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Review

Main functional ingredients, nutritional, and medicinal values of common wild edible fungi: a review

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Abstract

Common wild edible fungi are not only delicious but are also high in nutritional and medicinal values. They contain many functional ingredients such as polysaccharides, alkaloids, choline, triterpenes, essential amino acids, vitamins, and minerals as their chemical constituents. Seven species of common wild edible fungi were chosen for their main functional ingredients, nutritional values, and medicinal importance in this review.

Introduction

Several thousand species of wild mushrooms exist around the world; some are extremely poisonous, and some are inedible due to unpalatable flavour, poor texture, or small size (Hua and Zhang, 2018). Edible fungi are not only delicious, but also possess high nutritional and medicinal values. Generally, the fruiting season of wild edible fungi is from May to November (Lai *et al.,* 2009), and they often grow in broad-leaved coniferous forest or broad-leaved mixed forest (Shen *et al.,* 2002). According to a report, there are about 2,000 types of edible fungi around the world, and 987 species are used for medicinal and food purposes in China (Zhao *et al.,* 2007). Owing to its local environment, the Yunnan province is an excellent habitat for wild edible fungi; Yunnan province is one of the richest resources of wild edible fungi in China (Hua and Zhang, 2018). There are a total of 882 species, 96 genera, 35 families, 11 orders, and two classes of fungi found in the Yunnan province, which accounts for 40.7% of the world's and 90.0% of China's resources. According to the Chinese Edible Fungi Association, edible fungi production in China in 2018 reached 37.9 million tons, and more than RMB 293.8 billion..

Wild edible fungi contain many functional ingredients such as polysaccharides, alkaloids, choline, triterpenes, essential amino acids, vitamins, and minerals. The contents of functional ingredients in wild edible fungi are affected by the ambient conditions such as temperature, sunshine, and topography (Wang *et al.,* 2011). Generally, edible fungi have high nutritional value because of their rich nutritional ingredients; modern medicine shows that edible fungi have mainly anti-aging, anti-oxidative, immunity-boosting, and anti-cancer activities (Hong and Ying, 2018). In order to better understand and evaluate wild edible fungi in the Yunnan province, seven common species of wild edible fungi (*Termitomyces albuminosus, Thelephora ganbajun, Tricholoma matsutake, Boletus edulis, Dictyophora indusiata, Morchella esculenta,* and *Russula virescens*) were selected and reviewed (Table 1 and Figure 1). The main functional ingredients (Figure 2) and medicinal values of these wild edible fungi are also summarised.

Termitomyces albuminosus

Termitomyces is a genus of basidiomycete fungi (family Lyophyllaceae). There are 24 species of *Termitomyces* in China. *Termitomyces albuminosus* is a rare wild edible fungus which grows in a termite nest. At present, all *T. albuminosus* sold in the market come from wild sources (Hua and Zhang, 2018). A total of 73 volatile compounds were

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Table 1. The habitat characteristics and distribution for seven species of wild edible fungi.

Name	Habitat characteristic	Distribution
Termitomyces albuminosus	Hillsides, grasslands, fields, and forest margins at 25°C in 85 - 95% humidity conditions, and altitude of 1,000 - 1,500 m; grows in subterranean termite nest	Central and southern Yunnan, Sichuan, Guangzhou, and the vast area to the south of the Yangtze River
Thelephora ganbajun	Broad-leaved or coniferous and pine forests at 14 - 24°C in 80 - 90% humidity conditions, an elevation of 1,000 - 2,200 m	In the plateau of central Yunnan (Kunming, Chuxiong, Yimen, Baoshan, Qujing, and Malong)
Tricholoma matsutake	Pine or coniferous and broad-leaved mixed forest at 20.5°C in 80% humidity condition, and altitude of 2,400 - 2,800 m	Yunnan (Diqing, Lijiang, Dali, Chuxiong), Sichuan, Guangzhou, Heilongjiang, Jilin, and Shanxi
Boletus edulis	The ground in mixed forest at 24 - 28°C at a humidity condition of 80 - 90%	Central Yunnan, Sichuan, Guizhou, Heilongjiang, Liaoning, Jilin, Shanxi, Inner Mongolia, and Henan
Dictyophora indusiate	High temperature and humidity at 16 - 27°C in a humidity condition of 80 - 94% and altitude of 200 - 2,000 m	Sichuan, Yunnan, Heilongjiang, Jilin, Guizhou, and Shanxi
Morchella esculenta	On the edges of the broad-leaved forest, and coniferous and broad-leaved forest land; in fir and spruce forest grounds, grass slopes, and sugarcane at 1 - 15°C in a humidity condition of over 75% and altitude of 2,900 m	Yunnan (Gaolihong mountains, the Jinsha river basin, Diqing, and Lijiang), Gansu, Sichuan, Jilin, Xinjiang, Henan, and Shanxi
Russula virescens	Broad-leaved forests, harvest from June to September	Western Yunnan

