

**Annotated List of Macromycetes**  
**Found in the Greenhouses of the Botanic Garden**  
**of the Institute of Botany in Graz (Austria), 1998 - 2001**

Helmut PIDLICH-AIGNER<sup>1</sup>, Anton HAUSKNECHT<sup>2</sup> & Christian SCHEUER<sup>3</sup>

**Summary:** PIDLICH-AIGNER H., HAUSKNECHT A. & SCHEUER Ch. (2002): Annotated list of macromycetes found in the greenhouses of the Botanic Garden of the Institute of Botany in Graz (Austria), 1998 - 2001. – *Fritschiana* (Graz) 32: 49 - 61. – ISSN 1024-0306

The present compilation is a short version of the paper by PIDLICH-AIGNER & HAUSKNECHT (2001, *Österr. Z. Pilzk.* 10: 43-73 + colour illustr. IV-XI) on macromycetes found in the greenhouses of the Botanic Garden of the University of Graz (Austria). It contains an additional note on *Gymnopus luxurians*, including some figures. Nearly all other annotations are free, shortened translations from the annotations in the original paper, except for the additional general information on the occurrence of some native species in the natural environment.

Over a period of three years, 37 taxa were found altogether (33 Agaricales, 4 Aphyllophorales s.l.). The most remarkable taxa were treated in detail by PIDLICH-AIGNER & HAUSKNECHT (l.c.): *Conocybe crispella*, *Conocybe spec.*, *Coprinus plagioporus*, *Gymnopus luxurians*, *Gymnopus spec.*, *Lepiota elaiophylla*, *Leucocoprinus cepistipes* var. *rorulentus*, *Leucocoprinus denudatus*, *Melanoleuca rasilis* var. *leucophylloides*, *Melanotus flavolivens*, *Mycena spec.*, *Psathyrella pseudocorrugis*, *Rigidoporus lineatus*.

Some of the species are mainly known from the tropics or from North America. *Melanotus flavolivens* was a new record for Europe.

**Zusammenfassung:** PIDLICH-AIGNER H., HAUSKNECHT A. & SCHEUER Ch. (2002): Annotierte Liste der 1998 - 2001 in den Gewächshäusern des Botanischen Gartens des Institutes für Botanik in Graz (Österreich) gefundenen Großpilze. – *Fritschiana* (Graz) 32: 49 - 61. – ISSN 1024-0306

Die vorliegende Zusammenstellung ist eine gekürzte Version der Arbeit von PIDLICH-AIGNER & HAUSKNECHT (2001, *Österr. Z. Pilzk.* 10: 43-73 + farbige Abb. IV-XI) über "Großpilze in den Gewächshäusern des Botanischen Gartens der Universität Graz". Sie enthält eine zusätzliche Notiz über *Gymnopus luxurians* mit einigen Abbildungen. Bei allen anderen Anmerkungen handelt es sich um freie, gekürzte Übersetzungen der Annotationen in der Originalarbeit, ausgenommen die zusätzlichen allgemeinen Informationen zum Vorkommen einiger heimischer Arten in der natürlichen Umgebung.

Innerhalb von etwa drei Jahren wurden 37 Arten gefunden (33 Agaricales, 4 Aphyllophorales s.l.). Die bemerkenswertesten Taxa wurden von PIDLICH-AIGNER & HAUSKNECHT (l.c.) detailliert behandelt: *Conocybe crispella*, *Conocybe spec.*, *Coprinus plagioporus*, *Gymnopus luxurians*, *Gymnopus spec.*, *Lepiota elaiophylla*, *Leucocoprinus cepistipes* var. *rorulentus*, *Leucocoprinus denudatus*, *Melanoleuca rasilis* var. *leucophylloides*, *Melanotus flavolivens*, *Mycena spec.*, *Psathyrella pseudocorrugis*, *Rigidoporus lineatus*.

Einige der Taxa sind hauptsächlich aus den Tropen oder aus Nordamerika bekannt. *Melanotus flavolivens* war ein Neufund für Europa.

<sup>1</sup>) Helmut PIDLICH-AIGNER, Hoschweg 8, A-8046 Graz (e-mail: h.p.a.myk@aon.at)

<sup>2</sup>) Dkfm. Anton HAUSKNECHT, Sonndorferstraße 22, A-3712 Maissau

<sup>3</sup>) Dr. Christian SCHEUER, Institut für Botanik, Holteigasse 6, A-8010 Graz (e-mail: christian.scheuer@uni-graz.at)

Recently, PIDLICH-AIGNER & HAUSKNECHT (2001) have published an annotated list of macromycetes found in the greenhouses of the Botanic Garden in Graz, including descriptions, illustrations, and discussions of remarkable taxa. The fungi were recorded over a period of three years, and the following species were treated in detail: *Conocybe crispella*, *Conocybe* spec., *Coprinus plagioporus*, *Gymnopus luxurians*, *Gymnopus* spec., *Lepiota elaiophylla*, *Leucocoprinus cepistipes* var. *rorulentus*, *Leucocoprinus denudatus*, *Melanoleuca rasilis* var. *leucophylloides*, *Melanotus flavo-livens*, *Mycena* spec., *Psathyrella pseudocorrugis*, *Rigidoporus lineatus*.

Nearly all annotations in the present paper are free, shortened translations from the original paper by the third author, except for additional general information on the occurrence of some native species in the natural environment. Unless stated otherwise, the latter is mostly based on the flora by MOSER (1983).

It is not surprising that this work yielded an interesting mixture of taxa from the biogeographical and ecological point of view. A number of the native species found in the greenhouses usually occur in  $\pm$  natural types of woodland, other species (usually also regarded as 'native') are mainly or exclusively encountered in man-made environments and situations, and others are better known from the tropics or from North America and obviously introduced.

