

STUDIES IN LIGNICOLOUS ASCOMYCETES: XYLOPEZIA AND MYCOWINTERIA

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Sherwood-Pike, Martha (Geology Department, University of Oregon, Eugene, OR 97403) and Jean Boise (New York Botanical Garden, Bronx, NY 10458-5126). Studies in lignicolous ascomycetes: *Xylopezia* and *Mycowinteria*. *Brittonia* 38: 35–44. 1986.—A number of ascomycetes formerly named in *Odontotrema* (Ostropales) and the illegitimate *Winteria* (Rehm) Sacc. are redispersed in *Xylopezia* and *Mycowinteria* (a new name for *Winteria*). New combinations are introduced for ***Mycowinteria anodonta*** (= *Winteria lichenoides*), ***Xylopezia hemisphaerica*** (= *Odontotrema hemisphaericum*), ***Xylopezia excellens*** (= *Winteria excellens*), and ***Xylopezia inclusa*** (= *Odontotrema subintegrum*). *Xylopezia bisepitata* is described as new. *Xylopezia* and *Mycowinteria* are each isolated taxonomically and their affinities at the family level are obscure.

A curious feature of “excluded species” is the frequency with which the same residue of species will appear as exclusions from quite unrelated genera. A number of ascomycetes formerly named in *Odontotrema* Nyl. and the illegitimate *Winteria* (Rehm) Sacc. were encountered by us, coincidentally, during the course of a revision of *Odontotrema* (Ostropales: Odontotremataceae) by Sherwood-Pike (see Hawksworth & Sherwood, 1983) and during studies on *Trematosphaeria* Fuckel (Melanommatales: Melanommataceae) by Boise (1984). Independently we had excluded these species from the genera under study and reconsidered their taxonomic placement; this paper synthesizes our findings.

The species in question occur on dry, weathered wood and are most abundant in boreal and alpine areas. They produce small ascomata that are pyrenocarpous and immersed to erumpent from the substrate, characters stressed by nineteenth century workers in the taxonomy of *Trematosphaeria*, but the ascomata develop further to open by a broad pore, producing more discoid ascomata with the aspect of an *Odontotrema* or other members of the Ostropales. All have an anomalous ascus structure that does not correspond to either a classic unitunicate or bitunicate type. We refer these species to *Mycowinteria* Sherw. and *Xylopezia* v. Höhnel.

In *Mycowinteria* the asci are relatively thick-walled, have a thickened apex, blue diffusely in iodine, and have a broad I+ blue apical ring; they do not seem to be functionally bitunicate. The sparse, branched paraphyses have free ends, suggesting that development is ascohyemial. The one accepted species, *M. anodonta* (Nyl.) Sherw. & Boise, sometimes grows in association with algae but does not form even a rudimentary thallus. This combination of characters does not correspond to any well-characterized family of the Ascomycota, suggesting either that *Mycowinteria* is very isolated taxonomically, or that one of the characters regarded by taxonomists as fundamental to the classification of the Ascomycota has become modified beyond recognition from the ancestral form, obscuring the relationships of *Mycowinteria*.

In *Xylopezia* the asci are thick-walled, I–, not functionally bitunicate and lack an obvious apical apparatus. The interthecial filaments anastomose at the apex, suggesting ascolocular development. The genus can most plausibly be interpreted as a loculoascomycete that has secondarily lost its bitunicate ascus discharge mechanism. Its affinities at the family level are obscure.

The two genera are here distinguished on the basis of ascospores (transversely

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septate in *Xylopezia*; muriform in *Mycowinteria*) and on the reaction of the asci in iodine (I– in *Xylopezia*; I+ blue with a broad I+ blue pore in *Mycowinteria*). *Mycowinteria anodonta*, *Xylopezia biseptata* Sherw., and an undescribed *Xylopezia* (see discussion under *X. biseptata*) have green pigments in the ascoma wall.

***Mycowinteria* Sherw., nom. nov.**

Trematosphaeria subgen. *Winteria* Rehm, Ber. Naturhist. Vereins Augsburg 26: 72. 1881.

Winteria (Rehm) Sacc., Syll. Fungorum 2: 225. 1883; non *Winteria* Sacc., Michelia 1: 281. 1878.

Lectotype: *Winteria lichenoides* (Rehm ex Sacc.) Sacc. (v. Höhnel, 1909).

Ascomata small, scattered, circular or oblong in outline, immersed, raising the overlying substrate into pustules and eventually becoming partially erumpent, greenish-black, opening at maturity by a broad pore to expose the scarcely sunken hymenium. Margin composed of interwoven hyphae widely spaced in a greenish gelatinous matrix, not carbonized. Paraphyses simple to sparingly branched, sometimes anastomosing, septate, not forming a pigmented epithecium. Hymenial gel I+ blue. Asci cylindrical, thick-walled when young, not demonstrably functionally bitunicate, I+ diffusely blue in the region of the apex with a broad I+ apical ring, 4–8-spored. Ascospores euseptate, muriform.

On weathered wood, sometimes associated with protococcoid algae but not forming a definite lichen thallus; Europe and North America.

