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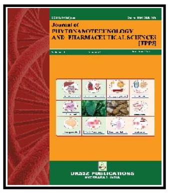

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Therapeutic potential of oyster mushroom: A phytochemical and pharmacological perspective

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Abstract

The oyster mushroom (*Pleurotus ostreatus* (Jacq. ex Fr.) P.Kumm) belonging to the family Pleurotaceae is the second most cultivated mushroom commonly known as 'Dhingri' in India. Oyster mushrooms are good dietary sources as they contain high amounts of protein, fibre, carbohydrates, vitamins, and minerals. They are low in calories, fats, and sodium and are used for antibiotic production, anticancer drugs, and immunity boosters. They are widely regarded for their therapeutic and phytochemical properties. These edible fungi are rich in bioactive compounds, including polysaccharides, phenolic acids, flavonoids, and terpenoids, which have been associated with their antioxidant, anti-inflammatory, anticancer, and immunomodulatory properties. Additionally, oyster mushrooms are a rich source of essential nutrients, including proteins, vitamins, and minerals, making them a valuable dietary supplement for improving overall health. Oyster mushrooms have been traditionally valued in various cultures for both their culinary and medicinal benefits. Traditional Chinese medicine has recognized oyster mushrooms for their immune-boosting, anti-inflammatory, and cholesterol-lowering effects. Additionally, indigenous communities have utilized these mushrooms as a sustainable food source, appreciating their ability to grow on decaying wood and agricultural waste. Beyond food and medicine, oyster mushrooms have also played a role in natural pest control and fermentation processes. This review explores the physicochemical characteristics and therapeutic potential with emphasis on the recent advancements in understanding its bioactive compounds and mechanisms of action. Oyster mushrooms hold promise for future applications in functional foods, nutraceuticals, and alternative medicine.

1. Introduction

Mushrooms have become well-known worldwide for their nutritional and medicinal benefits. Cultivating them is a helpful bioconversion approach that turns waste materials into valuable resources. This technique has the potential to promote sustainable agriculture and forestry globally, including in India mushrooms have long been appreciated for their nutritional and medicinal properties, with several species being extensively studied for their health-promoting effects. Among these, oyster mushrooms (*Pleurotus* spp.) are outstanding due to their rich phytochemical profile and diverse therapeutic potential. These fungi are widely cultivated and consumed globally, not only for their culinary appeal but also for their numerous bioactive compounds that contribute to human health. Oyster mushrooms are rich in biological proteins, fibre, vitamins (C, B_1, B_3, folic acid, and B_{12}), minerals (potassium and phosphorus), and a high concentration of linoleic and oleic acid (Jarial *et al.,* 2024). Also, the presence of polysaccharides, phenolic and terpenoid compounds highlights the nutraceutical properties of oyster mushrooms. Oyster mushrooms have gained significant attention in recent years due to their role in disease prevention and management, attributed to their unique composition of secondary metabolites, antioxidants, and other bioactive substances (Diamantopoulou *et al.,* 2023). Oyster mushrooms are classified under the genus *Pleurotus*, which includes several species such as *P. ostreatus, P. pulmonarius, P. eryngii*, and *P. djamor* (Adebayo and Oloke, 2017). These mushrooms are known for their ability to grow on various lignocellulosic substrates, making them ecologically beneficial in decomposing organic matter. The phytochemical composition of oyster mushrooms includes phenolic compounds, flavonoids, polysaccharides, sterols, terpenoids, and lectins, among others. These compounds exhibit potent antioxidant, anti-inflammatory, anticancer, antimicrobial, immunomodulatory, and neuroprotective properties. Notably, oyster mushrooms are rich in β-glucans, a type of polysaccharide known for its ability to enhance immune function and combat infections (Tiupova *et al.,* 2025). Additionally, they contain lovastatin, a naturally occurring statin that helps in cholesterol regulation, making them beneficial for cardiovascular health. The therapeutic potential of oyster mushrooms has been widely explored in scientific studies, demonstrating their efficacy in managing chronic diseases such as diabetes, cardiovascular disorders, cancer, and neurodegenerative conditions (Zhao *et al.,* 2024). The antioxidant properties of oyster mushrooms help neutralize free radicals, thereby reducing oxidative stress, which is a major contributing factor to ageing and various diseases. Their anti-inflammatory compounds assist in mitigating inflammatory responses, making them useful in conditions like arthritis and autoimmune disorders (Tiupova *et al.,* 2025). Moreover, their antimi-