With very few exceptions, herbarium specimens are deposited in the private herbarium of H. Pidlich-Aigner and in the public herbarium of the Institute of Botany of the University of Vienna (WU).

Thanks are due to Univ.-Prof. Dr. Herwig Teppner for giving his permission to photograph and collect in the greenhouses, to the staff of the Botanic Garden for keeping contact with the first author and providing prompt information about newly grown fruitbodies, and to Dr. Walter Obermayer for help with the illustrations of the present paper.

### **Annotated list**

Explanation of abbreviations: TROP. = tropical greenhouse; TEMP. = temperate greenhouse, including the sections 'Succulents I' and 'Succulents II' (the latter including the cycads); COOL = cool greenhouse.

The tropical, temperate and cool sections also include the corresponding parts of the nursery. The show case in the section 'Succulents I' has a tropical microclimate and serves for the presentation of flowering tropical plants to the visitors. For a plan of the greenhouses, see Fig. 6, p. 59.

#### ***Armillaria mellea* (VAHL: FR.) KUMMER**

TROP.: on basal part of a tree trunk serving as a phorophyte for epiphytic plants, 7 Dec. 1998 (Pidlich-Aigner 974); 18 Nov. 1999 (WU 20217).

Native, a common and dangerous pathogen of trees and shrubs.

#### ***Coniophora puteana* (SCHUM.: FR.) P. KARST.**

TEMP.: on wood, leaf litter and soil, 27 Nov. 1998 (Pidlich-Aigner 973); 5 Nov. 1999 (det. W. Dämon; GZU, S, WSP, TROM, LI, KL, and herb. W. Dämon; SCHEUER 2001).

Tree trunks and spruce logs served as barriers for the various sections in the temperate greenhouse until 1999. They have been removed in order to prevent damage by this rather aggressive wood decay fungus from the large wooden flower pots.

Native, also frequently found in cool, damp indoor environments, as indicated by the German vernacular name 'Kellerschwamm' (= 'cellar fungus').

**Conocybe crispella** (MURRILL) SINGER

TEMP.: on soil in a flower pot with *Ptychosperma microcarpum* (Ericaceae) in the nursery, 14 June 1999 (Pidlich-Aigner 1072, WU 19467).

This species, close to our fairly common *C. albipes* (OTTH) HAUSKN., syn. *C. lactea* (LANGE) MÉTROD, was described from North America and first recorded for Europe a few years ago (HAUSKNECHT 1997), only from indoor environments. It is widespread in the tropics in grassy places.

**Conocybe** spec.

TROP.: in a flower pot in the nursery, 9 Feb. 2000 (Pidlich-Aigner 1347, Hausknecht S3189).

The same species was also found in a greenhouse in Berlin in 1989 (Hausknecht S2602, and herb. E. Ludwig). It is apparently undescribed, but none of the existing collections is rich enough to serve as a satisfactory holotype.

In side view, the basidiospores of this fungus are somewhat hexagonal in outline. These spores and the caulocystidia with some lecythiform elements point towards sect. *Pilosellae*. Similar taxa were treated by WATLING (1994).

**Coprinus disseminatus** (PERS.: FR.) S.F. GRAY

TROP.: apparently on bare soil but most probably on buried pieces of wood, 28 Sep. 1999 (Pidlich-Aigner 1265); on a palm fruit in the nursery, 16 Dec. 2000 (Pidlich-Aigner 1640).

Native and quite common, often extremely abundant on decaying tree stumps in ± damp places.

**Coprinus domesticus** (BOLT.: FR.) S.F. GRAY

TEMP.: two fruitbodies, apparently on bare soil but, again, most probably on buried pieces of wood, 16 May 1998 (Pidlich-Aigner 632).

Native, on decaying logs and branches, often also in cool, damp indoor environments like cellars (as indicated by the specific epithet), but also recorded in mines. Usually accompanied by a conspicuous and rather shaggy rusty-brown superficial mycelium, the so-called *Ozonium*.

**Coprinus plagioporus** ROMAGN.

TEMP.: two basidiocarps on small pieces of wood, 2 Jan. 2000 (Pidlich-Aigner 1346, WU 20206).

Outdoors this species seems to be extremely rare in eastern Austria, only one collection is known from Lower Austria, on plant litter beside a vineyard (WU 9898).

*C. plagioporus* may be confused with *C. fallax* M. LANGE & A.H. SMITH and *C. subpurpureus* A.H. SMITH (see also ULJÉ & BAS 1991).

**Gymnopus dryophilus** (BULL.: FR.) MURRILL

COOL: numerous fruitbodies on a rather small spot, 25 Sep. 2000 (Pidlich-Aigner 1495, WU 20944).

A common native species occurring in all sorts of woodland, from the lowlands up to the alpine zone.

**Gymnopus luxurians** (PECK) MURRILL

(Figures 1 - 4)

TROP.: on soil, connected with small pieces of wood or bark by rhizomorphs, 9 Oct. 1996 (GZU), 3 Feb. 1998 (Pidlich-Aigner 575), 2 Apr. 1998 (WU 18846), 30 Apr. 1998 (WU 18024).