Winteria lichenoides, a relatively common European fungus that occurs on conifer wood at high elevations, has a confusing taxonomic and nomenclatural history. The generic name *Winteria* (Rehm) Sacc. is illegitimate, being predated by *Winteria* Sacc., an obligate synonym of *Selinia* Karst. *Winteria* (Rehm) Sacc. was proposed for conservation by Hawksworth and Sherwood (1981), but was rejected. There is no other currently available name for a genus typified by *Winteria lichenoides*.

A number of authors (von Arx & Müller, 1975; Holm & Holm, 1977; Riedl, 1971) have suggested that *Winteria lichenoides* was allied to or possibly synonymous with *Mycoglaena* v. Höhnel. Species of *Mycoglaena* occur on smooth bark of living trees and have indubitable bitunicate asci. The genus has been assigned by Barr (1979) to the Micropeltidaceae in the Pleosporales. It is unlikely that *W. lichenoides* is closely related to *Mycoglaena* despite similarities in pigmentation and ascospore type.

Winteria lichenoides could conceivably be accommodated in *Protothelenella* Rasanen (= *Gloeopyrenia* Zschacke, nom. inval.) a genus of pyrenocarpous lichens formerly included in *Microglæna* Körber having *Gloeocapsa* Kuetzing as phyco-biont and occurring on soil and mosses (Keissler, 1930–1938). Its asci and hymenial gel are diffusely I+ blue. The type species, *Mycoglaena reducta* Th. M. Fr., is unknown to us, but the published descriptions suggest that it is not congeneric with *W. lichenoides*. In most, if not all, of the cases that have been critically examined, nonlichenized and dubiously lichenized ascomycetes occurring on dry wood have been found to be quite distinct at the generic level from lichenized fungi growing on other substrates.

As presently circumscribed, *Mycowinteria* is monotypic. One of us (MS-P) has collected fragmentary material (on *Salix*, milepost 4 on Road 330, S of Paisley, Lake Co., Oregon, 9 Jan 1984, OSC) of a similar green-pigmented muriform-spored ascomycete in eastern Oregon; it has I– asci and I– hymenial gel. The same area also yielded two green-pigmented species with transversely septate spores, discussed under *Xylopezia* below. In all probability, more intensive collecting in dry coniferous forests at high elevations, especially in the mycologically poorly known areas outside of Europe, would uncover additional species of *Xy-*

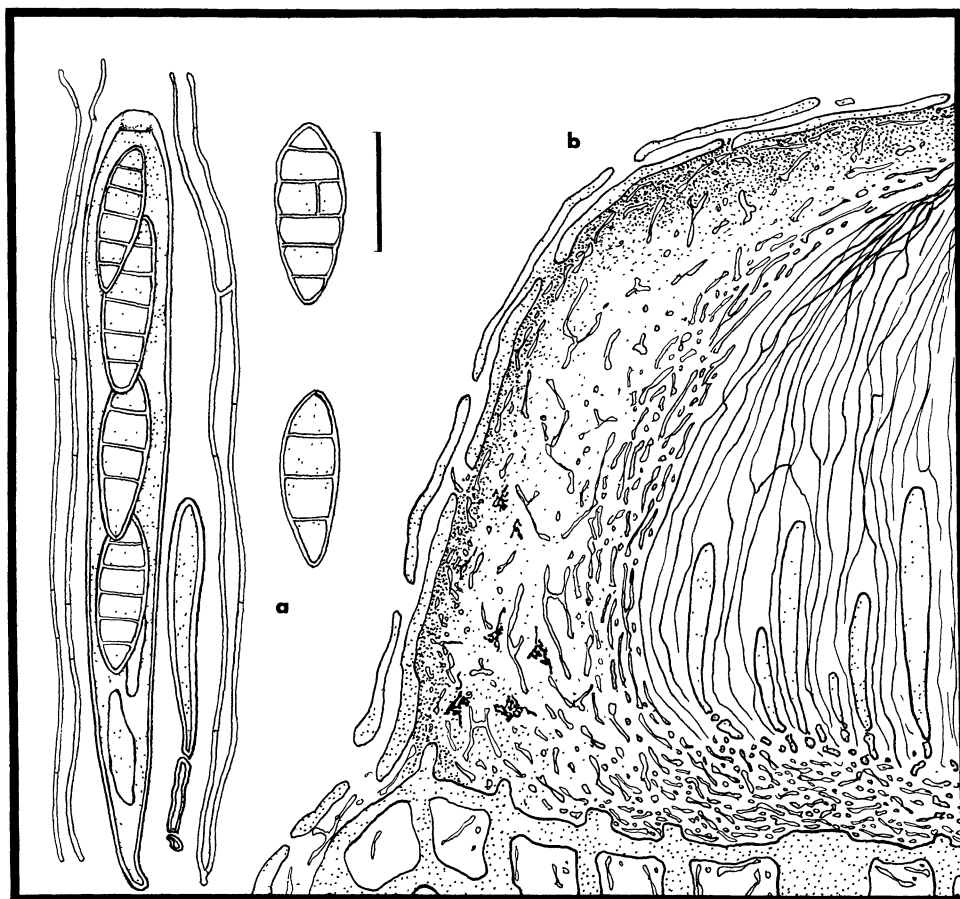


FIG. 1. *Mycowinteria anodonta*. A. Asci, ascospores, and paraphyses. Bar = 10 μ m. B. Cross-section of margin. Bar = 25 μ m.

lopezia and *Mycowinteria*, which would help to clarify the circumscription and relationships of these two problematical genera.