Figure 1. Seven species of wild edible fungi. *Termitomyces albuminosus* (A), *Thelephora ganbajun* (B), *Tricholoma matsutake* (C), *Boletus edulis* (D), *Dictyophora indusiata* (E), *Morchella esculenta* (F), and *Russula virescens* (G).

identified by GC-MS in *T. albuminosus* sample. Among these, linoleic acid was present in the maximum amount accounting for 24.9% of total volatile oil (Li, 2009). *Termitomyces albuminosus* is rich in essential amino acids, out of which, eight essential amino acids (EAA) account for about 37% of the total amino acid content (TAA) (Sun and Zhang, 2004; Zhao *et al.,* 2007). The protein content reported in previous studies could be up to 28.28% (Zhao and Wang, 1997). The main chemical components include ergosterol and polysaccharide. Six sesquiterpenoids, teucdiol B-F, and epi-guaidiol A showing anti-acetylcholinesterase activity in a dose-dependent manner have been isolated from the fermented broth of *T. albuminosus* (Li *et al.,* 2019). Furthermore, eight cerebrosides known as termitomycesphins A-H isolated from *T. albuminosus* exhibited neuritogenic activity against PC12 cells (Qi *et al.,* 2000; 2001; Qu *et al.,* 2012). Polysaccharide content of *T. albuminosus* is about 0.99%, which can improve immunity, promote the transformation of lymphocytes, prevent and cure hyperlipidaemia, and prevent arteriosclerosis (Feng and Wang, 2011; He, 2016). WSP1 was identified as an antioxidant polysaccharide of *T. albuminosus* which has strong scavenging ability on DPPH radical. Having a molecular weight of 9 kDa, this polysaccharide is mainly composed of fucose and galactose in a molar ratio of 1:3.09 based on the possible repeating unit of →2-α-l-Fucp-1→(6-α-d-Galp-1)$_3$→ (Hong and Ying, 2018). A known sesquiterpenoid epi-guaidiol A obtained by

