Some rare fungi from the Attergau area, Upper Austria

Einige seltene Pilze aus dem Attergaugebiet, Oberösterreich

JAMES TERENCE PALMER
25, Beech Road, Sutton Weaver
via Runcorn, Cheshire WA7 3ER, England

Received 16. 9. 1996

Key words: *Geoglossum vleugelianum*, *Glomus radiatum*, *Mycocalia denudata*, *Nidularia deformis*, *Nothomitra cinnamomea*. - New records, bog. - Fungi of Austria.

Abstract: Collections of four species from different fungal groups were made in a single bog during the Mykologische Dreiländertagung in St. Georgen im Attergau in 1962 and are reported in the Austrian literature for the first time: (1) *Geoglossum vleugelianum*, which appears to be otherwise known only from one or more collections in England, Finland, Norway and Sweden, (2) *Glomus radiatum*, reported only from several collections in North America, (3) *Mycocalia denudata*, not found previously or since in Austria and apparently very rare elsewhere, except the British Isles, and (4) *Nothomitra cinnamomea*, described and only known from this find. A collection from another locality was *Nidularia deformis*, found previously in the Attergau region but only occasionally collected in Austria.

Zusammenfassung: Aufsammlungen von vier seltenen Arten aus ganz verschiedenen Pilzgruppen wurden in einem einzigen Moor während der Mykologischen Dreiländertagung in St. Georgen im Attergau im Jahr 1962 gemacht und werden hier erstmals in der österreichischen Literatur vorgestellt: (1) *Geoglossum vleugelianum*, das sonst nur von einer oder mehreren Aufsammlungen in England, Finnland, Norwegen und Schweden bekannt ist; (2) *Glomus radiatum*, sonst nur von einigen Kollektionen aus Nordamerika berichtet; (3) *Mycocalia denudata*, die weder vorher noch nachher in Österreich gefunden wurde und die offensichtlich auch anderswo selten ist, außer auf den Britischen Inseln; und (4) *Nothomitra cinnamomea*, die von hier beschrieben wurde und nur von diesen Aufsammlungen bekannt ist. Weiters wurde an einem anderen Fundort *Nidularia deformis* gesammelt, die bereits vorher aus dem Attergau bekannt war, aber sonst nur gelegentlich in Österreich gefunden wurde.

During the Dreiländertagung in St. Georgen im Attergau in 1962, the author collected four fungi from various fungal groups in a small bog in the vicinity of Straß im Attergau, namely *Geoglossum vleugelianum* NANNF., *Glomus radiatum* (THAXTER) GERDEMANN & TRAPPE, *Mycocalia denudata* (FR.) J. T. PALMER and *Nothomitra cinnamomea* MAAS GEEST., as well as the commoner species *Nidularia deformis* (WILLD.: PERS.) FR. in a wood on Buchberg.

Nothomitra cinnamomea was described by MAAS GEESTERANUS (1964) as a new genus and species with no further collections known. These species, with the exception of *Nidularia deformis*, are also absent from RICEK (1989) and the other Austrian mycological literature.

Material and methods

The collections were first given the author's collection number (i.e. P 11387), after which they were placed in the mycological herbarium of the Hartley Botanical Laboratories, University of Liverpool, with the herbarium number of LIVU MYC. (i.e. 2476) but were later transferred to the author's private herbarium (i.e. J.T.P. 1968), for which the initials PLMR were earlier used. Token specimens from each collection were mostly, however, left in LIVU MYC., which is now in K. As the author subsequently specialized in the *Sclerotiniaceae*, the *Endogonaceae* were sent in 1973 to Prof. L. E. HAWKER, University of Bristol, the former British specialist for the hypogeous fungi, whose herbarium is also now in K. The *Geoglossaceae* were given in 1985 to Dr A. S. SILVERSIDE, University of Paisley, on learning that he was interested in this family.

Initially, parts of the two *Geoglossaceae* collections were sent to Dr R. W. G. DENNIS (K) for his opinion whilst, some time later, all three collections, together with the other collections of this family in LIVU MYC., were revised by Dr R. A. MAAS GEESTERANUS (L). Duplicates from the various collections were subsequently sent to several institutes, and, consequently, are currently found, together with most of the voucher specimens of the author, in the herbaria B, BPI, K, L, M, O, UPS, WU, and also in the private herbaria of J. T. P. and Dr SILVERSIDE, herewith designated A. S. S.

