

## Přehled literatury a praktické příklady použití

### [Medicinal Mushrooms: Their Bioactive Components, Nutritional Value and Application in Functional Food Production-A Review.](#)

Łysakowska P, Sobota A, Wirkijowska A. *Molecules*. 2023 Jul 14;28(14):5393. doi: 10.3390/molecules28145393. PMID: 37513265 Free PMC article. Review.

Pers.), Reishi (*Ganoderma lucidum* (Curtis) P. Karst.), Chaga (***Inonotus obliquus*** (Ach. ex Pers.) Pilat), Cordyceps (*Ophiocordyceps sinensis* (Berk.) G.H. ...

## REISHI

### [The Lingzhi or Reishi Medicinal Mushroom \*Ganoderma lucidum\* \(Agaricomycetes\) Can Combat Cytokine Storm and Other COVID-19 Related Pathologies: A Review.](#)

Rowaiye AB, Ogugua AJ, Bur D, Wood T, Labbo Z, Chukwu C, Afolabi FJ, Nwonu EJ, Agbalalah T. *Int J Med Mushrooms*. 2023;25(5):1-15. doi: 10.1615/IntJMedMushrooms.2023048109. PMID: 37183915 Review.

This work reviews studies on lingzhi or **reishi** medicinal mushroom, *Ganoderma lucidum* and its properties that may potentially combat SARS-CoV-2 infection and the co-morbidities. ...

### [Ganoderma lucidum \(Reishi\) inhibits cancer cell growth and expression of key molecules in inflammatory breast cancer.](#)

Martínez-Montemayor MM, Acevedo RR, Otero-Franqui E, Cubano LA, Dharmawardhane SF. *Nutr Cancer*. 2011;63(7):1085-94. doi: 10.1080/01635581.2011.601845. Epub 2011 Sep 2. PMID: 21888505 Free PMC article.

Herein we describe the potential of the medicinal mushroom *Ganoderma lucidum* (**Reishi**) as an attractive candidate for anti-IBC therapy. **Reishi** contains biological compounds that are cytotoxic against cancer cells. ...These findings suggest that **Reishi** is an ef ...

18

### [EFFECT OF DRY EXTRACT FROM REISHI MUSHROOMS ON THE STATE OF ANTIOXIDANT SYSTEM IN RATS WITH DMH-INDUCED COLON CARCINOGENESIS.](#)

Herasymets I, Fira L, Medvid I, Fira D, Yasinovskiy O, Grytsyshyn L. *Wiad Lek*. 2023;76(12):2632-2640. doi: 10.36740/WLek202312112. PMID: 38290027 Free article.

The effectiveness of the dry extract of **reishi** mushrooms and its positive effect on the state of pro- and antioxidant systems was experimentally proved. CONCLUSION: Conclusions: The use of the dry extract of **reishi** mushrooms under conditions of DMH-induced colon car ...

### [Ganoderma lucidum \(Reishi\) suppresses proliferation and migration of breast cancer cells via inhibiting Wnt/beta-catenin signaling.](#)

Zhang Y. *Biochem Biophys Res Commun*. 2017 Jul 8;488(4):679-684. doi: 10.1016/j.bbrc.2017.04.086. Epub 2017 Apr 17. PMID: 28427938

The medical mushroom *Ganoderma lucidum* (**Reishi**), a traditional Chinese medicine, has exhibited a promising anti-cancer effect. ...Our results provide evidence that **Reishi** suppresses breast cancer cell growth and migration through inhibiting Wnt/beta-catenin signalin ...

[Hypotensive effects and angiotensin-converting enzyme inhibitory peptides of reishi \(Ganoderma lingzhi\) auto-digested extract.](#)

Tran HB, Yamamoto A, Matsumoto S, Ito H, Igami K, Miyazaki T, Kondo R, Shimizu K. *Molecules*. 2014 Aug 29;19(9):13473-85. doi: 10.3390/molecules190913473. PMID: 25178067 Free PMC article.

**Reishi** (*Ganoderma lingzhi*) has been used as a traditional medicine for millennia. However, relatively little is known about this mushroom's proteins and their bioactivities. In this study, we used **reishi**'s own proteases to hydrolyze its protein and obtained auto-dig ...