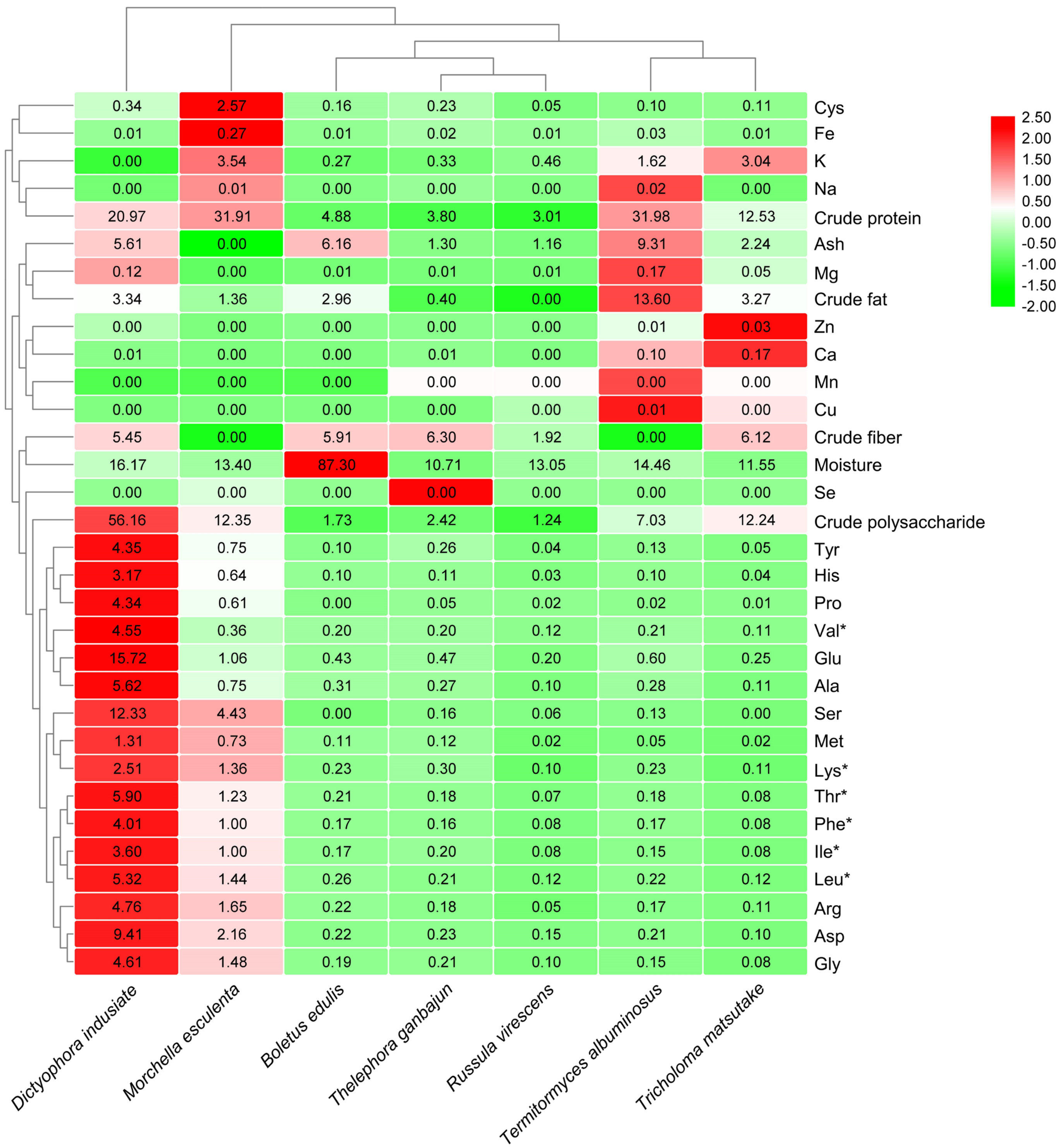

Figure 2. Heat map and cluster analysis of nutrients in seven species of wild edible fungi.

microbial fermentation from the pharmaceutical metabolites of *T. albuminosus* had shown obvious anti-acetylcholinesterase activity in a dose-dependent manner, which might indicate that *T. albuminosus* possess the pharmaceutical potential for Alzheimer's disease (Li *et al.,* 2019). *Termitomyces albuminosus* mainly shows anti-oxidative, anti-tumour, immunity boosting, blood fat lowering, and anti-inflammatory activities. As mentioned in the Compendium of Materia Medica, *T. albuminosus* is mainly used to cure dyspepsia, excessive phlegm, shortness of breath, mental fatigue, abdominal fullness and distention, and haemorrhoids (Hua and Zhang, 2018). There are only few studies which reported the nutritional values and functional components of *T. albuminosus*. Majority studies mainly focus on the useful physiological activities of *T. albuminosus*.