Reagents used by the author at the time of collection for microscopical examination were chiefly 10% ammonia, erythrosin B in 10% ammonia and Melzer.

The author's interest also in the *Endogonaceae* stemmed from his many finds of *Glomus* (then *Endogone*) *fuegianum* (SPEG.) GERDEMANN & TRAPPE, mainly associated with *Nardus stricta* L., in many *Sphagnum* bogs on the moors of the Pennine Hills of Northwest England, which were included in the recent revision of the British hypogeous fungi by PEGLER & al. (1993). This species was originally described from "under moss" in Tierra del Fuego (Staten Island = Isla de los Estados, Argentinia, and Clarence Island, Chile), but is also known from a completely different habitat beneath *Taxus baccata* L. in Southwest England (GODFREY 1957). The Austrian finds were, however, different and were determined as *Endogone radiata*, described from Canada and the United States, with the aid of the description in THAXTER (1922). *Mycocalia* J. T. PALMER and *Nidularia* FR. & NORDH. (*Gasteromycetes*) were the author's still earlier specialist interest.

Investigated collections

Locality 1: Austria, Oberösterreich, St. Georgen im Attergau, Buchberg, 8047/3, 29. 9. 1962:

Basidiomycotina, Gasteromycetes:
***Nidularia deformis* (WILLD.: PERS.) FR. in FR. & NORDH.** (1817), Symb. Gast. **1**: 3.
Syn.: *Nidularia farcta* (ROTH: PERS.) FR.

On twigs and woody fragments of *Fagus sylvatica* L. and probably *Picea abies* (L.) KARSTEN on a damp woodland footpath, J. T. P. 1973 (= LIVU MYC. 2481 and P. 11397) with duplicates in K, M and WU 15601.

Short description:

Fruitbodies to 10 mm, rounded to pisiform, sessile, finally irregularly opened above. Peridia cream to cinnamon-buff, thickly felted, formed of yellow, spinose hyphae with an inner layer of hyaline, branched, septate hyphae with clamp connections. Peridioles 1-1.5 mm in diam., disciform, in a gelatinous matrix free within the cup, chestnut brown, with a cortex of interwoven, simple or little branched, brownish hyphae with

thick walls, to 8 µm in diam. Basidiospores 4.8-8.0 x 3.0-5.2 µm, broadly ellipsoid, hyaline.

Comments: This collection is included here as the species seems to be somewhat rare in Austria with a single collection from Austria in WU [Niederösterreich, Schrems, Eliasteich (7156/3), leg. A. and K. MADER, 2. 10. 1976, including a colour slide: MADER, WU 9720], although RICEK (1989) reported three localities in the Attergau area: Traschwand (8146/2), Limberg (8147/1) and St. Georgen, Kogelberg (8046/4).

Locality 2: Austria, Oberösterreich, nördlich von Straß/Attergau, G'Föhra Moos[1], 670 m alt., 8046/4, 30. 9. 1962:

Ascomycotina, *Geoglossaceae*:
***Geoglossum vleugelianum* NANNF.** (1942), Ark. Bot. **30A**: 43-44.

Amongst *Sphagnum* and *Juncus articulatus* L., J. T. P. 1940 (= LIVU MYC. 2399 and P. 11390), revid. R. A. MAAS GEESTERANUS as "should be compared with *Geoglossum vleugelianum*", currently in K, L 963.243-490, M (as *G. cookeianum* NANNF.), O, UPS (the latter as "*G. vleugelianum* NANNF. ?") and private herbarium A. S. S.

Short description:

Fruitbodies to 5 cm tall, non-viscid, with fertile part dark brownish to black-olivaceous, sharply delimited from stipe, which dark fuliginous and distinctly squamulose. Asci 60-75 x 5.0-6.5 µm, 8-spored, J?, cylindrical. Ascospores 63-85 x 5-6 µm, cylindrical-clavate, up to 7-septate, fuliginous. Paraphyses not adherent, stout, coloured almost from the base, septate, upwardly clavate, straight or curved, more densely septate and swollen above, where the apical cell usually pyriform or almost globose, 6-10 µm thick.

Comments: The species appears to be only known from Finland (ECKBLAD, pers. comm.), Great Britain (SILVERSIDE, pers. comm.), Norway (ECKBLAD 1963) and Sweden (NANNFELDT 1942).