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crobial activity has shown promising effects against pathogenic bacteria, fungi, and viruses, highlighting their potential as natural antimicrobial agents. In the realm of cancer research, oyster mushrooms have been studied for their cytotoxic and apoptosis-inducing effects on cancer cells (Zhao *et al.,* 2024). The presence of bioactive compounds such as polysaccharides and flavonoids has been linked to the inhibition of tumour growth and enhancement of immune responses against malignancies. Furthermore, their neuroprotective properties, attributed to their ability to modulate neurotransmitter levels and prevent neurodegeneration, suggest their potential role in managing diseases like Alzheimer's and Parkinson's. Given their extensive pharmacological properties and minimal side effects, oyster mushrooms present a promising natural alternative for promoting human health and preventing various diseases (Sarma *et al.,* 2018). This review provides a comprehensive exploration of the phytochemical composition and therapeutic benefits of oyster mushrooms, highlighting their potential applications in functional foods, nutraceuticals, and pharmaceutical industries. As research continues to uncover new bioactive compounds and their mechanisms of action, oyster mushrooms hold great promise as a valuable medicinal resource in modern healthcare (Nasiruddin *et al.,* 2018).

2. Physicochemical and antioxidant characteristics

2.1 Moisture

Moisture content in oyster mushrooms (*Pleurotus* spp.) varies slightly across studies. Saxena and Rai (1990) reported 90.02 per cent, while Singh and Verma (1991) recorded higher values of 91.70 and 92.69 per cent in *P. djamor* and *P. platypus*. Sheikh *et al.* (2010) found the same parameter as 88.00 per cent, whereas Zulqarnain *et al.* (2012) reported it as 91.30 per cent for the same species. Singh and Thakur (2016) and Nagulwar and More (2020) observed 88.80 per cent, while Fasoranti *et al.* (2019) noted a narrow range of 90.20 to 90.30 per cent. However, Wickramasinghe *et al.* (2023) and Effiong *et al.* (2024) reported the same parameter as 89.23 and 91.01 per cent.

2.2 Total soluble solids

Bora and Kawatra (2014) have reported the TSS content as 3.01˚B in oyster mushrooms whereas, a very high TSS content of 16.66 (DW) per cent has been reported in the same mushroom (*P. osteratus)* by Hassan (2020). In another study, the TSS content in the range of 4.20 to 4.50ºB on a fresh weight basis in oyster mushrooms has been reported by Zahid *et al.* (2020). However, Eliopoulos *et al.* (2024) reported the same parameter as 2.53˚ B.

2.3 Sugars

Bora and Kawatra (2014) reported reducing and non-reducing sugars in *P. florida* at 0.38 per cent and 2.63 per cent, with total sugars at 4.70 per cent (Lin *et al.,* 2016). Duhan *et al.* (2017) recorded lower values of total sugars at 0.16 per cent, reducing sugars at 0.07 per cent, and non-reducing sugars at 0.09 per cent, respectively, while Zahid *et al.* (2020) found significantly higher levels at 5.80 per cent, 0.40 per cent, and 5.50 per cent of the same parameter on a dry weight basis.