Thelephora ganbajun

Thelepora is a genus of basidiomycete fungi (family Thelephoraceae). In the Chinese market, *T. uialis, T. gangbajun, T. aurantiotincta, T. palmata, T. fuscela*, and *T. japonica* are the major species, with the first two are the most prevalent. Their supply is entirely from the wild because their artificial cultivation is not yet possible. *Thelephora ganbajun* has a unique and strong flavour. Six volatile compounds were identified by GC-MS, and the substances responsible for its unique flavour were identified as 1-octene-3-alcohol, 3-octanone, and 3-octanol (Wang *et al.,* 2011). *Thelephora ganbajun* contains amino acids, proteins, minerals, vitamins, and germ-forming acid which are responsible for its high nutritional value. *Thelephora ganbajun* is rich in minerals like copper, zinc, iron, manganese, potassium, phosphorus, sodium, selenium, and magnesium. The content of selenium (4.604 mg/100 g, fresh) is the maximum among the minerals present, and is 47 times greater than the selenium content of *Tricholoma matsutake*. Selenium can inhibit the growth of cancer cells, and improve immunity. As shown in Figure 2, there are a total of 17 amino acids (3,417 mg/100 g) found in *T. ganbajun*, including eight essential amino acids (1,863 mg/100 g) needed by the human body (EAA/TAA = 11/20) (Wu and Wang, 2005). The main chemical components include triphenolics, polysaccharides, steroids, and aliphatic compounds (Li *et al.,* 2015; Chen *et al.,* 2017). Yang *et al.* (2004) reported that *p*-terphenyl derivatives of *T. ganbajun* showed antioxidant activity *in vitro*. Chemically, the compounds are 3',4,4''-trihydroxy-6'-methoxy[1,1':4',1''-terphenyl] -2'',5''-dione, tris[benzeneacetic acid]5'-methoxy-3',6'-dioxo [1,1':4',1''-terphenyl]-2',4,4''-triylester, and tris[benzeneacetic acid] 7,8-dihydroxy-3-(4-hydroxyphenyl)dibenzofuran-1,2,4-triyl ester. The IC_{50} values for lipid peroxidation in rat liver homogenate were 400, 48, and 54 μm; EC_{50} values of increasing superoxide dismutase (SOD) activities were 182, 74, and 204 μm; and EC_{50} values of scavenging DPPH (1,1-diphenyl-2-picrylhydrazyl) radical activity were 49, 1233, and 55 μm (Hu and Liu, 2001; Yang *et al.,* 2004). The polysaccharides obtained from *T. ganbajun* have many physiological activities such as anti-oxidation, anti-tumour, and immunity improving activities (Lu *et al.,* 2015). The relative molecular weight of the two new polysaccharide from *T. ganbajun*, TZP1-1 and TZP2-1, which showed a certain cytotoxicity on HeLa and SH-SY5Y cells, were 2.07×10^6 and 4.886×10^3 Da, respectively. Constitution wise, TZP1-1 has mannose, rhamnose, galactose, and xylose in a molar ratio of 4:1:83.9:7.5, while TZP2-1 has mannose, glucose, galactose, and xylose in a molar ratio of 5.4:1:79.0:8.1, and has triple helix conformation (Gong *et al.,* 2020). Vialinin A and B obtained from *T. uialis* have a strong inhibitory effect on TNF (Okada *et al.,* 2013). Thelephantin O and vialinin A extracts of *T. ganbajun* fruit bodies in ethanol could inhibit HepG2 cells, and showed no cytotoxicity to the healthy cells (Norikura *et al.,* 2011). *Thelephora ganbajun* can be used to dispel cold, stimulate the circulation of blood, cause muscles and joints to relax, cure pain in waist and leg, cure numbness in hands and feet, reduce discomfort in tendons, and cure convulsions in all four limbs (Zhao and Wang, 1997).

Tricholoma matsutake

Tricholoma is a genus of basidiomycete fungi (family Tricholomataceae). In China, *T. matsutake*, is a rare wild edible fungus with high economic value, and an endangered species under the state protection. It is also a rare and endangered species worldwide. It is known as “king of mushrooms”. *Tricholoma matsutake* is mainly distributed in Yunnan and Sichuan provinces in China. It is rich in mineral elements and vitamins such as vitamins B_1, B_2, B_3, and vitamin C. As shown in Figure 2, crude protein content is 11% in the fresh fruit bodies (He, 2016), and there are 17 amino acids found in *T. matsutake* (24.73%), including eight essential amino acids needed by the human body (EAA/TAA = 34.6%) (Liu *et al.,* 2010). Four purified polysaccharides, H-TMP, E-TMP, M-TMP, and U-TMP have Fuc, Gal, Glc, Xyl, Man, and Glu A in a molar ratio of 8.72:22.79:44.54:6.22:15.62:2.11, 13.04:35.00:31.69:3.69:14.91:1.66, 9.39:24.84:46.42:4.78:13.53:1.08, and 7.22:24.32:45.67:3.97:14.79:1.88, respectively (Wu *et al.,* 2018). Other purified polysaccharides, TM-P1A, TM-P2A, and TM-P2B, have been evaluated by You *et al.* (2013; 2014). TM-P1A and TM-P2B were found to be mainly composed of Glu, Gal, and Man in a molar ratio of 8.7:1.8. The monosaccharide constituents of TM-P2A were Glu, Gal, Man, and Fuc in a molar ratio of 17.7:7.9:3.9:1.0. Three novel *T. matsutake* polysaccharides, TMP30, TMP60, and TMP80 were isolated and purified, both having Fuc, Gal, Glc, Xyl, and Man in a molar ratio of 9.3:26.8:40.1:2.6:16.4, 6.6:17.6:42.3:12.1:21.1, and 8.1:21.2:43.0:4.2:23.6, respectively (Chen *et al.,* 2017). Among these polysaccharides, TMP80 had the highest antioxidant activity. The polysaccharides obtained from *T. matsutake* have strong and potential antioxidant, and natural broad-spectrum anti-microbial, anti-tumour, and immunomodulatory activities. A novel polysaccharide from *T. matsutake* having a composition of Glc, Gal, and Xyl in a molar ratio of 79.37:9.81:10.82 and 8.89 × 10^4 Da could significantly attenuate PC12 cell damage caused by hydrogen peroxide, and significantly promote the lymphocyte and macrophage cells *in vitro* in the dose range of 50 - 200 and 100 - 400 μg/mL, respectively (Ding *et al.,* 2010; Hou *et al.,* 2013). Another study reports on the extraction of three antioxidant polysaccharides that could be promising active macromolecules for biomedical use (Chen *et al.,* 2017). Study on the polysaccharides of *T. matsutake* showed that the fungus may be used as a potential source of natural broad-spectrum anti-bacterial, anti-tumour, and immunomodulatory compounds (Kim *et al.,* 2008; Byeon *et al.,* 2009; Hou *et al.,* 2013). *Tricholoma matsutake* has heat-clearing, diuretic, intestines- and stomach-protective, pain-relieving, cancer-resisting, immunity-improving, and phlegm-eliminating effects.

