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THE NUTRITIONAL AND HEALTH PROPERTIES OF AN OYSTER MUSHROOM (*Pleurotus ostreatus* (Jacq. Fr) P. Kumm.)

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ABSTRACT

An oyster mushroom (*Pleurotus ostreatus* (Jacq.) P. Kumm) is a cultivated species of mushrooms characterizing with unique culinary and medicinal properties. Its' nutritional value comes from proteins, carbohydrates, fatty acids, vitamins and mineral nutrients present in their fruitbodies. Because of a high content of fiber (mainly chitin) and low content of fat, they are a valuable element of an atherosclerosis diet. The fruitbodies of oyster mushrooms are an important source of biologically active substances, specific polysaccharides and polyphenols, which influence a human immune system, so that it fights against cancer cells. ß-D-glucans have an advantageous effect on digestive system, lower blood cholesterol and triglycerides level, decrease the risk of ischaemic heart disease. Active substances present in the mushrooms have antioxidant, antibacterial, antiviral, antidiabetic and anti-inflammatory properties. Numerous scientific studies prove high efficiency of the therapy with the use of preparations and extracts from *Pleurotus ostreatus* mycelia, both in prophylaxis and cure of civilization diseases, atherosclerosis and cancer.

Key words: *Pleurotus ostreatus*, nutritional value, biologically active substances, lovastatin, ß-D-glucan, health properties

INTRODUCTION

Over the past decade or so, the interest in cultivation of *Pleurotus ostreatus* (oyster mushroom), which, alongside *Agaricus bisporus* (button mushroom), has become one of the preferably and the most often eaten macrofungi, has been observed. The oyster mushroom has a significant position among cultivated mushroom species, both on a global and domestic markets. The popularity of this species comes not only from taste and flavour properties or possibility to cultivate it ex situ, but also its' nutritional and, what's more important, health properties. A proven relationship between consumption of *Pleurotus ostreatus* fruitbodies and include this species on the list of medicinal or therapeutic food [Kim at al. 2009]. As a consequence, *Pleurotus ostreatus* is no longer been treated as an aromatic addition to an everyday diet, but has become a valuable source of medicated substances [Nikolova at al. 2007]. The aim of the presented work is to characterize the oyster mushroom in relation to the use of its' nutritional and health properties to produce functional foods and nutraceuticals. The role and biological activity of the substances contained in fruitbodies of this mushroom species, intensively introduced into a commercial production is described.

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Phot. 1. *Pleurotus ostreatus* is successfully cultivated on straw bales

Characterization and occurrence. *Pleurotus ostreatus* (*Basidiomycota*) of the *Pleurotaceae* family is native to China, however nowadays it is widespread across the world. The oyster mushroom, as a saprophyte, grows on decayed wood of many deciduous trees species, such as willow, poplar, birch or beech. Fruitbodies emerge in late Autumn, as low night temperature encourage appearing and growth of the mushrooms. In an intensive, commercial cultivation, *Pleurotus ostreatus* is successfully cultivated on straw bales (phot. 1), sawdust and other materials of plant origin [Gregori et al. 2007].

Fruitbodies of *Pleurotus ostreatus* form characteristic groups to which they owe the name. A pileus of *Pleurotus ostreatus* ranges from 5 to 25 cm in diameter, its' surface is smooth with slightly curled sides upwards. Together with the growth of a fruitbody, shape of the pileus changes from arched in young specimens to flabellate or resembling oyster shells in mature ones. The pileus colour changes as well, from dark in early stages of growth to increasingly light thereafter. A lamellate hymenophore sits on a short but solid, white or grey, stipe. It is usually white or creamy in young specimens, changing into grey or even violet in older ones. A trama is white, fibrous and slightly tough, with a mild-taste and pleasant mushroom flavour. The type and content of the growing media directly influences the taste and flavour of fruitbodies [Gapiński et al. 2001].

Nutrient content. *P. ostreatus* is included in the 'functional food', it means it has a scientifically proven positive influence on health, beyond basic nutrition. The chemical content of *Pleurotus* is a varietal feature, depending to a higher extent on environmental conditions, type and content of the media, cultivation method, sporocarps maturity [Patel et al. 2012].