2.4 Ascorbic acid

The ascorbic acid content in *P. ostreatus* varies widely, with Justo *et al.* (1998) reporting 28 to 35 mg/100 g and Calgarirmak (2007) noting lower levels of 5.38 to 16.10 mg/100 g. On a dry weight basis, it ranged from 24.68 to 68.06 mg/100 g (Nasiruddin *et al.,* 2018), with Hassan (2020) recording 41.28 mg/100 g. A lower range of ascorbic acid content ranging from 10.46 to 11.51 mg/100 g was determined by Kundu *et al.* (2022) in *Pleurotus* mushrooms. Whereas, Fozia *et al.* (2022) reported a very high range of ascorbic acid content of 32.4 to 36 mg/100 g (DW) in oyster mushrooms.

2.5 Fat

Fat content in oyster mushrooms varies slightly across studies. Sheikh *et al.* (2010) reported 0.41 per cent, while Chirinang and Intarapiche (2009) found 0.56 per cent in *P. ostreatus*. Cuptapun *et al.* (2010) recorded 0.62 per cent of fat content, with Bora and Kawatra (2014) noting 0.72 per cent and Singh and Thakur (2016) reporting 0.74 per cent. Fasoranti *et al.* (2019) observed a lower fat content of 0.40 per cent, whereas Nagulwar and More (2020) recorded a high fat content of 0.80 per cent.

2.6 Protein

The protein content in oyster mushrooms varies across studies. Saxena and Rai (1990) reported the protein content as 2.50 per cent (FW), while Singh and Verma (1991) found it as 14.1 to 16.86 per cent (DW). Higher values of protein content as 26.97 to 31.96 per cent (DW) were recorded by Khanna *et al.* (1992). Tyagi (2004) noted the same parameter as 2.28 per cent (FW), while Hien-Duc (2006) reported it as 2.62 per cent. Chirinang and Intarapiche (2009) recorded the protein content as 20.80 per cent (DW), and Sheikh *et al.* (2010) found 4.20 per cent (FW) of the protein content in the oyster mushrooms. Cuptapun *et al.* (2010) reported the same parameter at 19.59 per cent (DW), while Tolera *et al.* (2017) observed a very high protein content at 28.80 per cent (DW). Nagulwar and More (2020) recorded an average protein content of 4.70 per cent (FW) whereas, Wickramasinghe *et al.* (2023) found a very high protein concentration of 23.29 per cent in oyster mushrooms on a dry weight basis. Effiong *et al.* (2024) also analysed the protein level in similar cultivars on a dry weight basis and found a lower concentration of 17.06 per cent. Eliopoulos *et al.* (2024) observed a slightly similar protein level of 17.67 per cent (DW) in oyster mushrooms.

2.7 Fibre

Verma *et al.* (1987) reported the fibre content in the range of 7.90 to 8.20 per cent (DW), while Saxena and Rai (1990) noted it as 1.30 per cent (FW). Matilla *et al.* (2002) found the same parameter as 2.40 per cent (FW), and Hien-Duc (2006) recorded a lower fat content of 1.62 per cent. Cuptapun *et al.* (2010) reported a high fibre content of 18.52 per cent (DW), with Zulqarnain *et al.* (2012) noting it as 16.20 per cent. Singh (2013) found the same parameter as 0.83 per cent (FW), while Bora and Kawatra (2014) recorded it as high as 11.87 per cent (DW). Naraian and Dixit (2017) reported 29.30 to 31.60 g dietary fibre, Tolera *et al.* (2017) found it as 12.87 per cent (DW) whereas, Fasoranti *et al.* (2019) observed it in a higher range as 19.70 to 20.12 per cent (DW). Effiong *et al.* (2024) reported a very high fibre content of 23.63 per cent on a dry weight basis in oyster mushrooms.

