Data on the fungal diversity of Balgarka Nature Park (Central Balkan, Bulgaria)

Melania M. Gyosheva[1], Dimitar Y. Stoykov[1] & Yulian A. Marinov[2]

[1] Department of Plant and Fungal Diversity and Resources, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 23 Acad. G. Bonchev St, 1113 Sofia, Bulgaria, e-mail: melanygyosheva@abv.bg (corresponding author); stoykovdimitar@abv.bg

2 Regional Natural History Museum of Plovdiv, 34 Hristo G. Danov St, 4000 Plovdiv, Bulgaria, e-mail: julianmarinov@abv.bg

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Abstract. Data on the fungal diversity of Balgarka Nature Park is reported. Most of the taxa have been recorded during 2012–2014, in different plant communities on its territory. A total number of 244 species (ascomycetes, basidiomycetes and slime moulds) are included. Two of them (*Mycena arcangeliana* and *Steccherinum fimbriatum*) are new to Bulgaria. Of all fungal taxa, 235 species are reported for the first time from the Park area. Ten larger fungi are of high conservation value and are included in the Red List of Fungi in Bulgaria.

Key words: *Ascomycota*, *Basidiomycota*, Bulgarian mycota, fungal diversity and conservation, *Mycetozoa*

Introduction

Balgarka Nature Park is situated at the top and the northern slopes of Schipchenska and Trevnenska Mts (Central Stara Planina Mts). It was declared as a nature park in 2002, with a total area of 21 772.163 ha. Its highest point is peak Karadzhova Kula (1511 m a.s.l.). The geological rock base is composed of schists, granite, sandstone, gneisses, dolomites, and limestones. The soil cover consists of haplic luvisoils, cambsoils and rendzinas (Apostolova & al. 2012). The vegetation cover is dominated by deciduous forests, and beech forests prevail (2110 *Luzulo-Fagetum* beech forests, 2130 *Asperulo-Fagetum* beech forests, 9150 MediEuropean limestone beech forests-*Cephalanthero-Fagion*). Grasslands cover large areas of the highest parts of the park.

Balgarka Nature Park comprises four protected sites: Studen Kladenets, Mehchenitsa-Iovovtsi, Sokolski Manastir, Stolishta, and two natural landmarks: Mahnatite Skali (Fig. 1) and Vikanata Skala.

The entire territory of the Park is included in the Balgarka Important Plant Area in the IPAS network in Bulgaria (Peev & al. 2012). Only 19 fungal species (ascomycetes and basidiomycetes) have been published so far from the Balgarka Nature Park (Barzakov 1926a, b; Gyosheva 2015; Peev & al. 2012; Stoichev 1981, 1987; Stoichev & Dimcheva 1987; Stoykov 2012b; Stoykov & al. 2015), predominantly larger fungi. Two species among them are of conservation value (Gyosheva & al. 2006), namely *Hericium erinaceus* (Bull. : Fr.) Pers. and *Peziza michelii* (Boud.) Dennis.

The paper presents information about the species diversity, ecological-trophic structure and conservation value of the fungi from the territory of Balgarka Nature Park, collected by the authors within the framework of a project aimed at the preparation of a Management Plan for this protected area.

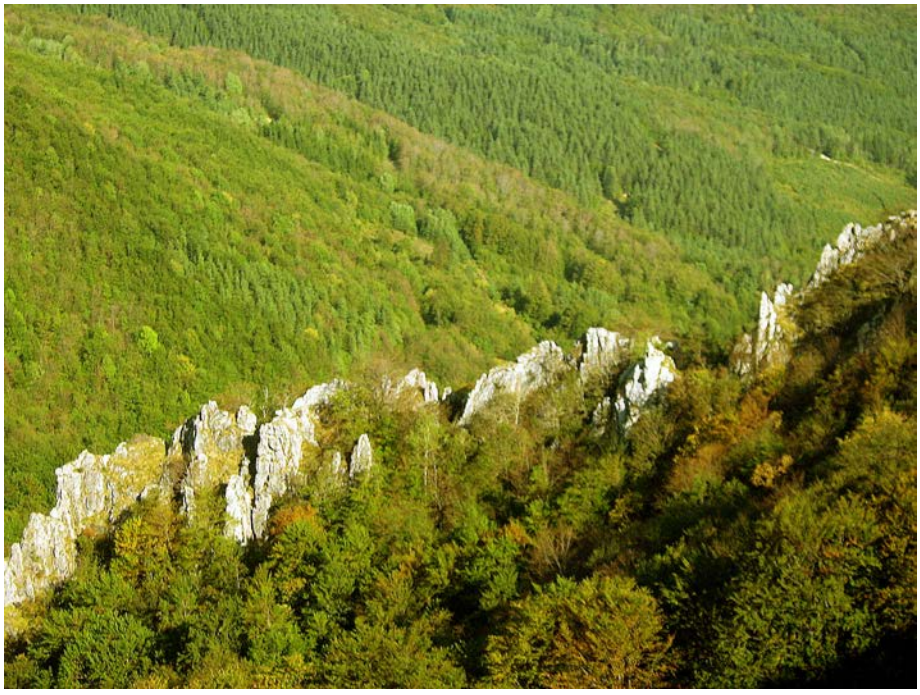

Fig. 1. View of the Mahnatite Skali natural landmark.

Material and methods

Field studies in the Balgarka Nature Park were carried out by the tracking method during the period 2012–2014. The object of mycological investigations were mainly forest communities, and particularly old beech forests within the protected areas in the Schipchenskia and Trevnenska Mts.

During field work, information about the substrata and host plants was collected. GPS data on the localities of fungi with conservation value were obtained using Garmin 62, and color photographs were taken by Canon PS digital cameras. Identification of the collected materials was confirmed partly in the field and mostly in laboratory conditions, using the following works: small-sized ascomycetes – mainly after Munk (1957), Breitenbach & Kränzlin (1981), Ragazzi & al. (2012), Stoykov (2012a), larger fungi – using the works of Courtecuisse & Duhem (1995), Dennis (1968), Krieglsteiner (2000, 2001), Hansen & Knudsen (2000), Phillips (2006), etc. The ecological-trophic groups are given after Dimitrova & Gyosheva (2010) and Gyosheva & Denchev (2000). The threat status follows the Red List of Fungi in Bulgaria (Gyosheva & al. 2006). The studied specimens of fungi (new for Bulgaria and those of conservation significance) are preserved in the Mycological Collection of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Sofia (SOMF).

Results and discussion

Species diversity of fungi

The total number of the fungi registered during the present study in the Balgarka Nature Park is 239 species. Five species of slime moulds were also recorded. The taxa belong to *Ascomycota* (4 classes, 10 orders, 18 families, 32 genera, and 46 species), *Basidiomycota* (3 classes, 11 orders, 49 families, 113 genera, and 193 species) and *Mycetozoa* (1 class, 3 orders, 3 families, 4 genera, and 5 species). *Agaricales* is the order with the highest number of species (105). The most species-rich families are *Gnomoniaceae* (10) and *Xylariaceae* (9) among the ascomycetes; and *Polyporaceae* (19), *Agaricaceae* (18), *Tricholomataceae* (13), and *Russulaceae* (12) of the basidiomycetes. Genera with the highest number of species are: *Amanita* (9 species), *Russula* (8), *Mycena* (6), *Agaricus*, *Gymnopus*, *Lactarius*, *Polyporus* and *Tricholoma* (4 species each).