Carbohydrates. The content of dry weight ranges from 8 to 13%. *Pleurotus* is included in a low calorie foods [Manzi et al. 2004]. Over a half of dry weight

are carbohydrates, which are structural components of cell walls. There are about 5 to 10 g of carbohydrates in dry sporocarps [Muszyńska et al. 2011a, b]. Cell walls contain insoluble carbohydrates, cellulose and chitin 0.32 g in fresh weight of mushrooms [Manzi et al. 2001]. Depending on the oyster mushroom breed it contains from 27 to 38% of soluble fractions [Manzi and Pizzoferrato 2000]. The main components of soluble fractions are: chitosan, hemicellulose and α-glucans (1% of sporocarp dry weight) and ß-glucans (29.9% of sporocarp dry weight) [Sun and Liu 2009, Papaspyridi et al. 2010]. These compounds have a significant importance for proper functioning of a digestive system. Glucans increase viscosity of intestinal, while chitin and chitosan stimulate excretion of bile acids. In an acid stomach environment components of chitosans form insoluble in water complexes with bale acids, which increase faecal mass and facilitate its' excretion from the body [Synytsya et al. 2008]. They are also assigned an ability to bind potential carcinogens (heavy metals, bale acids, some nitrites), what ease their excretion from the organism [Rathee et al. 2012]. Additionally, glucans, thanks to the ability to decrease absorption sugar from food, contribute to lowering blood glucose level, and thanks to the ability to bind sodium ions they are indirectly responsible for lowering blood pressure. Fraction of glucans present in *Pleurotus ostreatus* selectively induces development of desirable bacterial flora (e.g. lactic bacteria and bifidobacteria) and stimulates fermentation led by anaerobes. Metabolites of dietary fibres of an oyster mushroom play also an important role in maintaining a balance between proliferation, differentiation and apoptosis of colon epithelium cells, preventing negative changes which might cause cancer [Iwalokun et al. 2007]. Glucans of *Pleurotus ostreatus* positively influence an immune system, maintain homeostasis of the organism, have anti-oxidative and anti-inflammatory properties [Selegean et al. 2009].

Proteins and amino acids. Nitrogen compounds, proteins, free amino acids and non-protein nitrogenous compounds play an essential role among the components included in *Pleurotus ostreatus* fruitbodies. The total protein content in fruitbodies of the species ranges from 16 to 25% of dry weight [Manzi et al. 2004] and up to 2.5 g in 10 g of dry weight [Muszyńska et al. 2011a]. A content of proteins in macrofungi depends on the species and development phase of the fruitbody. In comparison to an oyster mushroom, a content of proteins in other species might be higher and may range from 10 to 40% [Barros et al. 2008]. *Pleurotus ostreatus* protein characterizes with a high content of egzogenous aminoacids, which are not produced by human organism and have to be supplied in sufficient amounts with food. Among the egzogenous aminoacids, 100 g of fresh fruitbodies contain the most leucine (145 g), lysine (126 g) and phynylalanine (120 g) [Papaspyridi et al. 2010]. An average assimilability of an oyster mushroom proteins is high – 84%. In case of an oyster mushroom, limiting amino acids, in comparison to an egg white, are sulphuric amino acids, methionine and cysteine as well as aromatic amino acids, that are phenylalanine and tyrosine. *Pleurotus* also contains significant amount of non-protein nitrogenous compounds, urea, biogenic amino acids or chitin, which is not digested by gastrointestinal tract enzymes. An oyster mushroom is tasty, however it cannot be the only protein consumed, as to meet daily protein needs, about 4 kg of fruitbodies should be eaten [Gapiński et al. 2001].

Fatty acids. The fruitbodies of *Pleurotus ostreatus* contain a low amount of fats, about 0.4% of fresh weight [Manzi et al. 2001]. The content and ratio of fatty acids of pleurotus are very beneficial for human diet because of a high content of linolenic acid (55% of fatty acids) and oleic acid (4% of fatty acids), while the amount of saturated fatty acids is only about 10% of total fatty acids [Muszyńska et al. 2011a, b].