2.8 Ash

Chirinang and Intarapiche (2009) reported 5.81 per cent (DW) of ash content, while Sheikh *et al.* (2010) noted a low value of 1.60 per cent (FW). Cuptapun *et al.* (2010) found 3.66 per cent (DW) of ash content, whereas Zulqarnain *et al.* (2012) reported the same parameter as high 8.10 per cent. Bora and Kawatra (2014) reported it as 7.82 per cent (DW), and Singh and Thakur (2016) observed the ash content as 1.06 per cent (FW). Tolera *et al.* (2017) recorded very high ash content as 9.76 per cent (DW), while Fasoranti *et al.* (2019) reported it as 5.93 to 6.20 per cent in two cultivars. Wickramasinghe *et al.* (2023) reported an ash content of 7.89 per cent dry weight basis, while Effiong *et al.* (2024) recorded a slightly higher ash content of 8.22 per cent dry weight. Diamantopoulou *et al.* (2023) found the same parameter in the range of 3.41 to 8.50 per cent in oyster mushrooms. Eliopoulos *et al.* (2024) reported a low ash content of 4.72 per cent (DW).

2.9 Total phenols

Arbaayah and Kalsom (2013) have reported a very wide range of total phenol content ranging from 3936 to 5194 mg TAE/100 g of dry weight in different oyster cultivars. A total phenol content of 964 to 1435 mg catechol equivalent/100 g (DW) in 6 oyster mushroom species has been reported by Mansuri *et al.* (2017). However, a very low total phenol content of 405 mg/100 g in oyster mushrooms has been reported by Hassan (2020). Diamantopoulou *et al.* (2023) found 104.1 to 706.7 mg GAE/100 g of phenols in oyster mushrooms. Effiong *et al.* (2024) found a very low phenol concentration of 24.14 mg GAE/100 g in oyster mushrooms. Another study by Pezos *et al.* (2024) reported the total phenolic content of oyster mushrooms as 2538 mg GAE/g on a dry basis.

Table 1: Physicochemical and antioxidant properties of oyster mushrooms

Composition	Oyster mushroom	Reference
Moisture (%)	68.90 - 92.69	Saxena and Rai, 1990; Singh and Verma,1991; Sheikh *et al.*, 2010; Zulqarnain *et al.*, 2012; Singh and Thakur, 2016; Fasoranti *et al.*, 2019; Nagulwar and More, 2020; Wickramasinghe *et al.*, 2023; Effiong *et al.*, 2024.
Total soluble solids (ºB)	2.53 - 4.5 (FW)16.66 (DW)	Bora and Kawatra, 2014; Hassan, 2020; Zahid *et al.*, 2022; Eliopoulos *et al.*, 2024.
Total sugar (%)	0.16 - 4.70 (FW) 5.80 (DW)	Bora and Kawatra, 2014; Lin *et al.*, 2016; Duhan *et al.*, 2017; Zahid *et al.*, 2022.
Ascorbic acid (mg/100 g)	5.38 - 41.28 (FW) 24.68-68.06 (DW)	Justo *et al.*, 1998; Calgarirmak, 2007; Nasiruddin *et al.*, 2018; Hassan, 2020; Kundu *et al.*, 2022; Fozia *et al.*, 2022.
Fat (%)	0.41 - 0.80	Sheikh *et al.*, 2010; Chirinang and Intarapiche, 2009; Cuptapun *et al.*, 2010; Bora and Katwara, 2014; Singh and Thakur, 2016; Fasoranti *et al.*, 2019; Nagulwar and More, 2020.
Protein (%)	2.28 - 4.7 (FW)14.10 - 31.96 (DW)	Saxena and Rai, 1990; Singh and Verma, 1991; Khanna *et al.*, 1992; Tyagi, 2004; Hien-Duc, 2006; Chirinang and Intarapiche, 2009; Sheikh *et al.*, 2010; Cuptapun *et al.*, 2010; Tolera *et al.*, 2017; Nagulwar and More, 2020; Wickramasinghe *et al.*, 2023; Effiong *et al.*, 2023; Eliopoulos *et al.*, 2024.
Fiber (%)	0.83 - 2.40 (FW) 7.90 - 31.60 (DW)	Verma *et al.*, 1987; Saxena and Rai, 1990; Matilla *et al.*, 2002; Hien-Duc, 2006; Cuptapun *et al.*, 2010; Zulqarnain *et al.*, 2012; Singh, 2013; Bora and Kawatra, 2014; Naraian and Dixit, 2017; Tolera *et al.*, 2017; Fasoranti *et al.*, 2019; Effiong *et al.*, 2024.
Ash content (%)	0.90 - 3.66 (FW) 3.60 - 9.76 (DW)	Chirinang and Intarapiche, 2009; Sheikh *et al.*, 2010; Cuptapun *et al.*, 2010; Zulqarnain *et al.*, 2012; Bora and Kawatra, 2014; Singh and Thakur, 2016; Tolera *et al.*, 2017; Fasoranti *et al.*, 2019; Wickramasinghe *et al.*, 2023; Diamantopoulou *et al.*, 2023; Eliopoulos *et al.*, 2024.
Total phenols (mg/100 g)	24.14 - 405 (FW) 964 - 5194 (DW)	Arbaayah and Kalsom, 2013; Mansuri *et al.*, 2017; Hassan, 2020; Effiong *et al.*, 2024; Pezos *et al.*, 2024; Diamantopoulou *et al.*, 2023.
Antioxidant activity DPPH assay (per cent)	1.5 - 75.5 per cent, 5.61-8.88 mg/ml	Yang *et al.*, 2002; Arbaayah and Kalsom, 2013; Lin *et al.*, 2016; Mansuri *et al.*, 2017; Fasoranti *et al.*, 2019; Egra *et al.*, 2019.
Antioxidant activity ABTS assay (µg/ml)	90.05 - 92.10 per cent, 2.63 - 73.25 mg/ml, 1.04 - 11.27 Trolox/g	Imah *et al.*, 2019; Calabretti *et al.*, 2021; Diamantopoulou *et al.*, 2023.
Antioxidant activity FRAP assay (µg/ml)	0.25 - 11.06 Trolox/g	Diamantopoulou *et al.*, 2023.

