

NEW DATA OF SOME RARE LARGER FUNGI OF *AGARICACEAE* (*AGARICALES*) IN BULGARIA

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ABSTRACT

New data on seventeen rare macromycetous species from *Agaricaceae* are reported. Seven of them – *Agaricus altipes*, *A. bohusii*, *A. macrocarpus*, *Battarrea phalloides*, *Chlorophyllum agaricoides*, *Tulostoma fimbriatum* and *T. volvulatum* are of high conservation value included in the Red List of fungi in Bulgaria. All taxa are presented with brief chorological data and notes on their distribution in the country. Presented are macroscopic pictures of species of conservation value.

Key words: *Agaricaceae, chorological data, conservation value, rare species, Red List.*

INTRODUCTION

Mycological analysis of the literature shows that the diversity of *Agaricaceae* in the country is relatively low studied.

The paper presents new chorological data for eighteen rare fungi belonging to *Agaricaceae* in Bulgaria. Seven species have conservation value included in the *Red List of Fungi in Bulgaria* (Gyosheva et al., 2006).

MATERIALS 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 PR Bulgaria* (Jordanov, 1966) [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.

Studied specimens are kept in the Mycological Collection of the Agricultural university, Plovdiv (SOA).

The fungi were identified with the aid of works by Binyamini and Wright (1986), Wright (1987), Baseia and Galvão (2002), Baseia and Milanez (2002) and Cortez et al. (2009).

The author's names of the taxa are abbreviated according to Kirk and Ansell (2004). Nomenclature of species follows Kirk et al. (2008). 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 conservation status is indicated according to the *Preliminary Red List and threat status of Bulgarian macromycetes* (Gyosheva et al. 2000) and *Red List of fungi in Bulgaria* (Gyosheva et al. 2006).

RESULTS

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

***Agaricus altipes* (F.H. Møller) Pilát (Fig. 1)**

Rhodopi Mts (*Central*), in coniferous forest of *Picea abies*, above the village of Mugla, Smolyan distr., 30.09.2008, leg. & det. *M. Lacheva* (SOA 6000183).

Distribution: The species was reported from [1, 8, 17 (c)] (Gyosheva and Dimcheva, 1991, Lacheva, 2006, 2008, 2011a).

Endangered [EN B1ab(i,ii,iii,iv)]. Included in the *Red List of Fungi in Bulgaria* (Gyosheva et al., 2006).

***A. bernardii* (Quél.) Quél.**

Tundzha Hilly Country, of meadow on north slope over granite quarry, the village of Hlyabovo, Topolovgrad distr., 06.06.2010, leg. & det. *M. Lacheva* (SOA 6000188).

Distribution: The species was reported from [5 (e), 16, 18, 19] (Hinkova and Drumeva, 1978, Lacheva, 2006, 2011).

***A. bohussii* Bon (Fig. 2)**

Stara Planina Mts (*Central*), in a beech forest of *Fagus sylvatica*, in the Komina locality close to Glogene monastery, near Glozhene village, Teteven distr., 24.08.2011, leg. *M. Lacheva* (SOA 6000186).

Distribution: The species was reported from [5 (c), 10, 17 (c), 18, 20] (Stoichev and Anastasov, 1988, Lacheva, 2006, 2011a).

Critically Endangered [CR A3d; B2ab(i,ii,iv)]. Included in the *Red List of Fungi in Bulgaria* (Gyosheva et al., 2006).

***A. fuscofibrillosus* (F.H. Møller) Pilát**

Mt Sredna Gora, in a community of *Pinus nigra* and *Betula pendula*, between Bogdan village and Clement village, Hisar distr., 02.10.2009, leg. & det. *M. Lacheva* (SOA 6000190); the fork of the village Voynagovo, Plovdiv distr., in a *Pinus sylvestris* and *Betula pendula* planting, 16.10.2009, leg. & det. *M. Lacheva* (SOA 6000191).

Distribution: The species was reported from [2, 5 (c), 11, 16, 17 (c), 18] (Stoichev and Lacheva, 2002, Lacheva, 2006).