Larger fungi formed the prevailing group, comprising a total of 208 species. Thirty microfungi were recorded on the territory of the Park, mainly from orders

Diaporthales, *Erysiphales* (powdery mildews), *Hypocreales*, *Xylariales,* and *Pucciniales* (rusts).

During the present investigation, 235 species were found for the first time in the Balgarka Nature Park. Two of them are new for Bulgaria: *Mycena arcangeliana* Bres. and *Steccherinum fimbriatum* (Pers.) J. Erikss. The greatest diversity of fungi was registered in pure and mixed communities of *Fagus sylvatica* L. – 121 species. A detailed list of all fungal taxa and their localities in the Park area are presented in Table 1.

Ecological and trophic structure

Fungi of 11 ecological and trophic groups were found in different plant communities visited in the Balgarka Nature Park (Table 1): leaf debris saprotrophs – 8 species, cone saprotrophs – 1; litter saprotrophs – 14; humus saprotrophs – 37; wood saprotrophs – 90; moss saprotrophs – 2; herbs saprotrophs – 3; coprotrophs – 4; mycorrhizal fungi – 60; wood parasites – 30, and herb parasites – 6.

Wood saprotrophs, mycorrhizal fungi and humus saprotrophs prevailed among all studied taxa. Most fungi from the above groups are inhabitants of the beech forests. Nevertheless, wood parasites are highly important in terms of the sanitary status of the forest ecosystems: *Armillaria mellea*, *Biscogniauxia mediterranea*, *Diaporthe oncostoma*, *Fomes fomentarius*, *Fomitopsis pinicola*, *Ganoderma applanatum*, *Heterobasidion annosum*, *Ophiognomonia leptostyla*, *Phelinus igniarius*, *Pholiota adiposa*, *Piptoporus betulinus*, etc.

Data presented on the ecological and trophic structure of fungi are preliminary. The study of fungal diversity in this protected area is still in its initial stage.

Species of conservation significance

Ten larger fungi of conservation value, included in the Red List of Fungi in Bulgaria (Gyosheva & al. 2006), have been recorded in the Balgarka Nature Park by the authors during field studies (Plate I, Figs 1-8). These fungi are listed under the following threat categories: *Critically Endangered* (CR) – 1 species (*Clavicorona pyxidata)*; *Endangered* (EN) – 3 (*Chlorophyllum agaricoides*, *Hericium erinaceus*, *Peziza michelii*); *Vulnerable* (VU) – 5 (*Amanita caesarea*, *Arrhenia spathulata*, *Hohenbuehelia petaloides*, *Leccinum quercinum*, *Strobilomyces strobilaceus*); and *Near Threatened* (NT) – 1 (*Hericium coralloides*). Eight of them have not been published before from the Park area. Five species (*Amanita caesarea*, *Chlorophyllum agaricoides*, *Clavicorona pyxidata*, *Hericium erinaceus* and *Peziza michelii*) are also included in the *Red Data Book of the Republic of Bulgaria* (Peev & al. 2015). *H. erinaceus* is a fungus threatened at European level. It is listed in the Criterion A (ii) species from the Balgarka Important Plant Area in Bulgaria (Apostolova & al. 2012).

Amanita caesarea, *Hericium erinaceus* and *Strobilomyces strobilaceus* have been included in the Mapping Programme of the European Council for the Conservation of Fungi (Fraiture & Otto 2015).

Larger fungi of conservation importance have been found mainly in the beech and oak forests of the Park (Table 1).

Conclusion

Data presented in the text and Table 1 suggests that the territory of Balgarka Nature Park is marked by significant and interesting fungal diversity. This conclusion is supported especially by the recorded species with conservation value and by the great variety of ecological and trophic groups of fungi.

On the basis of the results of mycological investigations carried out in 2012–2014, we have identified the old forests of *Fagus sylvatica* as most representative in terms of their fungal diversity from the following territories in the Park: Shipchenska Mts: Uzana locality, upper streams of river Yantra, Sokolski Manastir protected site, vicinities of the Hristo Smirnenski Dam; Trevnenska Mts: Mahnatite Skali natural landmark, Studen Kladenets protected site, the regions of peaks Balgarka, Belnovrah and Golyam Krastets, Izvora locality, and the area of Konarskoto village.

However, further mycological investigations in the Park area will reveal new data about species diversity and ecology of fungi, premised by the combination of basic rocks and supported vegetation in the forests and in the open grasslands.

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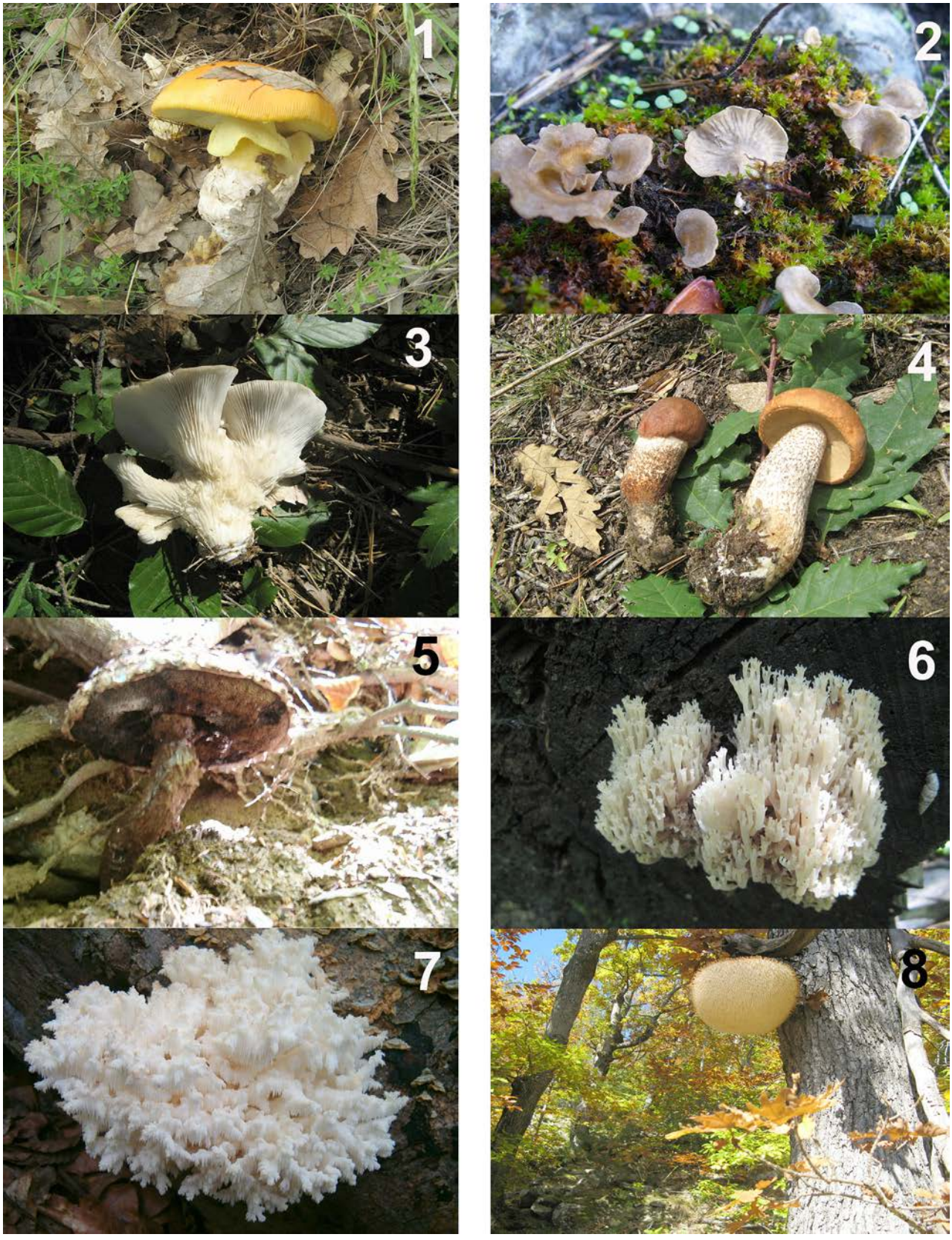
Plate I



