



Online Version ISSN: 1314-412X
Volume 4, Number 4
December 2012

AGRICULTURAL SCIENCE AND TECHNOLOGY

2012

An International Journal Published by Faculty of Agriculture,
Trakia University, Stara Zagora, Bulgaria

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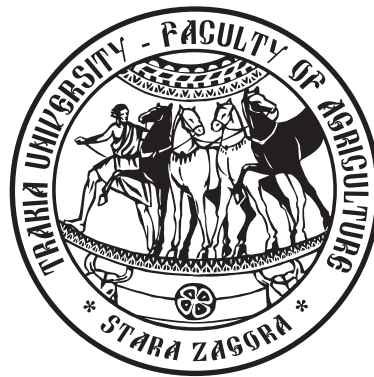
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*AGRICULTURAL
SCIENCE AND TECHNOLOGY*

2012

An International Journal Published by Faculty of Agriculture,
Trakia University, Stara Zagora, Bulgaria

New data for some rare macromycetes in Bulgaria

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Abstract. New records on twenty-seven rare macromycetous species are reported. Eleven species are of high conservation value included in the Red List of fungi in Bulgaria. The predominant part of macromycetes belongs to the class Agaricomycetes, one species belongs to the class Pezizomycetes. All taxa are presented with brief chorological data and notes on their distribution in the country. Presented are macroscopic pictures of some of the typical species.

Keywords: Bulgarian mycota, conservation value, macromycetes, rare taxa

Introduction

Field work in connection with the study of the diversity of macromycetes species in Bulgaria, was associated with the discovery of many rare and endangered fungi for which information is particularly important for future updating of documents related to their conservation.

This paper presents new information about twenty seven larger fungi from Bulgaria. Twenty five species belong to the class Agaricomycetes, two species to the class Ascomycetes. Most of the species are rare and noteworthy in Bulgaria. Eleven species of them are of high conservation value included in the Red List of fungi in

Bulgaria (Gyosheva et al., 2006). Four of them in the Red Data Book of the Republic of Bulgaria (Peev et al., 2011). The aim of the paper is to enrich the information about fungal diversity of the Bulgaria.

Material and methods

The macromycetes were registered during mycological field trips in differently floristic regions of the country. Distribution of the taxa is given according to the floristic regions adopted in the Flora of the Bulgaria (Jordanov, 1966) (Figure 1). The studied specimens are kept in the Mycological Collection of the Agricultural University,

