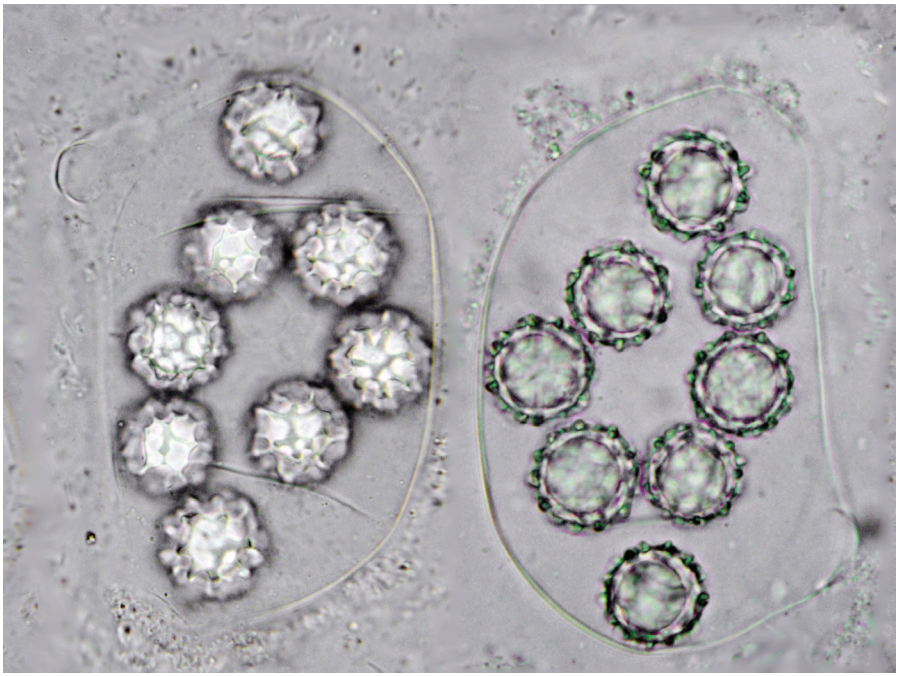
# CATATHELASMA

a journal on biodiversity, taxonomy and conservation of fungi

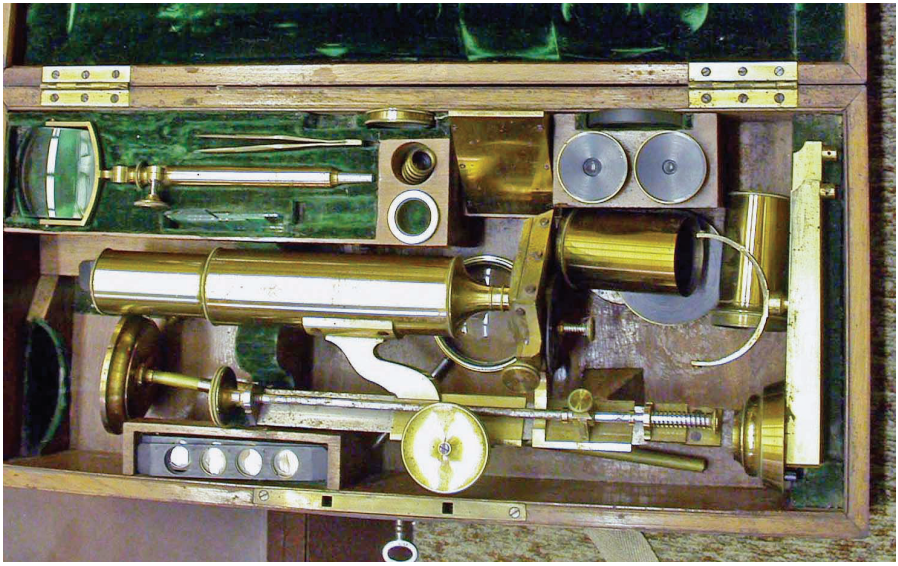
No. 14 December 2012

***Mattirolomyces terfezioides*** (Podunajská nížina, Čenkov; see p. 5-9)

ISSN 1335-7670 Catathelasma 14: 1-32



***Mattirolomyces terfezioides, asci and spores***
(Podunajská nížina, Čenkov; see p. 5-9)



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CATATHELASMA is edited by Pavel Lizoň and published by the Slovak Mycological Society in Bratislava with the financial support of the Slovak Academy of Sciences. ISSN 1335-7670.

**Editor's Acknowledgements**

The Editor express his appreciation to Drs. Vladimír Antonín (Moravian Museum, Brno, Czech Rep.) and Pavel Lizoň (Institute of Botany, SAS, Bratislava, Slovakia) who have, prior to the acceptance for publication, reviewed, read and commented contributions appearing in this issue. Zdeno Bašta kindly helped with the cover.

**Instructions to Authors**

Catathelasma publishes contributions to the better knowledge of fungi preferably in Slovakia and central Europe. Papers should be on biodiversity (mycofloristics), distribution of selected taxa, taxonomy and nomenclature, conservation of fungi, and book reviews and notices. We accept also announcements on literature for sale and/or exchange (classified) and on events atractive for mycologists. Manuscripts have to be submitted in English with a Slovak or Czech summary.

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- illustrations: line drawings (scanned and "doc" or "tif" formatted)
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# FIRST RECORD OF MATTIROLOMYCES TERFEZIOIDES FROM SLOVAKIA – THE NORTHERNMOST LOCALITY IN EUROPE

STANISLAV GLEJDURA AND VLADIMÍR KUNCA[1]

**Key words:** Pezizaceae, hypogeous fungi, ecology

## INTRODUCTION

The hypogeous genus *Mattirolomyces* was established by E. Fisher (1938) for *Choiromyces terfezioides* Mattir. (Mattirolo, 1887), on the basis of globose ascocarps, elipsoid shape of asci and globose reticulate spores. Trappe (1971) placed *M. terfezioides* (Mattir.) E. Fisch. together with *Terfezia spinosa* Harkn. into desert-truffle genus *Terfezia* on rang to a subgenus. Followed up molecular phylogenetic analyses showed that *Mattirolomyces* is an independent genus (Percudani & al., 1999, Díez & al., 2002) and belongs to Pezizaceae (Læssøe & Hansen, 2007, Trappe & al. 2010). The genus was represented by one species for a long time. Recent studies showed that the genus has world-wide distribution and contains five species in present time: *M. austroafricanus* from South Africa, *M. mexicanus* from Mexico, *M. spinosus* from the USA, *M. mulpu* from Australia and *M. terfezioides* from Europe only (Kovács & al., 2011).

The distribution of *M. terfezioides* in Europe is scarce and is known only from a few European countries in the warm belt of the temperate continental climate and partly in Mediterranean climate in the Southern Europe. The southern- and the westernmost locality is in Spain, in Madrid (Kovács & al., 2009), the easternmost finding is in Hungary, near Zsurk (Csorbainé & al., 2008). Further country with occurrence is France, east of Avignon (Alsheikh, 1994), Italy, Moncalieri-Piemonte (type locality) and other findings from the North Italy (Montecchi & Sarasini, 2000) and Serbia, Natural Reserve Deliblato near Danube River (Lawrynowicz & al., 1997). The majority of the localities is in the Carpathian Basin (Csorbainé & al., 2008). In 2010 was *M. terfezioides* collected in Slovakia from two different localities in Žitný ostrov island, finding from Tonkovce (Dunajská Streda District) is the northernmost locality in Europe.

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## MATERIALS AND METHODS

Description of the species is based on fresh specimens of author's collections in Podunajská nížina lowland, Slovakia. The micro-characters were observed in fresh and dried material in distilled water, microphotographs of asci with spores were made in distilled water too. The soil samples (from A horizon) were analyzed in the laboratory of our institution. Soil pH value were determined in water suspension (HANNA HI 9321). Voucher specimens are held in S. Glejdura's herbarium (PSG), V. Kunca's herbarium (PVK), and the hebrarium of Slovak National Museum (BRA).

## SPECIES DESCRIPTION

Ascocarps initially hypogeous, when mature semihypogeous, globose or slightly flattened, 2-7.5 cm diameter, whitish than yellowish, ochre-grayish, over-matured with rose spots (see photograph on p. [XX]). Peridium thin 60-110 µm, pseudoparenchymatous composed of polygonal, irregular cells. Gleba whitish, mature ochroe-rose, not very firm, marbled with white veins. Flavor and taste sweet. Asci not organized in hymenium, broadly ellipsoid to pyriform with short appendage, 80-145 x 35-55 µm, 8-spored (see photograph on p. [XX]). Ascospores biseriate or irregularly disposed in asci, globose, 16-18 µm without ornamentation, hyaline, with age yellowish, with de Bary bubbles when mounted in cotton blue in lactic acid, ornamented with nearly polygonal meshes, spiny at the angles. It is edible. Since it is very sweet it is especially used in desserts preparation in Hungary.