***A. impudicus* (Rea) Pilát**

Mt Sredna Gora, under *Acer negundo*, park in the Karlovo town, 20.08.2009, leg. & det. *M. Lacheva* (SOA 6000193).

Distribution: The species was reported from [16, 18, 19] (Lacheva and Stoichev, 2004, Lacheva, 2006).

***A. macrocarpus* (F.H. Møller) F.H. Møller (Fig. 3)**

Rhodopi Mts (*Central*), on meadow near the forest mixed of *Fagus sylvatica* and *Pinus sylvestris*, above Ravnishta chalet, 28.09.2010, leg. & det. *M. Lacheva* (SOA); on meadow, near the village of Semchinovo, Pazardjik distr., 14.09.2010, leg. & det. *M. Lacheva* (SOA 6000212); in a deciduous forest of *Quercus* sp., near Pyasachnik dam, Plovdiv distr., Пловдивско, 03.06.2008, leg. & det. *M. Lacheva* (SOA 6000213).

Distribution: The species was reported from [1, 5(e), 8, 14, 17(w), 18] (Kuthan and Kotlaba, 1988, Lacheva, 2006).

Endangered [EN B1ab(i,ii,iv)]. Included in the *Red List of Fungi in Bulgaria* (Gyosheva et al., 2006).

***A. pilatianus* Bohus**

Mt Sredna Gora, under single trees *Robinia pseudoacacia*, to a pheasant farm in the village Drangovo, Plovdiv distr., 06.09.2009, leg. & det. *M. Lacheva* (SOA 6000196); Krasново village, Strelcha town, in the park of Mineral Baths, 06.09.2009, leg. & det. *M. Lacheva* (SOA 6000181).

Distribution: The species was reported from [18] (Stoichev and Lacheva, 2002, Lacheva, 2006).

***A. porphyizon* Orton**

Tundzha Hilly Country, in meadow in mixed deciduous forest of *Quercus* sp. and *Carpinus orientalis*, Svetlina village, Rubin Kamak locality, Topolovgrad town, 08.09.2008, leg. & det. *M. Lacheva* (SOA 6000207).

Distribution: The species was reported from [3, 14, 17, 18, 19] (Lacheva, 2006, 2011a).

***A. romagnesii* Wasser**

Thracian Lowland, in the outskirts of a mixed forest of *Pinus sylvestris* and *Fagus sylvatica*, above the village of Kuklen, Plovdiv distr., 13.06.2009, leg. & det. *M. Lacheva* (SOA 6000209).

Distribution: The species was reported from [17 (c), 18] (Lacheva, 2006).

***Battarrea phalloides* (Dicks. : Pers.) Pers (Fig. 4)**

Thracian Lowland, of meadow on the left of the bridge over the River Stryama, near the Stryama village, Plovdiv distr., 23.10.2008, leg. & det. *M. Lacheva* (SOA 6000206).

Distribution: The species is known from [18] (Lacheva, 2012).

Endangered [EN B1ab(i,ii,iii,iv)]. Included in the Red List of fungi in Bulgaria (Gyosheva et al., 2006).

***Chlorophyllum agaricoides* (Czern.) Vellinga (Fig. 5)**

Mt Sredna Gora, of the dunghill near Krasново village, Plovdiv distr., 28.04.2011, leg. *G. Stoichev*, det. *G. Stoichev* (SOA 6000189); Rhodopi Mts (*Western*), on manure, farmyard in the village Jrebichko, Pazardjik distr., 23.05.2004, leg. & det. *G. Stoichev*, *M. Lacheva*, (SOA 6000203).

Distribution: The species is known from [5, 7, 14, 16, 17, 18, 19] (Lacheva, 2011, 2012).

Endangered [EN B1ab(i,ii,iii,iv)]. Included in the *Red List of Fungi in Bulgaria* (Gyosheva et al., 2006).