2.10 Antioxidant activity

Antioxidant activity in oyster mushrooms varies widely. Yang *et al.* (2002) reported antioxidant activity of 15.9 to 43.9 per cent, while Arbaayah and Kalsom (2013) noted a narrower range of 5.61 to 8.88 mg/ml. Lin *et al.* (2016) found 1.5 to 3.17 per cent in golden oyster mushrooms, and Mansuri *et al.* (2017) recorded 23.12 to 34.56 per cent across six species. Fasoranti *et al.* (2019) reported a high 75.50 per cent (ethanolic extract), while Egra *et al.* (2019) observed 8.20 to 13.88 per cent. Calabretti *et al.* (2021) used the ABTS assay to assess the antioxidant activity of *Pleurotus* mushrooms, and the results ranged from 2.63 to 73.25 mg/ml. The antioxidant activity of oyster mushrooms varied from 0.35 to 13.22, 1.04 to 11.27, and 0.25 to 11.06 mg Trolox/g in the DPPH, ABTS, and FRAP assays, respectively (Diamantopoulou *et al.,* 2023). Effiong *et al.* (2024) investigated the antioxidant activity of oyster mushrooms and reported it as 87.67 per cent whereas Gebru *et al.* (2024) showed a narrow range of antioxidant activity in oyster mushrooms, ranging from 44.24 to 75.68 per cent.

