basidiomes, we have found no characteristics that would warrant seggregation of several taxa at this time.

Collections from Nevada, California, and Australia were cultivated, yielding yeast type haploid phases. In a subculture form the Nevada collection that became contaminated by a *Cladosporium* sp., hyphae developed from the *Stilbum* colonies and bore haustoria that penetrated hyphae of the contaminant. Basidiocarps were produced in the vicinity of the interface between the two colonies (RJB, personal obs.), suggesting that *Stilbum vulgare* is mycoparasitic. Growth on agaric basidiomes also suggests possible mycoparasitism.

Fibulostilbum Seifert et Oberwinkler *gen. nov.*

Genus Heterobasidiomycetum carposomatibus stilboideis, hyphis fibulatis, basidiis aseptatis Chionosphaera similis. Basidiosporae hyalinae, tunicis levibus, aseptatae, per repetitionem vel (?) hyphibus germinant.

Species typica: F. phylacicola Seifert et Bandoni.

Etym.: Fibula = clamp connection; *stilbum*, stilbum-like.

Basidiomes synnema-like, the stalk composed of clamped hyphae. Basidia *Chionosphaera*-like, clavate, aseptate, bearing 4-8 terminal spores. Basidiospores hyaline, smooth walled, aseptate, inamyloid, germinating by a repetitive process or (?) by a hypha.

Fibulostilbum is characterized by clamped hyphae, *Chionosphaera*-like basidia with 4-8 terminal spores, and basidiospores that germinate by a repetitive process. It is unknown whether repetitive germination involves abstriction or whether the secondary spores are passively released.

Fibulostilbum phylacicola Seifert et Bandoni *sp. nov.*

Fructificatio minuta, stilboidea, 0.75-2.2 mm longa, ex hyphis nodulosi-septatis, distinctis et hyalinis composita, in superficie stromatorum Phylaciae poculiforme crescit. Capitulum hemisphaericum ad globosum, 75-240 µm in diam. Cystidia et hyphidia desunt. Basidia clavata, 21-40 x 3.5-5 (-8) µm, mature non septata, sterigmatibus brevibus. Basidiosporae hyalinae, inamyloideae, ellipsoideae, 5-8 (-9) x 2-5 µm, tunicis levibus, in apicem basidii natae sunt; sterigmatibus curvatis conidia secundaria producunt.

VENEZUELA. Amazonas, Neblina Base Camp on Rio Baria, alt. 140 m, leg. Amy Rossman nº 2198, 21 Feb. 1985, on *P. poculiformis*. (*Holotypus* VEN, *Isotypus* BPI 1104665).

Basidiomes (Fig. 2A) gregarious or scattered on host stroma, sometimes giving the latter a hirsute appearance, 0.75-2,2 mm tall, slender, the stipe white or strawcolored, sometimes darker brown at the base, smooth, translucent when dry, 60-150 µm wide at the base, tapering to 25-100 µm, then expanding up to 90 µm below the capitulum. Hyphae of stipe (Fig. 2D, E) 2.5-4.5 µm wide with thin to slightly thickened walls near the capitulum, 2.5-6 µm in diam., the walls up to 2.5 µm thick near the stipe base and the lumen then narrow, primary septa with clamps, secondary septa thin, lacking clamps. Capitulum hemispherical, globose or ellipsoidal, 75-240 µm diam., white, pallid, appearing frosty when dry, milky pellucid when moist. Hymenium (Fig. 2C) composed entirely of basidia, collapsed basidia, and fertile hyphae; fertile hyphae proliferating repeatedly, becoming step-like, resulting in compact clusters of 2-3 mature or maturing basidia and walls of numerous spent basidia. Basidia (Fig. 3A, B, D) 21-40 µm long., 3.5-5 (-8) µm wide at the widest point, 1.5-3 µm wide at base, aseptate, clavate, with 4-8 sterigmata; sterigmata under 1 µm long., becoming occluded after spore release, the basidia then collapsing. Basidiospores (Fig. 3C) 5-8 (-9) x 2-5 µm, ellipsoidal to ovoid, sometimes slightly curved or flattened on one side, hyaline, inamyloid, thin walled, attachment point conspicuous or inconspicuous; germination by budding or by repetition.

Habitat: Growing on stromata of *Phylacia poculiformis* (Mont.) Mont.

Type locality: Venezuela, Amazonas.

Distribution: Neotropical (Brazil, Colombia, Venezuela).