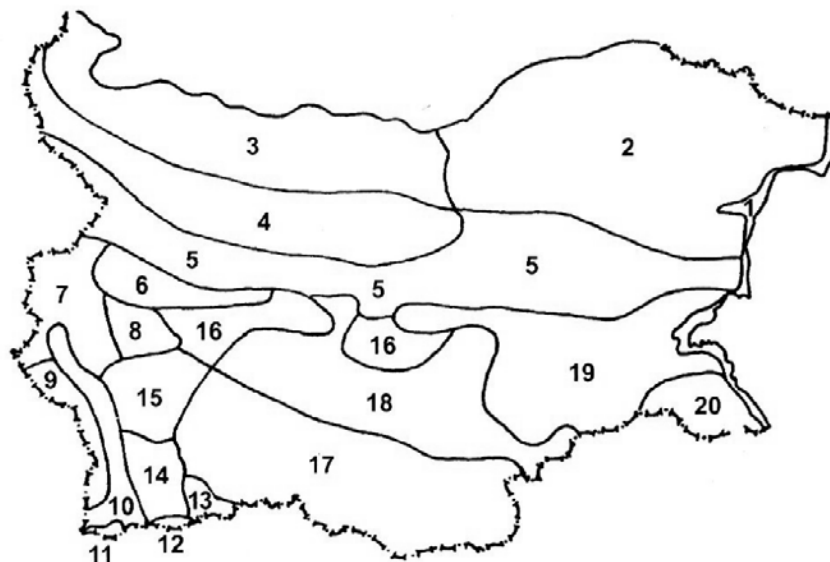


Figure 1. Map of the floristic regions of Bulgaria

[1] Black Sea Coast, [2] Northeast Bulgaria, [3] Danubian Plain, [4] Forebalkan, [5] Stara Planina Mts (western, central, eastern), [6] Sofia region, [7] Znepole region, [8] Vitosha region, [9] West Frontier Mts, [10] Valley of Struma River, [11] Mt Belasitsa, [12] Mt Slavyanka, [13] Valley of Mesta River, [14] Pirin Mts, [15] Rila Mts, [16] Mt Sredna Gora (western, eastern), [17] Rhodopi Mts (western, central, eastern), [18] Thracian Lowland, [19] Tundzha Hilly Country, [20] Mt Strandzha

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Plovdiv (SOA). Some of the typical rare and endangered specimens are supplied with color photograph and description in order to allow further revision, as well as appropriate field notes.

The microscopic examination of fungi was conducted in water. The amyloidity was tested with Melzer's solution (Kirk et al., 2008). The author's names of the taxa are abbreviated according to Kirk and Ansell (2004). The systematic arrangement of species follows Kirk et al. (2008). The conservation status is indicated in according to the Red List of fungi in Bulgaria (Gyosheva et al., 2006).

Results

Due to the studies carried out in different regions of Bulgaria the macromycetous fungi were recorded.

Pezizomycetes

Pezizales

Pezizaceae

Discina ancilis (Pers. : Fr.) Sacc.

Rhodopi Mts (Eastern), in a pine plantation of *Pinus nigra*, on damp soil among mosses, above Madjarovo town, distr. Haskovo, 01.09.2004, leg. and det. G. Stoichev (SOA 6000269). The species is reported for Stara Planina Mts (Western), Znepole region, Vitosha region, Pirin Mts (Denchev and Assyov, 2010; Assyov, 2012). *Vulnerable* species, according to Gyosheva et al. (2006), reported for first time from the Rhodopi Mts.

Sarcosphaera coronaria (Jacq.) J. Schröt.

Rhodopi Mts (Central), Asenovgrad town, nearly the Saint Kirik monastery, in a culture of *Pinus nigra*, 25.05.2010, leg. and det. M. Lacheva (SOA 6000265). The species was reported from Znepole region by Hinkova and Stoichev (1983) [sub. *Sarcosphaera eximia*



Figure 2. Fruitbodies of *Amanita vittadinii*

Naucoria alnetorum (Maire) Kühner & Romagn.

Rhodopi Mts (Eastern), on soil among mosses under *Alnus glutinosa*, above Madjarovo town, distr. Haskovo, 01.09.2004, leg. and det. G. Stoichev, M. Lacheva (SOA 6000244). The species is known so far only once from Vitosha Mt (Stoichev and Gyosheva, 2005) and is reported the first time from Rhodopi Mts.

Cortinariaceae

Crepidotus epibryus (Fr. : Fr.) Quél. (Figure 4)

Stara Planina Mts (Central), dead mosses and on leaves of

(Jdurieu & Lév.) Maire] and Gyosheva (1984, 1991), from Rhodopi Mts (Burzakov, 1931) and Hinkova (1961) [sub. *Pustularia coronaria* (Jacq.) Rehm]. *Sarcosphaera coronaria* is a rare species on a European level and is one of the 33 fungal species listed in the proposal for inclusion of fungi in the Appendix I of the Bern Convention (Dahlberg and Croneborg, 2003).

Vulnerable species (Gyosheva et al., 2006; Denchev and Petrova, 2011). The species is known from Stara Planina Mts, Sofia region, Znepole region, Thracian Lowland (Denchev and Petrova, 2011).