However, SILVERSIDE writes that the "single specimen plus a fragment of *Sphagnum recurvum* var. *mucronatum*" in the packet of J. T. P. 1940 received from the author, is "NOT *G. vleugelianum*" but is "fairly sure that it is *G.(eoglossum) uliginosum* HAKELIER (1967)" as "... it has a smooth stem" and "seems to have been viscid when fresh. ... There appears to be an uninterrupted layer of paraphyses down to the stem base, which would tie in with the apparent viscidity." whilst "The spores are exactly right, ... too gracile and are regularly 7-septate." but has hardly yet found "the really characteristic *uliginosum* paraphyses with abruptly swollen distal ends to sequential

[1] At the time of the collections, the author understood from a passerby that the name of the bog was "Fehra Moos" and so it was published in MAAS GEESTERANUS (1964). However, Mr SCHÜSSLER recently wrote to the author: "Ich habe mich bei Bekannten im Attergaugebiet und bei der Gemeinde Straß erkundigt: der richtige Name wäre G'Föhra Moos, aber es wird im Dialekt meist als Fehra Moos ausgesprochen. Der Name kommt von Föhren. Dieses Moos liegt nördlich von Straß/Attergau nicht weit davon entfernt".

intermediary segments. ... It is such paraphyses that could cause *G. uliginosum* to be confused with *G. vleugelianum*, so I would guess that at least one specimen of your collection had them. I find that development of these more distinctive paraphyses does often vary between specimens within a single collection."

Whilst no description accompanied the collection on its return from L, enclosed was a drawing (Figs. 1 and 2) by Dr MAAS GEESTERANUS of three spores (two 5- and one 7-septate) and five paraphyses. It would therefore appear that the collection probably contained more than one species which only a reinvestigastion of the various duplicates in K, L, M, O and UPS will clarify. However, neither *Geoglossum uliginosum* nor *G. vleugelianum* are so far known for Austria, hence the addition of one or both species is very wellcome.