1. *Mycowinteria anodonta* (Nyl.) Sherw. & Boise, comb. nov. (Fig. 1)

Odontotrema anodontum Nyl., Flora 52: 411. 1869. TYPE: FINLAND. Lapponia enontekiensis, Enontekie, Kilpisjarvi, J. P. Norrlin 1867 (HOLOTYPE: H-NYL 4406!; ISOTYPE: H!).

Trematosphaeria lichenoides Rehm, Ascomyceten 285. 1875. nom. nud.

Zignoella lichenoides Rehm ex Sacc., Michelia 1: 347. 1878. *Trematosphaeria* (subg. *Winteria*) *lichenoides* (Rehm ex Sacc.) Rehm, Ber. Naturhist. Vereins Augsburg 26: 72. 1881. *Winteria lichenoides* (Rehm ex Sacc.) Sacc., Syll. Fungorum 2: 225. 1883. *Mycoglaena lichenoides* (Rehm ex Sacc.) Riedl, Oesterr. Bot. Z. 119: 61. 1971. TYPE: GERMANY. Tyrol: Längenthal near Kühteil, 6300 ft, on *Pinus cembra*, Aug 1874, Rehm, *Ascom.* 285 (ISOTYPE: NY!).

Ascomata scattered on bleached patches of decorticate conifer wood, at first immersed, raising the overlying substrate in small pustules, circular or slightly elongate, 0.3–0.6 mm diam, greenish-black, remaining closed for a long time, finally opening by a broad nondentate pore to expose the scarcely sunken hymenium. Margin in cross-section ca 40 μ m thick, of loosely interwoven and branched hyphae 1.5 μ m diam widely spaced in a gel tinged with dark-green pigment, not carbonaceous. Periphysoids absent. Interthelial filaments numerous,

less than 1 μm diam. Subhymenium colorless, ca 20 μm thick, of tightly-packed hyphae 1.5 μm diam, resting directly on the substrate. Asci 70–90 \times 10–15 μm , initially 8-spored but usually ascospores abort to leave 4 or 6 mature spores. Ascospores uniseriate, oblong with a slightly tapered base, hyaline 3–5-septate transversely, with one incomplete longitudinal septum, 14.5–18 \times 6–8 μm .

Additional material examined: SWEDEN. Lule Lappmark, on decorticate twigs of fallen *Picea*, 21 Jun 1977, *Coppins & Tibell* (E).

Mycowinteria anodonta may have algal cells associated with its ascomata and has been considered to be a lichen by some authors. This same type of loose association with green algae is found in a number of other wood-inhabiting ascomycetes not normally classified as lichens, including some species of *Orbilina* Fr. and *Odontotrema*. It may be biologically significant in terms of the nutrition of these fungi, but it would be impractical to attempt to document such associations on a large scale and use them as a major taxonomic criterion.

XYLOPEZIA v. Höhnel

Xylopezia v. Höhnel, Ann. Mycol. 15: 308. 1917. TYPE: *Stictis hemisphaerica* Fr.

Ascomata lignicolous, dark colored, raising the overlying substrate into pustules but not becoming erumpent, the hymenium exposed by erosion of the overlying host and fungus tissue to form a broad circular pore. Margin of densely-packed, dark hyphal textura intricata, sometimes carbonized externally. Interthecial filaments (pseudoparaphyses) numerous, filiform, septate, branched, and anastomosing above to form an epithecium. Hymenial gel I–. Asci thick-walled, cylindrical, I–, without a distinct apical pore or ring, not functionally bitunicate, 8-spored. Ascospores colorless, transversely septate.

On weathered wood in temperate and boreal localities, widespread. The four species described below appear to be distinct, although there is some overlap in the characters used to differentiate them.

The superficial similarities between *Odontotrema* and *Xylopezia* have long been a source of confusion to mycologists. Both genera produce orbicular, black, immersed ascomata on decorticated wood, open by a pore, and have transversely septate colorless spores. Von Höhnel (1917) was the first to separate the two genera; however, his reasons for removing *O. hemisphaericum* (Fr. : Fr.) Rehm from *Odontotrema* are not entirely clear. Because he considered *Xylopezia* to belong to the Phacidiales, together with *Colpoma* Wallr. and *Therrya* Sacc., he may have considered the principal diagnostic character of the genus to be the stromatized covering layer, which contrasts with the more excipuloid margin of *Odontotrema*. He pointed out that the related species *O. subintegrum* Nyl. resembled *Winteria*. The genera have also been separated on the grounds that *Xylopezia* lacks the I+ blue hymenial gel found in most species of *Odontotrema*.