Boletus edulis

Boletus is a genus of basidiomycete fungi (family Boletaceae). In family Boletaceae, there are 35 genera and 787 species, with 16 genera (*Boletus, Pulveroboletus, Leccinum, Aureobletus, Sinoboletus, Tylopilus, Xanthoconium, Boletellus, Phylloporus, Austroboletus, Strobilomyces, Chalciporus, Boletochaete, Chamonixia, Gastroboletus,* and *Tubosaeta*) growing in China. In Yunnan province, the edible species include *B. edulis, B. magnificus, B. aereus,* and *B. speciosus*. *Boletus edulis* contains essential elements (Figure 2). Except for polysaccharides, flavonoids are the chemical substances found in *B. edulis* which also have many physiological activities such as anti-oxidation, anti-tumour, and immunity-boosting activities. The medicinal value of *B. edulis* is attributed to the alkaloids, choline, and ammonia in it. A water-soluble heteropolysaccharide, BEPF1, was isolated from B. edulis. BEPF1 has a molecular weight of 1.08 × 10^4 Da, and it is composed of Fuc, Man, Glu, and Gal in the ratio of 0.21:0.23:1.17:1.00, which consists of α-d-(1→6)-galactopyranan backbone with a terminal of α-l-fucosyl unit on O-2 of the 2-d-(2→6)-galactosyl units, *β*-d-(1→6)-4-O-Me-glucopyranan, and β-d-(1→6)-glucopyranan backbone with a terminal β-d-glucosyl unit, and contains a minor amount of 2,6-β-d-mannopyranan residues (Zhang *et al.,* 2014). Three polysaccharides, BEBP-1, BEBP-2, and BEBP-3 were isolated and purified from *B. edulis*. BEBP-1 was found to be composed of Glu, Gal, Xyl, Man, and Rha in a molar ratio of 30.5:6.7:0.8:27.2:1.0, BEBP-2 was composed of Glu, Gal, Xyl, and Man in a molar ratio of 11.8:3.6:1.0:5.1, and BEBP-3 was composed of Glu, Man, and Gal in a molar ratio of 7.3:16.6:1.0; and had a good potential antioxidant activity as determined after the evaluation of antioxidant activities of these polysaccharides both *in vitro* and *in vivo* (Luo *et al.,* 2012). Extracts of the fruit bodies had the inhibition rate of 100 and 90% against the sarcoma 180 and Ehrlich's ascites tumour of mice, respectively (Hua and Zhang, 2018). *Boletus edulis* is effective in dispelling cold, clearing heat, nourishing blood, resisting aging process, and stimulating blood circulation. It can also be used to cure waist and leg pain, numbness in hands and feet, convulsions in limbs, leukorrhea and infertility in women, and influenza.