Agaricomycetes

Agaricales

Amanitaceae

Amanita vittadinii (Moretti) Vittad (Figure 2)

Thracian Plain, in a *Populus nigra* plantation, Kadievo village, Plovdiv distr., 01.09.2007, leg. and det. M. Lacheva (SOA 6000263); on a meadow with *Eryngium campestre*, Benkovski village, Plovdiv distr., 24.10.2007, leg. & det. M. Lacheva (SOA 6000259); on a meadow with *Paliurus spina-christi*, Graf Ignatievo town, Plovdiv distr., 02.10.2010, leg. and det. M. Lacheva (SOA 6000256). The species was reported from Danubian Plain, Sofia region, Znepole region, Vitosha region, Central Rhodopi Mts and the Thracian Lowland (Denchev and Assyov, 2010).

Vulnerable species, according to Gyosheva et al. (2006).

Bolbitiaceae

Hebeloma anthracophilum Maire (Figure 3)

Rila Mts, on burnt ground, along *Picea abies* forest, near the Treshtenik chalet above Yakoruda town, 20.06.2010, leg. and det. M. Lacheva (SOA 6000257). The species was reported from Central Rhodopi Mts and from Western Rhodopi Mts (Stoichev and Gyosheva, 2005). The species is reported the first time from Rila Mts.



Figure 3. Fruitbodies of *Hebeloma anthracophilum*

Verbascum thabsiforme, in grassy place, between Rozino village and Klisura town, 13.09.2009, leg. and det. M. Lacheva (SOA 6000246). The species was reported from Lozenska Planina Mt – Western Sredna Gora (Hinkova and Fakirova 1970) and Eastern Sredna Gora (Stoichev and Gyosheva, 2005) and is recorded the first time from Stara Planina Mts.

Crepidotus lundellii Pilát (Figure 5)

Rhodopi Mts (Central), on dead coniferous twig, in a community of *Pinus sylvestris*, above Byala Cherkva village, 26.09.2004, leg.



Figure 4. Fruitbodies of *Crepidotus epibryus*

and det. G. Stoichev (SOA 6000242). The species is reported the first time from Central Rhodopi Mts (Stoichev and Gyosheva, 2005).

Galerina triscopa (Fr.) Kühner

Mt Sredna Gora, among mosses, in a community of *Pinus sylvestris* and *Betula pendula*, around Banya village, 29.09.2004, leg. and det. G. Stoichev (SOA 6000223). Rhodopi Mts (Central), among mosses, in a *Pinus sylvestris* forest, around Brestnik village, Plovdiv district, 10.09.2005, leg. and det. M. Lacheva (SOA 6000217). The species is reported the first time from Mt Sredna Gora (Stoichev and Gyosheva, 2005).

Inocybe margaritospora (Berk.) Sacc.

Rhodopi Mts (Central), on soil, in a community of *Fagus sylvatica*, above Bachkovo monastery, 10.11.2005, leg. and det. G. Stoichev (SOA 6000231).

The species is reported the first time from Central Rhodopi Mts (Stoichev and Gyosheva, 2005).

Strophariaceae

Stropharia albonitens (Fr.) P. Karst.

Stara Planina Mts (Central), on soil, in open grassy place, between Rozino village and Klisura town, 13.09.2009, leg. and det. M. Lacheva (SOA 6000261). The species is known from Central Rhodopes Mts and Lozenska Planina Mt – Western Sredna Gora (Stoichev and Gyosheva, 2005). It is reported the first time from Stara Planina Mts.



Figure 6. Fruitbodies of *Crinipellis mauretanica*



Figure 5. Fruitbodies of *Crepidotus lundellii*

Tricholomataceae

Crinipellis mauretanica Maire (Figure 6)

Mt Sredna Gora, Hisar distr., nearly the Momina Banya locality, an open meadow grasses among, 09.06.2005, leg. and det. G. Stoichev, M. Lacheva, (SOA 6000228); *ibid*, in grassy places, 21.09.2011, leg. and det. M. Lacheva (SOA 6000261). The species was reported so far only from the Thracian Lowland (Stoichev and Gyosheva, 2005) and Eastern Stara Planina Mts (Assyov et al., 2012). The species is recorded here for the first time from Mt Sredna Gora. *Endangered* species (Gyosheva et al., 2006, Gyosheva, 2011).