Larger fungi of conservation value. **Fig. 1.** *Amanita caesarea*; **Fig. 2.** *Arrhenia spathulata*; **Fig. 3.** *Hohenbuehelia petaloides*; **Fig. 4.** *Leccinum quercinum*; **Fig. 5.** *Strobilomyces strobilaceus*; **Fig. 6.** *Clavicorona pyxidata*; **Fig. 7.** *Hericium coralloides*; **Fig. 8.** *Hericium erinaceus*.

Table 1 Checklist of the fungi recorded in the Balgarka Nature Park during 2012–2014 period.

Taxa	Localities	Substrata (Hosts)	ETG
Ascomycota			
Dothideomycetes			
Hysteriales			
Hysteriaceae			
1. *Hysterium pulicare* Pers. : Fr.	above Gorski Dom Balgarka; below Belnovrah peak	bark of *Acer pseudoplatanus* and *Quercus dalechampii*	LeS
Pleosporales			
Cucurbitariaceae			
2. *Cucurbitaria elongata* (Fr.) Grev.	near Stoevtsi village	dead branch of *Robinia pseudoacacia*	LeS
Leotiomycetes			
Erysiphales			
Erysiphaceae			
3. *Erysiphe alphitoides* (Griffon & Maubl.) U. Braun & S. Takam.	Shipchenska and Trevnenska Mts	leaves of *Quercus dalechampii*	LeP
4. *E. cichoracearum* DC.	above Stoevtsi village, near the road to Mahnatite Skali natural landmark	plants of *Telekia speciosa*	HP
5. *Neoerysiphe galeopsidis* (DC.) U. Braun	along Hristo Smirnenski Dam, above Gabrovo town	plants of *Galeopsis speciosa*	HP
6. *Podosphaera aphanis* (Wallr.) U. Braun & S.Takam.	Golyam Bazovets peak	leaves of *Agrimonia eupatoria*	HP
Helotiales			
Dermataceae			
7. *Trochila craterium* (DC.) Fr.	near Panicharka River	dry leaves of *Hedera helix*	HS
8. *T. laurocerasi* (Desm.) Fr.	Suhata Cheshma locality, below Sinite Skali	dry leaves of *Laurocerasus officinalis*	HS
Helotiaceae			
9. *Bisporella citrina* (Batsch) Korf & S. E. Carp.	above Stoevtsi village, Mahnatite Skali natural landmark	dead beech wood	LeS
10. *Chlorociboria aeruginosa* (Oeder : Fr.) Seaver ex C.S. Ramamurthi, Korf & L.R. Batra	Uzana locality, above Gabrovo town; Izvora locality, above Plachkovtsi town; Studen Kladenets protected site	dead beech wood	LeS
Rhytismatales			
Rhytismataceae			
11. *Rhytisma acerinum* (Pers. : Pers.) Fr.	Shipchenska and Trevnenska Mts	living leaves of *Acer* spp.	LeP
Pezizomycetes			
Pezizales			
Discinaceae			
12. *Gyromitra esculenta* (Pers.) Fr.	Shipchenska and Trevnenska Mts	sandy soil in spruce and mixed forests with pine	Hu
Helvellaceae			
13. *Helvella crispa* (Scop.) Fr.	below Belnovrah peak	soil, in beach forest	Hu
14. *H. lacunosa* Afzel. : Fr.	above Gorski Dom Balgarka	soil and dead wood in beech forests	Hu, LeS
Morchellaceae			
15. *Mitrophora semilibera* (DC.) Lév.	above Stanchov Han village	soil, near deciduous forest	Hu
16. *Morchella esculenta* (L.) Pers.	below Golyam Krastets peak	soil, near deciduous forest	Hu
Pezizaceae			
17. *Peziza badia* (Pers.) Fayod	Izvora locality, above Plachkovtsi town	soil, in beech forest	Hu
18. *P. michelii* (Boud.) Dennis (**EN**)	above Stanchov Han village	soil, in deciduous forest	Hu
Pyronemataceae			
19. *Aleuria aurantia* (Pers.) Fuckel	Izvora locality, above Plachkovtsi town	soil, near beach forest	Hu
20. *Scutellinia crinita*(Bull.) Lambotte	Shipchenska and Trevnenska Mts	damp soil	Hu
Sordariomycetes			
Diaporthales			
Diaporthaceae			
21. *Diaporthe oncostoma* (Duby) Fuckel	Sinite Skali locality	dry twigs of *Robinia pseudoacacia*	LeP

Table 1. Continuation.

