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BIOLOGICALLY ACTIVE SUBSTANCES IN FRUIT BODIES OF WOOD DECOMPOSING FUNGI*

Keywords: wood decaying fungi, GC-MS, terpenes, steroids, fatty acids.

Wood decaying fungi contain a large amount of chitin, melanins, glucans, and other biologically active substances [1–3]. They are used in food and pharmaceutical industries. Studies are being made on the physicochemical properties in a number of phenolic, steroid, and triterpene compounds of fungal origin [1, 2]. Thus, the comparative study of biologically active secondary metabolites in various taxonomic groups in aphyllorphoroid fungi is important.

The study deals with the composition of biologically active substances in extracts of wood decaying fungi that cause brown rot - edged tinder fungus (*Fomitopsis pinicola* (Sw.) P. Karst.), and white rot – fungi (*Fomes fomentarius* (L.) Fr.), humpbacked (*Trametes gibbosa* (Pers.) Fr.), chaga (*Inonotus obliquus* (Ach. Ex Pers.) Pilát), birch sponge (*Piptoporus betulinus* (Bull.) P. Karst.), bipartite (*Trichaptum bifforme* (Fr.) Ryvarden), nesting hapalopilus (*Hapalopilus nidulans* (Fr.) P. Karst.). Methanol extracts were obtained from the grinded fungi fruit bodies. Chemical composition was studied using GC-MS. Individual substances were identified by mass spectra using a NIST mass spectra library.

The relative content of biologically active substances in methanol extracts from the fruiting bodies of studied wood decaying fungi is presented in the table.

The results show that the real tinder contains up to 18 % fatty acids, 51.6 % steroids and 83.5 % triterpene compounds. The nest fungus – 32.7% of fatty acids, 9.8 % of steroid substances and 27.0 % of tetracyclic triterpenoids. Chaga is characterized by the presence of 14 % fatty acids, 11.6 % of which are unsaturated; with a minimum ergosterol content of 2.4 %, the extract contains 30 % of betulin. A distinctive feature

of the extract from the birch sponge is the presence of 67.9 % arabitol, in the absence of steroid and triterpene compounds.

Table

The relative content of biologically active substances in extracts from the fruiting bodies of a wood decaying fungi

Retention time, min	Chemical substances	Relative content of biologically active substances in extracts of tinder fungi, %						
		<i>Fomes fomentarius</i>	<i>Trametes gibbosa</i>	<i>Inonotus obliquus</i>	<i>Piptoporus betulinus</i>	<i>Trichaptum bifforme</i>	<i>Hapalopilus nidulans</i>	<i>Fomitopsis pinicola</i>
10.78	Phenol, 2,6-dimethoxy-, CAS 91-10-1			4.98				
13.00	L-Arabinitol, CAS 7643-75-6				67.88		4.86	
14.86	Sorbitol, CAS 50-70-4				10.04		2.34	7.8
15.73	Hexadecanoic acid, methyl ester CAS 112-39-0	3.27	8.53			6.32	1.35	0.36
15.92	n-Hexadecanoic acid, CAS 57-10-3	1.79	2.52	3.13	0.94	1.52	2.2	1.19
16.86	9,12-Octadecadienoic acid (Z,Z)-, methyl ester, CAS 112-63-0	1,95	15.19			49.7	4.2	1.69
18.46	9-Octadecenamide, CAS 301-02-0	11.26	8.93	11.64	2.67	10.25	11.3	5.62
30.07	Ergosterol, CAS 57-87-4	20.16	6,55	2.24	5.38	5.1	13.9	30.15
32.22	.gamma.-Ergosterol, CAS 516-78-9	3.69	1,43				4.77	4.64
30.54	Ergosta-7,22-dien-3-ol, (3.beta., 5.alpha.,22E)-, CAS 2465-11-4	12.12					15.91	
33.85	Lanosterol, CAS 79-63-0			3.36				
35.07	Lup-20(29)-en-3-one, CAS 1617-70-5		5.89					
35.92	Lupeol, CAS 545-47-1		6.61					
22.10	Betulin, CAS 473-98-3	5.06	14.56	30.53			5.39	

Bordered tinder fungus, which causes brown rot of wood, contains 30.15 % ergosterol, which is a provitamin form of vitamin D₂. The tinder fungus extract contains 67.8 % fatty acids, of which 50.0 % are unsaturated fatty acids. A distinctive feature of the birch sponge extract is the presence of 67.9 % arabinitol, and the absence of steroid and triterpene compounds. Bordered tinder fungus, which causes brown rot of wood, contains 30.15 % ergosterol, which is a provitamin form of vitamin D₂. The tinder fungus extract contains 67.8 % fatty acids, of which 50.0 % are unsaturated fatty acids.

The results show that wood decaying fungi could be considered as the potential resource of biologically active substances.

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RELATIONS BETWEEN PHYSICAL AND CHEMICAL PROPERTIES OF MELANINE PIGMENTS IN WOOD DECAYING FUNGI AND THEIR ANTIOXIDANT ACTIVITY*

Keywords: melanin, wood decaying fungi, antioxidant activity, elemental composition.

Melanins are high molecular weight heteropolymers of an irregular chemical structure [1, 2]. They are synthesized in fungi by enzymatic oxidation, autooxidation and polycondensation of simple phenolic precursors. As a result, melanins differ in physicochemical properties [3]. The high content of paramagnetic centers allows melanins to deactivate the natural radicals formed in a number of physical and chemical processes due to the large electron absorption capacity of these compounds [4].

The purpose of the work is to study the physicochemical properties of melanins in a number of fungi and their antioxidant activity.

The object of the study were the melanin pigments extracted from the fruiting bodies of fungi that cause brown rot - the edged tinder, and white rot - of the real, flat, false, oak false, as well as sterile mowed, chaga. Melanin pigments from fruiting bodies were obtained by alkaline extraction according to the previously described