A rare polypore Grifola frondosa in Minsk City

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The new site for *G. frondosa* in Belarus is described from the center of Minsk

The polyporoid fungus *Grifola frondosa* (Dicks.) Gray (syn. *Polyporus frondosus* (Dicks.) Fr., *Polypilus frondosus* (Dicks.) P. Karst.; *Basidiomycetes*[*]) is single known *Grifola* species, with rare distribution in Europe. The species is regarded as relict in northern part of its areal, and was included in Red Data Book of USSR (Burova, Petrova, 1984). The fungus produces striking, large multi-pileate fruitbodies on stumps and at trunk bases of old trees, as *Acer*, *Betula*, *Carpinus*, *Fraxinus*, *Quercus, Ulmus*; main host is *Quercus robur*, occasional hosts are also *Larix* and *Pinus* (Burova, Petrova, 1984; Jülich, 1984; Halauko, Syarzhanina, 1993; Ryvarden, Gilbertson, 1993; Bondartseva, 1998). It affects as a patogen causing white core rot of roots and lower part of trunk, and has the ability to spread in soil by mycelium (Komarova, 1964; Bondartseva, 1998). Though, its esthetic attraction and discontinuous distribution in Belarus, together with good food qualities (Bondartsev, 1953; Ryvarden, Gilbertson, 1993), defined the fungus as the object of conservation, included in the second edition of the Red Data Book of Belarus under the 3rd category — "rare" or "species with limited populations" (Halauko, Syarzhanina, 1993).

There were ten known sites of the species in the republic (fig. 1): in Buda-Kashalyova district near Kashalyova (1), Lel'chytsy district near Danilevichy (2), Asipovichy district (3, dubious data), Barysau (4) and Cherven' (5) districts, Zhytkavichy district (6, including one find from Prypyatski Reserve — 7), Pruzhany district (8, in Belavezhskaya Pushcha National Park), in Stoubtsy district near Varapai (9, collected by N.A. Kopach), and in Hlubokae district at Douhae Lake (10, found by G.V. Vynaev).

New (the eleventh) find of *G. frondosa* was made by G.V. Vynaev 11 October 2002 in Minsk, on Belaruskaya street, 8, on the right bank of the Svislach river, 0.85 km far from the town geographical center (if to do the binding to the Main Post Office). Atypically very hot and dry summer and then very cold September and October preceded the appearing of the basidiomata.

At 12 October 2002 the site was documented by G.V. Vynaev, E.O. Yurchenko, and K.E. Dovgailo. The collection material was deposited in the Institute of Experimental Botany Fungal Herbarium (MSK–F) under inventory number 6187.

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[*] The genus *Grifola* is belonged to *Coriolaceae* (*Poriales*) according to the system accepted in the 8th edition of Ainsworth and Bisby's dictionary of the fungi (1995). In the 9th edition of the Dictionary the new systematical position of the genus in *Meripilaceae* (*Polyporales*) has been proposed.

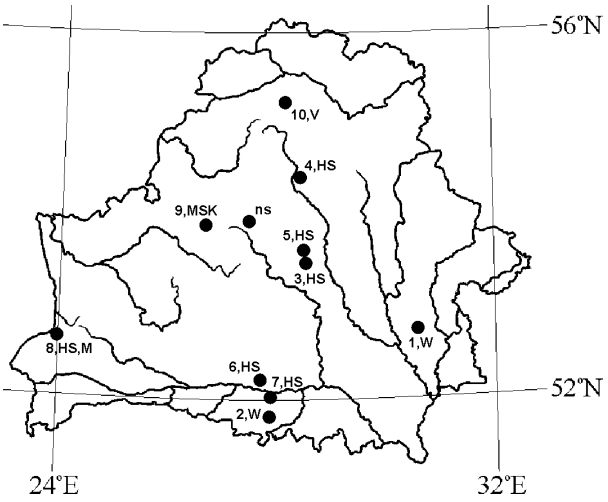

Fig. 1. Distribution of *Grifola frondosa* in Belarus: W — data of Wyssotzky et al. (1925), HS — data of Halauko and Syarzhanina (1993), M — data of Mikhalevich (1997), V — data of Vynaev (1985, verbal communication), ns — newly found site.

Fig. 2. View of *Grifola frondosa* site in Minsk: A — general view of the site (photo by G.V. Vynaev), B — oak trunk base with basidiomata shown by arrows (digital photo by K.E. Dovgailo).