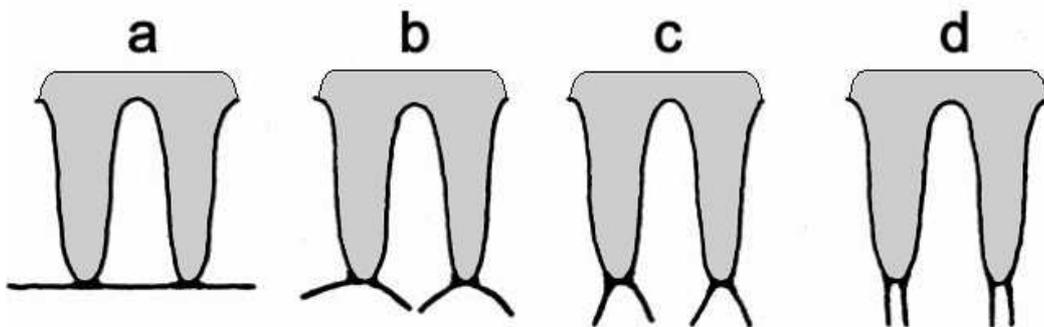
From 1996 until 1998, this species was sometimes very abundant and fruiting nearly everywhere in the tropical greenhouse, especially in 1998, but finally it was found only on a single spot in 1999.

*G. luxurians* was originally described from North America. Only in recent years it was found in Europe, mainly in greenhouses, but also in ruderal places in parks. It is also known from Benin (West Africa) and the Hawaiian Islands. The present records from the greenhouses in Graz were the first ones in Austria (cf. HAUSKNECHT & KRISAI-GREILHUBER 2000). ANTONÍN & HERINK (1999) examined further specimens from Germany, Italy, the Netherlands, and the Czech Republic, BON & MASSART (1996) reported three collections from France. For references to illustrations and additional records see ANTONÍN & HERINK (1999).

The robust basidiocarps with their brown, later pallescent caps and stout, often twisted stipes grow in fascicles (Fig. 2, 4). Most collections from our tropical greenhouse were sterile, especially those found during the winter months, the lamellae bearing only basidioles. This sterility may apparently be correlated with fewer lamellae and anomalous 'double' gill edges which occur quite frequently in this species.

ANTONÍN & HERINK (1999) described and illustrated *G. luxurians* in detail and discussed its variability with special reference to the structure of those gill edges. While such 'anomalous' fruitbodies are still young, the gill edges are connected to each other, completely closing off the interlamellar space (Fig. 1a). Later they crack apart (Fig. 1b), and the remnants of this connecting plectenchyma form two downy white fringes along every single gill edge, which are well visible with a hand lens (Fig. 1c, 3). In old fruitbodies, the two fringes converge (Fig. 1d), finally often becoming attached to each other and coalescing to form a simple gill edge.

However, it must be noted that ANTONÍN & HERINK (1999) have studied 20 specimens from outdoor and greenhouse habitats and found a continuous transition between basidiocarps with well-developed lamellar connections and basidiocarps without them, concluding that this anomalous gill development may be caused by certain environmental conditions (high humidity?).



**Figure 1.** *Gymnopus luxurians*: Schematic drawing of gill development in cross section: **(a)** young stage, interlamellar space completely closed off by neighbouring gill edges connected by a plectenchyma; **(b)** gill edges cracking apart; **(c)** typical appearance of the gill edge with its two fringes in mature fruitbodies [cf. Fig. 3]; **(d)** parallel to convergent fringes in old fruitbodies; (re-drawn from ANTONÍN & HERINK 1999).

---

**Figures 2–3.** *Gymnopus luxurians*: **(2)** three fascicles of fruitbodies (grid unit 1 cm<sup>2</sup>). **(3)** pileus from below, showing the anomalous 'double' gill edges of a mature fruitbody; every single gill edge with two downy white fringes along a smooth, slightly darker middle line [cf. Fig. 1c]; (phot. H. Pidlich-Aigner).