## SPECIMENS STUDIED, HABITAT AND ECOLOGY

Podunajská nížina lowland, Čenkov, next to the National Reserve Čenkovská lesostep and Danube River, 110 m, under *Gleditschia triacanthos* and *Robinia pseudoacacia* in sandy soil, pH of soil 7,41, contens of organic material 27.7 %, 17. X. 2010, J. Mezey (PSG 3007); ibidem, 21. X. 2010, S. Glejdura and V. Kunca (PSG 1601, PVK).

The specimens were collected directly under *Gleditschia triacanthos* and *Robinia pseudoacacia* in mixed forest with *Juglans regia, Populus tremula*, *Quercus rubra* and *Tilia cordata*. The shrub layer consists of *Berberis vulgaris*, *Crataegus sp*., *Prunus spinosa*, *Euonymus europaeus*, herb layer is composed by *Agrymonia eupatonia, Aster* sp., *Canabis ruderalis*, *Geranium robertianum*, *Nepeta* sp., *Tithymalus cyparissia, Viola* af. *epipsila* and grasses *Brachypodium sylvaticum* and *Elytrigia* sp.

Podunajská nížina lowland, Čenkov, cca 300 m, S of the first locality, under *Pinus sylvestris, Robinia pseudoacacia*, 2. XI. 2010, S. Glejdura (PSG 1241).

In mixed forest with dominance of *Quercus* sp. The shrub layer consists of *Prunus spinosa,* herb layer of *Ballota nigra*, *Conyza canadensis*, *Dactylis glomerata*, *Salvia pratensis*.

Podunajská nížina lowland, Eliášovce, settlement Tomkovce, near Malý Dunaj river, 120 m, in the *Asparagus* plantation, in sandy soil, 7. XI. 2010, T. Peršová, (BRACR 16580).
The closest trees and shrubs (*Pinus silvestris* and *Chamaeocyparis sp.)* were ca 20 m from the site of the collection and unlikely that the fungus form a symbiosis with them. *Asparagus* might be its mycorrhiza partner.

## DISCUSSION

*Mattirolomyces terfezioides* is a mycorrhizal fungus, forming unusual mycorrhiza with weak colonisation of the roots of *Robinia pseudoacacia* (Bratek, 1996). Similar type of mycorrhiza, based on molecular and morphological methods was found also with other woody plants: *Celtis occidentalis*, *Crataegus monogyna*, *Lygustrum vulgare* and herbs *Muscari racemosum*, *Salvia glutinosa* and *Viola cyanea* (Kovács & al., 2007). It follows that spectrum of hosts is relatively wide. Previous data of plants recorded from habitats of *Mattirolomyces terfezioides* throughout the Europe as *Cerasus avium* (Szemere, 1965), *Populus alba*, *Crataegus*, *Pinus nigra*, *Salix* and *Juniperus* (Lawrynowicz & al., 1997), *Asparagus officinalis*, *Ficus*, *Prunus* (Montecchi & Sarasini, 2000) and presented data open field to study other possible mycorrhizal partners, some of which can be useful in a cultivation of that culinary valuable fungus in future.

The majority of localities is in the Carpathian Basin (especially in Hungary), mainly on the slightly basic sandy soils deposited by the Danube (Bratek & al., 2007, Csorbainé & al., 2008). Habitats in Slovakia and Serbia are very similar to Hungarian ones, common feature is sandy soil close to the Danube River with similar ecology and temperature range. Although the most localities are in forests with *Robinia pseudoacacia* introduced to Europe from North America, *M. terfezioides* is not known from the American continent. There is a question if is that species strictly European and *Robinia pseudoacacia* is only one of chosen useful mycorrhizal partner living in suitable ecological conditions typical for the Carpathian Basin and these habitats are crucial to the life of this fungus.

## ACKNOWLEDGEMENT

The paper was supported by The Slovak Grant Agency VEGA, grant no. 1/1190/12. We wish to thank Nataša Kandová for laboratory analyses,

Václav Kautman for the ecological data and Jozef Mezey and T. Peršová for providing information on localities with occurrence of *Mattirolomyces terfezioides*.

## REFERENCES

Alsheikh, A. M. 1994. Taxonomy and mycorrhizal ecology of the desert trufles in the genus Terfezia. PhD Diss., Oregon State University, Corvalis.

Bratek, Z., E. Jakucs & K. Bóka. 1996. Mycorrhizae between black locust (Robinia pseudoacacia) and Terfezia terfezioides. *Mycorrhiza* 6: 271-274.

Csorbainé, A. G. & al. 2008. Choiromyces meandriformis and Mattirolomyces terfezioides: peculiar truffles with new perspectives. XVII Convegno Nazionale di Micologia , Pavia 10–12 Novembre 2008, p. 36.

Díez, J., J. L. Manjón & F. Martin. 2002. Molecular phylogeny of the mycorrhizal desert truffles (Terfezia and Tirmania), host specifity and edaphic tolerance. *Mycologia* 94: 247-259.

Fisher, E. 1938. Klasse Ascomycetes, Reihe Euascales. Unterreihe VIII. Tuberineae. In: A. Engler & H. Harms (eds), Natürlichen Pflanzenfamilien, vol. 5. Leipzig.

Kovács, G. M., E. Jakucs & I. Bagi. 2007. Identification of host plants and description of sclerotia of the truffle Mattirolomaces terfezioides. *Mycol. Progr.* 6: 19-26.

Kovács, G. M., M. P. Martín & F. D. Calogne. 2009. First record of Mattirolomyces terfezioides from the Iberian Peninsula: its southern- and westernmost lokality. *Mycotaxon* 110: 325-330.

Kovács, G. M. & al. 2011. Terfezia dissapears from the American truffle mycota as two new genera and Mattirolomyces species emerge. *Mycologia* 103: 831-840.

Ławrynowicz, M., M. Marković & M. Ivančević. 1997. Terfezia terfezioides – a new hypogeous fungus for Balkan Peninsula. *Acta Mycol.* 32: 233-238.

Læssøe, T. & K. Hansen. 2007. Truffle trouble: what happened to the Tuberales:. *Mycol. Res.* 111: 1075-1099.

Mattirolo, O. 1887. Illustrazione di tre nuove specie di Tuberacee Italiane. *Mem. Della Reale Accad. Sci. Torino* 38: 377-393.

Montecchi, A. & M. Sarasini. 2000. Fungi ipogei d'Europa. Trento.

Percudani, R. & all. 1999. Molecular phylogeny of truffles (Pezizales: Terfeziaceae, Tuberaceae) derived from nuclear rDNA sequence analysis. *Mol. Phylogenet. Evol.* 13: 169-180.

Szemere, L. 1965. Die unterirdischen Pilze des Karpatenbeckens. Budapest.

Trappe, J. M. 1971. A synopsis of the Carbomycetaceae and Terfeziaceae (Tuberales). *Trans. Br. Mycol. Soc.* 57: 85-92.

Trappe, J. M., G. M. Kovács & A. V. Claridge. 2010. Comparative taxonomy of desert truffles of the Australian outback and African Kalahari. *Mycol. Progr.* 9: 131-143.

Stanislav Glejdura a Vladimír Kunca: Prvý nález Mattirolomyces terfezioides zo Slovenska – najsevernejšia lokalita v Európe. *Catathelasma* (14): 5-9, 2012.

Podzemka *Mattirolomyces terfeziodes* bola zbieraná na dvoch lokalitách pri Čenkove (pod gledíčiou trojtŕňovou, agátom bielym a borovicou lesnou a na jednej lokalite pri Eliášovciach – osade Tomkovce (na špargľovej plantáži).

## BOOK NOTICES

PAVEL LIZOŇ

Anna Ronikier. 2012. **Fungi of the Sarnia Skała massif in the Tatra Mountains (Poland).** Polish Botanical Studies 28: 1-293, incl. 184 figures (line drawings, B/W a color photographs, graphs) and ecodiagrams and distribution maps (p. 195-293). ISBN 978-83-62975-07-5, ISSN 0867-0730. Sold by W. Szafer Institute of Botany, Polish Academy of Science. Price: EUR 29.00.

