



Original Contribution

SOME RARE AND NOTEWORTHY LARGER FUNGI IN BULGARIA

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ABSTRACT

The paper reports 23 rare and noteworthy Bulgarian larger fungi including the confirmation of the presence of *Paxillus rubicundulus* in the country and the second records of *Cantharellus pallens*, *Crinipellis mauretanicus*, *Ditiola peziziformis*, *Geopora arenicola*, *Laccaria proxima*, *Marasmius collinus* and *Pterula multifida*. Brief descriptions are provided for *Cantharellus pallens*, *Ditiola peziziformis*, *Geopora arenicola*, *Gymnopus quercophilus*, *Marasmius collinus*, and *Paxillus rubicundulus* based upon the Bulgarian specimens. *Geopora arenicola*, *Trichoglossum hirsutum* var. *hirsutum*, *Cantharellus amethysteus*, *C. pallens*, *Laccaria proxima* and *Paxillus rubicundulus* are illustrated. In addition, new collections of some threatened, rare and less known species are also included.

Key words: ascomycetes, basidiomycetes, Bulgarian mycota, fungal conservation, larger fungi

INTRODUCTION

Recording of fungi is an important task which serves different scientific and practical purposes. Some peculiarities of the Bulgarian mycological literature were reviewed by Denchev & Bakalova (1), who found a pattern suggesting that possibly many species might be under-recorded. The conscientious recording is especially important for rare species worthy of conservation, which has been emphasized by several authors (2-4, and others). This report presents information about some rare and noteworthy fungi from Bulgaria.

MATERIALS AND METHODS

Fungi were collected during mycological field trips in different parts of the country. The examined specimens are kept in the Mycological Collection of the Institute of Biodiversity and Ecosystem Research (SOMF) and are documented with photographs and/or appropriate field notes. The sources used for

the determination are listed under every particular taxon as 'Reference literature'.

The microscopic examination of fungi was conducted in water and 5% KOH. The amyloidity was tested with Melzer's solution (recipe after 5).

The previous records are listed according to the respective checklists for the different groups of fungi (6-8), unless other references are provided. Wherever indicated, the threat status follows the *Red list of fungi in Bulgaria* (9).

Ascomycetes

Cudonia confusa Bres.

Specimen examined. Northern Pirin Mts, ca 1 km below Bunderitsa chalet, in a coniferous forest, dominated by *Picea abies* (L.) H. Karst., 25 Aug 2009, leg. et det. B. Assyov & D. Stoykov (SOMF 29338).

Rarely recorded species, known so far only from Rila Mts (10; 11).

Reference literature (12).

Discina ancilis (Pers. : Fr.) Sacc.

Specimen examined. Znepole region, Golo Burdo Mt, near Orлите chalet above Radomir town, in a pine plantation, on damp soil, 7 May 2004, leg. et det. M. Gyosheva (SOMF 29315).

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Vulnerable species, reported from Western Stara Planina Mts, Vitosha region (Vitosha Mt), and Pirin Mts.

Reference literature (13, 14).

***Geopora arenicola* (Lév.) Kers (Fig. 1)**

Specimen examined. Thracian Plain, Besaparski Ridove, on sandy soil, 17 Apr 2010, leg. R. Natcheva, det. M. Gyosheva (SOMF 29136).

Apothecia sessile, immersed in the substrate, globose, up to 15 mm in diam.; the margin

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splitting into irregular rays; outer surface with light brown up to 1 mm long hairs, binding particles of the substrate. Hymenophore smooth, grey or whitish grey. Asci 8-spored, non amyloid. Ascospores uniseriate, 20–30(32) × 14–17 μm, ellipsoid, with one central guttule. Paraphyses cylindrical, septate.

This species has been reported only once before in Bulgaria, from the Northern Black Sea coast (near Galata village).

Reference literature (15, 16, 17)



Fig. 1. Fruitbodies of *Geopora arenicola*

***Leotia lubrica* (Scop. : Fr.) Pers.**

Specimen examined. Znepole region, Konyavska Mt, near Momin Kladenets chalet, among *Dicranum* sp., 30 Sep 2007, leg. et det. M. Gyosheva (SOMF 29314).