Site characterization. Two basidiomata were found near old *Quercus robur* tree in a small sector of tree plantation between the river and the street (fig. 2: A, B). Relief of the site has weak decline to the river (*ca.* 5°); the oak base is on the level about 2 m above the water surface. Artificial community occupying this locality consists of sparsely distributed (mostly old-growing) trees and modified by cutting herb cover on moderately rich soil.

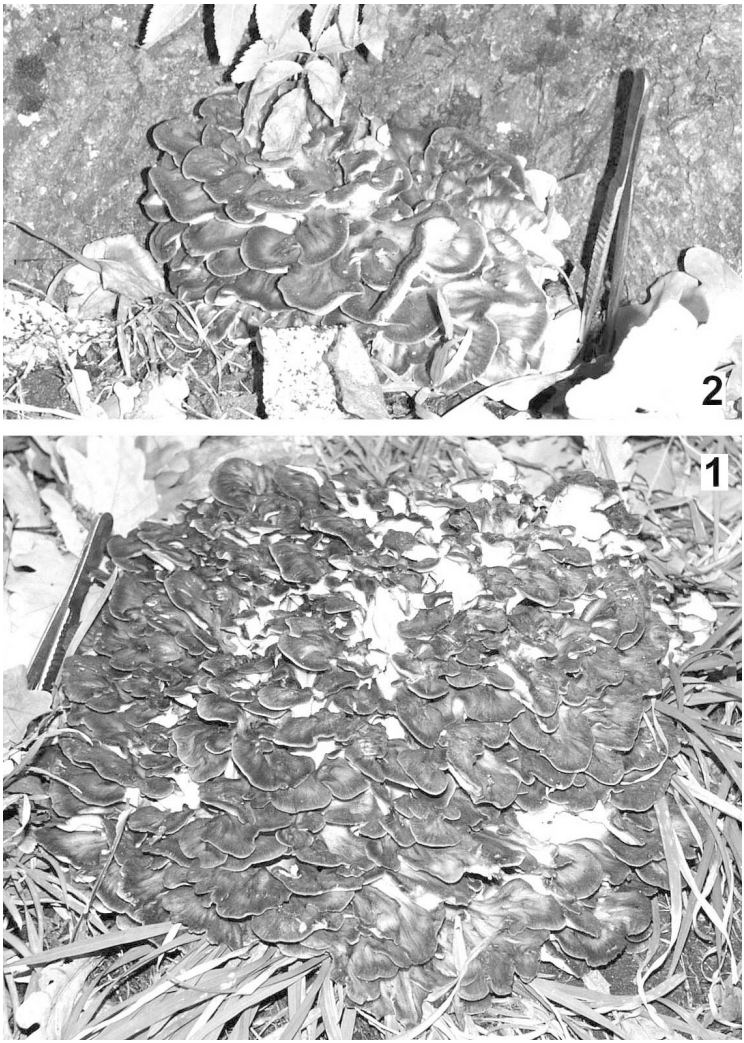

Fig. 3. *Grifola frondosa* basidiomata No.1 and 2 (digital photo by K.E. Dovgailo).

Factually the lignous flora of the site represents a collection of exotic or adventitious (*Acer campestre*, *Acer* sp., *Crataegus submollis*, *Juglans cinerea*, *Populus* ×*canadensis*, *Pseudotsuga menziesii*, *Robinia pseudacacia*, *Sambucus racemosa*) and aboriginal (*Betula pendula*, *Fraxinus excelsior*, *Pyrus communis*, *Quercus robur*, *Tilia cordata*, *Ulmus glabra*) species. The herb ground cover is composed of common synanthropic species — *Arctium tomentosum*, *Artemisia vulgaris*, *Atriplex patula*, *Dactylis glomerata*, *Geum urbanum*, *Lamium album*, *Leonurus villosus*, *Poa annua*, *Polygonum aviculare*, *Taraxacum officinale*, *Trifolium repens*, with scarce elements of nemoral forests — *Aegopodium podagraria*, *Anthriscus sylvestris*, *Glechoma hederacea*.

The fungus-bearing tree deserves separate attention as rather interesting natural object. It is possibly the oldest oak in borders of the town, with trunk diam 1.1 m and girth 3.45 m at 1.5 m above the ground, and crown *ca.* 24–25 m height. The trunk is surrounded by small elevation 25–30 cm high. The age of the tree is near 125–130 years.

Description of basidiomata. The general view of basidiomata is shown on fig. 3. The details on their size and position are shown in the table.