Taxa	Localities	Substrata (Hosts)	ETG
Gnomoniaceae			
22. *Gnomonia arnstadtiensis* Auersw.	above Todorchetata village, near Panicharka river; Sokolski Manastir protected site	dead leaves of *Carpinus betulus*	Fd
23. *G. carpinicola* (Höhn.) Sogonov	above Bazovets railway station	dead leaves of *Carpinus betulus*	Fd
24. *G. gnomon* (Tode : Fr.) J. Schröt.	Sokolski Manastir protected site	dead leaves of *Coriylus avellana*	Fd
25. *Gnomoniopsis comari* (P. Karst.) Sogonov s. lat.	Golyam Bazovets peak	dead steams of *Agrimonia eupatotia*	HS
26. *Hypospilina pustula* (Pers. : Fr.) M. Monod	above Stanchov Han village	dead leaves of *Quercus rubra*	Fd
27. *Mamiania fimbriata* (Pers. : Fr.) Ces. & De Not.	Shipchenska and Trevnenska Mts	living leaves of *Carpinus betulus*	LeP
28. *Ophiognomonia ischnostyla* (Desm.) Sogonov	Sokolski Manastir protected site	dead leaves of *Juglans regia*	Fd
29. *O. leptostyla* (Fr. : Fr.) Sogonov	near Hristo Smirnenski Dam; above Stanchov Han village	dead leaves of *Juglans regia*	LeP
30. *O. setacea* (Pers. : Fr.) Sogonov	along Hristo Smirnenski Dam	dead leaves of *Quercus cerris*	Fd
31. *Plagiostoma bavaricum* (Rehm) M.E. Barr	above Stanchov Han village	dead leaves of *Acer pseudoplatanus*	Fd
Valsaceae			
32. *Cytospora nivea* Fuckel, viz. its sexual counterpart *Leucostoma niveum* (Hoffm. : Fr.) Höhn.	near the road Krastets - Bazovets village	old twigs of *Populus* sp.	LeP
Hypocreales			
Hypocreaceae			
33. *Protocrea farinosa* (Berk. & Broome) Petch	below Balgarka peak - on the border of the park area	dead beech wood	LeS
Nectriaceae			
34. *Nectria cinnabarina* (Tode) Fr.	above Gorski Dom Balgarka	dead beech branches	LeP
Phyllachorales			
Polystigmataceae			
35. *Polystigma rubrum* (Pers.) DC.	above Bazovets village	living leaves of *Prunus domestica*	LeP
Xylariales			
Diatrypaceae			
36. *Diatrype disciformis* (Hoffm. : Fr.) Fr.	Shipchenska and Trevnenska Mts	dead beech branches	LeS
37. *D. stigma* (Hoffm. : Fr.) Fr.	Trevnenska Mt	dead beech and hornbeam branches	LeS
Xylariaceae			
38. *Annulohypoxylon cohaerens* (Pers. : Fr.) Y.M. Ju, J.D. Rogers & H.M. Hsieh	near Yabalka (district of Gabrovo town)	bark of *Fagus sylvatica*	LeP
39. *Biscogniauxia mediterranea* (De Not.) Kuntze	below Belnovrah peak	bark of *Quercus dalechampii*	LeP
40. *B. nummularia* (Bull. : Fr.) Kuntze	Trevnenska Mts	dead beech branches	LeS
41. *Hypoxylon fragiforme* (Pers. : Fr.) J.Kickx f.	Shipchenska and Trevnenska Mts	on dead branches of beech, bark	LeS
42. *H. multiforme* (Fr. : Fr.) Fr.	Shipchenska and Trevnenska Mts	dead beech branches	LeS
43. *Kretzchmaria deusta* (Hoffm. : Fr.) P.M.D. Martin	Shipchenska and Trevnenska Mts	dead beech wood	LeS
44. *Nemania serpens* (Pers. : Fr.) Gray	Shipchenska and Trevnenska Mt	dead beech branches	LeS
45. *Xylaria hypoxylon* (L.) Grev.	Shipchenska and Trevnenska Mts	dead beech wood	LeS
46. *X. polymorpha* (Pers. : Fr.) Grev.	near Hristo Smirnenski Dam; above Stanchov Han village	dead deciduous wood	LeS
Basidiomycota			
Agaricomycetes			
Agaricales			
Agaricaceae			
47. *Agaricus arvensis* Schaeff.	Shipchenska and Trevnenska Mts	soil, in grassy places	Hu

Table 1. Continuation.

Taxa	Localities	Substrata (Hosts)	ETG
48. *A. campestris* L. : Fr.	Shipchenska and Trevnenska Mts	soil, in grassy places	Hu
49. *A. sylvaticus* Schaeff.	Shipchenska and Trevnenska Mts	soil, in coniferous and mixed forests	Hu
50. *A. urinascens* (Jul. Schдff. & F.H. Mцller) Singer var. *urinascens*	above Bazovets village	soil, in meadows	Hu
51. *Bovista plumbea* Pers. : Pers.	Shipchenska and Trevnenska Mts	soil, in grassy places	Hu
52. *Calvata gigantea* (Batsch : Pers.) Lloyd	below Balgarka peak	soil, in a meadow	Hu
53. *C. utriformis* (Bull. : Pers.) Jaap	Shipchenska and Trevnenska Mts	soil, in grassy places	Hu
54. *Chlorophyllum agaricoides* (Czern.) Vellinga (**EN**)	above Stanchov Han village, near Gaidari village	soil, in deciduous forest	Hu
55. *Ch. rachodes* (Vittad.) Vellinga	Shipchenska and Trevnenska Mts	soil, in forests and grassy places	Hu
56. *Coprinus comatus* (O.F. Mьll. : Fr.) Pers.	Shipchenska and Trevnenska Mts	soil, near forests	C
57. *Cyathus striatus* (Huds. : Pers.) Willd.	above Todorchetata village; below Balgarka peak	dead wood, in deciduous forests	LeS
58. *Cystoderma cinnabarinum* (Alb. & Schwein. : Fr.) Fayod	below Golyam Krastets peak; above Gorski Dom Balgarka	litter, in coniferous and mixed forests	St
59. *Lycoperdon lividum* Pers.	above Bazovets village	sandy soil, in dry meadow	Hu
60. *L. mammiforme* Pers. : Pers.	above Stanchov Han village	soil, in beech forest	Hu
61. *L. perlatum* Pers. : Pers.	Shipchenska and Trevnenska Mts	litter, in forests	St
62. *L. pyriforme* Schaeff. : Pers. var. *pyriforme*	Shipchenska and Trevnenska mountains	dead beech wood	LeS
63. *Macrolepiota mastoidea* (Fr. : Fr.) Singer	below Bedek peak; near Gorski Dom Balgarka	soil, in beech forest	Hu
64. *M. procera* (Scop. : Fr.) Singer	Shipchenska and Trevnenska mountains	soil, in foresrs and grassy places	Hu
Amanitaceae			
65. *Amanita caesarea* (Scop. : Fr.) Pers. (**VU**)	above Stanchov Han, below Belnovrah peak	soil, in oak forest	Mr
66. *A. critina* (Schaeff.) Pers. var. *citrina*	above Stanchov Han, below Belnovrah peak	soil, in mixed forest (oak, pine)	Mr
67. *A. gemmata* (Fr.) Bertill.	above Gorski Dom Balgarka	soil, in spruce forest	Mr
68. *A. muscaria* (L. : Fr.) Pers.	Shipchenska and Trevnenska Mts	soil, in spruce forests	Mr
69. *A. pantherina* (DC. : Fr.) Krombh. var. *pantherina*	below Golyam Krastets peak	soil, in pine forest	Mr
70. *A. phalloides* (Vaill. : Fr.) Link	below Belnovrah peak	soil, in oak forest	Mr
71. *A. rubescens* Pers. : Fr.	Shipchenska and Trevnenska Mts	soil, in deciduous and coniferous forests	Mr
72. *A. vaginata* (Bull. : Fr.) Lam.	Shipchenska and Trevnenska Mts	soil, in deciduous and coniferous forests	Mr
73. *A. virosa* (Fr.) Bertill.	near Gorski Dom Balgarka	soil, in spruce forest	Mr
Bolbitiaceae			
74. *Bolbitius titubans* (Bull. : Fr.) Fr. var. *titubans*	below Golyam Krastets peak, near the road	litter, in deciduous forest	C
Cortinariaceae			
75. *Cortinarius infractus* (Pers. : Fr.) Fr.	below Belnovrah peak	soil, in deciduous forest, under oak	Mr
76. *C. torvus* (Fr. : Fr.) Fr.	below Belnovrah peak	soil, in deciduous forest	Mr
Cyphellaceae			
77. *Chondrostereum purpureum* (Pers . : Fr.) Pouzar	below Golyam Krastets peak	dead twigs of pine	LeS
Entolomataceae			
78. *Clitopilus prunulus* (Scop. : Fr.) P. Kumm.	above Stanchov Han village	soil, in beech forest	Mr
79. *Entoloma clypeatum* (L. : Fr.) P. Kumm.	above Stanchov Han village, near Vlasatili	soil, under *Prunus spinosa*	Mr
80. *E. vernum* S. Laundell	Trevnenska Mt: near Gorski Dom Balgarka; below Stolishta protected site; above Konarskoto village	soil, in spruce forests	Mr
Fistulinaceae			
81. *Fistulina hepatica* (Schaeff. : Fr.) With.	below Belnovrah peak	living trunk of oak	LeP
Hydnangiaceae			
82. *Laccaria amethystina* Cooke	below Belnovrah peak	soil, in mixed forest	Mr
83. *L. laccata* (Scop. : Fr.) Cooke	above Stanchov Han	soil, in beech forest	Mr