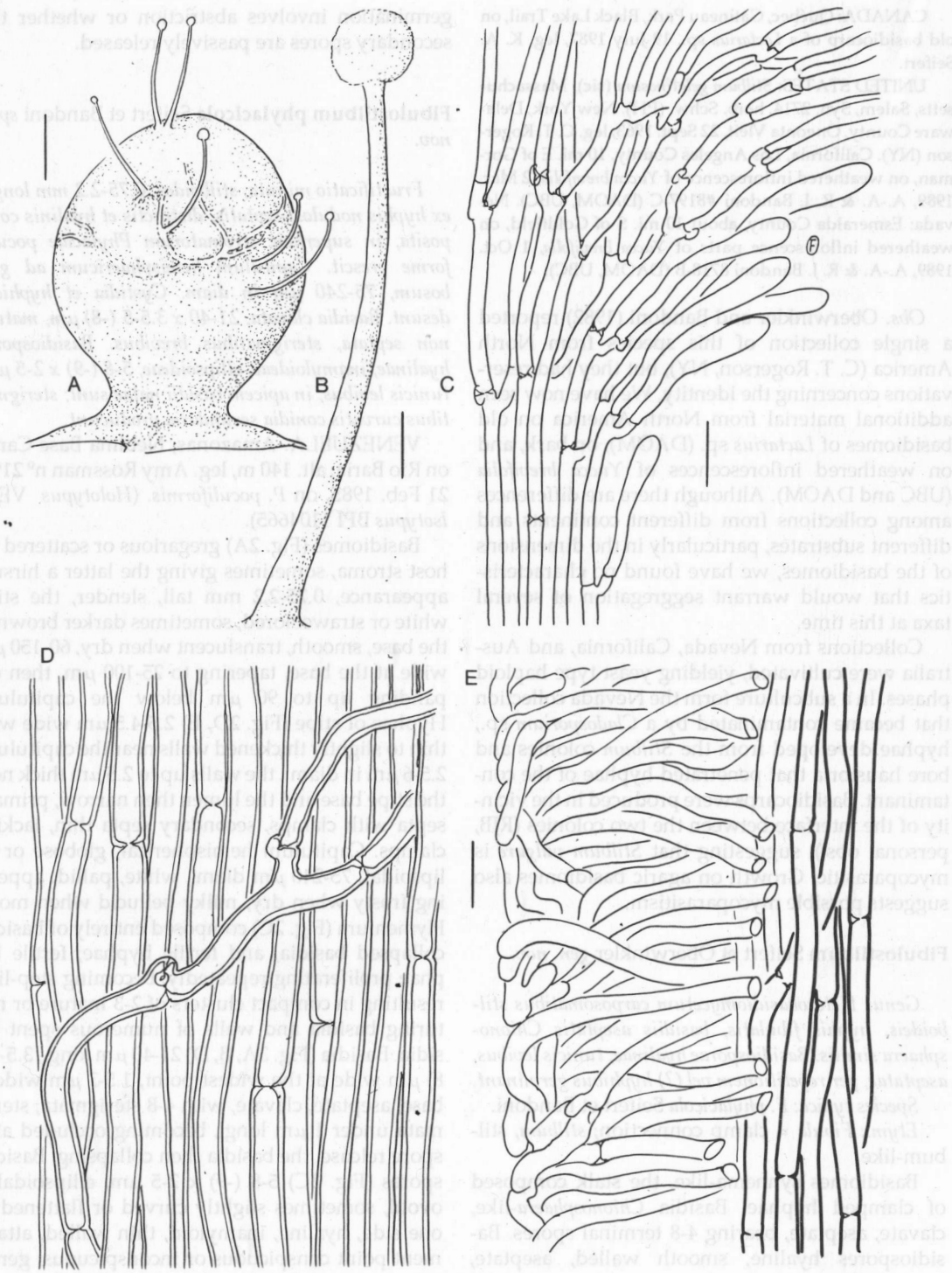

Fig. 2.-- *Fibulostilbum phylacicola* (from AR 2219, VEN). A, habit sketch of basidiomes on stroma of *Phylacia poculiformis*. B, Single basidiome, enlarged. C, hymenial structure with fertile hyphae and young basidia. D, hyphal arrangement of stipe surface; note clamp connections. E, section through stipe showing distinct interior structure. (Fig. 2 del. F. Oberwinkler. Bar in A = 1 mm; bar in B = 200 μm, bars in C, D = 10 μm).