***Leucocoprinus birnbaumii* (Corda) Singer**

Thracian Lowland, on meadow, under single trees of *R. pseudoacacia*, in Dalbokoto Dere locality, near Shtarkovo village, Pazardjik town, 17.10.2008, leg. & det. *M. Lacheva* (SOA 6000211); on meadow, near Carimir village, Plovdiv distr., 19.09.2009, leg. & det. *M. Lacheva* (SOA 6000205); on meadow, near Vinogradec village, Pazardjik town, 22.09.2009, leg. & det. *M. Lacheva* (SOA 6000199).

Distribution: The species is known from [8, 16, 18] (Gyosheva, 2000, Stoichev and Gyosheva, 2005, Lacheva, 2011b).

***Leucocoprinus jubilaei* (Joss.) Wasser**

Thracian Lowland, on meadow under *Populus canescens*, Carimir village, Plovdiv distr., 19.09.2009, leg. & det. *M. Lacheva* (SOA 6000184).

Distribution: The species was reported only once for Bulgaria from [18] (Lacheva, 2011b).

***Mycenastrum corium* (Guersv.) Desv.**

Mt Sredna Gora, a dunghill, near the Staro Jelezare village, Plovdiv distr., 21.08.2011, leg. & det. *M. Lacheva* (SOA 6000187); Thracian Lowland, on meadow, Shtarkovo village, Pazardjik town., 08.2011, leg. & det. *M. Lacheva* (SOA 6000208).

Distribution: The species was reported for [7, 11, 16(3), 17(c), 18] (Lacheva, 2012).

***Tulostoma fimbriatum* Fr.**

Rhodopi Mts (*Central*), on stony meadow, above Hrabrino village, Plovdiv distr., 08.09.2010, leg. & det. *M. Lacheva* (SOA 6000204); on open meadow, near Belashtica village, Plovdiv distr., 18.09.2011, leg. & det. *M. Lacheva* (SOA 6000210).

Distribution: The species is known from [5(3), 10, 17(c), 18] (Lacheva, 2012).

Endangered [EN B1ab(i,ii,iii,iv)]. Included in the *Red List of Fungi in Bulgaria* (Gyosheva et al., 2006).

***T. melanocyclum* Bres.**

Rhodopi Mts (*Central*), the dry meadow with *Eryngium campestre*, above Kuklen village, Plovdiv distr., 16.10.2011, leg. & det. *M. Lacheva* (SOA 6000202).

Distribution: The species is known from [1, 10, 18] (Lacheva, 2012).

***T. volvulatum* I.G. Borshch.**

Tundzha Hilly Country, on open rocky meadow, Sakarci village, Topolovgrad town, 14.08.2010, leg. & det. *M. Lacheva* (SOA 6000200); of meadow in the gully with *Paliurus spinachristi*, Bulgarska Polyana village, Topolovgrad town, 14.10.2010, leg. & det. *M. Lacheva* (SOA 6000182).

Distribution: The species is known from [1, 18] (Lacheva, 2012).

Endangered [EN B1ab(i,ii,iii,iv)]. Included in the *Red List of Fungi in Bulgaria* (Gyosheva et al., 2006).

Several representatives of the genus *Agaricus* have conservation value. In Red list of fungi in Bulgaria includes 5 species of the genus: *Agaricus altipes*, *A. essettei*, *A. bohusii*, *A. macrocarpus* and *A. squamulifer* (Gyosheva et al., 2006).

Based on years of research, I believe that apart from those included in the Red List species of the genus *Agaricus*, especially conservation importance are the following members of the genus: *A. bernardii*, *A. fuscofibrilosus*, *A. impudicus*, *A. pilatianus*, *A. porphyrizon* and *A. romagnesii*.

So far, these species are found in 1-2 to several fields, and will therefore be subject to serious observations and in the future should also be included in the Red List of fungi in Bulgaria in the next update.



Fig. 1. Fruitbodies of *Agaricus altipes*. **Fig. 2.** Fruitbodies of *Agaricus bohusii*. **Fig. 3.** Fruitbodies of *Agaricus macrocarpus*. **Fig. 4.** Fruitbodies of *Battarrea phalloides*. **Fig. 5.** Fruitbodies of *Chlorophyllum agaricoides*.

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