Fig. 2: *Gymnopus luxurians*

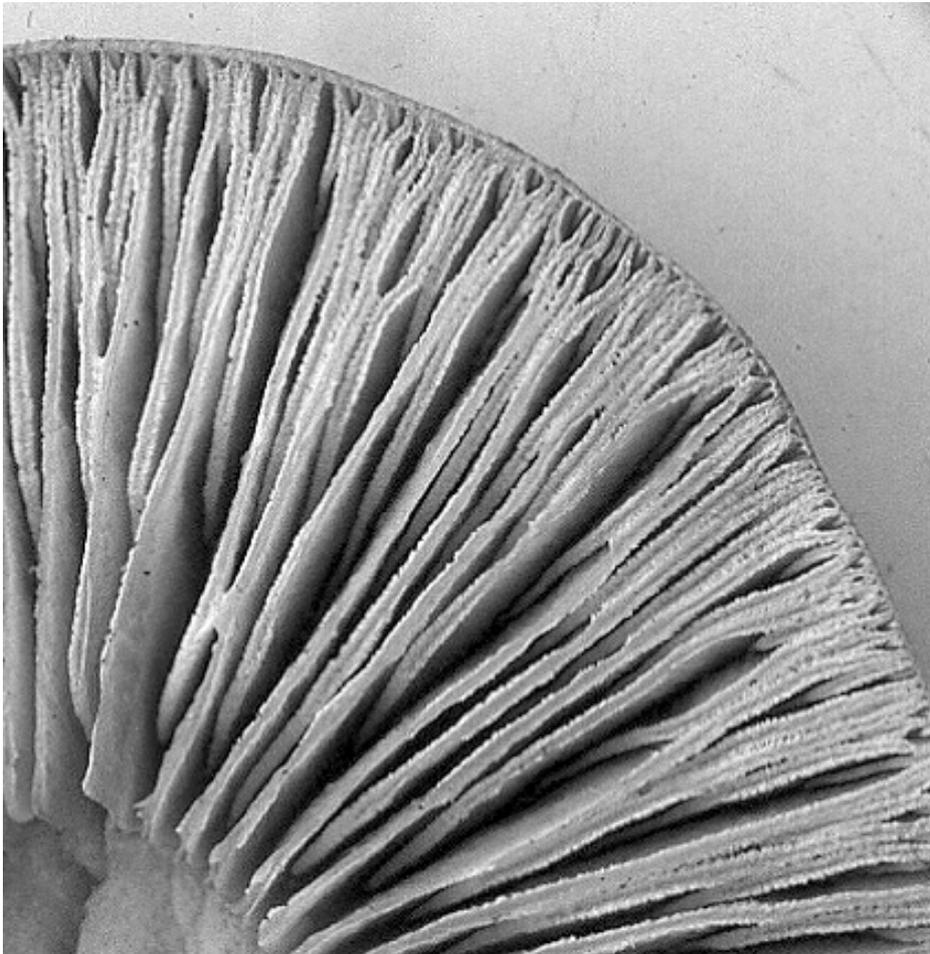


Fig. 3: *Gymnopus luxurians*



Fig. 4: *Gymnopus luxurians*



Fig. 5: *Rigidoporus lineatus*

***Gymnopus* spec.**

TROP.: in a flower pot with *Oncidium aplatium* in the nursery from 28 Dec. 2000 (Pidlich-Aigner 1642, WU 21007) until 12 Feb. 2001 (WU 21143), either directly on small pieces of conifer wood or bark, or connected with them by rhizomorphs.

According to ANTONÍN & NOORDELOOS (1997), the intense odour of this fungus points towards sect. *Vestipedes* subsect. *Impudicae*, although coralloid and diverticulate terminal cells are only sparsely developed in the pileocutis. Its affinities are with *G. herinkii* ANTONÍN & NOORDEL., but our taxon is apparently undescribed.

***Hemimycena cucullata* (PERS.: FR.) SINGER**

COOL: two fruitbodies on the root mass of a formerly potted *Arisarum proboscideum* (Araceae) 26 Mar. 1999 (Pidlich-Aigner 1019, WU 19473), apparently re-found in July 2000.

Native, usually found on plant litter and on tree stumps.

***Hohenbuehelia mastrucata* (FR.: FR.) SINGER**

TROP.: a few fruitbodies on small pieces of wood in the show case, 16 Oct. 2000 (Pidlich-Aigner 1600, WU 20943).

This species is native and usually found on wood of deciduous trees. However, *Hohenbuehelia* species are generally uncommon in Central Europe. They are characterized by laterally attached ('pleurotoid') fruitbodies, a gelatinized layer in the pileocutis, and in most species also by metuloid cystidia in the hymenium.

***Hohenbuehelia petalodes* (BULL.: FR.) SCHULZ.**

TROP.: Richly fruiting fascicles, 17 July 1998 (Pidlich-Aigner 693, WU 19151), 6 May 1999, and July 2000.

Native, on the ground in grassy places in woodland, parks and gardens; keyed out under the name *H. geogenia* (DC. ex FR.) SING. by MOSER (1983), but see the recent treatment by S. ELBORNE (in BAS & al. 1995).

***Hypholoma fasciculare* (HUDS.: FR.) KUMMER**

TROP.: A fascicle of three basidiocarps on a large wooden flower pot standing on the ground, 21 Jan. 2000 (Pidlich-Aigner 1344, WU 20220).

A common native species on rotting stumps and logs, both on conifers and deciduous woody plants.

***Lepiota aspera* (PERS.: FR.) QUÉL.**

TROP.: fruitbodies appearing singly in a rather small area of the tropical greenhouse, 16 May 1998 (Pidlich-Aigner 633), 13 July 1998, 10 May 1999 (Pidlich-Aigner 1059, WU 19803), 7 July 1999, July 2000, and 16 Oct. 2000.

The individual fruitbodies showed high variability in basidiospore dimensions, sometimes it was difficult to separate our finds from *L. perplexa* KNUDSEN.

Native and rather common; sometimes found together with *L. cristata* and *L. clypeolaria* (BULL.: FR.) KUMMER in semi-ruderal situations in and around Graz.

***Lepiota cristata* (BOLT.: FR.) KUMMER**

TROP.: few fruitbodies, always on the same spot, 28 Sep. 1998 (Pidlich-Aigner 881), 7 Jan. 1999, 10 Feb. 1999, 12 May 1999, 16 Dec. 2000. — TEMP. (Succulents I): rather numerous on sandy substrate, 10 Nov. 1998 (Pidlich-Aigner 970), 5 Oct. 1999.

This is one of the common and well-known native *Lepiota* species, with very typical 'bullet-shaped' basidiospores.

---

**Figures 4–5. (4) *Gymnopus luxurians*:** fruitbodies on soil in the tropical greenhouse. **(5) *Rigidoporus lineatus*:** fruitbodies on the outside of a flower pot; (phot. H. Pidlich-Aigner).

***Lepiota elaiophylla*** VELLINGA & HUIJSER

TROP.: 3 Aug. 1998 (Pidlich-Aigner 713, WU 18988), on a different spot 16 Aug.–20 Oct. 1999; the often somewhat bulbous stipe bases were connected with small pieces of wood or bark by rhizomorphs.

This *Lepiota* species with yellow gills, which is usually found in greenhouses or flower pots, was formerly included in *L. xanthophylla* ORTON. Only recently, *L. elaiophylla* was recognized and described as a distinct species (VELLINGA & HUIJSER 1997). Due to the former confusion with *L. xanthophylla*, there exists only one additional reliable record from Austria so far (greenhouse in the Botanical Garden in Vienna, WU 20257).