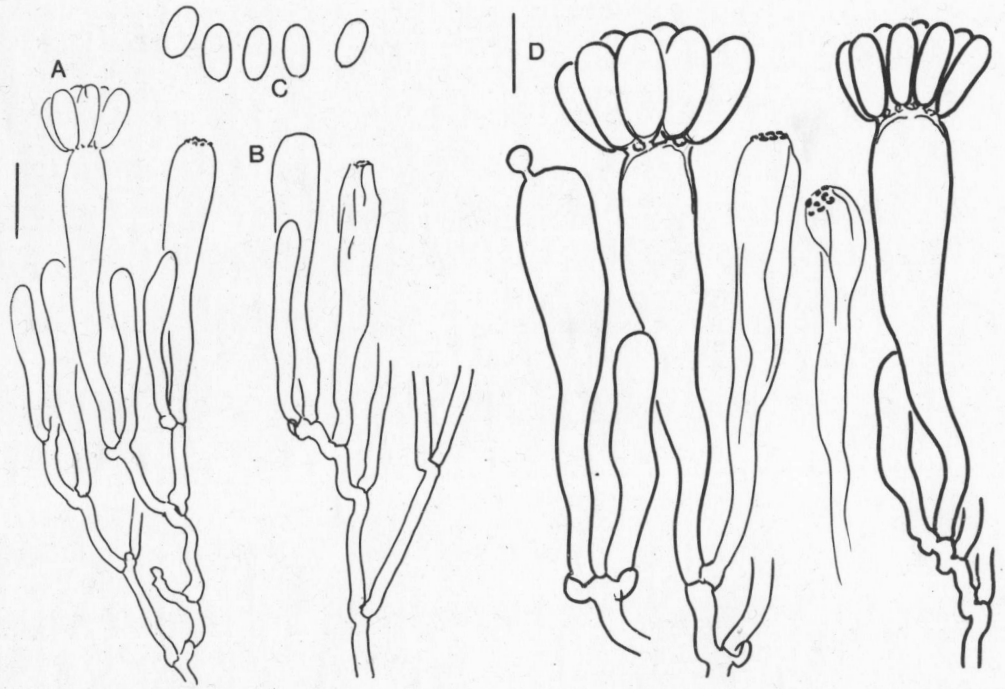

Fig. 3.-- *Fibulostilbum phylacicola* (from AR 2219, VEN). A, B, basidia in different stages of development, one with attached basidiospores. C, basidiospores. D, mature basidia, spent basidia, and fertile hyphae; note steplike appearance of older fertile hyphae on far right. (Fig. 3 del. Oberwinkler. Bars = 10 μm in Fig. A, 5 μm in Fig. B).

Specimens examined

All on *P. poculiformis*.

VENEZUELA: Amazonas, Neblina Base Camp on Rio Baria alt. 140 m, leg. Amy Rossman nº 2219, 23 Feb. 1985 (BPI 1104664). Amazonas, along Rio Mawarinuma outside Canon Grande, leg. G. J. Samuels nº 1151, Apr. May 1984 (NY, VEN).

BRAZIL: Amazonas, Serra Araca, leg. G. J. Samuels nº 579, 28 Feb. 1984 (NY, VEN); Territoria federal de Roraima, base of west slope of Serra Araca, leg. G. J. Samuels nº 587, 29 Feb. 1984 (NY, VEN).

COLOMBIA: Dpto. Boyacá, vicinity of km post 165 on Chocontá-Aguaclara Rd., leg. K. P. Dumont et al. CO4822, 11 June 1976 (NY).

Obs. Fibulostilbum phylacicola is distinguished from *Chionosphaera apobasidialis* Cox by the presence of clamp connections, by the unusual repetitive basidiospore germination, and by habit and size. Repetitive spore germination has not previously been reported in the Atractiellales; further study is necessary to determine whether the secondary spores are ballistospores or are passively released. Clampless hyphae bearing ellipsoid to falcate conidia, 8-20 x 4-7 μm were found in one collection, but their interpretation remains uncertain. Basidiocarps of *F. phylacicola* are taller than those of *Stilbum vulgare*, but resemble them closely in external appearance.

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Gary Samuels and Amy Rossman provided the collections of *F. phylacicola*, and Scott Redhead identified the host of the Québec collection of *Stilbum vulgare*. The curators of the following herbaria loaned specimens for this study: BPI, DAOM, H, L, M, NY, PH, U, UPS, VEN and W. Portions of the study were supported by a grant (NRC A 801) to RJB from the Natural Science and Engineering Research Council of Canada.

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