Table 1. Continuation.

Taxa	Localities	Substrata (Hosts)	ETG
84. *L. tortilis* (Bolton) Cooke	above Stanchov Han	damp soil, near beech forest	Mr
Hygrophoraceae			
85. *Hygrocybe conica* (Schaeff. : Fr.) P. Kumm. var. *conica*	above Bazovets village	soil, in meadows	Hu
86. *H. virginea* (Wulfen : Fr.) P. D. Orton & Watling var. *virginea*	near Gorski Dom Balgarka	soil, near spruce forest	Hu
87. *Hygrophorus eburneus* (Bull. : Fr.) Fr.	below Bedek peak	soil, in beech forests	Mr
Inocybaceae			
88. *Crepidotus lundellii* Pilát	near Yabalka (district of Gabrovo town)	dead wood, in beech forest	LeS
89. *C. variabilis* (Pers.) P. Kumm.	above Shumeli village, near the Byala reka river	dead twigs of beech and hazelbush	LeS
90. *Inocybe erubescens* A. Blytt	below Belnovrah peak and Golyam Krastets peak	soil, in deciduous forests, under oak	Mr
91. *I. petiginosa* (Fr. : Fr.) Gillet	below Golyam Krastets peak	soil, in oak forest	Mr
Lyophyllaceae			
92. *Calocybe gambosa* (Fr. : Fr.) Donk	above Stanchov Han	soil, in a meadow	Mr
Marasmiaceae			
93. *Gymnopus confluens* (Pers. : Fr.) Antonín, Halling & Noordel.	Izvora locality, above Plachkovtsi town	litter, in beech forest	St
94. *G. dryophillus* (Bull. :Fr.) Murrill.	bgelow Golyam Krastets peak	litter, in oak forest	St
95. *G. hariolorum* (Bull. : Fr.) Antonín, Halling & Noordel.	Izvora locality, above Plachkovtsi town	litter, in beech forest	St
96. *G. fusipes* (Bull. : Fr.) Gray	below Golyam Krastets peak	litter, in oak forest	St, LeP
97. *Marasmiellus foetidum* (Sowerby : Fr.) Antonín, Halling & Noordel.	Studen Kladenets protected site	dead twigs, in beech forest	LeS
98. *Marasmius oreades* (Bolton : Fr.) Fr.	Shipchenska and Trevnenska Mts	soil, in grassy places	Mr
99. *M. rotula* (Scop.) Fr.	Shipchenska and Trevnenska Mts	dead twigs and in litter, in deciduous forests	Mr Fd, LeS
100. *Megacollybia platyphylla* (Pers. : Fr.) Kotl. & Pouzar	Shipchenska and Trevnenska Mts	litter, in beech forests	St
101. *Mycetinis alliaceus* (Jacq. : Fr.) Earle	Shipchenska and Trevnenska Mts	dead twigs and in litter, in beech forests	St, LeS
102. *M. scordonius* (Fr.) A. W. Wilson & Desjardin	below Golyam Krastets peak	litter, in pine forest	St
Mycenaceae			
103. *Mycena arcangeliana* Bres.*	Izvora locality, above Plachkovtsi town	dead wood, in beech forest	LeS
104. *M. crocata* (Schrad. : Fr.) P. Kumm.	Shipchenska and Trevnenska Mts	litter, in beech forests	St
105. *M. galericulata* (Scop. : Fr.) Gray	Shipchenska and Trevnenska Mts	dead wood, in beech forest	LeS
106. *M. pura* (Pers. : Fr.) P. Kumm. f. *pura*	Shipchenska and Trevnenska Mts	litter, in deciduous and coniferous forests	St
107. *M. renati* Quél.	Golyam Krastets peak	dead twigs in beech forest	LeS
108. *M. rosea* (Schumach.) Gramberg	Shipchenska and Trevnenska mountains	litter, in beech forests	St
109. *Panellus mitis* (Pers. : Fr.) Singer	above Mrazetsi village	dead deciduous wood	LeS
110. *P. stipticus* (Bull. : Fr.) P. Karst.	Izvora locality, above Plachkovtsi town	dead deciduous wood	LeS
Physalariaceae			
111. *Armillaria mellea* (Vahl : Fr.) P. Kumm.	Shipchenska and Trevnenska Mts	dead wood of *Acer pseudoplatanus* and on beech stumps	LeP
112. *Flamulina velutipes* (Curtis : Fr.) Singer	above Stanchov Han village	dead wood in beech forests	LeS
113. *Oudemansiella mucida* (Schrad. : Fr.) Höhn.	Izvora locality, above Plachkovtsi town	dead wood in beech forests	LeS
114. *Strobilurus staphanocystis* (Kьhner & Romagn. ex Hora) Singer	Trevnenska Mt: below Stolishta protected site and near Gorski Dom Balgarka	pine cones in coniferous forests	S
115. *Xerula pudens* (Pers.) Singer	below Belnovrah peak	dead oak wood, in deciduous forest	LeS
116. *X. radicata* (Relhan : Fr.) Dörfelt	Shipchenska and Trevnenska Mts	litter and on dead wood, in beech	LeS, St
Pleurotaceae			
117. *Hohenbuehelia petaloides* (Bull . : Fr.) Schulzer (**VU**)	above Gorski Dom Balgarka	dead wood, in beech forest	LeS

Table 1. Continuation.