## **CORDYCEPS**

[Cordyceps Polysaccharides: A Review of Their Immunomodulatory Effects.](#)

Chen L, Liu X, Zheng K, Wang Y, Li M, Zhang Y, Cui Y, Deng S, Liu S, Zhang G, Li L, He Y. *Molecules*. 2024 Oct 29;29(21):5107. doi: 10.3390/molecules29215107. PMID: 39519748 Free PMC article. Review.

**Cordyceps** primarily consists of ascomycetes, a parasitic fungus that infects insects and arthropods. ...Many active constituents have been identified from **Cordyceps** sinensis, including cordycepin, adenosine, sterols, and polysaccharides. Polysaccharides constitute a ...

[Cordyceps as potential therapeutic agents for atherosclerosis.](#)

Zhang Y, Liu SJ. *J Integr Med*. 2024 Mar;22(2):102-114. doi: 10.1016/j.joim.2024.03.004. Epub 2024 Mar 7. PMID: 38494355 Review.

Notably, the current misuse of the terms **cordyceps** and *Ophiocordyceps sinensis* has caused confusion among researchers, and complicated the current academic research on **cordyceps**. This review focuses on the chemical composition, pharmacological actions, and underlying ...

[Bioactive compounds from Cordyceps and their therapeutic potential.](#)

Krishna KV, Ulhas RS, Malaviya A. *Crit Rev Biotechnol*. 2024 Aug;44(5):753-773. doi: 10.1080/07388551.2023.2231139. Epub 2023 Jul 30. PMID: 37518188 Review.

In this paper, the bioactivity of various classes of metabolites produced by **Cordyceps** spp., and their therapeutic properties have been reviewed in an attempt to update the existing literature. ...This review provides current knowledge on the bioactive potential of **Cord** ...

[Chinese Cordyceps: Bioactive Components, Antitumor Effects and Underlying Mechanism-A Review.](#)

Liu Y, Guo ZJ, Zhou XW. *Molecules*. 2022 Oct 4;27(19):6576. doi: 10.3390/molecules27196576. PMID: 36235111 Free PMC article. Review.

Chinese **Cordyceps** is a valuable source of natural products with various therapeutic effects. It is rich in various active components, of which adenosine, cordycepin and polysaccharides have been confirmed with significant immunomodulatory and antitumor functions. ...Moreov ...

## HERICIUM

### [Neurotrophic and Neuroprotective Effects of \*Hericium erinaceus\*.](#)

Szućko-Kociuba I, Trzeciak-Ryczek A, Kupnicka P, Chlubek D. *Int J Mol Sci*. 2023 Nov 3;24(21):15960. doi: 10.3390/ijms242115960. PMID: 37958943 Free PMC article. Review.

**Hericium erinaceus** is a valuable mushroom known for its strong bioactive properties. It shows promising potential as an excellent neuroprotective agent, capable of stimulating nerve growth factor release, regulating inflammatory processes, reducing oxidative stress, and sa ...

### [Improvement of cognitive functions by oral intake of \*Hericium erinaceus\*.](#)

Saitsu Y, Nishide A, Kikushima K, Shimizu K, Ohnuki K. *Biomed Res*. 2019;40(4):125-131. doi: 10.2220/biomedres.40.125. PMID: 31413233 Free article. Clinical Trial.

**Hericium erinaceus** has been recognized as medical mushroom since ancient time, but its scientific evidence for human health has been still uncertain. ...

### [Therapeutic Potential of \*Hericium erinaceus\* for Depressive Disorder.](#)

Chong PS, Fung ML, Wong KH, Lim LW. *Int J Mol Sci*. 2019 Dec 25;21(1):163. doi: 10.3390/ijms21010163. PMID: 31881712 Free PMC article. Review.

Although various anti-depressants are currently available, their efficacies are barely adequate and many have side effects. **Hericium erinaceus**, also known as Lion's mane mushroom, has been shown to have various health benefits, including antioxidative, antidiabetic, antica ...

### [Improving effects of the mushroom Yamabushitake \(\*Hericium erinaceus\*\) on mild cognitive impairment: a double-blind placebo-controlled clinical trial.](#)

Mori K, Inatomi S, Ouchi K, Azumi Y, Tuchida T. *Phytother Res*. 2009 Mar;23(3):367-72. doi: 10.1002/ptr.2634. PMID: 18844328 Clinical Trial.