The study is an assessment of the diversity of agaricoid, boletoid, cyphelloid and cantharelloid fungi of a small calcareous mountain. It is based on repeated surveys of the study area and detailed observations in 12 permanent plots through six vegetation periods (1999–2004). In total, 297 taxa were recorded in the study area, 115 of which have not been reported from the Tatra Mts before. Mycocoenological observations were made in order to distinguish groups of species locally characteristic of the typical plant associations: 42 species were recognized as characteristic of lower montane beech forest, 8 of upper montane spruce forest, and 11 of dwarf mountain pine shrubland. A comparison of the study area's fungal diversity with that of other mycologically investigated mountain ranges in the Alps and the Carpathians showed that the study site was most similar to the Swiss National Park and Berchtesgaden National Park.

# GEOGLOSSACEOUS FUNGI IN SLOVAKIA IV
# Geoglossum alveolatum, a new species for the country

VIKTOR KUČERA[2]

**Key words:** Ascomycetes**,** biodiversity

## INTRODUCTION

Since the rediscovery of *Trichoglossum hirsutum* in Slovakia (Mráz, 1997), several geoglossaceous fungi new in this country have been collected and identified. In *Trichoglossum*, *T. walteri* was reported in 2001 (Ripková & al., 2007) and *T. variabile* in 2005 (Kučera & al., 2008). Our research of grassland fungi in Slovakia resulted in discovery of quite rare *Trichoglossum octopartitum* (Kučera & al., 2010). We refered also about members of *Microglossum* (Ripková & Kučera, 2006; Kučera & al., 2008) and *Geoglossum* (Kučera & Lizoň, 2012). Now we would like to draw attention to *Geoglossum alveolatum,* another new member of Slovak mycoflora.

## MATERIAL AND METHODS

The macro-morphological characters of collections were observed in fresh material. The micro-morphological structures were observed in dried material using a light microscope with an oil immersion lens. Fragments of fruit-bodies were examined in tap water, 5% KOH, Melzer's reagent and a solution of Congo red in ammonia. Values of micro-morphological characters were evaluated as average plus and minus standard deviation of 30 measurements for each character (minimum/maximum values of the measurements are in parenthesis). Thirty ascospores per herbarium specimen were measured. Identification and nomenclature is based on Durand (1908), Mains (1954) and Nannfeldt (1942). Locality is georeferenced and the coordinates are in WGS 84 system. Description is based on voucher specimen that is deposited in the herbarium of the Institute of Botany, Slovak Academy of Sciences (SAV).

## RESULTS

***Geoglossum alveolatum*** (Rehm) E. J. Durand

Ascocarps (16)19–28 mm high, clavate, stipitate, scattered, solitary. Fertile part (5)7–12(15) × 2–4 mm, lanceolate to mace-shaped, apex obtuse, black, vertically grooved, glabrous. Sterile part (10)13–22 × 1–2 mm, delimited from the fertile part, cylindrical, slender or robust, when

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fresh conspicuously hairy (dark brown setose septate hairs in tufts arising from superficial hyphae in upper part of the stipe), brownish black to black [examined 6 fruitbodies]. Asci (182)185–198(206) × (16)18–20 µm, clavate, apex rounded, pore blue in Melzer's reagent, narowed below, 8-spored. Spores (77)85–88(95) × 5(6) µm, straight or slightly curved, sometimes tappering towards one end, at first non–septate, than 7-septate, finally 11-14 septate, translucent, hyalin, finally in some asci becoming pale brown or fuligineous. Paraphyses pale brown in the apical part, remotely septate, immersed in brown amorphous mater, apical cells usually abruptly elliptical to globose thickned, 16-25 x 6-8 µm.

HABITAT. On wooden detrit, in mixed forest.

DISTRIBUTION. North America, India, Japan, Papua New Guinea?, Asia (Durand, 1908; Spooner, 1987; Mains, 1954; Imai, 1941).

SPECIMEN STUDIED. Slovakia, Spišské vrchy Mts., Bijacovce, ca 2 km NNE from the village, mixed forest, wooden detrit, Q 6990d, N49°02'30.02" E20°48'14.09", alt. 748 m, 24. 10. 2007, V. Kučera (SAV 10530).

## DISCUSSION

Description of the taxon by Rehm (1904) is based on the specimen collected by Durand. Original material is deposited in Rehm herbarium in Stockholm (Nannfeldt, 1947). Isotype is held in the herbarium CUP, Cornell University, Ithaca, USA (Mains, 1954).

So far this is the only Slovak *Geoglossum* with hyaline spores, setose hairs on the stipe and paraphyses immersed in a brown matter. According to Durand (1908) sometimes is possible to find brown or fuliginous spores in some asci but are rare. The number of compartments is up to 15. It grows in the woods.

According to recently published data on *Geoglossum* in Slovakia (Kučera et al., 2012), *G. alveolatum* is macroscopically differentiated by brown setose hairs on the stipe (at least in the upper part) and by growth on decomposed wood. Microscopical differences are mainly in spore septation. *Geoglossum alveolatum* has spores with septas up to 15, *G. glabrum* – 7, *G. umbratile* - 7, *G. cookeanum* – 7, *G. glutinosum* – 7, *G. fallax* – up to 12. *G. alveolatum* has mainly hyaline spores but in other Slovak geoglossaceous fungi spores are fuligineous or brown. Visit of the collection site in 2011 brought no collections do to extremely dry period.

This is not only first record for Slovakia but propably also for Europe. *Geoglossum alveolatum* is a rare and an endangered species in Slovakia and should be included in the next edition of the Red list of Slovak fungi

(for older versions, see Lizoň, 2001) in the category “EN“. Fungus was growing in mixed forest which might be a pasture before (with old *Juniperus communis* shrubs). Fungus was accomanied by *Trichoglossum hirsutum* and *Clavaria* sp.

RELATED SPECIES. According to Durand (1908), Mains (1954) and Nannfeldt (1942) *Geoglossum intermedium*, *G. elongatum* and *G. alveolatum* have similar tufts of setose hairs. The main differences from our species are in the spore size (*G. elongatum* and *G. intermedium* have shorter spores) and in the number of septa (*G. elongatum* and *G. velugelianum* have less septate spores). *Geoglossum starbaeckii* lacks brown matter around paraphyses. None of the related species have been mentioned from Slovakia.

ACKNOWLEDGEMENTS

I would like to thank Slavomír Adamčík and Soňa Jančovičová for assistance in the field and Pavel Lizoň for commenting the draft of the manuscript. This study was supported by grant VEGA 2/0062/10.

REFERENCES

Durand, E. J. 1908. The Geoglossaceae of North America. *Ann. Mycol.* 6: 387–477.

Imai, S. 1941. Geoglossaceae Japoniae. *J. Fac. Agric. Hokkaido Imp. Univ. 4*5: 155–264.

Kučera, V., P. Lizoň & I. Kautmanová. 2008. Geoglossaceous fungi in Slovakia: rare and new taxa for the territory. *Biologia* 63: 482–486.

Kučera, V., P. Lizoň & I. Kautmanová. 2010. Geoglossoid fungi in Slovakia II. Trichoglossum octopartitum, a new species for the country. *Czech Mycol.* 62:13–18.

Kučera, V. & P. Lizoň. 2012. Geoglossaceous fungi in Slovakia III. The genus Geoglossum, *Biologia* 67: 654—658.

Lizoň, P. 2001. Červený zoznam húb Slovenska. 3. verzia (December 2001) – In: Baláž, D., Marhold, K. & Urban, P. (eds.), Červený zoznam rastlín a živočíchov Slovenska, *Ochr. Prir.* 20 (Suppl.): 6–13.

Mains, E. B. 1954. North American species of Geoglossum and Trichoglossum. *Mycologia* 46: 586–631.

Mráz, P. 1997. Rediscovery of Trichoglossum hirsutum in Slovakia. *Czech Mycol.* 49: 239–243.

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

Rehm, H. 1904. Ascomycetes Americae borealis. *Ann. Mycol.* 2(1): 32-37.

Ripková, S. & V. Kučera. 2006. Drobnojazýček zelený (Microglossum viride) a dutinovka otrubnatá (Encoelia furfuracea) –prehliadané druhy slovenskej mykoflóry? *Mykol. Listy* 96: 14–19.

Ripková, S., S. Adamčik, V. Kučera & L. Palko. 2007. Fungi of the Protected Landscape Area of Vihorlat. Huby chránenej krajinnej oblasti Vihorlat. Bratislava.
Spooner, B. M. 1987. Helotiales of Australasia. Geoglossaceae, Orbiliaceae, Sclerotiniaceae, Hyaloscyphaceae. Berlin & Stuttgart.