***Nothomitra cinnamomea* MAAS GEEST.** (1964), Persoonia **2**: 92-93.

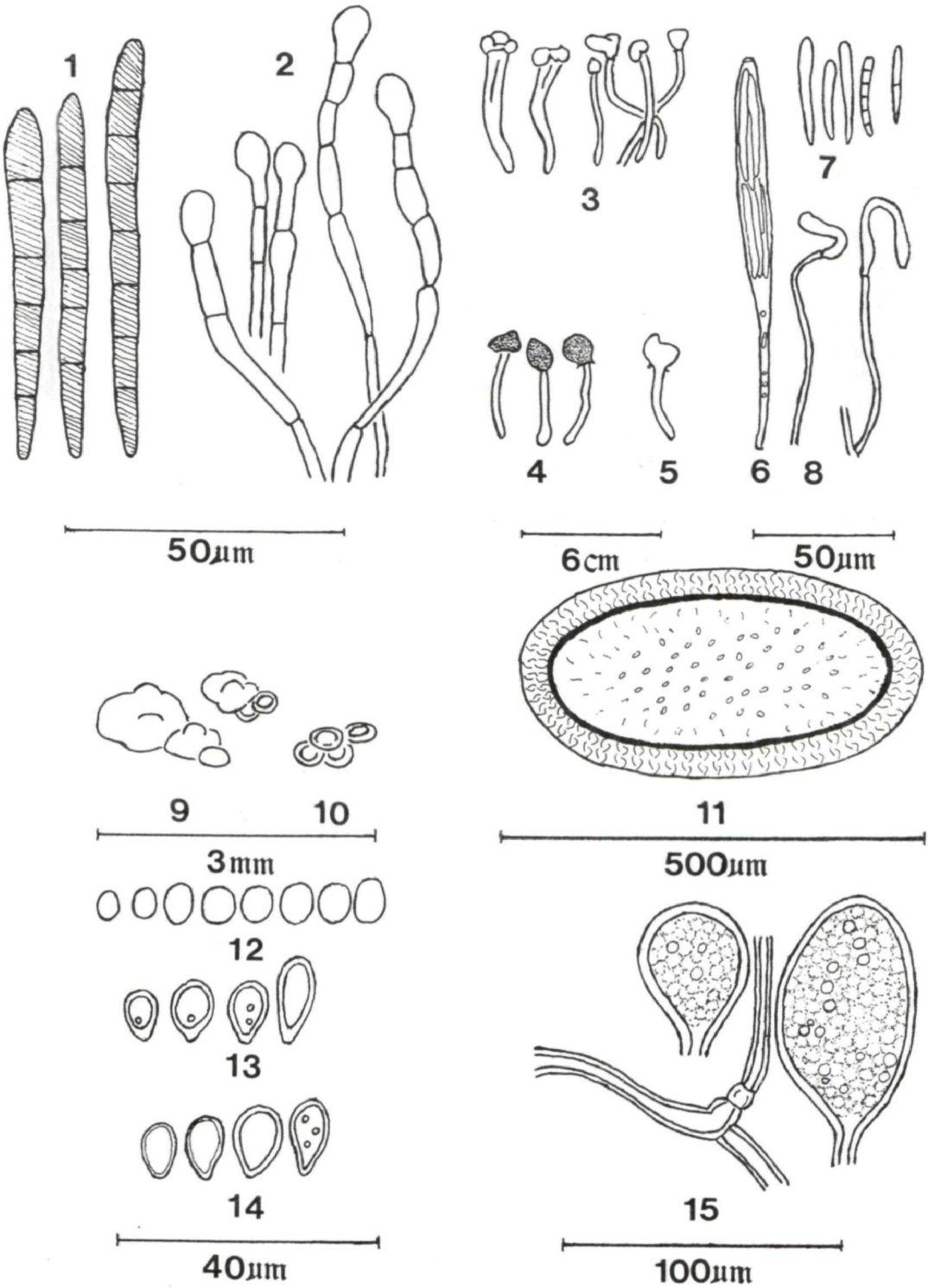
Amongst or on *Sphagnum* spec. between *J. articulatus*, J. T. P. 2004 (= LIVU MYC. 2543 and P. 11391), currently in WU 12561 with holotypus in L 962.271-144 and isotypes in K, O, UPS and private herbarium A. S. S.; on detritus and open ground amongst *Sphagnum* spec., J. T. P. 2005 (= LIVU MYC. 2544 and P. 11392) with duplicates in K, L 962.271-144, together with the holotypus, UPS and private herbarium A. S. S. Duplicates of J. T. P. 2004 & J. T. P. 2005 sent to M (as "PLMR 2004 and 2005") cannot now be found.

Short description:

Fruitbodies to 30 mm tall, stipitate, with the fertile head variously obovate, rounded to mitrate, pale cinnamon, apparently darkening with age, 1.5-6 x 2.8-8 mm, continuous with stipe, 5-27 mm long and 1-4.5 mm broad, which straight to flexuose, pale ochraceous. Asci 100-155 x 8-10 µm, cylindrical-clavate, J+. Spores 32.5-47.3 x 3.9-5.0 µm, hyaline, oblong-clavate, initially 1-celled, apparently becoming multi-guttulate to finally 6-celled. Paraphyses clavate, septate, with yellowish contents and curved to hooked apices to 2.7 µm broad.

MAAS GEESTERANUS (1964) wrote: "Mounted in Melzer's reagent, only the ascus pore stains blue, but if previously boiled in a solution of KOH the entire hymenium turns blue."

Figs. 1-2. *Geoglossum vleugelianum*, J. T. P. 1940 (traced from unpublished drawings by MAAS GEESTERANUS. - Fig. 1. Ascospores. - Fig. 2. Paraphyses. - Figs. 3-8 Nothomitra cinnamomea [with Figs. 3 and 8 traced from Figs. 16 and 20 in MAAS GEESTERANUS (1964) with the permission of Persoonia]. - Fig. 3. J. T. P. 2004 (L 962.271-144, holotypus), yellowish fruitbodies. - Fig. 4. J. T. P. 2005, darker fruitbodies and Fig. 5. section of one (from author's water-colour). - Fig. 6. J. T. P. 2004, ascus. - Fig. 7. J. T. P. 2004, ascospores. - Fig. 8. J. T. P. 2004, paraphyses. - Figs. 9-14. *Mycocalia denudata*. - Fig. 9. J. T. P. 1968, peridia with two peridioles emerging from one. - Fig. 10. J. T. P. 1975, loose peridioles. - Fig. 11. J. T. P. 1975, section of a peridiole. - Fig. 12. J. T. P. 1975, basidiospores. - Fig. 13. J. T. P. 1968, and Fig. 14. J. T. P. 1969, metamorphosed basidia. - Fig. 15. *Glomus radiatum*, J. T. P. 1981. Chlamydospores and thick-walled hyphae.



