



*Original Contribution*

**NEW RECORDS OF SEVEN RARE AND NOTEWORTHY  
BASIDIOMYCETES FROM BULGARIA**

**R. Alexov<sup>1\*</sup>, D. Vassilev<sup>2</sup>, P. Nedelev, I. Traikov**

<sup>1</sup>Ministry of Environment and Waters, Blagoevgrad Regional Inspectorate of Environment and Waters

<sup>2</sup>Foundation "Nature School" – Vlaha

**ABSTRACT**

This note provides information about new findings in Bulgaria of some threatened or otherwise noteworthy larger fungi. The first recent confirmation of the occurrence in Bulgaria of *Myriostoma coliforme* is noted and new interesting findings of the threatened fungi *Hericium erinaceum* and *Gomphus clavatus* are reported. All three species are considered rare and worthy of protection at European level. In addition, a third locality in Bulgaria is recorded for the alien bolete *Suillus lakei* and new encounters of the rare species *Pyrofomes demidoffii*, *Inonotus tamaricis* and *Strobilomyces strobilaceus* are documented.

**Key words:** alien fungi, Bulgaria, conservation of fungi, fungal diversity, larger fungi

**INTRODUCTION**

During field work of the authors, some new interesting encounters of threatened or rare fungi appeared. Since the recording of rare fungi is considered to be a crucial task (1) contributing to their protection, those intriguing records are listed herein. Moreover three of the species are included in the National Biodiversity and Protected Areas Monitoring System and their reporting is of a great importance.

**MATERIALS AND METHODS**

Fungi were recorded on different occasions during 2006–2011 mostly by the authors and were determined with appropriate monographic treatments (2–6). Specimens are preserved in the Mycological Collection of the Institute of Biodiversity and Ecosystem Research at the Bulgarian Academy of Sciences (SOMF). Photographic materials from the observations are available upon request from the corresponding author. The fungal names comply with the Checklist of the larger basidiomycetes in Bulgaria (7). The localities are presented on an UTM-grid map with 10 km square. For each record, data are

added for the units of the administrative division where it belongs as this is believed to facilitate the communication of the information to the local authorities responsible for the protection of rare species.

**RESULTS**

***Gomphus clavatus* (Bull. : Fr.) Pers.**

Western Rodopi Mts: on the south-western bank of Dospat Dam not far from Sarnitsa village (Pazardzhik distr., Velingrad municipality), at approximate coordinates 41°42'48.8"N, 24°2'05.6"E, in a coniferous forest, 14 August 2006, obs. P. Nedelev, **figs 1, 8.**

The species has been so far recorded only from Vitosha, Rila and Pirin Mts (7, 8). It has never been found before in Western Rodopi, although the availability of suitable habitats in this mountain made its presence seem highly likely. *Gomphus clavatus* is included in the Red List of fungi in Bulgaria (9) as *Vulnerable* [VU B1ab(i,iii,iv)] and appears in the proposal for inclusion of fungi in the Appendix I of the Bern Convention (10). It is one of the few species of fungi listed for legal protection by the Biodiversity Act (11) and is chosen for monitoring within the frame of the National Biodiversity and Protected Areas Monitoring System (12).

\*Correspondence to: Rossen Alexov, Blagoevgrad 2700, 1 Svoboda str., 2700, Blagoevgrad, Bulgaria, e-mail: rioskata@gmail.com



**Fig. 1.** Fruitbodies of *Gomphus clavatus*.

***Hericium erinaceus* (Bull. : Fr.) Pers.**

Sofia region: Sofia city (Sofia distr. and municipality), Lyulin Estate, Zapaden Park, on the slope above the tunnel facing towards the estate, at approximate coordinates 42°42'34.8"N, 23°16'30.1"E, on a living trunk of *Fraxinus* sp., 06 October 2008, obs. I. Traikov, **figs 1, 8**.

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 (7). It has never been found

before in Sofia Region. It is listed in the proposal for inclusion of fungi in the Appendix I of the Bern Convention (10) and on national level (9) is considered to be *Endangered* [EN B1ab (i,iii,iv)] and is among the fungal species chosen for monitoring within the frame of the National Biodiversity and Protected Areas Monitoring System (12). This fungus normally inhabits standing trees in old-grown forests and its occurrence in parkland and urban environment is quite unusual.