***Leucoagaricus americanus*** (PECK) VELLINGA

Syn. *L. bresadolae* (SCHULZER) BON (see VELLINGA 2000)

TROP.: only few fruitbodies, 5 Mar. 1998 (Pidlich-Aigner 578, WU 18059), 13 May 1998 (Pidlich-Aigner 624, WU 18061). — COOL: 19 July 1998 (Pidlich-Aigner 699, WU 19154).

Very similar to *Macrolepiota* species in habit, usually recorded in man-made situations (e.g., on sawdust heaps, bark chips, and compost).

***Leucoagaricus leucothites*** (VITT.) VASSER

COOL: single basidiocarps on 10 Mar. 1998 (Pidlich-Aigner 579, WU 18062) and 26 Mar. 1998.

This species was found quite frequently in the open in summer 2000, in garden meadows, but also in plant beds covered with bark mulch.

***Leucocoprinus birnbaumii*** (CORDA) SINGER

TROP., TEMP., COOL: very abundant in 1998 and 1999, especially in the tropical greenhouse (13 Feb. 1998; Pidlich-Aigner 576, WU 19161), just like *Gymnopus luxurians*. In the meantime, it has become rather rare, and in 2001 *L. birnbaumii* was only found on a single spot in the cool greenhouse.

Although *L. birnbaumii* is a tropical species, which does not occur in our natural environment, this is probably one of the best-known agarics in Europe, due to its frequent occurrence in flower pots and its intense lemon- or sulphur-yellow colour.

***Leucocoprinus cepistipes*** (SOW.: FR.) var. ***rorulentus*** (PANIZZI) BABOS

TROP.: 11 May 1998, 8 June 1998. — TEMP.: 27 July 1998 (Pidlich-Aigner 703, WU 19165); TEMP. (Succulents I): immediately beside the glass barrier to the tropical greenhouse, 28 Sep. 1998 (Pidlich-Aigner 882). — COOL: 11 May–10 June 1998 (11 May 1998: Pidlich-Aigner 622, WU 19163; 13 May 1998: Pidlich-Aigner 625, WU 18064, 18925; 18 May 1998: Pidlich-Aigner 634; 22 May 1998: WU 19150), 15 June–7 July 1999, July 2000. — This is the only species found in all greenhouses, most abundantly in the cool greenhouse. The stipe bases are connected with small pieces of wood or bark by rhizomorphs.

According to MIGLIOZZI & PERRONE (1992), var. *rorulentus* differs from var. *cepistipes*, e.g., by the presence of guttation droplets on all parts of the fruitbody, and by the greyish colour of the lamellae in older and dried fruitbodies. This was probably the first record of this fungus in Austria.

***Leucocoprinus denudatus*** (RABENH.) SINGER

COOL: only one collection, with three mature and several young basidiocarps in fascicles, attached to small pieces of wood or bark buried in the sandy substrate by rhizomorphs, 17 Aug. 1998 (Pidlich-Aigner 728, WU 18965).

A widespread species, but in Europe it is only known from gardens, parks, greenhouses, and flower pots (VASSER 1979, CANDUSSO & LANZONI 1990, BON 1996).

***Limacella glioderma*** (FR.) MAIRE

TROP.: 10 Nov. 1998 (Pidlich-Aigner 969) until July 1999, sparsely also 2000. — TEMP.: 24 Feb. 1998 (Pidlich-Aigner 577, WU 18063) until 2001. — COOL: 11 May 1998 (Pidlich-Aigner 623, WU 19155), 13 July 1998, May 1999; confined to rather small areas in all cases of occurrence.

A native species, especially of deciduous woodland; easily recognizable by the slimy, reddish-brown caps of the young fruitbodies.

***Lyophyllum fumosum*** (PERS.: FR.) ORTON

TEMP.: only two fruitbodies, 29 Jan. 2001 (Pidlich-Aigner 1645). — COOL: single or in fascicles, 26 Mar. 2000 (Pidlich-Aigner 1354, WU 20225) until Nov. 2000.

A native species of woodland and grazed land, where the fruitbodies are often grouped in fairy rings.

***Melanoleuca rasilis*** (FR.) SINGER **var. *leucophylloides*** BON

TEMP.: a single fruitbody on a sandy spot, 28 Oct. 1999 (Pidlich-Aigner 1309, WU 20113).

A native species of grassy places in woodland. This fruitbody was hidden in a dark corner behind a large flower pot and probably therefore the cap was ± grey, not as dark as in typical specimens (cf. BON 1995).

***Melanophyllum haematospermum*** (BULL.: FR.) KREISEL

Syn. *M. echinatum* (ROTH: FR.) SING.

TROP.: on two spots, 4 May 1998 (Pidlich-Aigner 614, 615; WU 18060, 19153), 27 Nov. 1998 (Pidlich-Aigner 972), Mar. 1999. — TEMP.: single or in small groups, 2 Apr. 1998 (Pidlich-Aigner 581, WU 19152).

In most collections, the caps measured up to 35 mm in diameter, only the collection of 4 May 1998, from an area of about 1 square meter in the tropical greenhouse, differed considerably by minute fruitbodies with caps only 10 mm in size. However, this was apparently a dwarf 'modification' rather than the forma *gracilis* mentioned by BON (1996), which should have much more pallid gills.

A native species of moist woodland, often under tall herbs like *Petasites* and *Adenostyles*, also in burnt places with the moss *Funaria* (MOSER 1983).

***Melanotus flavolivens*** (BERK. & CURT.) SINGER

TROP.: in a flower pot with a germinating palm fruit (*Veitchia* spec., a species native in New Caledonia) in the nursery, 14 Dec. 2000 (Pidlich-Aigner 1639, WU 21006).