Vitamins. The frutibodies of an oyster mushroom contain a good amount of group B vitamins, which are necessary to process food into energy and they are also formative substances for an organism. These compounds are responsible for a proper functioning of digestive, cardiovascular and nervous systems, as well as skin and mucous membranes [Ganeshpurkar et al. 2010]. The *Pleurotus ostreatus* fruitbodies contain the most of: niacin (vitamin PP 5.3 mg in 100 g of fresh weight), riboflavin (vitamin B_2 0.21 mg per

100 g of fresh weight), thiamin (vitamin B_1 0.15 mg per 100 g of fresh weight), which means that 100 g of fresh fruitbodies of an oyster mushroom supplement a daily nutrients requirements for these components. A content of vitamin B2 in general is higher in vegetables and in most of other mushroom species [Mattila et al 2001]. Persons suffering from chronic gastrointestinal diseases, which are often accompanied with deficiency of B vitamins, are advised to supplement diet with *Pleurotus ostreatus* [Reguła and Siwulski 2007]. An oyster mushroom also contains a low amount of folic acid (640 µg per 100 g), however, it is enough to supply an adult's daily requirement in 300%. A content of folic acid is on the same level as in vegetables, however it is higher in case of other mushroom species in which it ranges from 300 to 1412 µg per 100 g [Mattila et al. 2001]. Folic acid takes part in nucleic acids synthesis, it is necessary for normal growth, development and functioning of all the cells in an organism. A deficiency of folic acid might disrupt processes of synthesis, repair and transcription of DNA and lead to accumulation of DNA damage and hypermethylation, which are risk factors of cancer development, and in case of pregnant women, foetal anomalies or even miscarriage. The oyster mushroom fruitbodies contain vitamin C (20 mg per 100 g of dry weight), known from its' antioxidative properties, which content in 100 g of fresh mushrooms, according to different sources, allows to fulfill from 15 to 60% of daily requirements [Muszyńska et al. 2011a, b].

Minerals. Mineral substances are needed to mantain and regulate functioning of an organism. Mineral substances are present in sporocarps in an inorganic form as oxides, carbonates, sulphates, silicates and in organic combinations with proteins and lipids. A content of metals in a pleurotus sporocarps depends among other things from a growing substrat, variety, crop cycle, as well as from cultivation conditions and technology [Reguła and Siwulski 2007].

An oyster mushroom is an important source of mineral salts, especially sodium, which content ranges from 2.3 to 3.8 g per 100 g of dry weight and phosphorus, from 134 to 670 mg·100 g^{-1} of fresh weight. Depending on the growing media, there are also smaller amounts of calcium compounds (30–564 mg·100 g^{-1} d.w.), iron (23.1–63.5 mg·100 g^{-1} d.w.), magnesium (136–396 mg·100 g^{-1} d.w.). The oyster mushroom fruitbodies contain trace amounts of copper (2.4 mg·100 g^{-1} d.w.) and zinc (1.6 mg·100 g^{-1} d.w.). Mineral substances are present in different amounts, depending on a sporocarp part, more compounds are in a pileus than in a stipe. The amount depends also on a hymenophore diameter or age of a mushroom [Hernandez et al. 2003, Kalmis et al. 2008, Ndamitso and Abulude 2013].

Table 1. Content of a chosen bioelements and toxic metals in *Pleurotus ostreatus* sporocarp cultivated in Poland and Nigeria (mg·100·g^{-1}d.w.) [Reguła and Siwulski 2007, Ndamitso and Abulude 2013]

Bioelements and toxic metals	Cultivation in Poland	Cultivation in Nigeria
Calcium	276	564
Potassium	3312	2516
Sodium	133	556
Magnesium	128	396
Phospohorus	not analysed	670
Zinc	10.9	1.3
Copper	1,29	1.14
Manganese	not analysed	3.08
Lead	0	1.14
Cadmium	0.07	0
Mercury	0.008	not analysed