The classification of *Xylopezia* poses a problem because the developmental sequence, though never critically studied, appears to be ascolocular, but the asci do not look functionally bitunicate. The similarity of *Xylopezia* to *Odontotrema* lies entirely in secondary characters of pigmentation, spore septation and growth habit, and is probably the result of convergent evolution. We are inclined to think that the true taxonomic position of *Xylopezia* lies with the Loculoascomycetes rather than the Ostropales, and that the asci have secondarily lost their bitunicate discharge mechanism. A substantial proportion of the ascomycetes that occur on weathered wood have an anomalous ascus structure. This phenomenon, and possible explanations, are discussed in a separate paper (Sherwood, 1981).

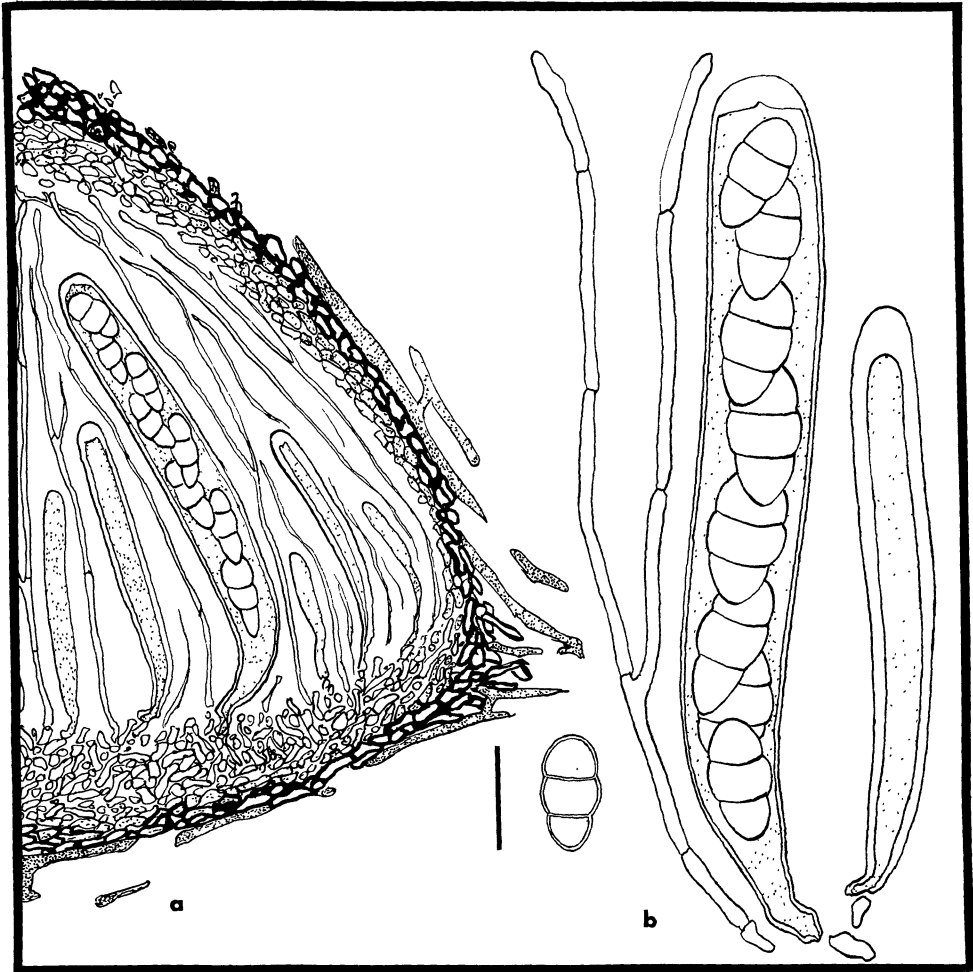


FIG. 2. *Xylopezia biseptata*. A. Cross-section of margin. Bar = 15 μ m. B. Asci, ascospores, and paraphyses. Bar = 10 μ m.

Key to species of *Xylopezia*

- | | |
|---|----------------------------|
| 1 Ascospores normally 2-septate | 1. <i>X. biseptata</i> |
| 1 Ascospores 3-5-septate. | |
| 2 Ascospores 9-12 \times 4-5 μ m; on conifer wood | 2. <i>X. excellens</i> |
| 2 Ascospores over 13 μ m long. | |
| 3 Ascomata black, 0.3-1.2 mm diam; ascospores 15-25 \times 5-7 μ m; chiefly on wood of conifers | 3. <i>X. hemisphaerica</i> |
| 3 Ascomata dark brown, 0.1-0.4 mm diam; ascospores 13-17 \times 4-6 μ m; chiefly on angiosperms | 4. <i>X. inclusa</i> |

1. *Xylopezia biseptata* Sherw., sp. nov. (Fig. 2)

Apothecia solitaria, primitus clausa et immersa, dein erumpentia, poro lato irregulare dehiscencia, orbicularia, viridi-atra, latit 0.2-0.6 mm. Margo extus carbonaceo. Periphysioidea nulla. Pseudoparaphyses filiformes, septatae, simplices vel ramosae, 1.5 μ m diam, in iodo non caerulescentes. Asci cylindrici, primo crassitunicati, breviter stipitati, apice ad 3.5 μ m incrassati, 75-90 \times 8-10 μ m, in iodo non caerulescentes, 8-sporei. Sporae oblongatae, hyalinae, biseptatae, 12-14 \times 5-7 μ m. In ligno decorticato *Juniperi* et *Chrysothamni*.