Endangered species, known from Central Stara Planina Mts, Vitosha region (Vitosha Mt, Plana Mt), and Rila Mts.

Reference literature (15, 16, 18)

***Spathularia flavida* Pers. : Fr.**

Specimen examined. Central Stara Planina Mts, in a beech forest near Haydushka Pesen chalet above Chiflik village (Trojan distr.), 42°48'19.2"N, 024°31'26.3"E, 20 Aug 2009, leg. et det. B. Assyov & D. Stoykov (SOMF 29346).

Reference literature (15, 16, 19).

***Trichoglossum hirsutum* (Pers. : Fr.) Boud. var. *hirsutum* (Fig. 2)**

Specimen examined. Central Rhodopi Mts: Chairski Ezera lakes, the waterside zone of

Kadiev Gyol lake, among *Sphagnum fallax* (H. Klinggr.) H. Klinggr., 17 Aug 2010, leg. R. Natcheva, det. M. Gyosheva (SOMF 29313).

Endangered species, so far reported only from Vitosha region (Vitosha Mt).

Reference literature (15, 16, 20)

Basidiomycetes

***Amanita strobiliformis* (Paulet) Bertillon**

Specimen examined. Znepole region, ca 1 km south of Sushitsa village (Treklyano municipality), dry grassy places and plantation of *Pinus* sp. and *Betula pendula* Roth along the road to Zlogosh village, 27 Jun 2009, leg. I. Assyova, B. Assyov & D. Stoykov, det. B. Assyov & I. Assyova (SOMF 29347).

Amanita strobiliformis is considered to be an *Endangered* species. Prior records from this region are from Golo Burdo Mt.

Reference literature (21, 22).



Fig. 2. Fruitbodies of *Trichoglossum hirsutum* var. *hirsutum*

***Cantharellus amethysteus* (Quél.) Sacc. (Fig. 3)**

Specimen examined. Central Stara Planina Mts, Boatin Reserve, in a pure stand of *Fagus sylvatica* L., 9 Jun 2003, leg. et det. B. Assyov & D. Stoykov (SOMF 29370).

Possibly not a rare species, but recently recorded for the Bulgarian mycota and so far known only from Western Stara Planina Mts.

Reference literature (23, 24, 25).

***Cantharellus friesii* Quél.**

Specimen examined. Central Rhodopi Mts, Smolyanski Ezera lakes above Smolyan town, in a mixed forest of *Picea abies* and *Fagus sylvatica*, 9 Jun 2003, leg. et det. M. Gyosheva (SOMF 29324).

Endangered species, in Bulgaria known from the Western Forebalkan, Central Stara Planina Mts, Vitosha Mt, and Central Rodopi Mts (near Dedovo village).

Reference literature (23, 24, 25, 26).



Fig. 3. Fruitbodies of *Cantharellus amethysteus*

***Cantharellus pallens* Pilát (Fig. 4)**

Pileus up to 2.5 cm in diam., convex to depressed or funnel-shaped, ivory, dry, smooth to finely scaly, unchanging or slightly yellowing when handled. Hymenophore strongly decurrent, plicate or ridged, furcate

and interveined, cream, yellowish to pale yellowish apricot. Stipe tapering below, firm, cream or somewhat concolorous with the pileus, surface bruising pale rusty. Context cream; odour and taste agreeable. Basidia elongate clavate; clamp-connexions present.

Basidiospores $8-9 \times 4.5-5 \mu\text{m}$, broadly ellipsoid to oblong ellipsoid, hyaline, thin-walled, with refractive content.

Specimen examined. Western Stara Planina Mts, above Berkovitsa town, in a mixed deciduous forest (*Carpinus betulus* L., *Castanea sativa* Mill., *Fagus sylvatica*), 18 Jun 2003, leg. et det. M. Gyosheva (SOMF 29325).



Fig. 4. Fruitbodies of *Cantharellus pallens*

***Clitocybe radicellata* Gillet**

Specimens examined. Vitosha region, Vitosha Mt, Rudartsi village, in a plantation of *Pinus sylvestris* L., among litter, 16 Feb 2007, leg. A. Grozdanov, det. M. Gyosheva (SOMF 29320); Western Sredna Gora Mt, Lozenska Mt, above Kokalyane village, under *Pinus sylvestris*, 20 Mar 2011, leg. P. Somov, det. M. Gyosheva (SOMF 29321).