Comments: Parts of the two collections were sent to K and L.

DENNIS (K) answered: (J. T. P. 2004) "I should think No. 11391 is *C.(udonia) confusa* BRES." and (J. T. P. 2005) "I know nothing like 11392. The colours are the wrong way round, *C. circinans* should have a pale head and dark stipe. Tentatively, I suppose it may represent *C. confusa* discoloured in some way as the two seem identical microscopically".

MAAS GEESTERANUS (L) considered the two collections to be the same taxon, which he described as the new genus *Nothomitra* with only a single species, *N. cinnamomea*, and recently wrote, in answer to the question whether the species had been refound: "We have several more of these ephemeral species which are never found again."

However, a second species, *Nothomitra kovalii* RAITVIIR (1971), is reported from conglomerate at the foot of the volcano Mendeleev on Kunashir Island, Kurile Islands, Russia, with the very strong amyloid reaction of the asci as the chief character. However, whilst the fertile heads were given as pallid rose-ochraceous, the fruitbodies 3-5 mm tall, asci 75-100 x 6-8 µm and spores 19-25 x 2 µm, they were all very much smaller than for *N. cinnamomea*.

Basidiomycotina, Gasteromycetes:
***Mycocalia denudata* (FR.) J. T. PALMER** (1961), Taxon **10**: 58.
= *Nidularia denudata* FR. in FR. & NORDH. (1817), Symb. Gast. **1**: 4.

On old, undetermined, herbaceous stalks amongst *Juncus articulatus* and *J. effusus* L., J. T. P. 1968 (= LIVU MYC. 2476 and P. 11387) with duplicates in B, BPI 727022, K, M and WU 15602; on old, often somewhat deteriorated leaves and culms of *J. articulatus* amongst mosses, J. T. P. 1969 (= LIVU MYC. 2477 and P. 11388) with duplicates in K, M, TAA 158062 and WU 15602; on mossy, herbaceous debris embedded in the soil amongst *Juncus articulatus*, J. T. P. 1970 (= LIVU MYC. 2478 and P. 11389) with duplicates in K and WU 15602; on *Sphagnum* spec., J. T. P. 1975 (= LIVU MYC. 2486 and P. 11418) with a duplicate in WU 15602.

Short description

Fruitbodies up to 2 mm diam., rounded, sometimes aggregating into compound structures, finally disintegrating to leave a heap of loose peridioles. Peridia white to sometimes yellowish, thin, smooth, but evanescent, formed of branched, septate, hyaline hyphae with clamp connections. Peridioles 345-470 x 310-470 µm, very numerous, free, developing in a gelatinous matrix, disciform in moist condition but biconcave when desiccated, yellowish ochraceous to chestnut brown. Cortex duplex with the hyphae of the outer wall (excortex) loosely interwoven with the inner (endocortex) denser and reddish brown. Basidiospores 6.0-8.8(-9.5) x 4.3-5.8 µm, broadly ovoid, hyaline. Metamorphosed Basidia[2] 8.6-15.5 x (4.7-)6.2-8.7(-9.5) µm, hyaline, pyriform to ellipsoid or truncate, thick-walled, sometimes guttulate.

---

[2] OLIVE (1946) coined "Metamorphosed Basidia" for these structures in his description of *Nidularia castanea* (WHITE) SACC. & D. SACC. in SACC. (= *Mycocalia duriaeana*) from North America.

Comments: *Mycocalia denudata*, described from Sweden on wood by FRIES in FRIES & NORDHOLM (1817), was found, where sought by the author, to be common in England, especially on old culms and leaves of *Juncus effusus* in acid habitats such as moors but also on a wide range of other substrates (PALMER 1958). Whilst mostly reported from single collections, the species has a worldwide distribution: Australia, including Tasmania (PALMER 1964 a), Austria (PALMER 1963[3]), Belgium (EYNDHOVEN & al. 1958), Canada (PALMER 1963[3] and BRODIE 1975), Chile (PALMER 1964 b[3 & 4]), the Czech Republic (CEJP 1958), Denmark (ELBORNE 1983), Estonia (JÄRVA 1962[3], 1973[3]), Finland (ULVINEN & al. 1989[3 & 5]), France (MORNAND 1985), Germany (PALMER 1963), Great Britain, including Ireland (PALMER 1958), Greenland ([6]), Iceland (HALLGRÍMSSON & al. 1992), The Netherlands (PALMER 1963[3]), Norway (PALMER 1964 b, MATTHIASSEN & GRANMO 1994), Poland (PALMER[7]), Spain (CALONGE & PALMER 1988) and Sweden (FRIES & NORDHOLM 1817, T. C. E. FRIES 1922, JEPPSON 1985). The former reports of *Mycocalia* (as *Nidularia*) *denudata* in the old literature appear to be *Nidularia deformis*.