Dictyophora indusiata

Dictyophora is a genus of basidiomycete fungi (family Phallaceae), and *D. indusiata* is known as "queen of mushrooms"; a precious edible and medicinal mushroom consumed in the Asian countries. It is rich in protein content (Figure 2). Habtemariam (2019) has reviewed the chemistry, pharmacology, and therapeutic potential of *D. indusiata*. The small molecular weight compounds of *D. indusiata* include terpenoids and alkaloids such as dictyoquinazol A, dictyoquinazol B, dictyoquinazol C, dictyophorine A, dictyophorine B, Teucrenone, (3R, 4S)-3, 7- dimethyl-1, 6-octadien-3, 4-dio, and its derivatives. Polysaccharides are the major bioactive components of *D. indusiata* showing antioxidant, anti-tumour, and anti-hyperlipidaemic activities along with their potential applications in immunotherapy, neurodegenerative, and chronic inflammatory diseases. The general backbone of the polysaccharides structure of *D. indusiata* is well established as a (1→6)-branched, (1→3)-β-D-glucan, and its molecular mass lies in the range of 801 – 4,656 kDa. A crude polysaccharide extract sample was shown to have a monosaccharide molar composition of Glc, Man, and Gal at 59.84, 23.55, and 12.95%, respectively. The evaluation of in vitro antioxidant activities suggested that polysaccharide of D. indusiata had the potential ability to scavenge free radicals, and might be used as a salutary food and natural medicine for preventing obesity-associated damages and complications (Wang *et al.,* 2019b). Polysaccharides of *D. indusiata* reduced inflammasome activation via decreasing NLRP3 expression in cytoplasmic pools, limiting self-assembly of NLRP3 inflammasome, as well as the subsequent activation of caspase-1 and the secretion of IL-1β and IL-18. It can be used as an anti-inflammatory agent against various inflammatory diseases (Wang *et al.,* 2019c). The anti-hyperlipidaemic, antioxidant, and organic protection effects of acidic-extractable *D. indusiata* polysaccharides have been demonstrated on hyperlipidaemic mice (Wang *et al.,* 2019a). Anti-fatigue activities of a novel polysaccharide from *D. indusiata* were investigated *in vivo*. It increased the loading swimming capacity, pole-climbing endurance, survival time under anoxia, liver, and muscle glycogen contents; at the same time it decreased the levels of blood urea nitrogen and lactic acid in blood serum (Wang *et al.,* 2015). The anti-tumour activity of a triple helical polysaccharide of *D. indusiata* was investigated. It was observed that anti-tumour activity *in vivo* and in high-dose group showed much higher anti-tumour activity (Deng *et al.,* 2013). These consequences confirmed the important role of polysaccharides from *D. indusiata* as a functional food and natural medicine in the fight against oxidative stress and prevention of hyperlipidaemia. *D. indusiata* has the effects of tranquillising the mind and improving health, nourishing vitality and spirit, and relieving inflammation and pain. There are relatively a greater number of studies reported on *D. indusiata* as compared to the other wild edible fungi. However, there are only a few studies that not only focus on the biological activities but also on the mechanism of action.

Morchella esculenta

Morchella is a genus of ascomycete fungi (family Morchellaceae) with 18 species found in China. *Morchella esculenta* is a precious and rare edible fungus with medicinal values in the world. At present, it is obtained through artificial and bionic cultivation methods. Research has shown that *M. esculenta* is rich in essential amino acids, polysaccharides, macronutrients, trace elements, and vitamins. It is rich in copper, zinc, iron, manganese, phosphorus, calcium, and magnesium. EAA accounts for about 47.4% of TAA in *M. esculenta* (Figure 2). The study on antioxidant activity of *M. esculenta* mycelia showed that it is an excellent source of antioxidants that are capable of imparting protection at different levels (Nitha *et al.,* 2010). Four purified polysaccharides, MEP-1, MEP-2, MEP-3, and MEP-4 were obtained after purification. MEP-1 had a molecular weight of 8.3×10^3 Da, and was composed of Man, Glu, Gal, and Ara in a molar ratio of 2.97:13.69:1.00:2.60. The molecular weight of MEP-2 was 11.6×10^3 Da, and its monosaccharide constituents were Man, Rha, Glu, and Gal in a molar ratio of 18.25:0.84:1.00:1.53. The molecular weight of MEP-3 was 43.6×10^3 Da, and its monosaccharide constituents were Ara, Man, Glu, and Gal in a molar ratio of 1.00:2.37:4.79:3.09. The molecular weight of MEP-4 was 81.835×10^3 Da, and its monosaccharide constituents were Xyl, Glu, Man, Rha, and Gal in a molar ratio of 5.4:5.0:6.5:7.8:72.3. *Morchella esculenta* polysaccharides were shown to inhibit the proliferation and growth of human colon cancer HT29 cells in time- and dose-dependent manners within 48 h. Furthermore, in antiproliferative concentrations, it was found to be non-toxic to the normal fibroblast cells (Liu and Sun, 2016). The study on hyperglycaemic activity of polysaccharides extracted from *M. esculenta* mycelia indicated that the polysaccharides could promote INS secretion, and trigger the expression of NGF protein (Liu *et al.,* 2018). This research laid a firm basis for the development of anti-hyperglycaemic and anti-oxidative food product based on *M. esculenta*. As reported in the Compendium of Materia Medica, *M. esculenta* has phlegm-eliminating, brain-relaxing, body-refreshing, and spleen- and kidney-toning effects. It also has preventive and therapeutic effects against myocardial infarction, stroke, renal insufficiency, and anaemia.