Viktor Kučera. Geoglosoidné huby Slovenska IV. Geoglossum alveolatum, nový druh pre územie Slovenska. *Catathelasma* (14): 11-14, 2012.

*Geoglossum alveolatum* je zriedkavý druh, pred rokom 2007 na Slovensku neznámy. Patrí medzi vzácne a ohrozené druhy našej mykoflóry. Rástol na odumretom dreve v zmiešanom lese pri Bijacovciach na Spiši.

# TECTELLA PATELLARIS (AGARICALES) RECORDED IN SLOVAKIA

SOŇA JANČOVIČOVÁ[3], STANISLAV GLEJDURA[4] AND VLADIMÍR KUNCA[4]

**Key words:** *Mycenaceae*, morphology, occurrence, ecology, Europe

## INTRODUCTION

With the only species *Tectella patellaris* (Fr.) Murrill, *Tectella* Earle is a monotypic genus in Europe (Elborne & Læssøe, 2012). The list of synonyms shows its unstable taxonomic concept. The species was classified into various genera such as *Panellus*, *Panus* (it was originally described in this genus), *Pleurotus* and *Pocillaria* (Kirk 2012), as well families *Favolaschiaceae* (Elborne & Læssøe, 2008), *Pleurotaceae* (e.g. Roux 2006) or *Tricholomataceae* (e. g. Moser, 1978, Hansen & Knudsen, 1992). Recently, *T. patellaris* is considered the member of family *Mycenaceae* (Elborne & Læssøe, 2012). Together with other European taxa of this family (those of genera *Hemimycena*, *Mycena*, *Roridomyces*, *Panellus*, *Resinomycena*, *Sarcomyxa* and *Xeromphalina*), it is characterized by white spore print, spores smooth, thin-walled, without germ pore and generally amyloid, and cystidia usually present (selected family characters). Within this family, on the other hand, *T. patellaris* is a unique species by having veil (covering lamellae when young) and thick-walled hyphae (Elborne & Læssøe, 2012). Crepidotoid habit of basidiomata is also very characteristic for *T. patellaris*, and, comparing with some other *Mycenaceae* species possessing similar stature of basidiomata (*Panellus* species), it is neither so well known, nor widely occurred. In Slovakia, *T. patellaris* was collected in 2000 for the first time (Mihál & al., 2011) and since then only twice in 2012. It seems the species is rather rare than overlooked. However, to state its frequency of occurrence and/or endangerment status, we lack the relevant data not only from Slovakia, but from the whole of Europe.

The aim of our paper is to present the Slovak collections of *T. patellaris*. We have described and illustrated the macro- and micromorphological characters of this species (based on the Slovak collections) and summarised the knowledge of its occurrence, ecology and threat in Europe.

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## MATERIAL AND METHODS

Three collections of *Tectella patellaris* from Slovakia and three from the Czech Republic were studied. The Slovak specimens are kept in the LDM (the herbarium of the Museum of Forestry, Zvolen), PSG (S. Glejdura's private herbarium, Zvolen) and SLO. The Czech specimens were from the herbarium PRM. The herbarium abbreviations SLO and PRM follow Holmgren & al. (1990). Data of the PRM specimens are presented in their original form (some explanatory information is added in square brackets); data on the Slovak specimens are modified.

The description of macromorphological characters of *T. patellaris* is based on fresh basidiomata of the collection SLO 1381. The micromorphological characters were studied on dried material (all included specimens were observed), from which the specimens LDM 2301, PSG 4667 and SLO 1381 were selected for statistics. The microscopic mounts were made in ammoniacal Congo red after a short pre-treatment in a 3 % KOH aqueous solution and Melzer's reagent, and studied under the Olympus BX41 and KAPA 2000 light microscopes under oil immersion lens at a magnification of 1000×. Illustrations of all microscopic structures were drawn using the drawing tube at a projection scale of 2000×. Statistics for micromorphological characters are based on 20 measurements of basidia and 30 measurements of spores and cheilocystidia and are given as minimum, maximum (in parentheses), average ± standard deviation and average values. All other micromorphological characters were measured 20× per specimen and are presented as minimum and maximum.

Abbreviations: L = number of lamellae reaching the stipe, l = number of lamellulae between each pair of lamellae, Q = ratio of length and width of spores. References to colours follow Küppers (2007); descriptive terminology is according to Vellinga (1988). The taxonomy and nomenclature of *T. patellaris* follows Elborne & Læssøe, (2012).

## RESULTS

### ***Tectella patellaris*** (Fr.) Murrill

MACROCHARACTERS. BASIDIOMATA (see photographs on p. 32) in crowded group and/or clustered (of all 11 basidiomata, 9 grouped, 2 clustered by a stipe-like tissue). PILEUS 5–12 × 5–10 mm, irregularly circular, rounded flabelliform or reniform, hemispherical to convex, seemingly smooth (see also pileipellis structure), dry to slightly viscid, slightly hygrophanous, brown (Teil 2, S60 Y90 M70); margin involute, flat, entire, not striate,

orange-brown (Teil 2, S40 Y90 M50). VEIL very distinct in juvenile basidiomata, membranaceous as covering lamellae completely and tomentose on pileus surface, later breaks up, leaving floccose remnants on the pileus margin and surface, whitish to light ochre (Teil 2, S10 Y40 M10). CONTEXT up to 1 mm wide (see also microcharacters), light brown, taste mild to slightly farinaceous, smell indistinct. GELATINOUS LAYER (between the context and pileipellis) very thin (see also microcharacters of context), but visible also by the naked eye (resp. using a magnifier), whitish. STIPE not developed; basidiomata attached to the substrate dorsally, by a stipe-like eccentric extension of the pileus, 2 × 2 mm, whitish to brown as pileus (Teil 2, S60 Y90 M70). LAMELLAE crowded, L = 24–36, l = 3, up to 1.5 wide, subventricose to ventricose, adnate centrally to eccentrically to the context (stipe absent; at that place of lamellae attachment, there is a distinct naked area, 1–2 mm in diam.), brown when moist (Teil 2, S60 Y90 M70), discolouring to light brown when drying (Teil 2, S40 Y60 M40) and darkening to brown again when dried (Teil 2, S60 Y80 M60); edge entire, concolorous. SPORE PRINT whitish.

MICROCHARACTERS. SPORES (3.5)3.8–5.1(5.2) × 1–1.5(1.8) µm, av. 4.4 × 1.2 µm, Q = (2.2)3–4.5(5.2), av. Q = 3.8, subcylindrical to baciliform, some allantoid in side view, smooth, colourless, thin-walled, amyloid. BASIDIA (11)15.5–25.3(26) × (3.5)3.7–4.8(6) µm, av. 20.4 × 4.3 µm (measured without sterigmata), 4-spored, rarely 2-spored, mostly narrowly cylindrical and narrowly clavate, rarely (8 %) clavate, colourless, thin-walled; sterigmata 2-5 µm long. BASIDIOLES (10)11.1–19.8(24) × (2)2.6–4.5(5) µm, av. 15.5 × 3.6 µm, cylindrical, narrowly cylindrical, clavate, narrowly clavate, obtuse on tips, colourless, thin-walled. CHEILOCYSTIDIA (15.4)20.7–29.1(37.7) × (4.3)7.6–10.4(12.3) µm, av. 24.9 × 9 µm, mostly clavate, lageniform, cylindrical and utriform, rarely (5 %) broadly clavate, broadly cylindrical and narrowly utriform, colourless, mostly thick-walled, less (21 %) thin-walled, reaching from the edge to the sides of lamellae up to the distance of c. 100 µm (see notes below). PLEUROCYSTIDIA absent. Distinct layers, different also in colour, can be seen on the cross section of the pileus: light brown context, whitish gelatinous layer and brown pileipellis. CONTEXT of pileus c. 500–700 µm deep (measured in the middle of pileus), composed of cylindrical, thick-walled, 3–7.5 µm wide, horizontal hyphae with the lumen narrower than third of their width; context of lamellae subregular, composed of hyphae similar to those in pileus context; the thick-walled hyphae of context(s) swell up in 3 % KOH (the wall thickness can double, but their relief become indistinct and the hyphae seem to be thin-walled). GELATINOUS LAYER c. 300–350 µm deep, of cylindrical, thin-walled, 1.5–4 µm wide,

horizontal to slightly repent hyphae, sparsely embedded into the gel (more densely arranged only immediately under the pileipellis, of depth c. 50 µm); the crystals of more or less regular shape are also present here. PILEIPELLIS a differentiated ixocutis of two types of hyphae: i) of parallel, thin-walled hyphae, in the layer of c. 30–40 µm depth (they are similar to those in gelationous layer, but densely arranged, passing radially from the point of attachment of basidiomata to the substrate), and ii) of pyramidal bundles of ascending to vertical, thick-walled hyphae that are 4–6.5 µm wide, 20–130 µm long, slightly distorted, sparsely and irregularly septate, on the tips obtuse or rarely forked; the pyramidal bundles are c. 50–130 µm high (the second type of hyphae, they are scale-forming hyphae, but too small to be visible by the naked eye and recognized as scales). VEIL composed of cylindrical, thick-walled, 2.3–4.6 µm wide, mostly distorted hyphae, densely covered with incrusting colourless crystals measuring 0.5–3.8 µm. CLAMP CONNECTIONS present in all tissues (Fig. 1).