Taxa	Localities	Substrata (Hosts)	ETG
118. *Pleurotus cornicopiae* (Paulet) Rolland	Golyam Krastets peak	dead wood, in beech forest	LeS
119. *P. ostreatus* (Jacq. : Fr.) P. Kumm.	Uzana locality; below Balgarka peak	beech stumps	LeS
120. *P. pulmonarius* (Fr. : Fr.) Quél.	Uzana locality; near Panicharka and Yantra rivers; Studen Kladenets protected site; Golyam Krastets peak	dead wood, in beech forests	LeS
Pluteaceae			
121. *Pluteus cervinus* (Schaeff.) P. Kumm.	below Golyam Krastets peak	stumps of beech	LeS
122. *Pluteus hispidulus* (Fr. : Fr.) Gillet	Mahnatite Skali natural landmark	dead wood, in beech forest	LeS
123. *Volvariella bombycina* (Schaeff. : Fr.) Singer var. *bombycina*	Trevnenska Mt: Krastatets locality	old beech tree	LeP, LeS
Psathyrellaceae			
124. *Coprinellus micaceus* (Bull. : Fr.) Vilgalys, Hopple & Jacq. Johnson	below Balgarka peak	beech stumps	LeS
125. *Coprinopsis atramentaria* (Bull. : Fr.) Redhead, Villgalys & Moncalvo	above Konarskoto village	beech stumps	LeS
126. *C. picacea* (Bull. : Fr.) Redhead, Vilgalys & Moncalvo	above Stanchov Han village	litter, in beech forest	St
127. *Panaeolus semiovatus* (Sowerby : Fr.) S. Lundell & Nannf. var. *semiovatus*	below Golyam Krastets peak	dung	C
128. *Parasola plicatilis* (Curtis : Fr.) Redhead, Vilgalys & Happle	below Golyam Krastets peak; under the peak of Golemiya Vis	soil, in grassy places	C
129. *Psathyrella candolleana* (Fr. : Fr.) Maire	road fork to Bazovets village; above Konarskoto village; near Suhata Reka river	deciduous stumps	
130. *P. multipedata* (Peck) A.H. Sm.	below Balgarka peak, on the borders of the park; below Golyam Krastets peak	soil, among grasses	Hu
Schizophyllaceae			
131. *Schizophyllum commune* Fr. : Fr.	Shipchenska and Trevnenska Mts	dead deciduous wood	LeS
Strophariaceae			
132. *Agrocybe cylindracea* (DC.) Maire	above Stanchov Han village	beech stumps	LeS
133. *A. praecox* (Pers. : Fr.) Fayod	below Golyam Krastets peak	soil, near beech forest	Hu
134. *Hypholoma capnoides* (Fr. : Fr.) P. Kumm.	Shipchenska and Trevnenska Mts	coniferous forests, pine stumps	LeS
135. *H. fasciculare* (Huds. : Fr.) P. Kumm.	Shipchenska and Trevnenska Mts	deciduous stumps, in wood	LeS
136. *Pholiota adiposa* (Batsch. : Fr.) P. Kumm.	Izvora locality, near Suhata Reka river	living beech trees	LeP
137. *Stropharia aeruginosa* (Curtis : Fr.) Quél.	Shipchenska and Trevnenska Mts	soil, in deciduous forests	Hu
Tapinellaceae			
138. *Tapinella panuoides* (Fr. : Fr.) E.J. Gilbert	above Gorski Dom Balgarka	pine stump	LeS
Tricholomataceae			
139. *Arrhenia spathulata* (Fr. : Fr.) Redhead (**VU**)	Topleshki Dol locality, near Hristo Smirnenski Dam	sandy soil, among *Tortula muralis*	Br
140. *Clitocybe gibba* (Pers. : Fr.) P. Kumm.	Shipchenska and Trevnenska Mts	soil, in coniferous and deciduous forests	Hu
141. *C. nebularis* (Batsch : Fr.) P. Kumm.	Shipchenska and Trevnenska Mts	soil, in beech and oak forests	Hu
142. *Lepista nuda* (Bull. : Fr.) Cooke	Shipchenska and Trevnenska Mts	soil, in beech and spruce forests	Hu
143. *L. personata* (Fr. : Fr.) Cooke	above Stanchov Han village	soil, in grassy places	Hu
144. *L. sordida* (Fr. : Fr.) Singer	Izvora locality, near the Suhata Reka river	soil, near beech forests	Hu
145. *Melanoleuca melaleuca* (Pers. : Fr.) Murrill	below Gorski Dom Balgarka	soil, near beech forest	Hu
146. *Rickennella fibula* (Bull. : Fr.) Raithelh.	above Stanchov Han village	among mosses, in beech forest with pine	Br
147. *Tricholoma album* (Schaeff. : Fr.) P. Kumm.	below Gorski Dom Balgarka	soil, in beech forest	Mr
148. *T. equestre* (L. : Fr.) P. Kumm. var. *equestre*	below Belnovrah peak	sandy soil, in mixed forest with pine	Mr

Table 1. Continuation.