Therapeutic potential of mushrooms

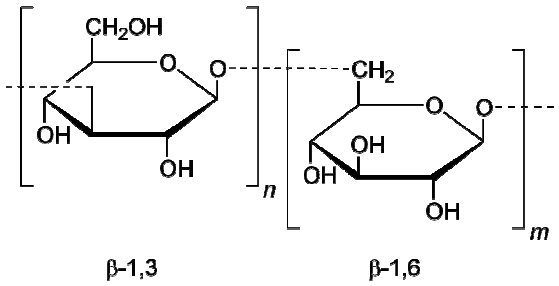
Lovastatin. Oyster mushroom sporocarps contain bioactive substances of documented pro-health properties (tab. 3). Such a compound is lovastatin, which in an inhibitor of 3-hydroxy-3-methyl-glutaryl-coenzyme, the main enzyme of cholesterol A reductase (MHG-CoA) synthesis [Shimada et al. 2003]. The content of this compound depends on the part of sporocarp and ranges from 165.3 to 606.5 µg per 1 g of dry weigh [Piska et al. 2017]. It also depends on a substrate composition, in the range of 165.3 in *P. ostreatus* (Korea) to 216.4 mg kg^{-1} d.w. in *P. ostreatus* (Taiwan) [Chen et al. 2012]. The advantage of a lovastatin containing diet on lipid profile involves lowering cholesterol and triglycerides level in blood plasma and liver cells [Hossain et al. 2003, Chen et al. 2012]. A diet enriched with lovastatin decreases production of VLDL (ultra low-density lipoproteins) and LDL (low-density lipoproteins) together with increase if HDL fraction level (high-density lipoproteins) [Ramkumar et al. 2010]. A positive effect of an oyster mushroom sporocarps used to treat patients suffering from an acute coronary syndrome was obtained. A *Pleurotus ostreatus* lovastatin was described as adjuvant targeting towards lymphocytes. It has an immunomodulating as well as tioxidative and fibrinolytic properties and might prevent from atherosclerosis [Aarons et al. 2007].

Studies conducted with the use of animals showed that a diet enriched with an oyster mushroom (10% of dry sporocarp) decreased a level of atherosclerosis of blood vessels. The addition of dry oyster mushroom sporocarps in a quantity of 4 to 10%, in comparision to a normal diet, reduced blood pressure and cholesterol level in blood of the tested animals [Bobek et al. 1993, Chen et al. 2012].

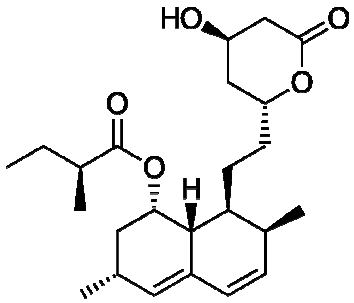
Polysaccharides. Mushrooms are a natural source of bioactive substances such as polysaccharides, that belong to a very differentiated group of molecules, which D-glucose particles are linked by α- or ß-glycosidic bonds in many places, so that they might form both simple chains and branched structures. Differences in biological activity of polysaccharides of an oyster mushroom result from a molecule size and a degree of branching. Water soluble β-glucans isolated from *Pleurotus ostreatus* characterize with a high biological activity [Zhang et al. 2007]. Manzi et al. [2004] indicated that mushrooms of a *Pleurotu*s genus contain even 414 mg of β-glucans per 100 g of an edible part. The above mentioned authors proved at the same time, that ß-glucans containing mainly ß-(1→3) bonds characterize with higher biological activity than ß-(1→6) bonds. A biological activity of an oyster mushroom depends also on a type of monomers forming a polysaccharide chain of a molecule, as well as a level of branching, that is a ratio of a molecule weight to a number of side chains. In case of an oyster mushroom a level of branching is very advantageous and accounts for 0.25 [Lemieszek and Rzeski 2012].