SELECTED PUBLISHED FIGURES AND/OR DESCRIPTIONS. Cetto (1995), Courtescuisse & Duhem (1995), Elborne & Læssøe (2012), Pilát (1935), Roux (2006), Seok et al. (2011), Schmitt & Heseler (2009).

MATERIAL STUDIED. SLOVAKIA, Stolické vrchy Mts., village of Muránska Zdychava, settlement of Števkov diel, SW slope, coord. 48° 45′ 15.3″ N, 20° 08′ 27.3″ E, alt. c. 660 m, the hedgerow (of the age c. 40 years) composed of self-sown woody species *Alnus glutinosa*, *Tilia cordata*, *Corylus avellana* and *Salix alba* (the hedgerow (pozn: Dá se tento termín použít i v tomto případě? Nebylo by vhodnější "liniové společenstvo" nebo něco podobného") is c. 30 m wide and 300 m long, passing along the field path and wet ravine and rimmed by the hay meadows from both sides; in the southern part, it is joined to the mixed forest mainly formed by *Fagus sylvatica* and *Picea abies*), on wood (from under the bark) of fallen branch of *Alnus glutinosa* (2.5 cm in diam.), 4 Oct. 2000, leg. S. Glejdura (LDM 2301). – Ibidem, locality called Karafová, NW slope, coord. 48° 46′ 24.5″ N, 20° 09′ 39.0″ E, alt. 783 m, at the edge of beech forest, c. 50 m of the riparian stand of the Zdychava Stream with dominant *Alnus glutinosa*, on wood (from under the bark) of fallen branch of *Fagus sylvatica* (1.5 cm in diam.), 22 Sept. 2012, leg. S. Jančovičová (SLO 1381). – Poľana Mts., village of Hriňová-Snohy, Zadná Poľana National Nature Reserve, NE slope, coord. 48° 38′ 38.25″ N, 19° 30′ 54.35″ E, alt. c. 1030 m, the forest (of the age c. 130 years) dominated by *Fagus sylvatica* with admixed *Abies alba*, on wood (from under the bark) of fallen branch of *Fagus sylvatica* (1.7 cm in diam.), 17 Oct. 2012, leg. V.

Kunca (PSG 4667). – CZECH REPUBLIC, Lenora: Zátoň, Prachatice, mons "Pažení", [Zátoň, a part of the village of Lenora in the Prachatice district, Pažení Hills], silva virginea dicta "Boubínský prales" [Boubínský prales National Nature Reserve, Šumava Mts., southern Bohemia], silva virginea: *Picea exc.*, *Fagus silv.*, ad partem trunci emortui fagi, jacentem ad terram, 18 IX. [Sept.] 1948, leg. J. Herink (PRM 609878). – Ibidem, silva frondosa: *Fagus silv.*, *Acer pseudoplat.*, ad ramnum fagi (PRM 609879). – Bohemia: montes Šumava – Boubín, IX. [Sept.] 1949, leg. J. Herink & J. Kubička (PRM 733320).

OCCURRENCE & ECOLOGY. In general, *Tectella patellaris* is known from Asia, North America, Australia and Europe (Schmitt & Heseler, 2009, Seok 2011). Within the Europe, the species has been recorded in several countries. In AUSTRIA – on rotten wood of *Fagus sylvatica* (Krisai-Greilhuber, 1999); in the Nordic countries, FINLAD, NORWAY and SWEDEN, – on branches of *Alnus* and *Corylus*, in late autumn to spring (Elborne & Læssøe, 2012); in FRANCE – on fallen branch of *Corylus avellana* (Cetto 1995) and of deciduous (unspecified) tree (Roux, 2006); in GERMANY – on barked standing trunks (c. 2–3 cm in diam.) of *Alnus glutinosa*, *Corylus avellana* and *Prunus serotina*, from the base up to 4 m above the ground; very rarely also on fallen pieces of trunks (before being broken off, these pieces of substrate were probably already colonised by the fungus (Schmitt & Heseler 2009); in GREAT BRITAIN – on branches of *Fagus sylvatica* and *Cerasus* sp. (Rea 1922 in Schmitt & Heseler 2009); in POLAND – on wood of fallen branch (from under the bark) of *Fagus sylvatica*, in October (Rutkowski, 2012, pers. comm.); in SLOVENIA – on fallen branch of *Corylus avellana*, in December (Trnkoczy, 2011); in SWITZERLAND – on wood of deciduous tree of *Alnus* sp. (Senn-Irlet & al., 2007); in UKRAINE – on *Fagus sylvatica*, in August (Pilát, 1935). In the CZECH REPUBLIC, thought unpublished, the species is known from the herbarium material. We have studied three collections which were found on fallen decaying branch and trunk of *Fagus sylvatica*, in September (see Material studied). In SLOVAKIA, *T. patellaris* (collected in three localities) grew on wood (protruding from under the bark) of fallen decaying branches (c. 1.5–2.5 cm in diam.) of *Alnus glutinosa* and *Fagus sylvatica*, in September and October (see Material studied).

Summing up the data on the occurrence and ecology (see above), *T. patellaris* is known from 13 European countries (Austria, the Czech Republic, Finland, France, Germany, Great Britain, Norway, Poland, Slovakia, Slovenia, Sweden, Switzerland and Ukraine). It grows as a saprotroph, producing basidiomata on fallen branches and standing

trunks, c. 1.5–3 cm in diam. (one record is also from the fallen trunk). Its most frequent hosts are *Alnus glutinosa*, *Coryllus avellana* and *Fagus sylvatica*, rare ones *Prunus serotina*, *Cerasus* sp. and *Quercus* sp. The period of basidiomata production is in the months of late summer to spring (from August to April, mostly from November to March). On the same substrate *T. patellaris* can be accompanied with various fungi such as *Exidia glandulosa*, *Daedaleopsis confragosa*, *Plicaturopsis crispa*, *Tremella mesenterica* and others (Roux, 2006, Schmitt & Heseler, 2009, Trnkoczy, 2011).

THREAT. *Tectella patellaris* is classified as endangered in Austria (Krisai-Grielhuber, 1999), Finlad (Rassi & al., 2001), Germany (Benkert & al., 1996), Norway (Brandrud & al., 2010) and Switzerland (Senn-Irlet & al., 2007).

NOTES ON SOME MICROMORPHOLOGICAL CHARACTERS. In Tab. 1, there are the values measured on spores, basidia and cheilocystidia of *Tectella patellaris* by Elborne & Læssøe (2012), Pilát (1935), Seok & al. (2011), Schmitt & Heseler (2009) and by ourselves. Comparing the values, the most similar are those measured on spores, except for Pilát's ones: the spore length does not exceed 4 µm (Pilát, 1935). Large variability is in the basidia measurements: they are distinctly smaller in Pilát (1935) and Schmitt & Heseler (2009). The latter authors presented also distinctly smaller cheilocystidia. On the other hand, comparing these values with those measured on the Slovak and Czech collections, they are still in the range of variability including the minimal and maximal values.

Based on our other observation, the cheilocystidia are reaching from the lamellae edge to the sides of lamellae up to the distance of c. 100 µm. In our opinion, there is no reason to recognise these cystidia on lamellae sides as pleurocystidia, as presented by Schmitt & Heseler (2009). All cystidia have the same morphology and the distance from the edge is short.

Within the European taxa of *Mycenaceae*, *T. patellaris* is the unique species based on the presence of thick-walled hyphae in almost all tissues of basidiomata.