Relatively rare species, so far known from Pirin Mts and Eastern Rhodopi Mts.

Reference literature (29, 30)

***Crinipellis mauretanicus* Maire**

Specimen examined. Eastern Forebalkan, near Golyama Zhelyazna village, in grassy places, 12 Oct 2008, leg. D. Stoykov, det. M. Gyosheva (SOMF 29317).

Endangered species, known so far only from the Thracian Lowland (Lauta Park in Plovdiv city).

Reference literature (31).

***Gymnopus quercophilus* (Pouzar) Antonín & Noordel.**

Marasmius quercophilus Pouzar; *Setulipes quercophilus* Antonín

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This striking chanterelle was previously reported once from the country based on a collection made by J. Kuthan and F. Kotlaba (27) in the Eastern Stara Planina Mts (near Vlas village). No samples of this species were available so far in the Bulgarian mycological collections.

Reference literature (23, 25, 28).

Specimen examined. Western Predbalkan, Vrachanski Balkan Nature Park, Voyvodin Dol ravine above Vratsa town (Montana distr.), on dead leaves of *Fagus sylvatica*, 30 Sep 2008, leg. et det. B. Assyov (SOMF 29356); Western Stara Planina Mts, between the villages Tsarichthina and Tchibaovtsi, on fallen leaves of *Fagus sylvatica*, 17 Aug 2009, leg. et det. B. Assyov & I. Assyova (SOMF 29350).

Pileus up to 0.5 cm in diameter, convex or slightly depressed on the disk or with a small umbo, later flattened; surface slightly sulcate, pale beige or pale buff with faint pinkish tint, darker at the center, paler to whitish towards the edge. Stipe 1–3 cm long and less than 0.5 mm wide, filiform, initially finely pubescent, later glabrous, reddish brown to dark brown with red tint, paler at the upper part below the pileus. Context thin; smell not distinctive. Gills whitish, distant. Cheilocystidia broadly clavate, of broom-cell type. Basidiospores $(7-7.3 \pm 0.4(-8) \times (4-4.5 \pm 0.3(-5) \mu\text{m}$ (n=10).

This species is most probably not rare, but more likely under-recorded due to its very small size. It usually inhabits oak leaves, but records on leaves of other *Fagaceae* (*Fagus*, *Castanea*) are also known (32). The very few

previous Bulgarian records are mostly published as *Marasmius splachnoides* (Hornem.) Fr. Some of them, however, may not be referable to *G. quercophilus*. Burzakov's findings (33) from spruce forests at

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high elevations may well belong to another marasmioid fungus, although this cannot be justified as the corresponding specimen is nowadays lost.

Reference literature (32, 34, 35, 36)

***Laccaria proxima* (Boud.) Pat. (Fig. 5)**



Fig. 5. Fruitbodies of *Laccaria proxima*

Specimen examined. Central Rhodopi Mts, Smolyanski Ezera Lakes, Lagot Lake, the floating turf in the lake, among *Sphagnum fallax*, *S. obtusum* Warnst. and *Polytrichum* sp., in a small bog-forest of *Picea abies*, 13 Oct 2011, leg. D. Ivanova & R. Natcheva, det. M. Gyosheva (SOMF 29343)

Reference literature (29, 37, 38, 39).

***Laccaria tortilis* (Bolton) Cooke**

Specimen examined. The Valley of River Struma, south of Kamenitsa village (Strumyani municipality, Sandanski distr.), above the graveyard, in a sparse woodland of *Quercus coccifera* L., ca 195 m s. m.; 41°38'56.7"N, 023°9'52.2"E, 21 Oct 2009, leg. et det. B. Assyov & I. Assyova (SOMF 29348).

Reference literature (29, 37, 38, 39)

***Leucocortinarius bulbiger* (Alb. & Schwein : Fr.) Singer**

Specimen examined. Northern Pirin Mts, ca 1 km below Bunderitsa chalet, in a coniferous forest, dominated by *Picea abies*, mixed with *Abies alba* Mill., 26 Aug 2009, leg. B. Assyov & D. Stoykov, det. B. Assyov (SOMF 29349).