Lichenomphalia alpina (Britzelm.) Redhead, Lutzoni, Moncalvo & Vilgalis (= *Omphalina luteovitellina* (Pilát & Nanf.) M. Lange)

Rila Mts, Treshtenik chalet, in the vicinity of a *Picea abies* forest, 16.09.2005, leg. and det. M. Lacheva, G. Stoichev (SOA 6000226). The species was reported from Vitosha Mt (Burzakov, 1933) and from Rila Mts. (Stoichev and Gyosheva, 2005).

Rickenella swartzii (Fr.) Kuyper

Rila Mts, among mosses, in open grassy place, the Treshtenik chalet, in the vicinity of a *Picea abies* forest, 16.09.2005, leg. M. Lacheva (SOA 6000232).

The species was reported by Vanev and Reid (1986) from Pirin Mts, from Rila Mts (Stoichev and Gyosheva, 2005).

Typhulaceae

Macrotyphula fistulosa (Holmsk. : Fr.) R.H. Petersen (Figure 7)

Stara Planina Mts (Central), in a beech forest of *Fagus*



Figure 7. Fruitbodies of *Macrotyphula fistulosa*



Figure 8. Fruitbodies of *Suillus lakei*

sylvatica, in the Komina locality close to Glozhene monastery, near Glozhene village, 24.09.2011, leg. and det. M. Lacheva (SOA 6000221). The species was reported from Central and Eastern Stara Planina Mts, Vitosha region, Rila Mts, Western Sredna Gora Mt, and the Central Rhodopi Mts (Assyov, 2010; Denchev and Assyov, 2010).

Vulnerable species, according to Gyosheva et al. (2006), recorded for the first time from Stara Planina Mts.

Boletales

Suillaceae

Suillus lakei (Murrill) A.H. Sm. & Thiers (Figure 8)

Rhodopi Mts (Central), near the village of Byala Cherkva, in a culture of *Pseudotsuga menziesii*, 19.09.2006, leg. and det. G. Stoichev, M. Lacheva (SOA 6000253). The species was reported from Western Stara Planina Mts (Assyov et al., 2006; Alexov et al., 2012), and West Frontier Mts–Ograzhden Mt (Assyov et al., 2010) as alien bolete species, strictly mycorrhizal with *Pseudotsuga* spp. It was suggested that it might be more widespread in Douglas fir plantations and that as an alien fungus it needs special attention.

Phallales

Gomphaceae

Gomphus clavatus (Pers. : Fr.) S.F. Gray (Figure 9)

Stara Planina Mts (Central), in a deciduous forest of *Fagus sylvatica*, in the Komina locality, close to Topilishte hamlet, near Glozhene village, Lovech distr., alt. 650 m, 24.07.2009, leg. and det.



Figure 9. Fruitbodies of *Gomphus clavatus*

M. Lacheva (SOA 6000268). Rhodopi Mts (Western), in a mixed forest of *Fagus sylvatica* and *Pinus sylvestris*, near the Ravnogor village, Pazardzhik district, 17.10.2010, leg. and det. M. Lacheva (SOA 6000229). The species has been so far recorded only from Vitosha region, Rila Mts, Pirin Mts and Western Rhodopi (Denchev and Assyov, 2010; Assyov et al., 2010; Alexov et al., 2012). It is one of the species listed for legal protection by the Biodiversity Act (Assyov and Denchev, 2010) and is chosen for monitoring within the frame of the National Biodiversity and Protected Areas Monitoring System (Denchev, 2006).