Tab. — **Description of *Grifola frondosa* basidiomata**

Basidioma No.	Position	Total diam, cm	Height, cm	Diam of basidioma base, cm	Weight, kg
1	*Ca.* 1.1 m from the trunk base, near a big root partly protruding from soil, obviously connected with the root by mycelium	32–24	18	7–8.5	3.35
2	At the trunk base, near a large root base, partly involving a stem of young *Sambucus racemosa* plant	17–18	10.5	*ca.* 2	0.45

Basidioma of almost hemispherical shape, with central massive core of fibrillose whitish flesh up to 9–13 cm diam and numerous lobe-like pilei, producing secondary ones; pilei branched several times and arranged in imbricate pattern, some accreted by side parts; common stipe-like base very short, central, thick or thinned, immersed in soil; consistency of basidioma fleshy-pliable, with more brittle pilei; during growth basidioma involving dead plant particles (grass blades, oak fruits cupules); separate *pilei* 15–50 mm wide and 20–45 cm long, *ca.* 6 mm thick, upper surface light chocolate brown, velvety, with minute dark appressed fibrous scales; *hymenophore* short-tubular (tubes 0.5–2 mm deep), whitish or cream, decurrent downwards up to the ground, with angular-ellipsoid pores 0.2–1 × 0.15–0.5 mm; on edges of separate stipe-like lobes pores almost labyrinthiform; *context hyphae* variable in morphology, clampless, moderately thin-walled, (1.8) 4–16 (20) μm wide,

with long or short cell segments, content hyaline, heterogeneous oily, or homogeneous refractive; swollen clavate hyphal ends present in context; *dissepiment hyphae* 1.7–3.5 μm wide, with scattered clamps, moderately thin-walled; *basidia* clavate with stalked base, with oily content, 32–38 × 6.5–7 μm; *spores* ellipsoid to ovoid, hyaline with central oil drop or with refractive content, (4.5) 6–7 (8.5) × (3.3) 3.7–5.3 (5.5) μm, smooth, with more or less thickened wall, inamyloid (fig. 4).

Large rounded core of basidioma is the feature peculiar to *Polyporus umbellatus* (Pers.) Fr., the species which is some similar in macromorphology with *G. frondosa*. But broadly ellipsoid spores, in average 6–7 μm long, chocolate brown color and gloss-like shape of pilei, and absence of pronounced secondary stipes fit to the concept of *G. frondosa* (Bondartsev, 1953; Phillips, 1981). In contrast to description in Bondartsev, spores of the specimen have rather rounded basal part.

Hyphal system of *G. frondosa* is described as dimitic (Ryvarden, Gilbertson, 1993) or sometimes as monomitic (Bondartseva, 1998), but it would be better to choose more correct definition — dimitic system without binding hyphae or sarcodimitic system.

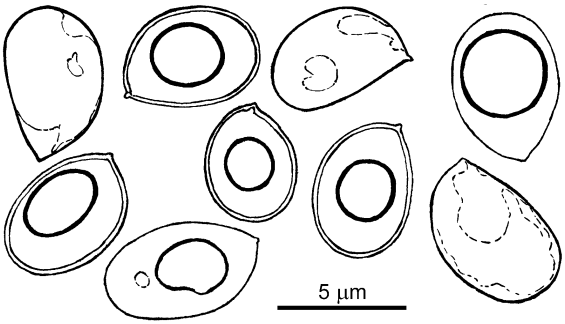

Fig. 4. Basidiospores of *Grifola frondosa* MSK 6187 (drawing by E.O. Yurchenko).

The fungus is known as element of pure and mixed broadleaf forests and so the dwelling of it among business and industrial town blocks, where natural vegetation apparently was destroyed centuries ago, is quite uncommon. But this fact supposes the ability of *G. frondosa*, together with some other rare fungi, sometimes to occupy anthropogenically strongly modified habitats. The describing find most probably originates from spores brought by air flows. The biological peculiarity of *G. frondosa* is life of a mycelium over many years in wood. Formation of basidiomata is rare event affected by certain weather conditions; in the rest period of life cycle the fungus causes hidden decay (Bondartsev, 1953). Thus, the likelihood exists that development of the mycelium began ten or more years ago.

Acknowledgements

Authors are grateful to Mrs. N.G. Kordiyako (Laboratory of Mycology, Institute of Experimental Botany, Minsk) for help in identification of the species, and to

Mr. N.O. Sumenkov (Laboratory of Geobotany, Institute of Experimental Botany) for estimation of the oak age by means of trunk boring.

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SUMMARY: A rare for Belarus, included in the National Red Data Book polypore *Grifola frondosa* (Dicks.) Gray was found 0.85 km far from Minsk geographical center. Two described basidiomata were associated with trunk base and root system of 130-years old living *Quercus robur* tree.

Key words: *Aphyllophorales*, *Quercus robur*, town landscape.

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