The first polysaccharide obtained from an oyster mushroom sporocarp was pleuran, which is β-glucan made of glucose molecules joined with β-(1→3) and β-(1→6) glycosidic bonds (fig. 1). A pleurotus pleuran characterizes with a molecular weight ranging from 600 000 to 700 000 kDa [Hozova et al. 2004, Sobieralski et al. 2012]. Pleuran has a very strong antioxydative potential, which is related to an ability to activate enzymes responsible for neutralization of free radicals: superoxide dismutase, glutathione peroxidase and catalase [Keyhani et al. 2007, Synytsya et al. 2008]. β-glucans extracted from an oyster mushroom sporocarps, thanks to antioxidative properties, protect cells against damages caused by reactive forms of oxygen, including mutagenic activity which might lead to cancer [Venkatakrishnana et al. 2010].

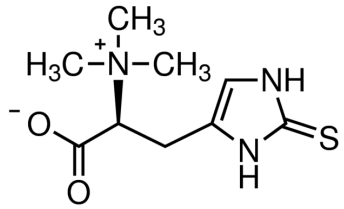
A positive effects of oyster mushrooms ß-glucans use was proven in case of cancer cells of a large intestine. A direct induction of cancer cells apoptosis, as well as activation of immunological response of an organism were observed [Sarangi et al. 2006]. A strong cytostatic effect of water and alcohol extracts towards human lung cancer cells (A549), cervical cancer (SiHa and HeLa), colorectal cancer (HT-29) [Lavi et al. 2006], leukemia (HL-60) [Venkatakrishnana et al. 2010], as well as a mouse sarcoma (S-180) was proven [Li et al. 2008, Maiti et al. 2011].



Pleuran



Lovastin



Ergothioneine

Fig. 1. Structural of anti-cancer compounds isolated from *P. ostreatus*

Zhang et al. [2007] noted that *Pleurotus ostreatus* ß-(1-3)-glucans with large molecules 500–2000 kDa, show stronger biological activity than those of a lower weight. High-molecular pleuran shows an anti-cancer activity through activation of an immunological system of an organism. It is assumed that the main anti-cancer mechanism comes from a higher activity of NK lymphocytes (natural killers) induced by polysaccharide and intensification of macrophages and neutrophils phagocytosis [Bobovčák et al. 2010, Bergendiova et al. 2011]. Particularly strong immunomodulatory properties were observed in case of carboxymethyl derivative of pleuran. It was also proven that pleuran has analgesic and anti-inflammatory properties [Smiderle et al. 2008].

Polysaccharides extracted from *Pleurotus ostreatus* are capable to fight efficiently against microorganisms: *Escherichia coli*, *Staphylococcus epidermidis*, *Staphylococcus aureus* [Akyuz et al. 2010], *Candida albicans* [Wolff et al. 2008], *Streptococcus*, *Enterococcus* [Thomson and Moland 2000]. It was estimated that ether-extract of the mushroom characterized with a higher activity against Gram-negative bacteria than an acetone one.

The effect of bioactive polysaccharide compounds of an oyster mushroom is reduction of pathogens and a beneficial increase in an amount of microbial flora. A biological activity depended on a solvent type [Vargas-Sáncheza et al. 2018].

Polysaccharide fractions of *P. ostreatus* show antiviral activity resulting from preventing virus from adsorption on cell surface, blocking virus nucleic acid replication or inhibiting enzymes, mainly RNA polymerase [Gregori et al. 2007].

Protein and glycoproteins. Research conducted on animals has shown that high molecular (40 and 41 kDa) lectins isolated from *Pleurotus ostreatus*, efficiently inhibit growth and development of leioyoma and hepatoma [Refaie et al. 2010]. Lectins cause apoptosis of cancer cells and encourage proliferation of active lymphocytes [Wang et al. 2007].

A pleurostrin peptide (7 kDa), which has a strong antifungal properties was found in pleurotus sporocarps. Pleurostrin efficiently inhibits growth of *Fusarium oxysporum*, *Mycosphaerella arachidicola*, *Physalospora pyricola* mycelium [Al-Hetar et al. 2011].