3. Phytochemical and therapeutic potential

Horticulture crops like fruits and vegetables including mushrooms are powerful sources of several phytocompounds with biological activity and this list includes a variety of medicinal or therapeutic plants (Thakur *et al.,* 2022). The great potential of bioactive compounds from mushrooms and their by-products in promoting health is driving interest in discovering new products with beneficial pharmacological effects, including antioxidant, anti-inflammatory, immunomodulatory, and neuroprotective properties (Hamid *et al.,* 2022). Nowadays, the consumption of mushrooms has increased due to their role in human health which is primarily due to the presence of phytochemicals with pharmacological potential which helps in the prevention of various diseases (Sharma *et al.,* 2019; Hamid *et al.,* 2022). Mushrooms are a good source of bioactive compounds and phytochemicals, making them valuable as both functional foods and medicinal resources. Though they belong to the kingdom of fungi unlike plants they also contain numerous bioactive compounds that have medicinal properties contributing to their numerous health benefits. The antioxidant, anti-inflammatory, antimicrobial, anticancer and immune-boosting properties are majorly contributed by the presence of polysaccharides, phenolic compounds, terpenoids, flavonoids and alkaloids. Oyster mushrooms are among the most widely cultivated and consumed edible mushrooms worldwide, known not only for their nutritional value but also for their phytochemical richness and therapeutic properties. These mushrooms contain a diverse range of bioactive compounds, including polysaccharides, phenolic compounds, flavonoids, terpenoids, sterols, alkaloids, and lectins, which contribute to their extensive medicinal benefits (Adebayo and Oloke, 2017; Hamid *et al.,* 2022). Bioactive compounds/nutraceuticals also increase an individual's immune response by acting as immunomodulators and assisting our defense system (Kaushal *et al.,* 2022). As research on functional foods and natural therapies expands, oyster mushrooms have gained significant attention for their role in promoting human health and preventing chronic diseases. One of the most well-studied bioactive compounds in oyster mushrooms is β-glucan, a polysaccharide that exhibits powerful immune-modulating effects. β-glucans stimulate macrophages, natural killer (NK) cells, and other components of the immune system, enhancing the body's ability to combat infections and cancerous growths (Cerletti *et al.,* 2021). In addition to their immunostimulatory properties, oyster mushrooms are a natural source of lovastatin, a compound known for its ability to lower cholesterol levels Lovastatin works by inhibiting the enzyme HMG-CoA reductase, which is involved in cholesterol synthesis, making oyster mushrooms beneficial for cardiovascular health and the prevention of heart disease (Chen *et al.,* 2012). The phenolic compounds and flavonoids found in oyster mushrooms contribute significantly to their antioxidant properties, which help neutralize free radicals and reduce oxidative stress. Oxidative stress is a major contributor to aging and various degenerative diseases, including neurodegenerative disorders, diabetes, and cancer (Correa *et al.,* 2016).

Table 2: Bioactive compounds in oyster mushroom

Compounds	Function	Reference
Polysaccharides (β-glucans)	Immune boosting properties-stimulate macrophages, natural killer cells, anticancer, cholesterol-lowering and prebiotic effects	Tiupova *et al.,* 2025
Phenols	Antioxidant-protect cells from oxidative stress, anti-inflammatory, neuroprotective properties and prevent chronic diseases	Correa *et al.,* 2016
Flavonoids	Antioxidants and neuroprotective properties	Chen *et al.,* 2012
Terpenoids	Anticancerous, liver-protective effects and anti-inflammatory	Devi *et al.,* 2024
Sterols (ergosterol, ergothioneine, phytosterols)	Ergosterol- precursor of vitamin D and ergothioneine-antioxidant	Chen *et al.,* 2012
Proteins and peptides	Antimicrobial and enzyme-inhibiting properties	Siwulska *et al.,* 2018
Lectins	Antiviral, antifungal and immunomodulatory activities	Siwulska *et al.,* 2018
Alkaloids	Antifungal and immunomodulatory activities	Correa *et al.,* 2016
Lovastatin	Cholesterol-lowering effects	Chen *et al.,* 2012