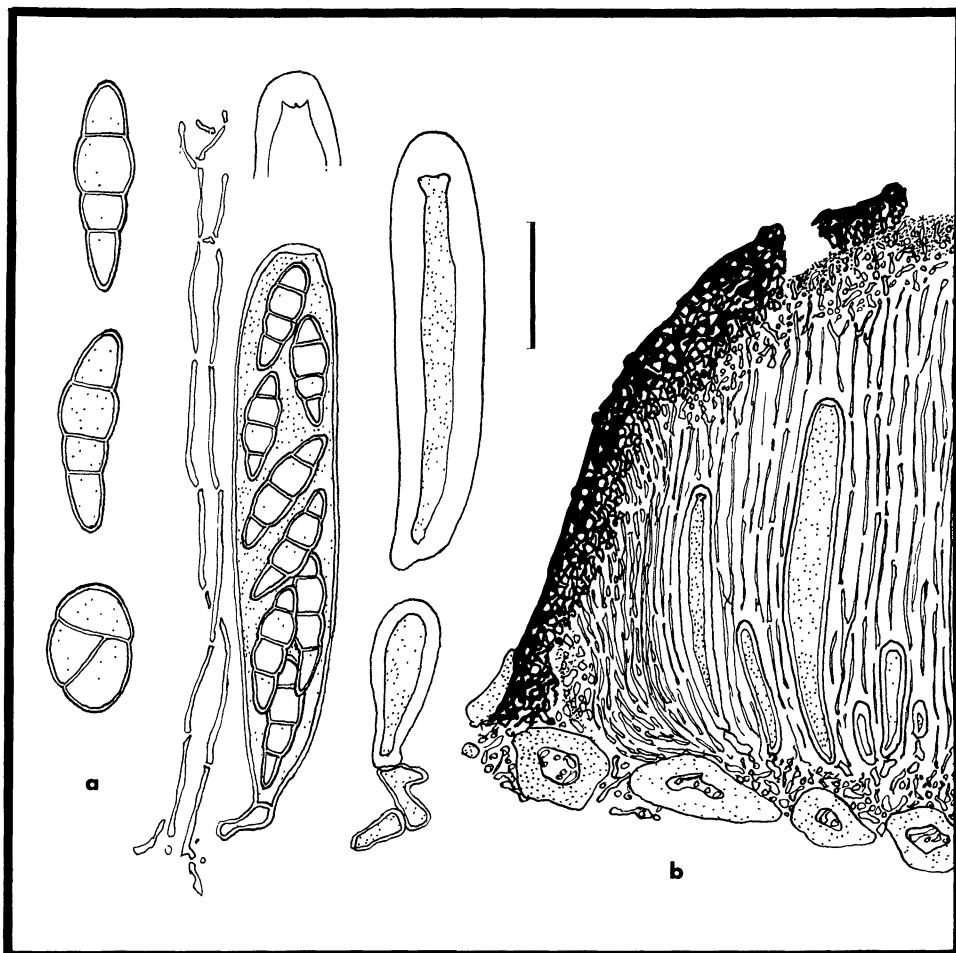


FIG. 3. *Xylopezia hemisphaerica*. A. Scapi, ascospores, and paraphyses. Bar = 10 μm . B. Cross-section of margin. Bar = 33 μm .

Ascomata greenish-black, the surrounding wood bleached but not stained green, 0.2–0.6 mm diam. Margin in cross-section 25–30 μm thick, of dark greenish-brown hyphae 2 μm diam with long axes parallel to the surface, externally with much included amorphous matter, noncarbonized. Subhymenium colorless, 15 μm thick, resting on a thin layer of dark greenish-brown fungal tissue resembling the margin. Pseudoparaphyses sparse, 1.5 μm diam, few septate, simple or sparingly branched, with free apices. Hymenial gel I–. Scapi cylindrical, thick-walled when young, the apical cap ca 3 μm thick at maturity, with a median indentation, 75–90 \times 8–10 μm , 8-spored. Ascospores uniseriate, hyaline, 2-septate, constricted at the septa, 12–14 \times 5–7 μm , I–.

On dry, decorticate wood of *Juniperus* and *Chrysothamnus*, eastern Oregon, U.S.A. The type locality is cold, high-elevation sagebrush desert with scattered juniper trees.

TYPE: UNITED STATES. OREGON: Lake Co., Picture Rock Pass, 4830 ft, on *Juniperus occidentalis*, 9 Jun 1984, M. Sherwood-Pike (HOLOTYPE: BPI!; ISOTYPE: IMI 288168!).

Additional specimen seen: UNITED STATES. OREGON: Lake Co., Picture Rock Pass, on *Chrysothamnus nauseosus*, 9 Jun 1984, *Sherwood-Pike* (BPI).