A double-blind, parallel-group, placebo-controlled trial was performed on 50- to 80-year-old Japanese men and women diagnosed with mild cognitive impairment in order to examine the efficacy of oral administration of Yamabushitake (**Hericium erinaceus**), an edible mushroom, f ...

[Hericium erinaceus: A possible future therapeutic treatment for the prevention and delayed progression of Alzheimer's disease? - A narrative review.](#)

Cornford N, Charnley M. Nutr Res Rev. 2025 Dec;38(2):613-627. doi: 10.1017/S0954422425000058. Epub 2025 Feb 24. PMID: 39988819 Review.

Despite efforts, researchers have yet to discover a therapeutic treatment that delays neurodegenerative progression or restores associated Alzheimer neuropathological processes. For centuries, **Hericium erinaceus** (HE) has been used predominantly in Asian countries for its c ...

## MAITAKE

[Maitake Medicinal Mushroom, Grifola frondosa \(Agaricomycetes\), and Its Neurotrophic Properties: A Mini-Review.](#)

Naguib AM, Apparoo Y, Xiong C, Phan CW. Int J Med Mushrooms. 2023;25(2):11-22. doi: 10.1615/IntJMedMushrooms.2022046849. PMID: 36749053 Review.

Neurologic conditions such as Alzheimer's disease (AD) and Parkinson's disease (PD) are challenging to treat due to their irreversible manner as well as the lack of effective treatment. **Grifola frondosa** (Dicks.: Fr.) S.F. Gray, or **maitake** mushroom, is believed to be ...

[Maitake extracts and their therapeutic potential.](#)

Mayell M. Altern Med Rev. 2001 Feb;6(1):48-60. PMID: 11207456 Review.

**Maitake** (**Grifola frondosa**) is the Japanese name for an edible fungus with a large fruiting body characterized by overlapping caps. ...The most recent development is the MD-fraction, a proprietary **maitake** extract its Japanese inventors consider to be a notable ...

[Antitumor activities of Grifola frondosa \(Maitake\) polysaccharide: A meta-analysis based on preclinical evidence and quality assessment.](#)

Zhao F, Guo Z, Ma ZR, Ma LL, Zhao J. J Ethnopharmacol. 2021 Nov 15;280:114395. doi: 10.1016/j.jep.2021.114395. Epub 2021 Jul 13. PMID: 34271115

ETHNOPHARMACOLOGICAL RELEVANCE: The antitumor effects of **Grifola frondosa/maitake** polysaccharide (GFP) have been reported in many preclinical studies, especially in vivo experiments. ...

[Maitake Pro4X has anti-cancer activity and prevents oncogenesis in BALBc mice.](#)

Roldan-Deamicis A, Alonso E, Brie B, Braico DA, Balogh GA. *Cancer Med.* 2016 Sep;5(9):2427-41. doi: 10.1002/cam4.744. Epub 2016 Jul 11. PMID: 27401257 Free PMC article.

For thousands of years, mushrooms have been used for medicinal purposes because of their curative properties. D-Fraction, an extract of **Maitake** (from the edible **Grifola** frondosa mushroom), rich in beta-glucans, exert notable effects in the immune system. ...The expe ...

[Effect of \*\*Maitake\*\* D-fraction in advanced laryngeal and pharyngeal cancers during concurrent chemoradiotherapy: A randomized clinical trial.](#)

Hu Q, Xie B. *Acta Biochim Pol.* 2022 Sep 7;69(3):625-632. doi: 10.18388/abp.2020\_5996. PMID: 36070433 Free article. Clinical Trial.

The polysaccharides of **Maitake** also have anti-radiation effect in radiation therapy during cancer treatment. This research aimed to illustrate **Maitake** D-Fraction effects on CCRT-associated adverse events and QOL. METHODS: During CCRT, **Maitake** capsules were ta ...

## AGARICUS

[Agaricus blazei Murill extract FA-2-b-beta inhibits gastric cancer cell proliferation through the mechanisms of cell-cycle blocking and apoptosis by the mitochondrial pathway.](#)

Fan J, Fan F, He J, Sun Y. *Asian J Surg.* 2024 Mar;47(3):1560-1561. doi: 10.1016/j.asjsur.2023.12.010. Epub 2023 Dec 13. PMID: 38097495 Free article. No abstract available.