This find agrees well with the description in the monographic treatment by HORAK (1977). So far, *M. flavolivens* was known from islands in the Pacific Ocean, New Caledonia, the Solomon Islands, and the Bonin Islands. This was the first record for Europe.

In spite of the differences in habit, *Melanotus* is very close to *Psilocybe* and has already been reduced to subgeneric rank by M.E. NOORDELOOS (in BAS & al. 1999).

***Mycena leptocephala*** (PERS.: FR.) GILLET

COOL: a single fruitbody in a flower pot in the nursery, 8 June 1999 (Pidlich-Aigner 1071), and another in the cool greenhouse, apparently on soil, 21 Jan. 2000 (Pidlich-Aigner 1343, WU 20221). — TROP.: somewhat doubtful records from the show case: single fruitbodies 16 Mar. 2000 and 25 Mar. 2000, ten fruitbodies 17 Apr. 2000 (Pidlich-Aigner 1352).

The fruitbodies from the show case had no clamp connections, and basidia with only two sterigmata beside normal basidia. However, MAAS GEESTERANUS (1992) has included a North American collection with these characters in *M. leptocephala*.

*M. leptcephala* is native and usually found on plant litter in woodland, mainly on buried small pieces of wood or dead roots (e.g., BREITENBACH & KRÄNZLIN 1991).

***Mycena sanguinolenta*** (ALB. & SCHWEINITZ: FR.) KUMMER

TEMP.: in a flower pot standing on the ground, 13 Oct. 1999 (Pidlich-Aigner 1312). — COOL: numerous fruitbodies on a metal basket 2 m above ground, filled with bark chips, *Sphagnum* and peat, serving as a substrate for orchids, 7 Apr. 1998 (Pidlich-Aigner 582, WU 19160); this basket was transferred into the garden in the middle of May where the fungus continued to produce fruitbodies until the end of July.

A native species usually found on needle litter in conifer woods. If the stipe base breaks, it oozes out a brownish-red juice, but more watery and much less copious than in the more robust, wood-inhabiting *M. haematopus* (PERS.: FR.) KUMMER.

***Mycena* spec.**

TROP.: about 20 fruitbodies on thick pieces of wood from the stem base of *Vitis vinifera* (therefore very irregular in shape and with numerous cavities), 13 July 1998 (Pidlich-Aigner 685, WU 20867).

G. ROBICH (Venezia, in litt.) has kindly examined our collection and noted that this is apparently a tropical species, which may finally be identifiable from living material. He has also provided detailed microscopic data which were included in the description in the original paper.

***Psathyrella candolleana*** (FR.: FR.) MAIRE

TROP.: three sparse fascicles on wood, 26 Mar. 1998 (Pidlich-Aigner 580, WU 19162), 10 June 1998, 8 June 1999. — TEMP.: five fruitbodies, also in fascicles, 23 Oct. 1999 (Pidlich-Aigner 1345, WU 20224).

A common native species in Europe, usually fasciculate or gregarious on or around decaying stumps.

***Psathyrella pseudocorrugis*** (ROMAGN.) BON

TEMP.: three fruitbodies in a flower pot with *Clerodendron* spec. (Verbenaceae), 15 Mar. 1999 (Pidlich-Aigner 1009, WU 19472).

According to KITS VAN WAVEREN (1985), *P. pseudocorrugis* is a rare terrestrial species, but in Middle Europe it is quite frequently found in floodplain forests and in *Robinia pseudacacia* stands.

***Psathyrella spadiceogrisea*** (SCHAEFF.) MAIRE

TEMP.: two fruitbodies in a flower pot, 3 Oct. 2000 (Pidlich-Aigner 1544, WU 20924).

Like *P. candolleana*, this is one of the most common native *Psathyrella* species, usually also found on or around decaying stumps.

***Rigidiporus lineatus*** (PERS.) RYV.

(Fig. 5, p. 55)

TROP.: in the nursery, on the outside of a very moist flower pot with substrate and the seedling of a date palm species, 19 Apr. 1999 (Pidlich-Aigner 1033, WU 19474).

According to RYVARDEN & GILBERTSON (1994), this is a common polypore in the tropics, but apparently only the third record from Europe. In Budapest it was found in a greenhouse, in former Czechoslovakia in a mine 450 m deep.

***Schizophyllum commune*** FR.: FR.

TROP.: on discs from soft-wooded tree trunks serving as 'stepping stones' on the ground, throughout the years; 16 Mar. 2000 (Pidlich-Aigner 1353, WU 20223).

A common native decomposer of wood on rather dry, ± undecayed logs and stumps.

***Steccherinum ochraceum*** (PERS.: FR.) S.F. GRAY

TROP.: numerous pileate fruitbodies on a tree trunk in the show case, 12 May 2000 (Pidlich-Aigner 1358, WU 20946).

A native wood-decay fungus; basidiocarps resupinate to pileate, with hydroid hymeniophore.

***Tubaria conspersa*** (PERS.: FR.) FAYOD

TEMP.: fresh and old fruitbodies transferred from the temperate greenhouse into the garden in mid-May, 2 June 1998 (Pidlich-Aigner 640, WU 19159), 27 July 1998.

Outdoors this native fungus is usually found on moist soil, often associated with small pieces of wood.