**Fig. 2.** Fruitbody of *Hericium erinaceum*.

***Inonotus tamaricis* (Pat.) Maire**

Southern Valley of Struma River: Lebnitsa village (Blagoevgrad distr., Sandanski municipality), at the greenhouses in the northern part of the village, at coordinates 41°31'28.8"N, 23°14'22.4"E on living shrubs of *Tamarix* sp., 108–115 m a. s. l., FM-80, 24 October 2010, leg. & det. R. Alexov & D. Vassilev (SOMF 29154), idem, 27 February 2011, obs. R. Alexov & D. Vassilev, **figs 3, 8.**

*Inonotus tamaricis* is a rare specialized parasite on old living shrubs of genus *Tamarix* (8). So far it has been reported only from the Black Sea coast and the Eastern Rodopi Mts (7) with two confirmed in the recent years localities in the coastal area (Primorsko and Pomorie),

where it is highly threatened by the development of tourism (8). The fungus is considered to be *Endangered* according to the Red List of Fungi in Bulgaria (9). The new locality is situated in the immediate vicinity of agricultural land and a significant threat for the species there is the ongoing removal of tamarisk shrubs by agricultural workers. The number of fruitbodies counted in Lebnitsa village is 34. Further search might possibly reveal more localities of *I. tamaricis* in the southern parts of the Valley of River Struma, where tamarisk is relatively often seen along the riverbanks or planted on road embankments.



**Fig. 3.** Fruitbody of *Inonotus tamaricis*.

***Myriostoma coliforme* (With. : Pers.) Corda**

Northern Valley of Struma River: Blagoevgrad town (Blagoevgrad distr. and municipality), in the yard of the estate of Nevrokopska Ecclesiastical Province, at approximate coordinates 42°01'31.2"N, 23°06'06.2"E, FM-75, 22 March 2007, leg. G. Manova, det. R. Alexov (SOMF 29155), **figs 4, 8.**

Northern Pirin Mts: in Vlahi village (Blagoevgrad distr., Kresna municipality), at coordinates 41°44'21.5"N, 23°13'36.9 E, FM-82, 6 November 2010, leg. et det. D. Vassilev & R. Alexov (SOMF 29156), idem, 27 February 2011, obs. D. Vassilev & R. Alexov, **figs 5, 8.**

*Myriostoma coliforme* 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

(10). It is chosen for monitoring within the frame of the National Biodiversity and Protected Areas Monitoring System (12). In Bulgaria this is a very rare species that has been found occasionally. Four previous findings of the fungus are known so far from the Black Sea coast, Northeastern Bulgaria, Southern Valley of River Struma and Western Sredna Gora Mts (7). The most recent encounter of the species dates back to 1983 (13). Furthermore, at least two of the previously known localities (Southern Black Sea coast and the one near Sandanski) are now under strong human pressure and are experiencing significant habitat changes. *Myriostoma coliforme* has not yet been evaluated for inclusion in the Red List of Fungi in Bulgaria (9), but nonetheless it is a rare species that is worthy of protection. A single fruitbody was found in the first locality (Blagoevgrad town) and fourteen in Vlahi village.





Fig. 4. Fruitbody of *Myriostoma coliforme*.



Fig. 5. Fruitbody of *Myriostoma coliforme*.

***Pyrofomes demidoffii* (Lev.) Kotl. & Pouzar**  
Southern Valley of Struma River: Kresna Gorge (Blagoevgrad distr., Kresna municipality), at approximate coordinates 41°44'14.0"N, 23°9'19.4"E & 41°44'37.4"N, 23°9'31.0"E, FM-72, 03 May 2010, obs. R. Alexov, **figs 6, 8**.

*Pyrofomes demidoffii* is a specialized parasite on living trunks of tree junipers (14), in Bulgaria only on *Juniperus excelsa*. Its distribution is thus restricted by the distribution of its host. In the country the fungus is known

from two localities only, the River Struma Valley (Kresna Gorge) and the Central Rodopi Mts (7). From the point of view of species conservation, this fungus is a very interesting example of a threatened fungus parasitizing (and thus possibly damaging) a rare host (1), even more so considering it is sometimes in detriment to the tree (14). Nevertheless, both *P. demidoffii* and *J. excelsa* are in need of protection. The fungus is considered as *Endangered* [EN B2ab(i,ii,iv)] in the Red List of Fungi in Bulgaria (9). The indication of this new encounter seems appropriate as the last

record from this area dates back to 1982 (15). The fungus was registered on two separate trees with single fruitbodies present. One of the

trees is situated in Tisata Nature Reserve and the other is outside the borders of the protected area.