[The beneficial effects of \*\*Agaricus blazei\*\* Murrill on hepatic antioxidant enzymes and the pancreatic tissue recovery in streptozotocin-induced diabetic rats.](#)

Wei Q, Huang L, Li J, Chen B, Xie B, Teng H, Chen L, Jiang Y. *J Food Biochem.* 2020 May;44(5):e13170. doi: 10.1111/jfbc.13170. Epub 2020 Mar 11. PMID: 32160646

**Agaricus blazei** Murrill (ABM), is a medicinal mushroom, has beneficial effects on diabetes mellitus. ...

[Agaricus bisporus and its by-products as a source of valuable extracts and bioactive compounds.](#)

Ramos M, Burgos N, Barnard A, Evans G, Preece J, Graz M, Ruthes AC, Jiménez-Quero A, Martínez-Abad A, Vilaplana F, Ngoc LP, Brouwer A, van der Burg B, Del Carmen Garrigós M, Jiménez A. *Food Chem.* 2019 Sep 15;292:176-187. doi: 10.1016/j.foodchem.2019.04.035. Epub 2019 Apr 9. PMID: 31054663 Review.

Cultivation of mushrooms, especially of the most common species **Agaricus bisporus**, represents an increasingly important food industry in Europe, but with a direct consequence in the increasing amount of by-products from their industrial production. This review focuses on c ...

[Lectins from the Edible Mushroom \*Agaricus bisporus\* and Their Therapeutic Potentials.](#)

Ismaya WT, Tjandrawinata RR, Rachmawati H. *Molecules*. 2020 May 20;25(10):2368. doi: 10.3390/molecules25102368. PMID: 32443732 Free PMC article. Review.

The mushroom **Agaricus bisporus** secretes biologically active compounds and proteins with benefits for human health. ...

[White button mushroom \(\*Agaricus bisporus\*\) lowers blood glucose and cholesterol levels in diabetic and hypercholesterolemic rats.](#)

Jeong SC, Jeong YT, Yang BK, Islam R, Koyyalamudi SR, Pang G, Cho KY, Song CH. *Nutr Res*. 2010 Jan;30(1):49-56. doi: 10.1016/j.nutres.2009.12.003. PMID: 20116660

**Agaricus bisporus** (white button mushroom; WBM) contains high levels of dietary fibers and antioxidants including vitamin C, D, and B(12); folates; and polyphenols that may provide beneficial effects on cardiovascular and diabetic diseases. ...The STZ-induced diabetic male ...

[The effects of \*Agaricus sylvaticus\* fungi dietary supplementation on the metabolism and blood pressure of patients with colorectal cancer during post surgical phase.](#)

Costa Fortes R, Carvalho Garbi Novaes MR. *Nutr Hosp*. 2011 Jan-Feb;26(1):176-86. PMID: 21519745 Clinical Trial.

OBJECTIVE: The objective of this study was to evaluate the metabolic and **blood** pressure effects on patients with colorectal cancer after dietary supplementation with **Agaricus sylvaticus**. ...The results were analyzed by Microsoft Excel 2003 and SPSS 14.0 programs, St ...

## **POLYPORUS**

[The efficacy of \*Polyporus Umbellatus\* polysaccharide in treating hepatitis B in China.](#)

Guo Z, Zang Y, Zhang L. *Prog Mol Biol Transl Sci*. 2019;163:329-360. doi: 10.1016/bs.pmbts.2019.03.012. Epub 2019 Apr 9. PMID: 31030753 Review.

**Polyporus umbellatus** polysaccharide (PUPS) has been identified as the major bioactive component in the mushroom **Polyporus umbellatus** that has immuno-enhancing, anti-tumor, anti-inflammatory, and hepatoprotective activities. ...Our aim was to review both the efficacy ...

[Homogeneous \*Polyporus\* Polysaccharide Inhibit Bladder Cancer by Resetting Tumor-Associated Macrophages Toward M1 Through NF-kappaB/NLRP3 Signaling.](#)

Liu C, He D, Zhang S, Chen H, Zhao J, Li X, Zeng X. *Front Immunol*. 2022 May 4;13:839460. doi: 10.3389/fimmu.2022.839460. eCollection 2022. PMID: 35603205 Free PMC article.

Bladder cancer(BC)is one of the most common urinary system tumors, which characterized by a high incidence. **Polyporus** polysaccharide is the main active component of **polyporus**, which is clinically used in the treatment of bladder cancer, but the mechanism is not clea ...