Reference literature (40, 41)

***Leucopaxillus compactus* (P. Karst.) Neuhoff**
Specimen examined. Western Sredna Gora Mt, Lozenska Mt, under Lalina Mogila peak, on calcareous soil in a beech woodland, 12 Jul 2009, leg. H. Pedashenko, det. M. Gyosheva (SOMF 29322).

Critically endangered species, so far recorded from Znepole region (Konyavska Mt), Western and Central Rhodopi Mts.

Reference literature (29, 42)

***Marasmius collinus* (Scop. : Fr.) Singer**

Specimen examined. Slavyanka Mt, Parilski Dol ravine, in a grassy place on calcareous soil, 19 Jun 2003, leg. D. Stoykov, det. M. Gyosheva (SOMF 29318).

Basidiomata collybioid. Pileus up to 3 cm in diam., convex, more or less hygrophanous, ochraceous to ochraceous brown; margin slightly striate. Stipe up to 7 cm, cylindrical, concolorous with the cap; surface smooth. Gills free, moderately distant, whitish to cream. Context brittle, whitish; odour not distinctive. Cheilocystidia absent. Basidiospores 7.5–10 × 4–6 µm, ellipsoid or oblong. Pileipellis of smooth clavate or difform elements, broom cells absent.

This species has been reported only once from Bulgaria, more than 80 years ago from Sofia city by B. Burzakov (43). All Burzakov's specimens are likely lost and this is the only confirmation for the presence of the fungus in this country.

Reference literature (31, 44, 45, 46, 47).

***Mutinus caninus* (Huds. : Pers.) Fr.**

Specimen examined. Western Stara Planina Mts, between Tsaritchina and Tchibaovtsi villages, in oak woodland, on rotting wood, 6 Aug 2009, leg. B. Assyov & D. Stoykov (SOMF 29318); Znepole region, Konyavska Mt, near Momin Kladenets chalet, under *Fagus sylvatica*, 16 Jun 2004, leg. et det. M. Gyosheva (SOMF 29345).

Vulnerable species, not recorded previously from Stara Planina Mts.

Reference literature (48, 49, 50).

***Paxillus rubicundulus* P.D. Orton (Fig. 6)**

Specimens examined. Eastern Forebalkan, near Golyama Zhelyazna village, under *Alnus glutinosa* (L.) Gaertn., 24 May 2009, leg. D. Stoykov, det. M. Gyosheva (SOMF 29327); the

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Valley of River Struma, Petrich distr., alder woodland at Skrat village, ca 415 m s. m.; 41°21'53.2"N, 022°59'21.9"E, under *A. glutinosa*, 24 Sep 2009, leg. B. Assyov, I. Assyova & D. Stoykov, det. B. Assyov (SOMF 29351); in alder tickets along the road between Gabrene village and Zlatarevo border point, ca 287 m s. m.; 41°22'37.1"N, 022°58'1.9"E, under *A. glutinosa*, 24 Sep 2009, leg. B. Assyov, I. Assyova & D. Stoykov, det. B. Assyov (SOMF 29352); Western Sredna Gora Mts, above Lozen village, in alder thickets, 15 Jul 1975, leg. et det. Cv. Hinkova & M. Drumeva (as *P. filamentosus*), rev. B. Assyov & D. Stoykov (SOMF 12419); Lozenska Planina Mt, in alder thickets, 27 Sep 1968, leg. et det. Cv. Hinkova & V. Fakirova (as *P. filamentosus*), rev. B. Assyov & D. Stoykov (SOMF 6987); Strandzha Mt, in riverside communities of *A. glutinosa* at the springs of Mladezhka River not far from Mladezhko village, 6 May 2004, leg. et det. B. Assyov (SOMF 29371); Marina Ryaka protected site, at the bottom of the ravine, under *A. glutinosa*, 07 Jun 2007, leg. et det. B. Assyov (SOMF 29372).