A preliminary substrate list for *M. denudata*, *M. duriaeana* (TUL. & C. TUL.) J. T. PALMER and *M. minutissima* (J. T. PALMER) J. T. PALMER was included in PALMER (1958). A German description with a key to the five species of the genus - the three mentioned as well as *M. reticulata* (PETCH) J. T. PALMER and *M. sphagneti* J. T. PALMER - is given in PALMER (1963).

Mycocalia is the genus of the *Nidulariaceae* with the smallest peridia, constructed of ephemeral hyaline, branched, septate hyphae with clamp connections and free peridioles, 200-600 µm in diameter. Whilst *Mycocalia denudata*, *M. minutissima* and *M. sphagneti* are only found in sour habitats, especially bogs, *M. duriaeana* has mostly been collected on calcareous dunes. *M. reticulata* is a tropical, very rare species, known only from some widely dispersed countries (CEJP & PALMER 1963 and GOOS 1977).

Zygomycotina, *Endogonaceae*:
***Glomus radiatum* (THAXTER) TRAPPE & GERDEM. in GERDEMANN & TRAPPE** (1974), Mycol. Mem. **5**: 46-47 (as *radiatus*).
= *Endogone radiata* THAXTER (1922), Proc. Amer. Acad. Arts & Sci. **57**: 316.

Amongst *Sphagnum* spec., J. T. P. 1963 (= LIVU MYC. 2460 and P. 11408), currently in K; J. T. P. 1980 (= LIVU MYC. 2507 and P. 11409), currently in K with single permanent slides in K (10169) and M; amongst *Sphagnum* spec. surrounding a clump of *Juncus articulatus*, J. T. P. 1981 (= LIVU MYC. 2508 and P. 11410), cur-

---

[3] Indicates only a brief mention without description or details.
[4] On underside of decayed wood of a *Nothofagus* spec. on the volcano Antillanca, alt. ca. 1000 m, Lago Puyehue, Province Osorno, Chile, 13. 4. 1963, leg. E. HORAK (Y116), det. and J. T. P. 2810 with a duplicate in ZT.
[5] On soil and debris of old culms and leaves of *Juncus effusus* in a roadside ditch leading to the south end of Isosuo Bog, Klaukkala near Nurmijärvi, Province Uusimaa, Finland, 18. 8. 1989, leg. & det. J. T. P. 4496 (89008) and H. HARMAJA with a duplicate in H. Basis of ULVINEN & al. (1989).
[6] Mr JEPPSON (pers. comm.) has informed the author, that the species has been collected on the banks of brooks in Greenland.
[7] On fallen limb of an undetermined tree at edge of a schwingmoor surrounding a small lake at Gąsiar, Mikolajki, Province Mazurian, Poland, 2. 9. 1966, leg. J. T. P. 3074 (66212) with a duplicate in WRSL.

rently in K with single permanent slides in K (10170) and M; amongst *Sphagnum* spec. and the roots of *J. articulatus*, J. T. P. 1982 (= LIVU MYC. 2509 and P. 11411), currently in K with single permanent slides in K (10171) and M; amongst *Sphagnum* spec., surrounding a clump of *Nardus stricta*, J. T. P. 1983 (= LIVU MYC. 2510 and P. 11412), currently in K with a duplicate in WU 14990, and single permanent slides in K (10172) and M.

Short description:

Fruitbodies (dried) to 4.5 mm diam., variously flattened globose or lobed, whitish. Chlamydospores 56-84 x 48-70 µm, ellipsoid to subglobose, thick-walled, with coarsely granular contents, developing from long, aseptate, thick-walled hyphae.