In the final part, the fungus species are arranged by the different greenhouses where they were found (cf. Fig. 6). Technical data and the various substrates are summarized in the original paper by PIDLICH-AIGNER & HAUSKNECHT (2001). For details see the references given under 'KARL-FRANZENS-UNIVERSITÄT GRAZ, BOTANISCHER GARTEN (1994)' and 'KARL-FRANZENS-UNIVERSITÄT GRAZ & STEIRISCHE LANDESREGIERUNG, LANDESBAUDIREKTION (1995)'.

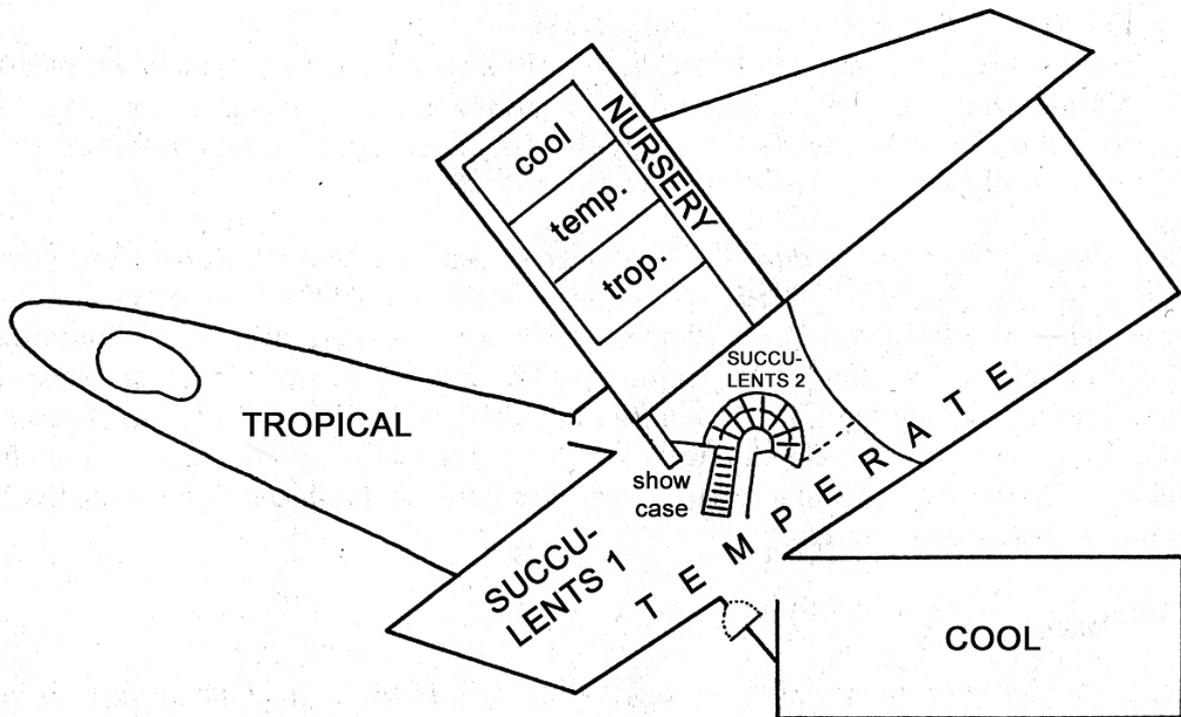


Fig. 6. Plan of the greenhouses of the Institute of Botany of the University of Graz.

**Tropical greenhouse**, incl. the corresponding section in the nursery and the show case:

<i>Armillaria mellea</i>	<i>Leucocoprinus birnbaumii</i>
<i>Conocybe</i> spec. [nursery]	<i>Leucocoprinus cepistipes</i>
<i>Coprinus disseminatus</i>	var. <i>rorulentus</i>
<i>Gymnopus luxurians</i>	<i>Limacella glioderma</i>
<i>Gymnopus</i> spec. [nursery]	<i>Melanophyllum haematospermum</i>
<i>Hohenbuehelia mastrucata</i>	<i>Melanotus flavolivens</i> [nursery]
[show case]	<i>Mycena</i> spec.
<i>Hohenbuehelia petalodes</i>	<i>Psathyrella candolleana</i>
<i>Hypholoma fasciculare</i>	<i>Rigidiporus lineatus</i> [nursery]
<i>Lepiota aspera</i>	<i>Schizophyllum commune</i>
<i>Lepiota cristata</i>	<i>Steccherinum ochraceum</i>
<i>Lepiota elaiophylla</i>	[show case]
<i>Leucoagaricus americanus</i>	

**Temperate greenhouse** (excl. succulents section), incl. the corresponding section in the nursery:

<i>Coniophora puteana</i>	<i>Melanoleuca rasilis</i>
<i>Conocybe crispella</i> [nursery]	var. <i>leucophylloides</i>
<i>Coprinus domesticus</i>	<i>Melanophyllum haematospermum</i>
<i>Coprinus plagioporus</i>	<i>Mycena sanguinolenta</i>
<i>Leucocoprinus birnbaumii</i>	<i>Psathyrella candolleana</i>
<i>Leucocoprinus cepistipes</i>	<i>Psathyrella pseudocorrugis</i>
var. <i>rorulentus</i>	<i>Psathyrella spadiceogrisea</i>
<i>Limacella glioderma</i>	<i>Tubaria conspersa</i>
<i>Lyophyllum fumosum</i>	

**Cool greenhouse**, incl. the corresponding section in the nursery:

<i>Gymnopus dryophilus</i>	<i>Leucocoprinus denudatus</i>
<i>Hemimycena cucullata</i>	<i>Limacella glioderma</i>
<i>Leucoagaricus americanus</i>	<i>Lyophyllum fumosum</i>
<i>Leucoagaricus leucothites</i>	<i>Mycena leptcephala</i>
<i>Leucocoprinus birnbaumii</i>	[also in the nursery]
<i>Leucocoprinus cepistipes</i>	<i>Mycena sanguinolenta</i>
var. <i>rorulentus</i>	