Fig. 6. Fruitbodies of *Paxillus rubicundulus*

Cap up to 8 cm in diameter, depressed to funnel shaped, smooth to velvety or scaly, ochraceous, ochraceous brown, yellowish brown, reddish brown or rusty, often with reddish hues, cap margin tomentose to smooth, more or less inrolled. Stipe cylindrical, not exuding droplets at the base, concolorous with the cap or slightly paler, darkening when bruised. Gills forking, pale ochraceous, more brownish at maturity, bruising reddish. Flesh pale yellowish, turning more reddish when exposed to air. Spore print pale rusty. Basidiospores $(5.5-7.0 \pm 0.4(-8) \times$

$(4-4.5 \pm 0.3(-5) \mu\text{m}$ ($n=30$), length/width ratio $(1.3-1.6 \pm 0.1(-1.8)$. Pileipellis hyphae mostly broader than $5 \mu\text{m}$.

The name *Paxillus filamentosus* Fr. was extensively used in the past and sometimes even more recently to denote the species now known as *P. rubicundulus*. Under this name the fungus was possibly recorded from under *A. glutinosa* in Bulgaria a long time ago by C. Hinkova and V. Fakirova (see 51). Assyov & Denchev in the *Checklist of larger basidiomycetes in Bulgaria* (8) followed Legon & Henrici (52) and listed *P.*

filamentosus as a *nomen dubium* owing to the brief and putative original description (53). They also commented that the Bulgarian record is possibly referable to *P. rubicundulus*. Although there could have been little doubt that this characteristic species is present in the country, its occurrence is now confirmed with new collections and reexamination of the older specimens of *P. filamentosus*, kept in SOMF. The reexamination of the specimen of Hinkova & Fakirova (SOMF 6987) produced the following spore measurements: $(6-)\bar{6}.8\pm 0.4(-8) \times (3.5-)\bar{4}.4\pm 0.4(-5.5) \mu\text{m}$ ($n=30$), length/width ratio $(1.3-)\bar{1}.5\pm 0.1(-1.8)$, while in SOMF 12419 they are $(6-)\bar{6}.5\pm 0.4(-7) \times (4-)\bar{4}.3\pm 0.2(-5) \mu\text{m}$ ($n=30$), length/width ratio $(1.3-)\bar{1}.5\pm 0.1(-1.7)$. Those values are not significantly different from those in the above description, which come from fresh collections. They allow drawing the conclusion that those collections are referable to *P. rubicundulus*. It is interesting to note that all so far known Bulgarian collections are apparently associated with *A. glutinosa* in lower altitudes, although there has been extensive search under other species of alders, growing at different elevations.

Reference literature (29, 54, 55, 56, 57, 58, 59).

***Pterula multifida* E.P.Fr. : Fr.**

Specimen examined. Sofia region, Sofia city, in a garden on dead parts at the base of stems of *Fallopia* sp., 27 Oct 2009, leg. V. Vladimirov, det. M. Gyosheva (SOMF 29319).

This species has been recorded from the country very recently (60) and this is its second Bulgarian collection.

Reference literature (26, 61)

***Tricholoma focale* (Fr.) Ricken**

Specimen examined. Znepole region, Egalnitsa village, in a pine plantation, 21 Oct 2010, leg. A. Grozdanov, det. M. Gyosheva (SOMF 29323).

Endangered species in the country known from Western Stara Planina Mts, Rila Mts, Western and Central Rhodopi Mts.

Reference literature (31, 62)

Dacrymycetes

***Ditiola peziziformis* (Lév.) D.A. Reid**

Basidiomata erumpent, stipitate turbinate to flattened discoid, gelatinous, with light yellow flat or slightly depressed fertile disc up to 5–6 mm in diam. and stipe-like white to cream structure; the outer surface (except the disk) tomentose, with thick-walled hyphae. Basidia 2-spored, furcate, with basal clamp-connexion.

Basidiospores $22-30 \times 8-10 \mu\text{m}$, ellipsoid, oblong, elongate elliptic to nearly cylindrical, septate at maturity.

Specimen examined. Western Rhodopi Mts, Longurli locality, on dead pine wood, 5 Jul 2004, leg. et det. M. Gyosheva (SOMF 29328).

This species has been reported only once in the country, from Vitosha Mt, more than half a century ago.

Reference literature (26, 63, 64)

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