Vulnerable species (Gyosheva et al., 2006; Gyosheva, 2011), which is recorded for the first time from the Stara Planina. It is included in the proposal for entry in the Appendix I of the Bern Convention (Dahlberg and Croneborg, 2003) and special attention has to be paid on its populations in Bulgaria.

Lentaria byssiseda (Pers. : Fr.) Corner (= *Clavaria byssiseda* Pers. : Fr.)

Rhodopi Mts (Central), Smolyan distr., the village of Momchilovtsi, on fallen fir twigs in a community of *Fagus sylvatica* and *Picea abies* forest, 30.09.2005, leg. and det. G. Stoichev (SOA 6000236). The species was reported from Vitosha Mt (Burzakov, 1926) from Western Stara Planina Mts (Vanev and Reid, 1986) and the Western Rhodopi Mts (Stoichev and Gyosheva, 2005).

Vulnerable species, according to Gyosheva et al. (2006).

Phallaceae

Clathrus ruber (P. Micheli ex) Pers. : Pers. (Figure 10)



Figure 10. Fruitbodies of *Clathrus ruber*



Figure 11. Fruitbodies of *Faerberia carbonaria*



Figure 12. Fruitbodies of *Hericium coralloides*

Black Sea coast—near the trail to cape Kaliakra, in deciduous forest of oaks (*Quercus cerris* L.), 07.06.2005, leg. and det. M. Lacheva (SOA 6000240). Rhodopi Mts (Eastern): Kardjali distr., near the village of Chernichino, in deciduous forest of *Quercus* sp., 13.07.2011, leg. and det. M. Lacheva (SOA 6000251). *Clathrus ruber* was recorded only from Sofia region (Hinkova, 1961; Assyov et al., 2010) and Northern Black Sea coast (Assyov et al., 2010). *Near Threatened* species (Gyosheva et al., 2006) which is recorded for the first time from the Rhodopi Mts.

Polyporales

Albatrellaceae

Albatrellus subrubescens (Murrill) Pouzar

Rhodopi Mts (Central), on soil, in a community of *Fagus sylvatica* and *Pinus sylvestris*, above Dedevo village, 14.09.2005, leg. and det. G. Stoichev (SOA 6000239). The species was reported only once from Central Rhodopi Mts (Stoichev and Gyosheva, 2005).

Atheliaceae

Irpicond pendulus (Alb. & Schwein. : Fr.) Pouzar (= *Radulum pendulinum* Nikol., *Irpex pendulus* Fr.)

Rhodopi Mts (Western), the town of Rakitovo, district Pazardzhik, under *Pinus sylvestris*, 26.09.2004, leg. and det. G. Stoichev, M. Lacheva (SOA 6000219). The species was reported only once from Thracian Lowland (Stoichev and Gyosheva, 2005).

Polyporaceae

Faerberia carbonaria (Alb. & Schwein. : Fr.) Pouzar (Figure 11)

Mt Sredna Gora, on carbons, along a spruce forest, above Strelcha town 30.09.2004, leg. and det. G. Stoichev, M. Lacheva (SOA 6000256). Rhodopi Mts (Central), Smolyan distr., the village of Momchilovtsi, on carbon, near *Picea abies* forest, 30.09.2010, leg. and det. M. Lacheva (SOA 6000268). The species reported from Black Sea Coast, Rila Mts and the Rhodopi Mts (Denchev and Assyov, 2010). It has never been found before in Mt Sredna Gora.

Russulales

Hericiaceae

Hericium coralloides (Scop. : Fr.) Pers. (Figure 12)

Sredna Gora Mt (Eastern), Plovdiv distr., above the village of Krastevich, in the deciduous forest of *Quercus* sp., of an oak stump, 03.10.2004, leg. and det. M. Lacheva & G. Stoichev (SOA 6000249). Tundzha Hilly Country: Bakadzhika locality, Yambol distr., in the mixed deciduous of *Carpinus orientalis* and *Acer campestre* forest, of an oak stump, 29.09.2007, leg. and det. M. Lacheva (SOA



Figure 13. Fruitbodies of *Sparassis crispa*

6000219). The species has been so far recorded from the Black Sea Coast, Northeast Bulgaria, Western, Central and Eastern Stara Planina, Mts Znepole region, Rila Mts, Western Sredna Gora Mt, Western and Eastern Rhodopi Mts, Thracian Lowland and Mt Strandzha (Denchev and Assyov, 2010). It is recorded for the first time from Toundzha Hilly Country. It is considered to be *Near Threatened*, according to Gyosheva et al. (2006).