**Fig. 6.** Fruitbody of *Pyrofomes demidoffii*.

***Strobilomyces strobilaceus* (Scop. : Fr.) Berk.**  
Western Stara Planina Mts: east of Tsaritchina village towards Tseretsel village (Sofia distr. and municipality), in a broadleaf forest, at approximate coordinates 42°53'0.4"N, 23°16'35.4"E, 42°53'12.2"N, 23°16'31.2"E and 42°53'12.0"N, 23°16'30.0"E, 13 July 2010 & 20 July 2010, leg. & det. P. Nedelev (SOMF 29157).

Rila Mts: Slavovo locality east of Blagoevgrad town (Blagoevgrad distr. and municipality), in a mixed beech – black pine forest, at coordinates 42°01'38.7"N, 23°16'31.6"E, 1049 m a. s. l., 09 July 2009, obs. R. Alexov.

Southern Pirin Mts: south of Papazchair locality, in a beach forest, under broadleaf shrubs, at coordinates 41°31'37.6"N, 23°39'14.3"E, 1620 m a. s. l., 16 August 2010, obs. R. Alexov.

*Strobilomyces strobilaceus* is listed as Vulnerable [VU B1ab(iii)+2ab(iii)] on the Red List of fungi in Bulgaria (9). It is so far the only rare species for which a detailed account and mapping have been published in the Bulgarian mycological literature (16). It was suggested by the authors of the account that

new findings may possibly occur, which is confirmed by the authors' own encounters.

***Suillus lakei* (Murrill) A.H. Sm. & Thiers**

Western Stara Planina Mts: between Tsaritchina and Balsha villages (Sofia distr., Kostinbrod municipality), under *Pseudotsuga menziesii*, at approximate coordinates 42°53'1.4"N, 23°15'27.5"E, FN-85, 31 October 2010, leg. et det. P. Nedelev (SOMF 29158), **figs 7, 8.**

*Suillus lakei* is a North American fungus, which appears as an alien species in Europe, apparently introduced through its mycorrhizal host-tree *Pseudotsuga* spp. (17). It has been so far known from Western Stara Planina Mts (17) and it was recently reported also from West Frontier Mts – Ograzhden Mt (8); it was suggested that it might be more widespread in Douglas fir plantations and that as an alien fungus it needs special attention. Eight fruitbodies were found in the new locality and no subsequent fruitbody-production was observed during the inspection of the place a week later.

**ACKNOWLEDGEMENTS.** The authors wish to thank to Mrs. G. Manova for the specimen of *Myriostoma coliforme*, kindly provided by her.





Fig. 7. Fruitbodies of *Suillus lakei*.

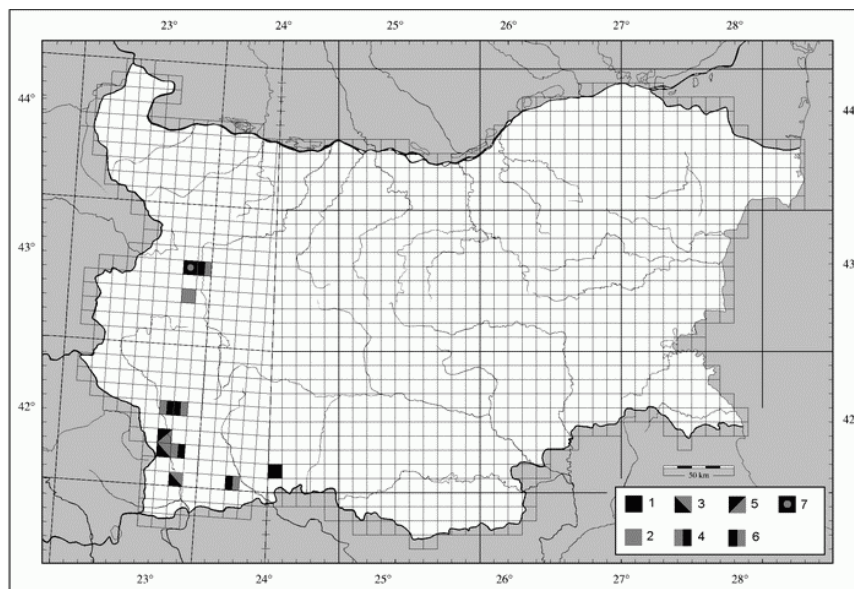


Fig. 8. Distribution of rare fungi according UTM-grid: 1. – *Gomphus clavatus*; 2. *Hericium erinaceum*; 3. *Inonotus tamaricis*; 4. *Myriostoma coliforme*; 5. *Pyrofomes demidoffii*; 6. *Strobilomyces strobilaceus*; 7. *Suillus lakei*.