Taxa	Localities	Substrata (Hosts)	ETG
149. *T. imbricatum* (Fr. : Fr.) P. Kumm.	below Golyam Krastets peak	soil, in pine forest	Mr
150. *T. sulphureum* (Bull. : Fr.) P. Kumm. var. *sulphureum*	below Belnovrah peak	on soil, in mixed forest with pine	Mr
151. *Tricholomopsis rutilans* (Schaeff. : Fr.) Singer	below Golyam Krastets peak	pine stump	LeS
Auriculariales			
Auriculariaceae			
152. *Auricularia auricula-judae* (Bull. : Fr.) Quél.	Shipchenska and Trevnenska Mts	dead wood and twigs of *Sambucus nigra*	LeS, LeP
153. *A. mesenterica* (Dicks. : Fr.) Pers.	Shipchenska and Trevnenska Mts	dead wood, in deciduous forests	LeS
154. *Exidia glandulosa* (Bull. : Fr.) Fr.	Shipchenska and Trevnenska Mts	dead wood in beech forests	LeS
155. *E. plana* (F.H. Wigg.) Donk	on the upper streams of Yantra river; above Potok village	dead wood in beech forests	LeS
Boletales			
Boletaceae			
156. *Boletus reticulatus* Schaeff.	Shipchenska and Trevnenska Mts	soil, under beech and hornbeam	Mr
157. *Leccinum crocipodium* (Letell.) Watling	below Golemiya Vis peak	soil, under beech and hornbeam	Mr
158. *L. pseudoscabrum* (Kallenb.) Šutara	Shipchenska and Trevnenska Mts	soil, under hornbeam	Mr
159. *L. quercinum* Pilát (**VU**)	below Golyam Krastets peak	soil, under *Quercus dalechampii*	Mr
160. *Neoboletus luridiformis* (Rostk.) Gelardi, Simonini & Vizzini	Shipchenska and Trevnenska Mts	soil, in beech and mixed forests	Mr
161. *Strobilomyces strobilaceus* (Scop. : Fr.) Berk. (**VU**)	below Balgarka peak, on the park's borderline	soil, in beech forest	Mr
162. *Suillellus luridus* (Schaeff.) Murrill	below Golyam Krastets peak; Krastatets locality - Trevnenska Mt.	soil, under oak and hornbeam	Mr
163. *Xerocomellus chrysenteron* (Bull.) Šutara	Shipchenska and Trevnenska Mts	soil, in deciduous and coniferous forests	Mr
164. *Xerocomus rubellus (Krombh.)* Quél.	above Stanchov Han village	soil, in deciduous and coniferous forests	Mr
165. *Xerocomus subtomentosus* (L.) Quél..	Shipchenska and Trevnenska Mts	soil, in beech and mixed forests	Mr
Gomphidaceae			
166. *Chrogomphus rutilus* (Schaeff. : Fr.) O.K. Mill.	Shipchenska and Trevnenska Mts	soil, under pine	Mr
Paxillaceae			
167. *Paxillus involutus* (Batsch. : Fr.) Fr.	below Gorski Dom Balgarka	soil, under pine	Mr
Scerodermataceae			
168. *Scleroderma cirinum* Pers. : Pers.	Shipchenska and Trevnenska Mts	sandy soil, in coniferous and deciduous forests	Mr
169. *S. verrucosum* (Bull. : Pers.) Pers.	below Belnovrah peak	sandy soil, in pine forest	Mr
Suillaceae			
170. *Suillus bovinus* (L. : Fr.) Roussel	Shipchenska and Trevnenska Mts	soil, in pine forests	Mr
171. *S. granulatus* (L. : Fr.) Roussel	Shipchenska and Trevnenska Mts	soil, in pine forests	Mr
172. *S. luteus* (L. : Fr.) Roussel	Shipchenska and Trevnenska Mts	soil, in coniferous forests	Mr
Cantharellales			
Cantharellaceae			
173. *Cantharellus cibarius* Fr. : Fr. var. *cibarius*	Shipchenska and Trevnenska Mts	soil, in beech and oak forests	Mr
174. *C. pallens* Pilát	Krastatets locality	soil, in mixed beech forest	Mr
175. *Craterellus cornucopioides* (L.) Pers.	below Belnovrah peak	sandy soil, under oak and pine	Mr
Hydnaceae			
176. *Hydnum repandum* L . : Fr. f. *repandum*	Shipchenska and Trevnenska Mts	soil, in coniferous and	Mr
177. *Sistosterma brinkmannii* (Bres.) J. Erikss.	below Bedek peak	dead wood, in beech forest	LeS

Table 1. Continuation.

Taxa	Localities	Substrata (Hosts)	ETG
Gomphales			
Gomphaceae			
178. *Ramaria flava* (Schaeff.) Quél.	Shipchenska and Trevnenska Mts	soil, in coniferous and deciduous forests	Hu
179. *R. formosa* (Pers. : Fr.) Quél.	Shipchenska and Trevnenska Mts	soil, in coniferous and deciduous forests	Hu
Hymenochaetales			
Hymenochaetaceae			
180. *Inonotus hispidus* (Bull. : Fr.) P. Karst.	above Stanchov Han village, near Karshtatsite	living tree of *Malus* sp.	LeP
181. *Hymenochaete rubiginosa* (Dicks. : Fr.) Lév.	below Golyam Krastets peak; Izvora locality	dead deciduous wood	LeS
182. *Phellinus igniarius* (L. : Fr.) Quél.	Shipchenska and Trevnenska Mts	living trees ofr *Salix* spp.	LeP
183. *Ph. tremulae* (Bondartsev) Bondartsev & P.N. Borisov	near the road to Bazovets village.	living tree of *Populus tremula*	LeP
184. *Ph. pomaceus* (Pers.) Maire	Shipchenska and Trevnenska Mts	living trees (plum, hornbeam, willow), dead wood	LeP, LeS
Phallales			
Phallaceae			
185. *Phallus impudicus* L. : Pers. f. *impudicus*	Shipchenska and Trevnenska Mts	soil, in beech forests	Hu
Polyporales			
Fomitopsidaceae			
186. *Daedalea quercina* (L. : Fr.) Pers.	Shipchenska and Trevnenska Mts	dead wood of oak and beech	LeS
187. *Fomitopsis pinicola* (Sw. : Fr.) P. Karst. f. *pinicola*	Shipchenska and Trevnenska Mts	living and dead wood in spruce forests	LeP, LeS
188. *Piptoporus betulinus* (Bull. : Fr.) P. Karst.	Shipchenska and Trevnenska Mts	living and dead stems of birch	LeP
Ganodermataceae			
189. *Ganoderma applanatum* (Pers.) Pat.	Shipchenska and Trevnenska Mts	living and dead deciduous wood	LeP
Meruliaceae			
190. *Steccherinum fimbriatum* (Pers.) J. Erikss.*	near Hristo Smirnenski Dam, Topleshki Dol locality	dead beech wood, in mixed, deciduous forest	LeS
Phanerochaetaceae			
191. *Phanerochaete tuberculata* (P. Karst.) Parmasto	near the road to Bazovets village	dead twigs of beech	LeS
Polyporaceae			
192. *Aurantiporus fissilis* (Berk. & M. A. Curtis) H. Jahn. ex Ryvarden	above Potok village	dead wood of *Juglans regia*	LeS
193. *Cerrena unicolor* (Bull. : Fr.) Murrill var. *unicolor*	Shipchenska Mt	dead wood , in beech forests	LeS
194. *Daedaleopsis confragosa* (Bolton : Fr.) J. Schröt	Shipchenska and Trevnenska Mts	dead wood, in deciduous forests	LeS
195. *Datronia mollis* (Sommerf. : Fr.) Donk	Shipchenska and Trevnenska Mts	dead beech wood	LeS
196. *Fomes fomentarius* (L. : Fr.) J.J. Kickx.	Shipchenska and Trevnenska Mts	living and dead wood of beech	LeP, LeS
197. *Laetiporus sulphureus* (Bull. : Fr.) Murrill	Shipchenska and Trevnenska Mts	living stems of *Salix, Fagus ,Prunus*	LeP
198. *Lentinus strigosus* (Schwein. : Fr.) Fr.	Mahnatite Skali natural landmark	dead beech wood	LeS
199. *Lenzites betulina* (L. : Fr.) Fr.	Shipchenska and Trevnenska Mts	dead deciduous wood	LeS
200. *Polyporus badius* (Pers.) Schwein.	Uzana locality; above Karshtatsite; below Balgarka peak	dead deciduous wood	LeS
201. *P. leptocephalus* (Jacq. : Fr.) Fr.	Shipchenska and Trevnenska Mts	dead deciduous wood	LeS
202. *P. squamosus* (Huds. : Fr.) Fr.	Shipchenska and Trevnenska Mts	living and dead stems of deciduous	LeP
203. *P. tuberaster* (Jacq. : Fr.) Fr.	above Sokolski Manastir protecred site, Suhodolieto locality	dead deciduous wood	LeS
204. *Pycnoporus cinnabarinus* (Jacq. : Fr.) P.Karst.	near Panicharka river, above Todorchetata village	dead twigs of *Prunus* sp.	LeS

Table 1. Continuation.