It is possible that an earlier name for this distinctive species exists in an inappropriate pyrenomycete genus. Because the tiny greenish black ascomata are extremely inconspicuous and the fungus occurs in an area where little mycological collecting has been done, it seems more probable that the species is genuinely new.

The ascus structure, absence of hymenial iodine reactions, and transversely septate spores would all place *X. biseptata* in *Xylopezia* rather than in *Mycowinteria*; its pigmentation, however, is that of *Mycowinteria*. There is also fragmentary material (on desert shrub, milepost 4 on road 330, S of Paisley, Lake Co., Oregon, 9 Jun 1984, OSC) of a similar fungus with the ascus structure of *Xylopezia* and the pigmentation of *Mycowinteria*; it has 1-septate spores. Clearly more extensive collecting of xylopezioid ascomycetes in xeric coniferous forests would be desirable in order to clarify their relationships.

2. *Xylopezia excellens* (Rehm ex Sacc.) Boise, comb. nov.

Zignoella excellens Rehm ex Sacc., *Michelia* 1: 347. 1878. *Trematosphaeria* (subg. *Winteria*) *excellens* (Rehm ex Sacc.) Rehm, *Ber. Naturhist. Vereins Augsburg* 26: 72. 1881. *Winteria excellens* (Rehm ex Sacc.) Sacc., *Syll. Fungorum* 2: 225. 1883. SYNTYPES: GERMANY. Bavaria: Schachen near Partenkirchen, 4500 ft, on decorticate conifer wood, Aug 1874, *Arnold* (Rehm, *Ascomyceten* 285-1) (ISOSYNTYPES: FH!, NY!). Tyrol: Längenthal near Kühthei, 6300 ft, on *Pinus cembra*, Aug 1874, *Rehm Ascomyceten* 285-2 (ISOSYNTYPES: FH!, NY!).

Ascomata immersed to erumpent, sphaeroid-apothecioid, oblong in outline, ca 0.5×0.3 mm, without a blackened basal layer. Pseudoparaphyses sparsely branched, $2 \mu\text{m}$ wide. Asci cylindrical-clavate, up to $47 \times 10 \mu\text{m}$, apex thickened and staining diffuse blue in IKI. Ascospores ellipsoid-obovoid, 1-(2-)3-septate, hyaline, $9-12 \times 4-5 \mu\text{m}$.

On weathered, decorticate conifer wood in Bavaria and Tyrol.

Xylopezia excellens has commonly been cited as a synonym of *X. hemisphaerica* (Shear, 1942 and references therein). However, the specimens used in those studies were probably misidentified. There is a discrepancy in ascospore size between published reports for *X. hemisphaerica* and the measurements of the specimen in Fries's herbarium (Sherwood, 1977). The spores of *X. hemisphaerica* are twice as large as those of *X. excellens*.

3. *Xylopezia hemisphaerica* (Fr. : Fr.) Sherw., comb. nov. (Fig. 3)

Stictis hemisphaerica Fr. : Fr., *Syst. Mycol.* 2: 196. 1823. *Xylographa hemisphaerica* (Fr. : Fr.) Fuckel, *Jahrb. Nassauischen Vereins Naturk.* 29/30: 27. 1876. *Odontotrema hemisphaericum* (Fr. : Fr.) Rehm, in *Rabenh. Krypt.-Fl.* 2, 1(3): 205. 1888. TYPE: Herb. Fries, sine coll. (presumed HOLOTYPE: UPS!).

Odontotrema firmatum Nyl., *Flora* 64: 188. 1881. TYPE: GREAT BRITAIN. SCOTLAND: Ben Lawers, 1878, *Crombie* (ISOTYPE: K!).

Odontotrema subintegrum var. *macrosporum* Vain., *Acta Soc. Fauna Flora Fenn.* 2(6): 146. 1885.

Ascomata immersed, scattered on bleached, decorticate wood, black, orbicular to oblong in outline, 0.3-1.2 mm diam, opening by a broad circular nondentate pore. Covering layer ca $20 \mu\text{m}$ thick, heavily carbonized; subhymenium colorless, of small-celled pseudoparenchyma, resting directly on the underlying substrate. Pseudoparaphyses numerous, slender, forming a brown epithecium. Asci $60-80 \times 12-15 \mu\text{m}$, thick-walled when young, cylindrical, subsessile, I-, 8-spored. Ascospores obclavate, colorless, somewhat thick-walled, 3(5)-septate, constricted at the septa, $16-25 \times 5-6.5 \mu\text{m}$. Hymenial gel I-.

On dry decorticate wood, chiefly of conifers, especially at high elevations, Europe, Central Asia, and North America. In Oregon U.S.A., it is very common in clearcut areas.

Von Höhnel (1917) typified *Xylopezia* by *Stictis hemisphaerica* Fr. but did not make the combination in *Xylopezia*.