## REFERENCES

- Denchev, C.M. & Bakalova, G.G., Centenary review of the fungal diversity investigations in Bulgaria. Bulgarian Mycological Society & Bulgarian Biodiversity Conservation Programme, Sofia, 2002.
- Hansen, L. & Knudsen, H., Nordic Macromycetes. Vol. 2. *Polyporales, Boletales, Agaricales, Russulales*. Helsinki University Printing House, Helsinki, 1992.
- Pegler, D.N., Læssøe, T. & Spooner B.M., British puffballs, earthstars and stinkhorns. Royal Botanic Gardens, Kew, 1995.
- Pegler, D.N., Roberts, P.J. & Spooner, B.M., British chanterelles and tooth fungi. An account of the British Cantharelloid and Stipitate Hydroid Fungi. Royal Botanic Gardens, Kew, 1997.
- Muñoz, J.A., *Boletus* s. l. In: *Fungi Europaei*. Vol. 1. Pp. 1-951. Edizioni Candusso, Alassio, 2005.
- Sarasini, M., *Gasteromyceti epigei*. AMB Fondazione Centro Studi Micologici, Trento, 2005.
- Denchev, C.M. & Assyov, B., Checklist of the larger basidiomycetes in Bulgaria. *Mycotaxon* 111:279-282 + on-line version: 1-76 (<http://www.mycotaxon.com/resources/checklists/denchev-v111-checklist.pdf>), 2006.
- Assyov, B., Stoykov, D. & Nikolova, S. New records of some rare and noteworthy

- larger fungi from Bulgaria. *Trakia Journal of Sciences*, 8(4):1-6, 2010.
9. Gyosheva, M.M., Denchev, C.M., Dimitrova, E.G., Assyov, B., Petrova, R.D. & Stoichev, G., Red List of fungi in Bulgaria. *Mycologia Balcanica*, 3:81-87, 2006.
10. Dahlberg, A. & Croneborg, H., 33 threatened fungi in Europe. Complementary and revised information on candidates for listing in Appendix I of the Bern Convention. T-PVS document (2001) 34 rev. 2. Council of Europe, Strasbourg, 2003.
11. Assyov, B. & Denchev, C.M., Conservation of larger basidiomycetes in Bulgaria: the case of *Boletus*. *Mycologia Balcanica*, 7:37-40, 2010.
12. Denchev, C.M., [Monitoring of fungi]. In: S. Yotov et al. (eds). [Development of a National Biodiversity Monitoring System in Bulgaria]. Ministry of Environment and Water, Sofia., 2006 [http://chm.moew.government.bg/iaos/files/Zaglavna\\_stranica+sadarjanie.doc](http://chm.moew.government.bg/iaos/files/Zaglavna_stranica+sadarjanie.doc);
- ALEXOV R., et al.  
[http://chm.moew.government.bg/iaos/files/Gabi\\_metodika.doc](http://chm.moew.government.bg/iaos/files/Gabi_metodika.doc). (In Bulgarian)
13. Stoichev, G.T. & Dimcheva, M.D., [New mushrooms for Pirin Mts and Bulgaria]. *Scientific Works of the Vasil Kolarov Higher Institute of Agriculture (Plovdiv)* 33(4):89-93, 1988. (In Bulgarian)
14. Doğan, H.H., Karadelev, M. & Işioğlu, M., Macrofungi diversity associated with the scale-leaf juniper trees, *Juniperus excelsa* and *J. foetidissima*, distributed in Turkey. *Turkish Journal of Botany* 35:219-237, 2011.
15. Stoichev, G.T., [New taxa and chorological data concerning the fungal flora of Bulgaria] *Fitologiya* 21:43-50, 1982. (In Bulgarian)
16. Assyov, B., Stoykov, D. & Nikolova, S. *Strobilomyces strobilaceus* (Scop. : Fr.) Berk. in Bulgaria. *Trakia Journal of Sciences*, 9 (1):1-4, 2011.
17. Assyov, B., Stoichev, G. & Vassilev, R., First records of mushroom species for Bulgaria. *Mycologia Balcanica*, 3:127-130, 2006.