Russula virescens

Russula is a genus of basidiomycete fungi (family Russulaceae). *Russula virescens* is one of the main innocuous wild edible fungi found in the Yunnan province. It is rich in mineral elements, amino acids, and vitamins. EAA accounts for about 41.8% of TAA of the fungus (Figure 2). The nutrients needed for their growth mainly come from white ant nests, so it is classified as a rare species. Polysaccharide is another main active ingredient in *R. virescens*, which has anti-oxidation and anti-tumour activities. A water-soluble polysaccharide obtained from the fruiting bodies of *R. virescens* showed significant hydroxyl radical scavenging *in vitro*. This polysaccharide with molecular weight 3.9×10^4 Da was found to be composed of Gal and Man in a ratio of 2:1, and a backbone consisting of (1→6)-linked-α-d-galactopyranosyl and (1→2,6)-linked-α-d- galactopyranosyl residues, that terminated in a single non-reducing terminal (1→)-α-d-mannopyranosyl residue at the O-2 position of each (1→2,6)-linked-α-d-galactopyranosyl residues along the main chain in the ratio of 1:1:1 (Sun *et al.,* 2010a). The studies done to evaluate antioxidant activity of the two polysaccharides of *R. virescens* showed that they could exhibit equivalent inhibiting power for self-oxidation of 1,2,3-phentriol to vitamin C, and a little higher scavenging activity of superoxide radical and hydroxyl radical than vitamin C. It was found to be a good chelating agent for ferrous ions, and also possessed good antioxidant properties (Sun *et al.,* 2010b). A study showed that (1→3)-β-D-glucan from *R. virescens* had no antitumor activity, while the sulphated derivatives exhibited enhanced anti-tumour activities on Sarcoma 180 tumour cell both *in vitro* and *in vivo*. These findings may serve as the basis for further study and development of potential anti-tumour and antioxidative compounds using polysaccharides obtained from *R. virescens*. It can also be used to clear liver, brighten eyes, cure stuffy chest, and lose weight.

Conclusion

In summary, wild edible fungi are beneficial for health due to their high nutritional values. These fungi are rich in minerals, especially the essential ones that are needed by humans. Different types of amino acids are found in these fungi in high content. These fungi also have all types of vitamins, and high protein content as the main nutritional component as compared to common vegetables. In addition, polysaccharide is the main bioactive substance in these fungi, and this has many activities such as anti-oxidation, anti-tumour, and immunity boosting. Polyphenols, flavonoids, and other chemical substances are also responsible for promoting the medicinal value of these fungi. Current study on wild edible fungi focuses mostly on the nutritional and medicinal contents and values, and the bioactivities of their constituent polysaccharides. However, the mechanism of rarefaction is still unknown. The study on wild edible fungi is inadequate as of date; certain wild edible fungi have been extensively studied while others remain underreported. In the present scenario of increasing health awareness, people are paying more attention to the nutritional and medicinal values of wild edible fungi. Therefore, the protection of wild edible fungal resources is much required for scientific research, development, and utilisation of these fungi. It is also necessary to develop commercially viable artificial and bionic cultivation methods to maintain a regular supply of wild edible fungal species.

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