Additional specimens seen: (see also Sherwood, 1977). FINLAND: Tavastia borealis, Jyväskylä, Lang (H-NYL 4394); Kuusamo, Maati Laurila, 5 Jul 1937, *Räsänen*, *Lichenes Fenniae* 675 (H); Repola, Koroppi, *Wainio* (H). U.S.S.R.: Nurmes, Pysvaara, 1875, *Wainio* (H). GREAT BRITAIN. SCOTLAND: Eastness, Rothiemurchus Forest, 1 May 1980, *Sherwood & Coppins* (K); Black Wood of Rannoch, 29 Apr 1980, *Sherwood & Coppins* (K); Abernethy Forest, 30 Apr 1980, *Sherwood & Coppins* (K). PAKISTAN. Kaghan Valley, Sharhan, 26 Jul 1951, *Ahmad* 4773 (K). UNITED STATES: CALIFORNIA. On wood of *Abies concolor*, *Harkness* 3298 (K); Nevada Co.: Sagehen Cr., Boiler Sta., on cone scales of *Pinus lambertiana*, 5 Aug 1975 (K). OREGON. Lane Co.: Marcola, Oct 1983, *Sherwood-Pike* (OSC); McKenzie Bridge, on wood of *Vaccinium*, 18 Feb 1984, *M. & L. Pike* (OSC). Klamath Co.: on *Ceanothus velutinus*, Davis Lake Rd., 9 Jun 1984, *Sherwood-Pike* (IMI 288170). Lake Co.: on *Pinus ponderosa*, 9 Jun 1984, *Sherwood-Pike* (IMI 288169).

4. *Xylopezia inclusa* (Pers.) Sherw., comb. nov. (Fig. 4)

Peziza inclusa Pers., Myc. Eur. 1: 307. 1822. *Stictis inclusa* (Pers.) Fr., Summa Veg. Scand. 2: 373. 1849. *Patellaria inclusa* (Pers.) P. Karst., Myc. Fenn. 1: 236. 1871. *Pseudostictis inclusa* (Pers.) Lambotte, Fl. Myc. Belg. 261. 1880. *Odontotrema inclusum* (Pers.) P. Karst., Rev. 146. 1885. TYPE: n.v.

Odontotrema subintegrum Nyl., Flora 50: 372. 1876. TYPE: FINLAND. Tavastia: Teurois, 1866, *Norrlin* 367 (HOLOTYPE: H!).

Odontotrema majus Leight., Trans. Linn. Soc. London Bot., ser. 2, 1: 239. 1880. TYPE: GREAT BRITAIN. ENGLAND: Hencote, on *Salix*, *Phillips* (designated here as LECTOTYPE: K!).

Odontotrema inclusum subsp. *affine* Bomm., Rouss. & Sacc., Syll. Fungorum 10: 46. 1892. TYPE: FRANCE. Pois: St. Thibert, "sur bois de hêtre" (beech?), May 1890, *Bommer & Rousseau* 51 (PAD!).

Copromyxa xylophagum A. Massal., nom. in herb.

Odontotrema xylophagum C. Massal., Atti Mem. Accad. d'Agricoltura. Sci. Lett. Arti et Commercio di Verona, ser. 4, 3: 66. 1902. TYPE: ITALY. Zevio: on *Salix* (HOLOTYPE: VER!).

Odontotrema molle Velenovský, Monogr. Disc. Bohem. 57. 1934. TYPE: CZECHOSLOVAKIA. Mníchovice: Bíla Skála, on *Betula alba*, 22 Mar 1929, *Velenovský* (PRM!).

Ascomata immersed in bleached decorticate wood, orbicular in outline, the overlying substrate barely raised above the plane of the surrounding wood, 0.1–0.3 mm diam, dark brown, smooth, at first closed, opening by a circular or oblong pore to expose the pale hymenium. Margin uniform, continuous with the basal layer, ca 20 μm thick, composed throughout of interwoven hyphae 1–2 μm diam, tightly packed and not noticeably gelatinous, hyaline below, brown above but not carbonaceous. Epithecium colorless. Pseudoparaphyses slender, 1–1.5 μm diam, branched, septate, not numerous. Hymenial gel I–. Asci up to 60 \times 11 μm , cylindrical, nearly sessile, I–, thick-walled when young, the cap about 3 μm thick, without a definite pore, 8-spored. Ascospores biseriate, fusiform, colorless, 3–5-septate, constricted at the septa, the second cell from the top usually broadest, (11.5) 13–16 (17) \times 4–6 μm .

On decorticated wood, chiefly of angiosperms, apparently common throughout northern Europe. There is some intergradation of characters between *X. inclusa* and *X. hemisphaerica*; specimens which are rather lightly carbonized and have spores of an intermediate size do occur. However, most collections readily fit into one species or the other. The intermediates may represent *X. hemisphaerica* in which pigment production has somehow been inhibited.