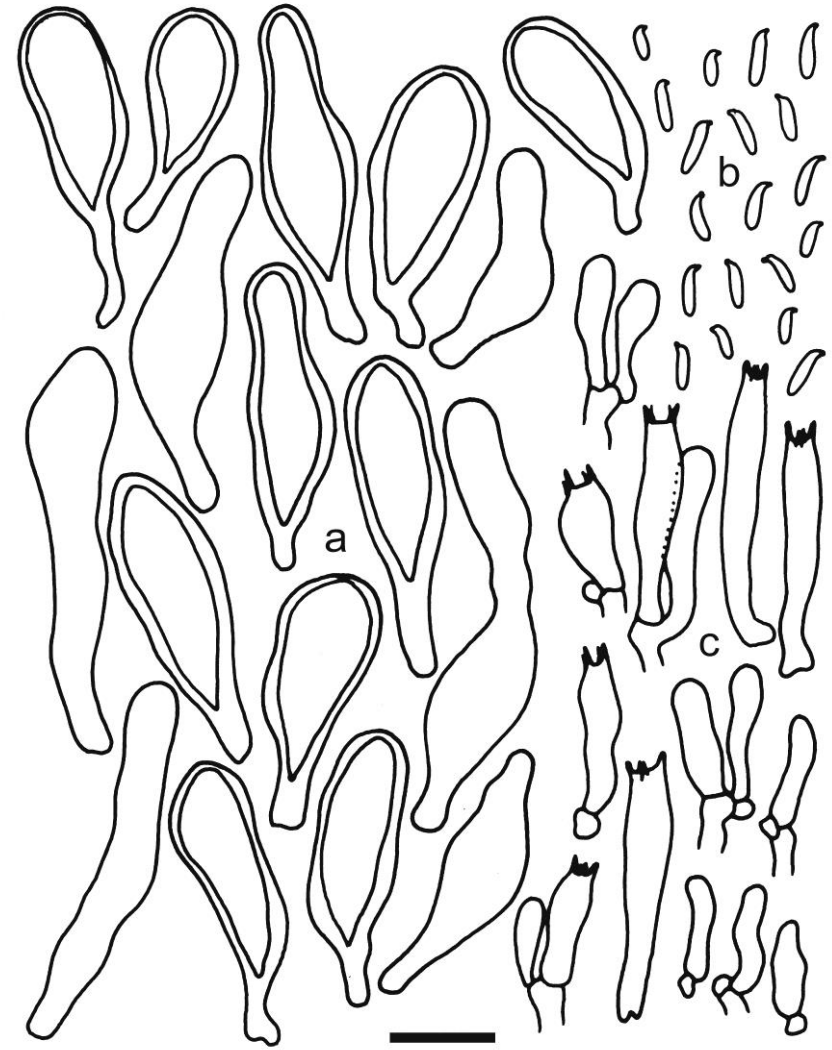


Fig. 1. *Tectella patellaris*: a – cheilocystidia, b – basidia and basidioles, c – spores (SLO 1381). Scale bar = 10 µm.

**Tab. 1. Comparison of values measured on spores, basidia and cheilocystidia of *Tectella patellarisis* in selected sources.** Data on the Slovak collections (LDM 2301, PSG 4667, SLO 1381) and Czech collections (PRM 609878, PRM 609879, PRM 733320) are based on our own observations; average +/- standard deviation values are presented).

| | spores (µm) | basidia (µm) | cheilocystidia (µm) |
|---|---|---|---|
| Elborne & Læssøe (2012) | 3-5.5 × 1-1.5 | - | 16-30 × 4-10 |
| Pilát (1935) | 3-4 × 0.8-1.3 | 10-12 × 2.5-3.5 | - |
| Seok et al. (2011) | 3.5-4.4 × 1-1.3 | 19.1-20 × 4.4 | 17.4-26.1 × 7.8-11.3 |
| Schmitt & Heseler (2009) | 3.3-5.4 × 1-1.7 | 9.5-11 × 3.2-4.1 | 10-20 × 3.2-5.1 |
| Czech collections | 3.2-4.9 × 1-1.4 | 15.5-22.5 × 3.7-5.1 | 23.2-34.1 × 6.7-9.6 |
| Slovak collections | 3.8-5.1 × 1-1.5 | 15.5-25.3 × 3.7-4.8 | 20.7-29.1 × 7.6-10.4 |

ACKNOWLEDGEMENTS

Our thanks go out to Jan Holec and Lenka Edrová (National Museum, Praha, Czech Rep.) who provided us with the *Tectella patellaris* specimens from the herbarium PRM. Jan Holec also kindly helped us with some literature. Comments by Vladimír Antonín (Moravian Museum, Brno, Czech Rep.) were very helpful. Data included in this work were granted thanks to the projects VEGA 2/0028/11, VEGA 1/1190/12 and APVV SK-CZ-0052-11.

REFERENCES

Benkert, D. & al. 1996. Rote Liste der Großpilze Deutschlands. In: G. Ludwig & M. Schnittler (eds.), Rote Listen gefährdeter Pflanzen Deutschlands. *Schriftenreihe für Vegetationskunde* 28: 377-426.

Brandrud, T.E. & al. 2010. Sopp. Fungi. In: J. Kålås & al. (eds.), Norsk rødliste for arter 2010. The 2010 Norwegian Red List for Species, p. 87–124, Trondheim.

Cetto, B. 1995. I funghi dal vero. Vol. 3, 5th ed. Trento.

Courtescuisse, R. & B. Duhem. 1995. Mushrooms and toadstools of Britain and Europe. London.

Elborne, S. A. & T. Læssøe. 2008. *Tectella*. In: H. Knudsen & J. Vesterholt (eds.), Funga Nordica, p. 390, Copenhagen.

Elborne, S.A. & Læssøe, T. 2012. *Tectella*. In: H. Knudsen & J. Vesterholt (eds.), Funga Nordica, p. 445, Copenhagen.

Hansen, L & H. Knudsen. 1992. Nordic macromycetes, Vol. 2. Copenhagen.

Holmgren, P. K., N. H.Holmgren & L. C. Barnett, (eds.). 1990. Index Herbariorum 1: The Herbaria of the World. Bronx.

Kirk, P. 2012. CABI Bioscience Database. http://www.speciesfungorum.org/ [accessed 5 Nov. 2012]

Krisai-Greilhuber, I. 1999. Rote Liste gefährdeter Großpilze Österreichs. In: H. Niklfeld (ed.), Rote Listen gefährdeter Pflanzen Österreichs, p. 229–266, Graz.
Küppers, H. 2007. DuMont Farbenatlas. Köln.
Mihál, I., S. Glejdura & D. Blanár. 2011. Makromycéty (Zygomycota, Ascomycota, Basidiomycota) v masíve Kohúta (Stolické vrchy). *Reussia* 6: 1–44.
Moser, M. 1978. Keys to Agarics and Boleti. Stuttgart.
Rassi, P. & al. (eds.) 2001. The red list of Finnish species. Helsinki.
Rea, C. 1922. British Basidiomycetae – a handbook to the larger British Fungi. Cambridge. [not seen, in Schmitt & Heseler 2009]
Roux, P. 2006. Mille et un champignons. Sainte-Sigolène.
Pilát, A. 1935. Pleurotus Fr. – hlíva. In: K. Kavina & A. Pilát (eds.), Atlas hub evropských, Vol. 2. Praha.
Senn-Irlet, B., G. Bieri & S. Egli. 2007. Rote Liste der gefährdeten Grosspilze der Schweiz. Birmensdorf.
Seok, S. J. & al. 2011. Tectella patellaris from Korea. *Mycobiology* 39: 303–305.
Schmitt, J.A. & U. Heseler. 2009. Der Schleierseitling Panellus patellaris: Selten, übersehen oder in Ausbreitung begriffen? http://www.tintling.ch/fachbeitraege/panellus_schmitt.htm [accessed 5 Nov. 2012]
Trnkoczy, A. 2011. Tectella patellaris (Fr.) Murrill (84928). http://mushroomobserver.org/observer/show_observation/84928 [accessed 5 Nov. 2012]

Soňa Jančovičová, Stanislav Glejdura a Vladimír Kunca: Tectella patellaris (Agaricales), druh zaznamenaný na Slovensku. *Catathelasma* (14): 15–22, 2012.

Zriedkavý druh, Tectella patellaris, je zo Slovenska doložený troma zbermi – dvoma zo Stolických vrchov (2000, 2012) a jednym z Poľany (2012). Opis a vyobrazenie makro- i mikromorfologických znakov týchto zberov je doplnený údajmi o výskyte, ekológii a ohrozenosti druhu v Európe.