Taxa	Localities	Substrata (Hosts)	ETG
205. *Trametes gibbosa* (Pers. : Fr.) Fr.	Shipchenska and Trevnenska Mts	dead deciduous wood	LeS
206. *T. hirsuta* (Willd. : Fr.) Gray	Shipchenska and Trevnenska Mts	dead deciduous wood	LeS
207. *T. versicolor* (L. : Fr.) Lloyd	Shipchenska and Trevnenska Mts	dead deciduous wood	LeS
208. *Trichaptum biforme* (Fr.) Ryvarden	Shipchenska and Trevnenska Mts	dead beech wood	LeS
209. *Tyromyces chioneus*(Fr. : Fr.) P. Karst.	near Byala Reka river, above Shumeli village	dead deciduous wood	LeS
210. *T. lacteus* (Fr. : Fr.) Mьrrill.	above Bazovets village	dead deciduous wood	LeS
Albatrellaceae			
211. *Albatrellus cristatus* (Schaeff. : Fr.) Kotl. & Pouzar	below Belnovrah peak	soil, in mixed forest (beech, pine)	Mr
Auriscalpiaceae			
212. *Clavicorona pyxidata* (Pers. : Fr.) Doty (**CR**)	below Golyam Krastets peak (the road to)	dead stem of *Tilia*sp.	LeS
Russulales			
Bondarzewiaceae			
213. *Heterobasidion annosum* (Fr. : Fr.) Bref.	Izvora locality; under Balgarka peak; below Golyam Krastets peak	the base of coniferous trees	LeP
Hericiaceae			
214. *Hericium coralloides* (Scop. : Fr.) Pers. (**NT**)	near Hristo Smirnenski Dam; Studen Kladenets protected site; Vlasatili village; below Mehchenitsa peak	dead stems of beech	LeS
215. *H. erinaceus* (Bull. : Fr.) Pers. (**EN**)	below Belnovrah peak	stems of old trees of *Quercus daleshampii*	LeP, LeS
Peniophoraceae			
216. *Peniophora lycii* (Pers. : Fr.) Höhn.& Litsch.	common in Shipchenska and Trevnenska Mts	dead twigs of beech and oak	LeS
217. *P. quercina* (Pers. : Fr.) Cooke	near Panicharka river, above Todorchetata village	dead twigs of hornbeam	LeS
Russulaceae			
218. *Lactarius circellatus* Fr.	above Stanchov Han village	soil, in beech and oak forests	Mr
219. *L. piperatus* (L. : Fr.) Pers.	Shipchenska and Trevnenska Mts	soil, in beech forests	Mr
220. *L. torminosus* (Schaeff. : Fr.) Pers.	below Golemiya Vis peak	soil, under birch	Mr
221. *L. volemus* (Fr. : Fr.) Fr.	near Hristo Smirnenski Dam; under Balgarka peak; above Stanchov Han village	soil, in beech and mixed forests	Mr
222. *Russula aeruginea* Fr.	above Stanchov Han village	soil, in oak forest	Mr
223. *R. cyanoxantha* (Schaeff.) Fr.	Shipchenska and Trevnenska Mts	soil, in beech and mixed forests	Mr
224. *R. delica* Fr.	Shipchenska and Trevnenska Mts	soil, coniferous and deciduous forests	Mr
225. *R. densifolia* Gillet	above Stanchov Han village	soil, in oak forest	Mr
226. *R. foetens* (Pers : Fr.) Fr.	above Stanchov Han village	soil, in oak forest	Mr
227. *R. luteotacta* Rea	Uzana locality; above Stanchov Han village	soil, in beech forests	Mr
228. *R. rosea* Pers.	Shipchenska and Trevnenska Mts	soil, in beech and oak forests	Mr
229. *R. virescens* (Shaeff.) Fr.	above Stanchov Han village	soil, in oak forest	Mr
Stereaceae			
230. *Stereum hirsutum* (Willd. : Fr.) Gray	Shipchenska and Trevnenska Mts	dead deciduous wood	LeS
231. *S. rugosum* (Pers. : Fr.) Fr.	Shipchenska and Trevnenska Mts	dead beech wood	LeS
232. *S. subtomentosum* Pouzar	Shipchenska and Trevnenska Mts	dead beech wood	LeS
233. *Xylobolus frustulatus (*Pers. : Fr.) Boidin	on the upper streams of Yantra river	dead oak wood	LeS
Dacrymycetes			
Tremellales			
Tremellaceae			
234. *Tremella mesenterica* Retz. : Fr.	Shipchenska and Trevnenska Mts	dead beech wood	LeS
Puccinomycetes			
Puccinales			

Table 1. Continuation.

Taxa	Localities	Substrata (Hosts)	ETG
Coleosporiaceae			
235. *Coleosporium tussilaginis* (Pers. : Pers.) Klob.	above Potok village - near Potok river; above Stoevtsi village - near Stoevska river	leaves of *Telekia speciosa*	HP
Melampsoraceae			
236. *Melampsora caprearum* Thьm.	Shipchenska and Trevnenska Mts	living leaves of *Salix caprea*	LeP
Phragmidiaceae			
237. *Phragmidium violaceum* (C. Schulz) G. Winter	Shipchenska and Trevnenska Mts	living leaves of *Rubus caesius*	HP
Pucciniaceae			
238. *Gymnosporangium cornutum* Arthur ex E. Kern	Shipchenska Mt	living leaves of *Sorbus aucuparia*	LeP
239. *Puccinia poarum* E. Nielsen	common in Shipchenska and Trevnenska Mts	leaves of *Petasites hybridus* and *Tussilago farfara*	HP
Mycetozoa (Myxomycota)			
Myxogastrea			
Liceales			
Tubiferaceae			
240. *Lycogala epidendrum* (J.C. Buxb. ex L.) Fr.	Shipchenska and Trevnenska Mts	dead beech wood	LeS
241. *Reticularia lycoperdon* Bull.	Uzana locality	beech trunks	LeS
Physarales			
Physaraceae			
242. *Fuligo septica* (L.) F.H. Wigg.	Shipchenska and Trevnenska Mts	dead beech wood	LeS
Stemonitales			
Stemonitidaceae			
243. *Stemonitis fusca* Roth	Topleshki Dol locality, near Hristo Smirnenski Dam	dead deciduous wood	LeS
244. *S. splendens* Rostaf.	the upper streams of Yantra river	dead beech wood	LeS

Legend. Ecological-trophic groups (**ETG**): **Saprotrophic fungi**: **Fd** – leaf debris saprotrophs; **S** – cone saprotrophs; **St** – litter saprotrophs; **Hu** – humus saprotrophs; **LeS** – wood saprotrophs; **Br** – moss saprotrophs; **HS** – herbs saprotrophs; **C** – coprotrophs; **Mr** – mycorrhizal fungi; **Parasites**: **LeP** – wood parasites; **HP** – herbs parasites. Conservation status follows Gyosheva & al. (2006). New taxa for the country are indicated with an asterisk (*).

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