[Polyporus Umbellatus polysaccharide ameliorates rheumatoid arthritis via inhibiting inflammation and regulating gut microbiota.](#)

Zheng Z, Dai J, Pan X, Xiang J, You P, Zhang H, Luo L. Int J Biol Macromol. 2025 Jul;318(Pt 4):145306. doi: 10.1016/j.ijbiomac.2025.145306. Epub 2025 Jun 15. PMID: 40527375

Rheumatoid arthritis (RA) is a chronic inflammatory joint disease that can cause cartilage and bone damage as well as a disability. **Polyporus Umbellatus polysaccharide (PUP)** as a beta-glucan exhibit remarkable anti-inflammatory activity. ...

[Homogeneous Polyporus polysaccharide exerts anti-bladder cancer effects via autophagy induction.](#)

Luo S, Huang X, Li S, Chen Y, Zhang X, Zeng X. Pharm Biol. 2024 Dec;62(1):214-221. doi: 10.1080/13880209.2024.2316195. Epub 2024 Feb 14. PMID: 38353262 Free PMC article.

CONTEXT: **Polyporus polysaccharide (PPS)**, the leading bioactive ingredient extracted from **Polyporus umbellatus (Pers.)** ...(Polyporaceae), has been demonstrated to exert anti-bladder **cancer** and immunomodulatory functions in macrophages. OBJECTIVE: To explore th ...

## AURICULARIA

[Auricularia auricula Polysaccharides Exert Anti-inflammatory Effects in Hepatic Fibrosis by the Gut-Liver Axis and Enhancing SCFA Metabolism.](#)

Zhang L, Liu ZX, Liu YH, Chen Y, Chen J, Lu CH. J Agric Food Chem. 2025 Feb 26;73(8):4617-4629. doi: 10.1021/acs.jafc.4c07952. Epub 2025 Feb 13. PMID: 39945558 Free PMC article.

**Auricularia auricula**, esteemed in Chinese culture for their culinary and medicinal properties, exhibits notable metabolic and immunomodulatory effects. ...

[Auricularia heimuer Ameliorates Oxidative Stress and Inflammation to Inhibit Atherosclerosis Development in ApoE\(-/-\) Mice.](#)

Zhao J, Ma S, Hu Y, Ling J, Wang Z, Wang J, Chen J, Zhang Y. *Nutrients*. 2025 Aug 28;17(17):2799. doi: 10.3390/nu17172799. PMID: 40944188 Free PMC article.

Background: Atherosclerosis is a chronic vascular disease triggered by lipid accumulation. **Auricularia** heimuer is rich in various bioactive compounds that have anti-inflammatory, antioxidant, and hypolipidemic properties. ...

[Auricularia auricula polysaccharides alleviate experimental silicosis by targeting EGFR through the "gut-lung axis".](#)

Wang S, Liu JX, Sun C, Li YG, Jiang HX, Jiang SL, Liang J, Wang WF, Kuang HX, Xia YG. *Int J Biol Macromol*. 2025 May;309(Pt 1):142541. doi: 10.1016/j.ijbiomac.2025.142541. Epub 2025 Mar 25. PMID: 40147652

There is an urgent need to find new drugs to minimize disease progression and deterioration. **Auricularia** auricula-judae is a traditional folk medicine that is used for nourishing lung functions. The aim of this study is to investigate the pharmacological action and potenti ...

[Auricularia auricula-judae \(Bull.\) polysaccharides improve obesity in mice by regulating gut microbiota and TLR4/JNK signaling pathway.](#)

Zhou Y, Jia Y, Xu N, Tang L, Chang Y. *Int J Biol Macromol*. 2023 Oct 1;250:126172. doi: 10.1016/j.ijbiomac.2023.126172. Epub 2023 Aug 7. PMID: 37558018

Obesity has emerged as a crucial factor impacting people's lives, and gut microbiota disorders contribute to its development and progression. **Auricularia** auricula-judae (Bull.) polysaccharides (AAPs), a traditional functional food in Asia, exhibit potential anti-obesity ef ...

[Auricularia auricular Adsorbs Aflatoxin B1 and Ameliorates Aflatoxin B1-Induced Liver Damage in Sprague Dawley Rats.](#)

Xu D, Huang M, Lei J, Song H, Hu L, Mo H. *Foods*. 2023 Jul 8;12(14):2644. doi: 10.3390/foods12142644. PMID: 37509736 Free PMC article.