## BOOK NOTICES

PAVEL LIZOŇ

Janusz Błaszkowski. 2012. **Glomeromycota.** [1]-303, incl. 83 figures (color photographs and diagrams). W. Szafer Institute of Botany, Polish Academy of Science, Kraków. ISBN 978-83-89648-82-2. Sold by the publisher. Price: EUR 36.00.

Professor Blaszkowski is well-known specialist in arbuscular mycorrhizal fungi (AMF). His book presents 137 species collected from maritime sandy dunes and rhizosphere soils of different cultivated and wild plants. Separate chapters describe methodologies, life cycles, significance, and structures of AMF, their taxonomy and classification, and definitions of morphological characters. Main chapter has keys to orders, families, genera and species of the Glomeromycota. Each taxon is illustrated and fully described. New genus *Corymbiglomus* Błaszk. & Chwat. with type species *C. corymbiforme (Glomus corymbiforme* Błaszk.) and new species *Acaulospora verna* Błaszk. are proposed. For more data and information about Glomeromycota consult Błaszkowski's web page at www.zor.zut.edu.pl/Glomeromycota.

# ANNOTATED MYCOLOGICAL BIBLIOGRAPHY of FRIEDRICH HAZSLINSZKY. Part 2

PAVEL LIZOŇ[5]

**Key words:** publications, fungi, lichens, Europe

Beiträge zur Kenntniss der Karpathenflora. IX. Brandpilze. X. Einige Coniomyceten. *Verh. Zool. Bot. Ges. Wien* 14, Abhandl.: 169-190, 1864. Basidiomycota, Uredinales, taxonomy, distribution, Slovakia.

Ueber Pleospora und Puccinia des Spargels. *Öster. Bot. Z.* 14: 371-375, 1864. Basidiomycota, Uredinales, Pleospora asparagi, Puccinia asparagi, taxonomy, morphotaxa.

Beitrag zur Kenntniss der Sphärien des Lyciums. *Verh. Zool. Bot. Ges. Wien* 15, Abhandl.: 447-452, pl. 14-15/fig. 1-24, 1865. Mitosporic fungi, Ascomycota, mostly Xylariales, taxonomy, host: Lycium barbatum.

Eperjes viránya fényporlói vagy Stilbospórái. *Math. Természettud. Közlem.*. 3: 61-66, pl. [1-2]/fig. 1-5, 1865. Mitosporic fungi, Stilbospora. taxonomy, Slovakia.

Synonyme der Sphaeria Lycii. *Verh. Zool. Bot. Ges. Wien* 17, Abhandl.: 171-172, 1867. Mitosporic fungi, Ascomycota, Xylariales, taxonomy, comparison with Rabenhorst's Fungi europaei exsiccati.

Die Sphärien der Rose. *Verh. Zool. Bot. Ges. Wien* 20, Abhandl.: 211-218, 1870. Mirosporic fungi, Ascomycota, Xylariales, taxonomy, host: Rosa sp., Hungary. field trip to Tapolcza, May 1869.

Der Nussschwamm als Farbenpflanze. *Öster. Bot. Z.* 20: 77, 1870. Basidiomycota, Polyporales, Inonotus hispidus, dyeing.

Einige neue oder wenig bekannte Arten der Pilzflora des südöstlichen Ungarns. *Verh. Zool. Bot. Ges. Wien* 23, Abhandl.: 361-368, 1873.

Forschritte der Mycologie in Ungarn. *Flora* 56: 142-143, 1873. [as 'Fridr. Harsling.'] Basidiomycota, book review of Kalchbrenner's Icones selectae Hymenomycetum Hungariae, vol. 1.

Hungarian fungi. *Grevillea* 1[1972-1973]: 154, 1873. Basidiomycota, book review of Kalchbrenner's Icones selectae Hymenomycetum Hungariae, vol. 1.

A gombák jeleméröl. *Magyar Tud. Akad. Értes.* 6(17)[1872]: 268-274, 1873; ? *Magyar Tud. Akad. Értes.* 3(9): pp. 11, 1873. Not located and not seen!

Icones selectae Hymenomycetum Hungariae. *Grevillea* 3[1974-1975]: 28-29, 1874. Basidiomycota, book review of Kalchbrenner's Icones, vol. 2.

[Magyarhon trifolái. *Magy. Tud. Akad. Értes.* 9: 36-37, 1875. Lecture on hypogeous fungi of Hungarian Empire presented to the 2nd meeting of the 3rd class of the Hungaria Academy of Science, 8. Febr. 1975.].

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A bánat-erdélyi határvidék gomba viránya. *Math. Természettud. Közlem.* 10[1872]: 38-63, pl. 1-4/fig.1-18, 1875. Myxomycotna, Basidiomycota, Ascomycota (incl. Discomycetes), taxonomy, distribution, "Bánat"- now divided between Romania, Serbia and Hungary, „Erdély“ - Transylvania

[Egy felszínti Hypogeus. *Értek. Természettud. Köréb.* 6(8): pp. 5, 1876. *Magy. Tud. Akad. Értes.* 9: 162, 1875. Lecture on Hydnangium carneum var. caldariorum to the 5th meeting of the 3rd class of the Hungaria Academy of Science, 10 May 1875 (pres. by L. Jurányi).] - now Romania.

Hungarian Geasters. *Grevillea* 3: 161-163, pl. 47, 1875. Basidiomycota (Gasteromycetes), distribution, Slovakia, Hungary).

Magyarhon hasgombái (Gasteromycetes). *Math. Természettud. Közlem.* 13[1875-1876]: 1-24, 1875. Basidiomycota (Gasteromycetes), taxonomy, distribution. Hungarian Empire.

Beiträge zur Kenntnis der ungarischen Pilz-Flora. III. Fungi hypogei. *Verh. Zool.-Bot. Ges. Wien* 25: 63-68, 1876. Ascomycota, Basidiomycota, sequestrate fungi, taxonomy, distribution, Slovakia, Hungarian Empire.

Ueber Sphaeria moriformis Tode und Sphaeria spurca Wallr. *Öster. Bot. Z.* 26: 93-94, 1876. Ascomycota, Xylariales, taxonomy.

Beiträge zur Kenntnis der ungarischen Pilz-Flora. IV. Trichogasteren. *Verh. Zool.-Bot. Ges. Wien* 26, Abhandl.: 217-228, 1877. Basidiomycota (Gasteromycetes), taxonomy, distribution, Slovakia, Hungarian Empire.

Phallus Clusianus Reich. und Kirschbaumia imperialis Schulzer. *Verh. Zool.-Bot. Ges. Wien* 26, Abhandl.: 78-, 1876. Not located there and not seen!

A szölö öbölye (Sphaeria vitis Rabh). *Értek. Természettud. Köréb.* 7(7): pp. 9, 1877. Note on a discussion on a paper that appeared in *Magy. Tud. Akad. Ért.* 10: 153, 1876.

Ueber Septosporium curvatum A. Br. *Öster. Bot. Z.* 27: 55-56, 1877. Ascomycota (Xylariales), mitosporic fungi a, taxonomy, life cycle.

Ein neuer Myxogasteren-Typus, *Öster. Bot. Z.* 27: 83-85, 1877. Myxomycota, taxonomy, new taxa.

Polyactis infestans. *Grevillea* 6: 77, pl. 98: fig. 1-8, 1877. Mitosporic fungi, taxonomy, new taxon, Slovakia.

Magyarhon üszökgombái és ragyái. *Math. Természettud. Közlem.* 14[1876-1877]: 81-197, 1877. Basidiomycota (Uredinales), Chytridiomycota, mitosporic fungi, taxonomy, key, Slovakia, Hungary, "?"; collectors: Kalchbrenner, Sadler (BPI), Bothár, Schneller, Holuby, Márkus, Schulzer, Bolla.

Magyarhon Myxogasterei. Eperjes, pp. 34, 1877. Not located and not seen!

Új adatok Magyarhon gombavirányához. *Math. Természettud. Közlem.* 15: 1-22, 1878. Myxomycota, Basidiomycota (Gasteromycetes, Uredinales), Ascomycota (Erysiphales), distribution, Slovakia, Hungary.

On Geaster orientalis n. sp. *Grevillea* 6: 108-109, pl. 98: fig. 9-15, 1878. Basidiomycota (Gasteromycetes), taxonomy, Romania.

A new lichen. *Grevillea* 6: 109, 1878. Lichens, taxonomy, Romania.

Új adatok magyarhon kryptogám virányához az 1878 évböl. *Értek. Természettud. Köréb.* 9(5)[1879]: pp. 15, 1880. Cryptogams, distribution, Hungarian Empire; not seen.