Hericium erinaceus (Bull. : Fr.) Pers.

Rhodopi Mts (Western), in an opening in a mixed forest of *Fagus sylvatica* and *Pinus sylvestris*, in the vicinity of Ravnogor village, district Pazardzhik, 17.09.2009, leg. and det. M. Lacheva (SOA 6000214). The species has been so far recorded from the Eastern Stara Planina Mts, Western Sredna Gora Mts, Central and Eastern Rodopi Mts and the Thracian Plain (Denchev and Assyov, 2010). It is listed in the proposal for inclusion of fungi in the Appendix I of the Bern Convention (Dahlberg and Croneborg, 2003) and is among the fungal species chosen for monitoring within the frame of the National Biodiversity and Protected Areas Monitoring System (Denchev, 2006). It is considered to be *Endangered*, according to Gyosheva et al. (2006).

Thelephorales

Bankeraceae

Hydnellum aurantiacum (Batsch : Fr.) P. Karst.

Rhodopi Mts (Western), on soil, in a coniferous forest of *Pinus sylvestris*, above the Ravnogor village, Pazardzhik district, 1300 m alt., 17.09.2009, leg. and det. M. Lacheva (SOA 6000242). The species was reported from Rila Mts (Burzakov, 1928), from Vitoshka Mt (Burzakov, 1933), from Western Rhodopi Mts (Hinkova et al., 1979) and from Western Rhodopi Mts (Stoichev and Gyosheva, 2005). It is considered to be *Endangered*, according to Gyosheva et al. (2006).

Sparassidaceae

Sparassis crispa (Wulfen : Fr.) Fr. (Figure 13)

Rhodopi Mts (Central), nearly the village of Byala Cherkva, in the community of *Picea abies* and *Pinus sylvestris* forests, 19.09.2008, leg. and det. M. Lacheva (SOA 6000220); Rila Mts, on soil in a community of *Picea abies* and *Pinus sylvestris*, above the Yakoruda town, 23.06.2010, leg. and det. M. Lacheva (SOA 6000234). The species was reported from Vitoshka region, Pirin Mts and Western Rhodopi Mts (Denchev and Assyov, 2010). It is considered to be *Endangered* (Gyosheva et al., 2006; Gyosheva, 2011).

Tremellales
Exidiaceae

Protomerulius caryae (Schwainn.) Ryvarden (Figure 14)

Rhodopi Mts (Central), on dead fir trunk, in a community of *Picea abies* and *Abies alba*, above Smolyanski ezera chalet, 07.10.2007, leg. and det. M. Lacheva (SOA 6000227). The species reported from Stara Planina Mts (Stoichev and Gyosheva, 2005).



Figure 14. Fruitbodies of *Protomerulius caryae*

Conclusion

In this paper enrich information fungal diversity in Bulgaria. Present new chorological data on rare and endangered macromycetes species in the country. The predominant part of macromycetes are of high conservation value included in the Red List of fungi in Bulgaria.

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Todorov N and Mitev J, 1995. Effect of level of feeding during dry period, and body condition score on reproductive performance in dairy cows, IXth International Conference on Production Diseases in Farm Animals, Sept. 11 – 14, Berlin, Germany, p. 302 (Abstr.).

Thesis:

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AGRICULTURAL SCIENCE AND TECHNOLOGY

Volume 4, Number 4
December 2012



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