Rat studies conducted *in vivo* and *in vitro* proved that lectins isolated from oyster mushroom sporocarps show ability to agglutinate cancer cells [Zusman et al 1997]. At the same time, mice studies showed that lectins decrease adverse reactions to anticancer medicines, mainly cyclophosphamide [Gerasimenya et al. 2002].

Healthful properties are assigned to extracted from *Pleurotus ostreatus* sporocarps, peptide-polysaccharide (PSPC) compounds of a low molecular weight 316.26 kDa. The main part of PSP are β-glucans (92.4%), in which saccharides molecules (glucose, galactose, mannose, xylose and arabinose),

are joined with β-(1→3) and β-(1→6)-D-gycosidic bonds, while a protein part is 2.5% of a complex. Protein-polysaccharide complexes isolated from an oyster mushroom sporocarps are strong stimulator of an immune system, therefore they have anticancer activity, what results in activation of macrophage cells, T-lymphocytes and different cytokines, particularly TNF-a, IFNγ, IL-1b, which inhibit proliferation and induce apoptosis of cancer cells [Refaie et al. 2009]. Complexes are valuable due to their ability to neutralize a toxic tioacetamid, as well as prevent the changes induced by them [Refaie et al. 2010].

The enzymes belonging to hydrolases and oxidoreductases present in *Pleurotus ostreatus* sporocarps play an important role in prevention of cardiovascular diseases and they enhance fat burning [Lindequist et al. 2005].

Animal studies proved, that P. ostreatus extract increased activity of antioxidant catalase group enzymes, mainly superoxide dismutase and glutathione peroxidase, which characterize with anti-aging properties [Jayakumar et al. 2010].

Phenolic compounds. A strong antioxydiative activity is given to phenolic compounds present in *Pleurotus ostreatus* sporocars, which are recognized as the most valuable antioxidants. A high content of phenolic compounds is present in dark coloured oyster mushroom sporocarps, in comparison to lighter coloured ones. Polyphenols protect against oxidation of different fractions of cholesterol, especially LDL, they activate synthesis of prostacyclins and have an anti-aggregatory properties [Yang et al. 2002]. Alcoholic extracts from *Pleurotus ostreatus* containing phenolic compounds characterize with a high anticancer potential due to their ability to protect cells against mutagenic activity of reactive forms of oxygen [Fu et al. 2009].

A presence of many phenolic acids was noted in oyster mushroom sporocarps: protocatechuic, p-hydroxybenzoic, sinapic, cinnamic, ferulic (tab. 2) [Muszyńska et al. 2013], gallic, homogentisic, chlorogenic [Kim et al. 2008]. It was proven, that among phenolic acids identified in oyster mushrooms sporocarps, the highest activity characterizes gallic, p-hydroxybenzoic and protocatechuic acids. These acids have strong antioxidative properties, which protect cells against oxidation and organism against a harmful activity of free radicals [Karaman et al. 2010].

Among the phenolic acids identified in oyster mushroom sporocarps, protocatechuic acid shows a strong anticoagulant activity [Alam et al. 2011].

Table 2. Content of phenolic compounds in *Pleurotus ostreatus* sporocarps extract

Phenolic compound	Muszyńska et al. [2013][a]	Kim et al. [2008][b]
p-hydroxybenzoic	3.60	–
Sinapic	2.11	–
Cinnamic	1.09	–
Ferulic	0.46	–
Protocatechuic	2.52	18.0
Gallic	–	7.0
Homogenstisic	–	16.0
Chlorogenic	–	19.0
Myricetin	–	21.0
Naringenin	–	9.0

[a] $mg \cdot kg^{-1}$ d.w., [b] $\mu \cdot g^{-1}$ d.w.