Comments: THAXTER (1922) reported this species from "in *Sphagnum*", Province Quebec, Canada and "under the leaf cover in spruce woods" from the states of Maine and New Hampshire, USA. GERDEMANN & TRAPPE (1974) give it "from wet mountain soils (stream banks and hummocks in a boggy montane meadow) in the Cascade Range of Oregon and Washington", also from New York, and associated in the field with endomycorrhizae of *Chamaecyparis nootkatensis* (D. DON.) SPACH. The Austrian finds appear to be the first for Europe.

Discussion and conclusions

Although the collection of *Nidularia deformis* on wet beech and, probably, spruce wood on Buchberg is noteworthy, the collection of *Glomus radiatum* appears to be new for Europe. *Geoglossum vleugelianum* is otherwise only known from several finds in Finland, Great Britain, Norway and Sweden, whilst part of this collection appears to be *Geoglossum uliginosum*, described from Sweden. *Mycocalia denudata*, very rare, except for Great Britain, has a worldwide distribution, and *Nothomitra cinnamomea*, a new genus and species, is only known from these two collections. So the finding of all these species in a single bog in Oberösterreich is extremely exceptional. G'Föhra Moos undoubtedly requires further and careful investigation with repeated visits. Regretfully, the author had no possibility to revisit the bog during the 23. Mycological Dreiländertagung in Ebensee 1994.

The author heartily thanks Dr J. VAN BRUMMELEN, Leiden, Miss SUSAN C. GRUFF, Ithaca, N. Y., Dr GRO GULDEN, Oslo, Dr L. HOLM, Uppsala, Mr M. JEPPSON, Trollhättan, and Dr IRMGARD KRISAI-GREILHUBER, Wien, for help in obtaining the literature, Dr R. A. MAAS GEESTERANUS, also the editorial board of Persoonia, for permission to use his drawings, further Prof. F.-E. ECKBLAD, Oslo, Dr A. RAITVIIR, Tartu, Mr R. SCHÜSSLER, Linz, Dr A. S. SILVERSIDE, Paisley, and Dr B. H. SPOONER, Kew, as well as the Directors and Curators of K, for the possibility to re-examine his specimens of *Glomus radiatum*, and B, BPI, M, O, TAA and UPS, to whom duplicates were sent, for information on their present situation.

References

BRODIE, H. J., 1975: The Bird's Nest Fungi. - Toronto, Buffalo: University of Toronto Press.

CALONGE, F. D., PALMER, J. T., 1988: *Mycocalia denudata* (FR.) J. T. PALMER, nueva para España. - Bol. Soc. Mic. Madrid **12**: 131-132.

CEJP, K., 1958: X. řád *Nidulariales* - Hnízdovkotvaré: 633-682 and 819-827. - In PILÁT, A., (Ed.): Gasteromycetes - Houby-Břichatky. - In NOVÁK, F. A. (Ed.): Flora ČSR, 1:1-863. - Praha: Československé Akademie Věd.

— PALMER, J. T., 1963: Rody *Nidularia* FR. a *Mycocalia* J. T. PALMER v Československu a *Mycocalia sphagneti* J. T. PALMER sp. nov. z Anglie. - The genera *Nidularia* FR. and *Mycocalia* J. T. PALMER and *Mycocalia sphagneti* J. T. PALMER sp. nov. from England. - Česká Mykol. **17**: 113-126.

ECKBLAD, F.-E., 1963: Contributions to the *Geoglossaceae* of Norway. - Nytt Mag. Bot. **10**: 137-158.

ELBORNE, S. A., 1983: *Mycocalia denudata* - en ny redesvamp for Danmark. - Svampe **7**: 45.

EYNDHOVEN, G. L. VAN, HANDKE, H.-H., LANGE, M., PALMER, J. T., 1958: Interesting Belgian gasteromycetes with observations on the development of *Trichaster melanocephalus* CZERN. - Bull. Jard. État Bruxelles **28**: 161-171.

FRIES, E. M., NORDHOLM, J., 1817: Symbolae Gasteromycorum ad illustrandam Floram Suecicam 1. - Lundae.

FRIES, T. C. E., 1922: Sveriges gasteromyceter. - Ark. Bot. **17**: 1-63.

GERDEMANN, J. W., TRAPPE, J. M., 1974: The *Endogonaceae* in the Pacific Northwest. - Mycol. Mem. **5**: 1-76.