While edible fungi have shown potential in detoxifying AFB1, there is a scarcity of literature on the application of **Auricularia** auricular (A. auricular) in this context. This study aimed to investigate the ability and underlying mechanism of A. auricular mycelia to adsorb ...

## CHAGA

[Chaga mushroom: a super-fungus with countless facets and untapped potential.](#)

Fordjour E, Manful CF, Javed R, Galagedara LW, Cuss CW, Cheema M, Thomas R. *Front Pharmacol.* 2023 Dec 5;14:1273786. doi: 10.3389/fphar.2023.1273786. eCollection 2023. PMID: 38116085 Free PMC article. Review.

**Inonotus obliquus (Chaga mushroom)** is an inexpensive fungus with a broad range of traditional and medicinal applications. ...

#### [Therapeutic properties of \*Inonotus obliquus\* \(Chaga mushroom\): A review.](#)

Ern PTY, Quan TY, Yee FS, Yin ACY. *Mycology.* 2023 Oct 20;15(2):144-161. doi: 10.1080/21501203.2023.2260408. eCollection 2024. PMID: 38813471 Free PMC article. Review.

**Inonotus obliquus**, also known as Chaga, is a medicinal mushroom that has been used for therapeutic purposes since the sixteenth century. ...Thus, this review aims to explore available information on the therapeutic potentials of **Inonotus obliquus** for t ...

#### [Chaga Mushroom Triterpenoids Inhibit Dihydrofolate Reductase and Act Synergistically with Conventional Therapies in Breast Cancer.](#)

Wang J, Beghelli D, Amici A, Sut S, Dall'Acqua S, Lupidi G, Dal Ben D, Bistoni O, Tomassoni D, Belletti B, Musa S, Mahajna J, Pucciarelli S, Marchini C. *Biomolecules.* 2024 Nov 17;14(11):1454. doi: 10.3390/biom14111454. PMID: 39595631 Free PMC article.

**Inonotus obliquus** (Chaga) is a medicinal mushroom with several pharmacological properties that is used as a tea in traditional Chinese medicine. ...Moreover, bioactive Chaga components exerted a synergistic action with cisplatin and with trastuzumab in SK-BR-3 cells ...

#### [Chaga mushroom triterpenoids as adjuncts to minimally invasive cancer therapies: A review.](#)

Plehn S, Wagle S, Rupasinghe HPV. *Curr Res Toxicol.* 2023 Nov 15;5:100137. doi: 10.1016/j.crtox.2023.100137. eCollection 2023. PMID: 38046279 Free PMC article.

Integrative cancer therapy management is continuously evolving to enhance treatment outcomes. **Chaga mushroom (Inonotus obliquus)** is a parasitic fungus acclaimed to contain pharmaceutical and nutraceutical value in the fight against cancer. ...Studies t ...

#### [Chaga mushroom extract suppresses oral cancer cell growth via inhibition of energy metabolism.](#)

Yeo D, Yun YG, Shin SJ, Dashnyam K, Khurelbaatar A, Lee JH, Kim HW. *Sci Rep.* 2024 May 9;14(1):10616. doi: 10.1038/s41598-024-61125-z. PMID: 38720012 Free PMC article.

Oral cancer stands as a prevalent malignancy worldwide; however, its therapeutic potential is limited by undesired effects and complications. As a medicinal edible fungus, **Chaga mushroom (Inonotus obliquus)** exhibits anticancer effects across diverse can ...

#### [Chaga mushroom extract induces autophagy via the AMPK-mTOR signaling pathway in breast cancer cells.](#)

Lee MG, Kwon YS, Nam KS, Kim SY, Hwang IH, Kim S, Jang H. *J Ethnopharmacol.* 2021 Jun 28;274:114081. doi: 10.1016/j.jep.2021.114081. Epub 2021 Mar 30. PMID: 33798660

ETHNOPHARMACOLOGICAL RELEVANCE: Chaga mushrooms (**Inonotus obliquus**) are commonly used in traditional treatments in Eastern Europe and Asia due to their diverse pharmacological effects, including anti-tumor and immunologic effects. ...AIM OF THE STUDY: Herein, we exa ...