Eine anti-jordanische Species. *Öster. Bot. Z.* 30: 41-44, 1880. Ascomycota, Eurotiales, Eurotium herbariorum, taxonomy, life cycle.

Hymenomycetologisches. *Öster. Bot. Z.* 31: 41-43, 1881. Basidiomycota, notes on Kalchbrenner's Icones selectae Hymenomycetum Hungariae

Rendhagyó köggombák. *Értek. Természettud. Köréb.* 11(19): 1-24, fig. 1-6. 1881. Ascomycota (Discomycetes), taxonomy, distribution, Slovakia, Hungarian Empire.

Bemerkungen zu den deutschen und ungarischen Geaster-Arten. *Verh. Bot. Ver. Prov. Brandenb.* 24, Abhandl.: 135-137, 1882. Basidiomycota (Gasteromycetes), taxonomy, Germany, Hungarian Empire.

Peltidium und Geoglossum. *Öster. Bot. Z.* 32: 7-8. 1882. Ascomycota (Discomycetes), taxonomy, Slovakia, Hungarian Empire.

Heterosphaeria Patella. *Öster. Bot. Z.* 33: 249-250, 1883. Ascomycota (Discomycetes), taxonomy, Hungarian Empire.

Commentarius in icones selectas Hymenomycetum Hungariae, Pestini 1873 editas. Eperjes, 1884. Basidiomycota (Agaricales s. l.), taxonomy, nomenclature, commentary to Kalchbrenner's Icones., Slovakia, Hungarian Empire.

Elömunkálatok Magyarhon gombavirányához. *Math. Természettud. Közlem.* 19(1883): 59-113, 1884. Basidiomycota (Agaricales, Ustilaginales, Uredinales, Gasteromycetes), Myxomycota, Ascomycota (Erysiphales), taxonomy, synonymies of Kalchbrenner's and Schulzer's names, distribution, Hungarian Empire.

Magyarhon és társországainak szabályos discomycetjei (Discomycetes.). *Math. Természettud. Közlem.* 21: 177-287, pl. 1-12. 1886. Ascomycota (Discomycetes), taxonomy, Slovakia, Hungary, Rumania, Croaria, Ukraine.

Einige neue oder wenig bekannte Discomyceten. *Verh. Zool.-Bot. Ges. Wien* 37, Abhandl.: 151-168, pl. 3/fig. 1-8, 1887.

A magyarhoni lemezgombák (Agaricini) elterjedése. *Math. Természettud. Közlem.* 24: 117-205, 1890. Basidiomycota (Agaricales s. l.), distribution, Hungarian Empire.

Magyarország és társországainak sphaeriái. *Math. Természettud. Közlem.* 25[1892-1893: 65-397, pl. 1-15/fig. 1-41, 1892. Ascomycota (Pyrenomycetes), taxonomy, keys, distribution, Hungarian Empire [separate printing: p. 1-333].

A honi Peronospora-félék. *Természetraizi Füz.* 16: 29-33, 1893.

Magyarhon és társországainak husos gombái. *Math. Természettud. Közlem.* 26: 155-370, 1895. Basidiomycota (Agaricales s. l.), taxonomy, distribution, monograph, Slovakia, Hungarian Empire.

Mágoczy-Dietz, S. Hazslinszky frigyes hagyatékából. III. közlemény. Új adatok Magyarhon és társországainak szabályos Discomycetjeinek ismeretéhez. *Bot. Közlem.* 23: 60-63, 1926. Ascomycota (Discomycetes), taxonomy, distribution, Slovakia, Hungarian Empire.

ACKOWLEDGEMENTS

Finalization of this paper was supported by grant VEGA 2/0150/12.

Pavel Lizoň: Komentovaná mykologická bibliografia Friedricha Hazslinszkeho. 2. časť *Catathelasma* (14): 25-28, 2012.

## BOOK NOTICES

ANNA GUTTOVÁ

Arne Thell & Roland Moberg (eds.). 2011. **Nordic Lichen Flora, vol. 4. Parmeliaceae.** [1]-184, CD with images, Museum of evolution, Uppsala University, Uppsala. ISBN 978-91-85221-24-0. Sold by the Swedish Botanical Society / Svenska Botaniska Föreningens (orders: sbf@sbf.c.se). Price: SEK 275.00.

The fourth volume of the series Nordic Lichen Flora, presenting the diversity of Parmeliaceae in five Nordic countries – Norway, Sweden, Denmark, Finland and Iceland, and their territories (Faroe Islands, Jan Mayen, Svalbard and Bjørnøya) was released in 2011. Authors team comprised thirteen experts, besides the Scandinavians also Philippe Clerc (Geneva), John A. Elix (Canberra) and Tiina Randlane (Tartu). The family Parmeliaceae is large, including 80 genera with ca 2300 species. These are foliose or fruticose macrolichens and many of them commonly occur either as epiphytes or on rocks. Here belong also the species well known to public (thinking back to natural science curricula of primary schools), e.g. *Hypogymnia physodes*, *Evernia prunastri*, *Parmelia sulcata* or *Pseudevernia furfuracea*. Only a small fraction of Parmeliaceae is reported from Nordic countries – 152 species of 41 genera. Despite great variety of biotopes in Slovakia it is even less – 117 species of 33 genera. We miss the members of the genera *Arctocetraria*, *Asahinea*, *Dactylina*, *Letharia* and *Masonhalea*. The centre of the distribution of the family, mainly the genera *Hypotrachyna*, *Menegazzia*, *Parmotrema*, *Usnea* and *Xanthoparmelia*, are subtropical to temperate areas of Southern Hemisphere.

The introduction to the book presents concise overlook of the family Parmeliaceae following the latest concepts based on the results of phylogenetic studies of the teams of Ana Crespo, Pekka Halonen, Matthew P. Nelsen and Arne Thell. Most of the species can be grouped within the well supported clades corresponding to the historical morphological groups – alectoroid, parmelioid and cetrarioid. It is pity, that the map of the area covered by the series Nordic Lichen Flora does not comprise the legend. The territory is divided into administrative units, each with its abbraviation. The reader may either consult the first volume of the series with full explanation or search the details in the atlas. The introduction and the geographical scope is followed by the dichotomic key of genera and the core part of the book – the overview of the genera and

species in alphabetic order. It follows the same form as was used in the three previous volumes. Each species comprises the information on basic nomenclature (basionymum and the information on type material), vernacular names in national languages, key bibliographic references, list of published illustrations of the taxon, the description of taxon, chemical characters, description of habitat where it grows, distribution – firstly in the Nordic countries and then in the world. Distribution maps are placed directly in the text in this volume, which is reader friendly (in the previous volumes they were placed in separate annex). Species profile is closed with a note – comments on related taxa and differencial characters. The final part of the book comprise the annex with summary of nomenclature novelties. Here newly designated type specimens prevail (e.g. lectotypes for *Allocetraria madreporiformis*, *Evernia illyrica, E. mesomorpha*, *Hypogymnia austerodes*, *H. bitteri*, *H. farinacea*, neotype for *Arctoparmelia incurva*, *Menegazzia terebrata*). The book comprises the description of newly established species *Usnea cylindrica* P.Clerc sp. nov., which includes *Usnea chaetophora* sensu auct. p.p. It is related to *U. dasypoga*, from which it differes by the type of ramification and habitus of main and secondary branches, and *U. barbata*, which has thinner cortex, thicker medulla, and different habitus of primary and secondary branches. The book is closed by the photographs with index.

The team of authors of this volume as well as the editors working on the series are acknowledged for this useful work disseminating the classical as well as modern knowledge on lichens.

Previous volumes from the series:

Ahti T., Jørgensen P. M., Kristinsson H., Moberg R., Søchting U., Thor G. 1999. Nordic Lichen Flora. Vol. 1. Introductory parts and calicioid lichens and fungi. Uddevalla.

Ahti T., Jørgensen P. M., Kristinsson H., Moberg R., Søchting U., Thor G. 2002. Nordic Lichen Flora. Vol. 2. Physciaceae. Uddevalla.

Ahti T., Jørgensen P. M., Kristinsson H., Moberg R., Søchting U., Thor G. 2007. Nordic Lichen Flora. Vol. 3. Cyanolichens. Uddevalla.

***Craterium microcrater Nees, painting by F. Hazslinszky***
(archives of the Natural History Museum, Budapest; see p. 25-28)

***Tectella patellaris*** (Stolické vrchy, Muránska Zdychava; see p. 15-22)