GODFREY, R. M., 1957: Studies of British species of *Endogone*. I. Morphology and taxonomy. - Trans. Brit. Mycol. Soc. **40**: 117-135.

GOOS, R. D., 1977: An addition to the bird's nest fungi of the Hawaiian Islands. - Canad. J. Bot. **55**: 2761-2763.

HAKELIER, N., 1967: Three new Swedish species of *Geoglossum*. - Svensk Bot. Tidsk. **61**: 419-424.

HALLGRÍMSSON, H., JENSSON, E., KRISTINSSON, H., 1992: Þrír nýir belgsveppir (Íslenskir belegsveppir VIII). - Náttúrfræð. **61**: 219-228.

JÄRVA, L., 1962: The Gasteromycetes of the Estonian S. S. R., their species, and the present state of their investigation. - Scripta Bot. **2**: 255-260. (Mainly an unannotated list in English, Estonian and Russian).

— 1973: A revised list of Estonian Gasteromycetes. - Folia Crypt. Estonica **2**: 15-16. (An annotated list).

JEPPSON, M., 1985: Notes on the genus *Mycocalia* (*Basidiomycetes*, *Nidulariales*) in Scandinavia. - Agarica **6**: 228-236.

MAAS GEESTERANUS, R. A., 1964: On some white-spored *Geoglossaceae*. - Persoonia **3**: 81-96.

MATHIASSEN, G., GRANMO, A., 1994: The 11th Nordic Mycological Congress in Skibotn, North Norway 1992. - Univ. Trondheim Vitensk. Mus. Rapp. Bot. Ser. 1995: **6**: 1-77.

MORNAND, J., 1985: Les Gastéromycètes de France 2. *Nidulariales*. - Doc. Mycol. **16**: 35-45.

NANNFELDT J. A., 1942: The *Geoglossaceae* of Sweden (with regard also to surrounding countries). - Ark. Bot. **30A**: 1-67.

OLIVE, L. S., 1946: Some taxonomic notes on the higher fungi. - Mycologia **38**: 534-537.

PALMER, J. T., 1958: Observations on Gasteromycetes. VI. Three British species of *Nidularia* FR. section *Sorosia* TUL.: ecology and distribution. - Trans. Brit. Mycol. Soc. **41**: 55-63.

— 1963: Deutsche und andere Arten der Gattung *Mycocalia*. - Z. Pilzk. **29**: 13-21.

— 1964 a: The situation of *Mycocalia* and *Nidularia* in Australia and Tasmania. - Adv. Front. Pl. Sci. **9**: 187-200.

— 1964 b: Observations on Gasteromycetes XII - *Mycocalia denudata* (FR.) J. T. PALMER: ELIAS FRIES's authentic specimen and three additional Scandinavian collections. - Nytt Mag. Bot. **12**: 43-53.

PEGLER, D. N., SPOONER, B. M., YOUNG, T. W. K., 1993: British Truffles - A revision of British hypogeous fungi. - Kew: Royal Botanic Gardens.

RAITVIIR, A., 1971: *Geoglossaceae* Daljnego Vostoka. C ključami dlja opredelenija *Geoglossaceae* SSSR. - Živaja priroda Daljnego Vostoka: 52-82. Tallinn: Valgus. (In Russian with a Latin diagnosis).

RICEK, E. W., 1989: Pilzflora des Attergaues, Hausruck- und Kobernausserwalds. - Abhandl. Zool.-Bot. Ges. Österr. **23**: 1-439. - Wien: Zool.-Bot. Ges.

THAXTER, R., 1922: A revision of the *Endogoneae*. - Proc. Amer. Acad. Arts Sci. **57**: 291-351.

ULVINEN, T., KOTIRANTA, H., HÄRKÖNEN, M., KORHONEN, M., JÄRVINEN, I., 1989: Suomen suursienten nimet. - Common names of Finnish macromycetes. - Karstenia **29** (suppl.): 1-110.

Note added in last minute:

A third species, *Nothomitra sinensis* W.-Y. ZHUANG, differing in shape and size of ascospores, which bud conidia within the asci, paraphyses and fruitbodies, has recently been described from exsiccati (leg. 1958 and 1978) in China.

ZUHANG, W.-Y., WANG., Z., 1997: Some new species and new records of discomycetes. - Mycotaxon **63**: 307-321.