Table. 3. Biological activity of *Pleurotus ostreatus*

Bioactivity	Bioactives effect	Reference
Anti-viral	ubiquitin	Brant and Piraino [2000]
	laccase	El-Fakharany et al. [2010]
	water and methanolic extract polysaccharide fraction	Santoyo et al. [2012]
Anti-neoplastic	polysaccharide extract	Wolf et al. [2008]
	pulverized mushrooms	Arora and Tandon [2015]
	polysaccharide fraction, glucan	Silva et al. [2012], Cao et al. [2015]
	proteoglycans	Sarangi et al. [2006]
	protein	Maiti et al. [2011], Wu et al. [2011]
	lectin	Lavi et al. [2006]
Anti-tumor immunomodulatory	water-soluble polysaccharide (POPS-1)	Choi et al. [2004]
	ethanol extract	Gu and Sivam [2006], Sarangi et al. [2006], Venkatakrishnana et al. [2010]
	Cibacron Blue F3GA, protein fraction	Maiti et al. [2011]
Anti-oxidative	pleuran (ß-1, 3-glucan with galactose and mannose) water and ethanolic extract (30%)	Bobek and Galbavý [2001], Jayakumar et al. [2010], Venkatakrishnana et al. [2010]; Rathee et al. [2012]
	ergothioneine	Woldegiorgis et al. [2014]
Anti-lipidemic	lowastin	Gunde-Cimerman and Plemenitas [2001], Hossain et al. [2003]
	ethanol extract	Analdihi et al. [2013], Ravi et al. [2013]
Hepatoprotective	ß-glucan phenol antioxidant enzymes	Fu et al. [2009]
	hot water extract	Refaie et al. (2009], (2010]
Hypocholesterolemic	dried fruiting (4–10%)	Bobek et al. [1991], (1993]
	lowastyna	Hossain et al. [2003], Khatun et al. [2007]
	pulverized mushrooms	Choudhury et al. [2013]
	lectin	Devi et al. [2013], (2015]
Anti-inflammantory	polysaccharides (1,3), (1,6)-linked ß-glucan	Bobek and Galbavý [2001], Smiderle et al. [2008], Jedinak et al. [2011]

Indole compounds. Higher fungi, including *Pleurotus ostreatus* are a good source of non-hallucinogenic indole compounds and their derivatives. A presence of 5-hydroxytryptophan (1.63 mg·100 g^{-1} d.w.), serotonin (6.52 mg·100 g^{-1} d.w.), tryptamine (0.91 mg·100 g^{-1} d.w.) and indolile-3-acetic acid (0.21 mg·100 g^{-1} d.w.) was confirmed in sporocarps of *Pleurotus ostreatus* [Muszyńska et al. 2011b, 2014]. It was noted, that serotonin included in oyster mushroom has soporific, antidepressive, anxiolytic and sedative properties. Serotonin is used to treat depression, insomnia, mood disorders, and the latest reports say that there is a possibility to use it in prevention of Alzheimer disease as well [Berger et al. 2009].

CONCLUSIONS

An oyster mushroom (*Pleurotus ostreatus*) belongs to a cultivated mushrooms and characterizes with a unique culinary and medicinal properties. A pro-health activity of oyster mushroom relates to a presence of natural biologically active compounds. Supporting natural defense mechanism through natural origin compounds present in a diet is one of the main aims of chemoprevention. Numerous scientific studies show that biologically active compounds contained in oyster mushroom sporocarps prevent against development of civilization diseases and support their treatment. Effectiveness of *Pleurotus ostreatus* bioactive compounds, mainly ß-glucan and lectin, in treatment of cancer and states of physical and psychological exhaustion; pleuran in cardiovascular and liver diseases, serotonin in treatment of neurosis was proven. The splendid effects of *Pleurotus ostreatus* use in treatment of advanced stages of cancer, often with vast metastatis and its' extreme help as a supporting instrument in chemo- and radiotherapy of different types of cancer is worth noting.

Sporocarps of an oyster mushroom are edible, both fresh and processed through drying, pickling or freezing. Mushrooms might be a perfect alternative for commonly used pharmacotherapy for patients with decreased immunity or in prevention of civilization diseases. Mushrooms might be concerned as functional food or make a base for products development. Because of high quality properties in terms of nutrition and organoleptic features, pleurotus might be recommended both for rational nutrition of healthy persons, convalescents, dieters and in prevention against diet-dependent diseases.

There is an urgent need to educate consumers and consider an oyster mushroom in our menu because of its' preventive and medicinal properties and a potential possibility to prolong human life.

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