**Temperate greenhouse (Succulents I):**

*Lepiota cristata*  
*Leucocoprinus cepistipes* var. *rorulentus*

**Temperate greenhouse (Succulents II, incl. the cycads):** no collections

## References

- ANTONÍN V. & HERINK J. (1999): Notes on the variability of *Gymnopus luxurians* (Tricholomataceae). – Czech Mycol. 52(1): 41-49.
- ANTONÍN V. & NOORDELOOS M.E. (1997): A monograph of *Marasmius*, *Collybia* and related genera in Europe, Part 2. *Collybia*, *Gymnopus*, *Rhodocollybia*, *Crinipellis*, *Chaetocalathus* and additions to *Marasmiellus*. – Libri Botanici 17, 256 pp. – Eching b. München: IHW.

- BAS C., KUYPER T.W., NOORDELOOS M.E. & VELLINGA E.C. (1995): Flora Agaricina Neerlandica 3. Tricholomataceae (2). – Rotterdam, Brookfield: Balkema.
- BAS C., KUYPER T.W., NOORDELOOS M.E. & VELLINGA E.C. (1999): Flora Agaricina Neerlandica 4. Strophariaceae, Tricholomataceae (3). – Rotterdam, Brookfield: Balkema.
- BON M. (1995): Die Großpilzflora von Europa 2. Tricholomataceae 1 (übersetzt und bearbeitet von F. MEDJEBEUR-THRUN und W.U. THRUN). – Eching b. München: IHW.
- BON M. (1996): Die Großpilzflora von Europa 3. Lepiotaceae (übersetzt und bearbeitet von F. MEDJEBEUR-THRUN und W.U. THRUN). – Eching b. München: IHW.
- BON M. & MASSART F. (1996): Deux espèces américaines découvertes dans le sud-ouest de la France. – Doc. mycol. 26/103: 29-32.
- BREITENBACH J. & KRÄNZLIN F. (1991): Pilze der Schweiz. Band 3. Röhrlinge und Blätterpilze, 1. Teil. – Luzern: Mykologia.
- CANDUSSO M. & LANZONI G. (1990): Fungi Europaei 4. Lepiota s.l. – Saronno: G. Biella.
- HAUSKNECHT A. (1997): Erste Funde von *Conocybe crispella* in Europa. – Boll. Gr. Micol. Bresadola 40: 261-265.
- HAUSKNECHT A. & KRISAI-GREILHUBER I. (2000): Rüblinge, Schwindlinge und verwandte Taxa in Ostösterreich. – Österr. Z. Pilzk. 9: 31-66.
- HORAK E. (1977): The genus *Melanotus* PAT. – Persoonia 9: 305-327.
- KARL-FRANZENS-UNIVERSITÄT GRAZ, BOTANISCHER GARTEN, Hrsg. (1994): Bodenaufbau und Substratmischungen in den Gewächshäusern. – Wien: Ungar.
- KARL-FRANZENS-UNIVERSITÄT GRAZ & STEIRISCHE LANDESREGIERUNG, LANDESBAUDIREKTION, Hrsg. (1995): Die Gewächshäuser der Uni Graz. – Wien: Ungar.
- KITS VAN WAVEREN E. (1985). The Dutch, French and British species of *Psathyrella*. – Persoonia Suppl. 2, 300 pp.
- MAAS GEESTERANUS R.A. (1992): Conspectus of the Mycenae of the Northern Hemisphere II. – Amsterdam, etc.: Kon. Nederl. Akad. Wetensch. Verh.
- MIGLIOZZI V. & PERRONE L. (1992): Sulle Lepiotee - 7° contributo. *Leucocoprinus cepistipes* var. *rorulentus* (PANIZZI) BABOS. – Boll. AMER 25: 3-8.
- MOSER M. (1983): Kleine Kryptogamenflora. Band IIb/2 (Basidiomyceten, 2. Teil). Die Röhrlinge und Blätterpilze (Polyporales, Boletales, Agaricales, Russulales). – Stuttgart, New York: G. Fischer.
- PIDLICH-AIGNER H. & HAUSKNECHT A. (2001). Großpilze in den Gewächshäusern des Botanischen Gartens der Universität Graz. – Österr. Z. Pilzk. 10: 43-73 (+ farbige Abb. IV-XI).
- RYVARDEN L. & GILBERTSON R.L. (1994): European Polypores 2. – Oslo: Fungiflora.
- SCHEUER Ch. (2001): Dupla Fungorum (2001), verteilt vom Institut für Botanik der Universität Graz (GZU). Schluß und alphabetischer Gesamtindex. – Fritschiana 24: 11-34.
- ULJÉ C.B. & BAS C. (1991): Studies in *Coprinus* - II. – Persoonia 14(3): 275-339.
- VASSER S.P. (1979): Fungorum rariorum icones coloratae 10. – Vaduz: J. Cramer.
- VELLINGA E.C. (2000): Notes on *Lepiota* and *Leucoagaricus*. Type studies on *Lepiota magnispora*, *Lepiota barssii*, and *Agaricus americanus*. – Mycotaon 76: 429-438.
- VELLINGA E.C. & HUIJSER H.A. (1997): Notes on *Lepiota xanthophylla* and its greenhouse counterpart. – Boll. Gr. Micol. Bresadola 40: 457-464.
- WATLING R. (1994): Observations on Malaysian Bolbitiaceae with records from Salomon Islands. – Garden's Bull. Singapore 45: 359-381.