In his description of *O. majus*, Leighton (1880, p. 239) alludes to several collections of the species as follows: "This I possess amongst the Arctic American lichens of Sir John Richardson; and now (Sept. 1876) it has occurred on drift

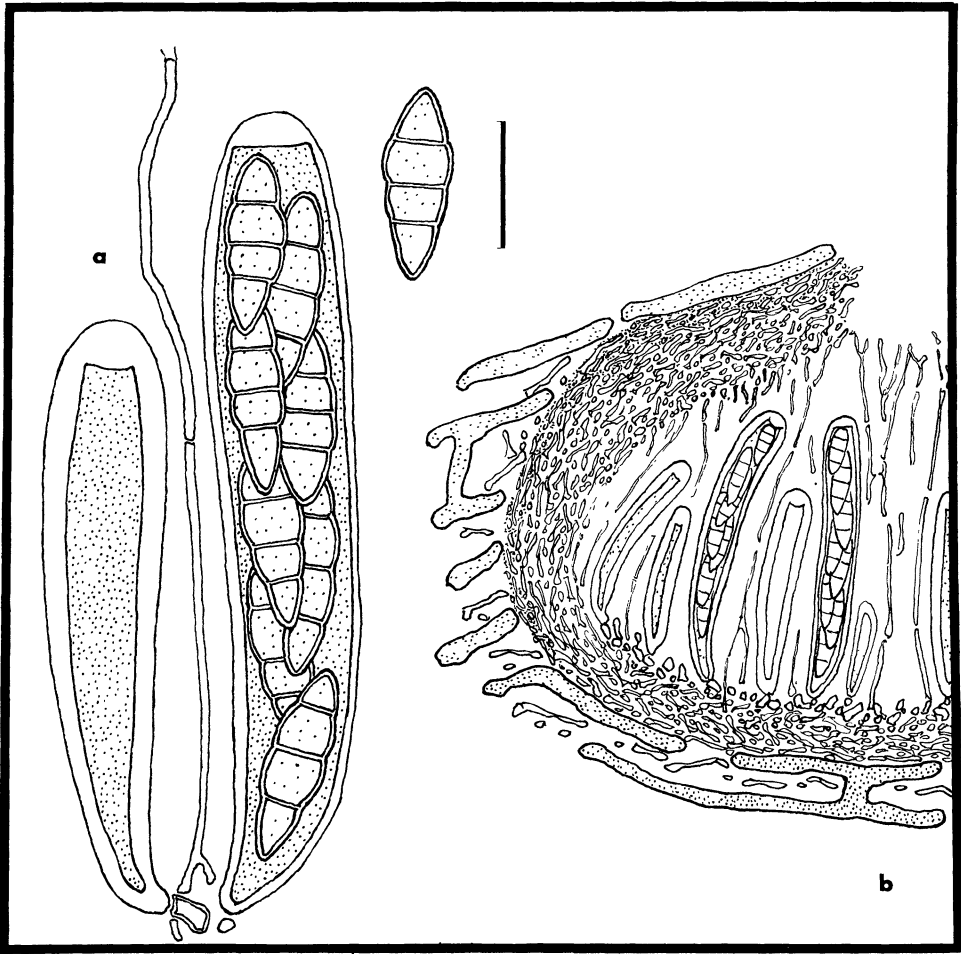


FIG. 4. *Xylopezia inclusa*. A. Ascus, ascospores, and paraphysis. Bar = 10 μ m. B. Cross-section of margin. Bar = 33 μ m.

wood in Goodwick Bay, Pembrokeshire. It has also been detected on old willow stumps at Hencote pool, near Shrewsbury, and on wood chips in Gloucestershire." All four collections are represented in Kew herbarium. Richardson's collection is in poor condition and is somewhat intermediate between *X. inclusa* and *X. hemisphaerica*; it would make a poor choice of lectotype. Of the three remaining, we here designate the Phillips Hencote collection as lectotype.

We have seen no material of *Peziza inclusa*. A specimen sent from Leiden herbarium was never received by M.S.-P. at the University of Liverpool and is presumably lost. The above interpretation of the species is in agreement with the protologue and with Karsten's use of the name, which has not been used in any other sense.

Additional specimens examined: FINLAND. Mustiala, in *Salic. capr.*, May 1869, *Karsten* (K). FRANCE: Falaise (H-NYL 4404). GREAT BRITAIN. ENGLAND: King's Lynn, Norfolk, on willow, May 1871, *Plowright* (K); Cirencester, on old beech clippings, Aug 1876, *Joshua* (K); Cirencester, Oakley Park, *Joshua* (K); Pembrokeshire, Goodwick Bay, Sep 1876, *Leighton* (K); Gloucestershire, Rodmorton, on elder, 1876, *Joshua* (K); Shropshire, Attingham Park, 1876, *Phillips* (K); Warwick,

Alcester Heath, on *Quercus*, 30 May 1972 (K.) SCOTLAND. Appin on *Calluna vulgaris*, 1877, Crombie (H-NYL 4399); Isle of Rhum, on pine trunk, 12 Apr 1961, Dennis (K).

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A Preliminary, Verified List of Plant Collectors in Mexico

A few copies of this book are still available for \$16 (U.S.) and \$18 (non-U.S.) from I. W. Knobloch, 438 Tulip Tree, East Lansing, MI 48823. The 179-page list includes 4200 collectors and 800 references to research in Mexico. It was published as *Phytologia Memoirs VI*.