The high antioxidant capacity of oyster mushrooms makes them a valuable dietary component in reducing the risk of chronic illnesses. Studies have shown that oyster mushrooms contain ergothioneine, a unique antioxidant and amino acid that protects cells from oxidative damage, particularly in the brain and nervous system, suggesting potential neuroprotective effects against conditions like Alzheimer's and Parkinson's diseases (Sarma *et al.,* 2018). Oyster mushrooms also exhibit anti-inflammatory properties, primarily due to the presence of terpenoids and sterols. Chronic inflammation is linked to various diseases, including arthritis, cardiovascular disorders, and certain types of cancer (Zhao *et al.,* 2024). The bioactive compounds in oyster mushrooms help regulate inflammatory pathways, reducing the production of pro-inflammatory cytokines and mitigating inflammation-related damage. Additionally, these mushrooms have demonstrated antimicrobial activity against a range of bacterial and fungal pathogens. Their natural antibacterial properties make them a promising alternative in combating antibiotic-resistant infections. The anticancer potential of oyster mushrooms is another area of growing interest (Devi *et al.,* 2024). Studies indicate that their bioactive compounds, particularly polysaccharides and flavonoids, exhibit cytotoxic effects against cancer cells by inducing apoptosis (programmed cell death) and inhibiting tumor growth. Oyster mushrooms have been shown to suppress the proliferation of cancerous cells in various types of cancers, including breast, colon, and lung cancer. Their ability to enhance immune function further supports their potential role in cancer therapy (Sarma *et al.,* 2018). Given their broad range of therapeutic properties, oyster mushrooms hold immense promise in the fields of functional foods, nutraceuticals, and alternative medicine. Their diverse phytochemical composition makes them an excellent natural resource for improving overall health, preventing diseases, and complementing conventional treatments.

Table 3: Therapeutic and phytochemical potential of oyster mushrooms

Property	Dose	Method/model used	Results	Reference
Anticataractogenic effect	250 µg/ml of oyster mushroom extract	Wistar rats	Prevention of cataract by maintaining antioxidant components	Isai *et al.,* 2009
Analgesic and anti-inflammatory	250 mg/kg and 500 mg/kg extracts	Formalin-induced pain rat models	Presence of compounds like flavonoids, phenols and polysaccharides induced analgesic and anti-inflammatory effects.	Ganeshpurkar and Rai, 2013
Antihyperlipidemic	500 µg/ml oyster mushroom extract	High fat diet induced hyperlipidemic rats	Reduced levels of total cholesterol, LDL and triglycerides	Choi *et al.,* 2017
Anticarcinogenic effect	Aqueous extract of oyster mushroom 1000 µg/ml	Pre effected cancer cells	Inhibition of cancer cells by 39.9 per cent	Mishra *et al.,* 2021
Hypolipidemic effect	200 mg of oyster mushroom extracts	Hypercholestrolemic rats	Reduction of total cholesterol triglycerides and low-density levels by 15, 34 and 22 per cent	Iqbal *et al.,* 2024

4. Conclusion

Oyster mushrooms have emerged as a rich source of bioactive compounds with great therapeutic potential. These rich sources of polysaccharides, flavonoids, phenolics, and terpenoids offer great health benefits, such as antioxidant, antimicrobial, anti-inflammatory, anticancer, and immunomodulatory effects. Their diverse phytochemical profile makes them a promising natural disease prevention and management resource. One of the most beneficial health benefits of oyster mushrooms is their ability to enhance immune function, primarily due to the presence of β-glucans. These compounds stimulate immune responses, helping the body fight infections and diseases. Additionally, their antioxidant properties play a crucial role in neutralizing free radicals, reducing oxidative stress, and protecting against chronic illnesses such as cardiovascular diseases, neurodegenerative disorders, and cancer. Other beneficial effects include antimicrobial potential and their ability to act as a natural medicine. However, their anti-inflammatory properties allow them to be used to manage conditions like arthritis and metabolic syndromes. Beyond their medicinal benefits, oyster mushrooms stand out for their sustainability and economic value. They can be cultivated on agricultural waste, making them an environmentally friendly and cost-effective food source. Their ease of cultivation and rich nutritional profile further enhance their appeal as a functional food that supports both human health and global food security. As interest in natural remedies and functional foods continues to grow, oyster mushrooms are likely to play a significant role in future healthcare, nutrition, and pharmaceutical advancements.

Conflict of interest

The authors declare no conflicts of interest relevant to this article.

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