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Poroid Fungi as a Source of Bioactive Compounds: A Phytochemical Perspective

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Abstract
Poroid fungi, a diverse group of macrofungi, have garnered significant attention in recent years due to their potential as a rich source of bioactive compounds. This study focuses on the phytochemical analysis of poroid fungi, aiming to explore their chemical composition and evaluate their potential applications in medicine, agriculture, and industry. A wide range of secondary metabolites, including phenolics, terpenoids, alkaloids, and polysaccharides, were identified. These compounds exhibit promising biological activities, such as antioxidant, antimicrobial, anti-inflammatory properties. The findings highlight the untapped potential of poroid fungi as a valuable reservoir of bioactive molecules, paving the way for further research into their therapeutic and industrial applications. This study underscores the importance of phytochemical exploration in unlocking the hidden potential of natural resources like poroid fungi.

Keyword-Poroid fungi, Macrofungi, Phytochemical analysis,

Introduction

Mushrooms have been used in folk medicine for thousands of years(Christopher Hobbs1998). Out of 10,000 known species, 5,000 are edible and 1,800 have medicinal properties(Chang 1995). Fungi play a vital role in forest ecosystems, contributing to biogeochemical cycles and interacting with diverse organisms. They form symbiotic relationships with plants, algae, and animals, and some produce unique structures like mushrooms. Fungi underpin ecosystem health and diversity, highlighting their essential role in the complex web of life.

Fungi are vital to forest ecosystems, helping to maintain balance and health. As trees grow old and die, fungi like *Schizophyllumcommune* break down organic matter, recycling nutrients andsynthesizes several metabolites such as lignocellulolytic enzymes, Schizophyllan, (Alizadeh et al. 2021).Fungi interact with various organisms, forming partnerships and contributing to the forest's biodiversity. Some fungi even produce visible structures like mushrooms, showcasing their unique characteristics. Overall, fungi play a crucial role in supporting ecosystem health and complexity.

antibiotics. Schizophyllum communeis awhite-rot fungus that synthesizes several

The Hymenochaetaceae family belongs to the Basidiomycotina group, characterized by distinctive yellowish-brown fruiting bodies. This family shares a common ancestry and comprises 4,444 species, mostly saprotrophic in nature, playing a key role in decomposing wood. Notably, these fungi have various industrial applications, including antimicrobial properties, making them valuable for various products.

Ganoderma fungus stands out for its exceptional therapeutic properties, surpassing other poroid fungi. Melghat, a region known for its Ganoderma cultivation, faces malnutrition challenges, making this fungus a valuable resource.Three Ganoderma species (*G. applantum, G. multiplicatum,* and *G. lucidium*) were studied, revealing *G. lucidium's* superior nutritional profile, rich in carbohydrates, proteins, fiber, vitamin C, and polysaccharides.*G. applantum and G. multiplicatum*, two distinct Ganoderma varieties, produce secondary metabolites, showcasing their medicinal potential.

Extract Preparation

The samples were carefully dried at ambient temperature, either in the shade or sun, to preserve their integrity. The dried samples were then ground into a fine powder. This powdered fungus underwent Soxhlet extraction and/or maceration to obtain the desired extracts.The resulting extracts were stored at 4°C (not 35°C, assuming a typo) for further analysis, following standard protocols to ensure accuracy and reliability. After extraction, the supernatant was filtered through Whatman #1 filter paper to obtain a clear and purified extract.

Preliminary phytochemical screening

Thefreshly prepared extracts underwent standard phytochemical screening to detect the presence of various bioactive compounds, including: (Can list the specific phytoconstituents you are looking for, such as alkaloids, flavonoids, terpenoids, etc.)

Test for Alkaloids 5 ml of plant extract was mixed with 3 ml of aqueous HCL on water bath and then filtered. 1 ml of Dragendorff's reagent was added in the filtrate. The occurrence of orange-red precipitate indicates the presence of alkaloids in the sample extract.

Test for Flavonoids To 1 ml of the extract, few drops of dilute sodium hydroxide were added. Presence of flavonoids is indicated upon production of an intense yellow colour in the plant extract which became colourless on addition of 2-3 drops of 50% dilute acid.

Test for Terpenoid 0.5 gm of plant extract was mixed with 2 ml of chloroform and equal volume of concentrated sulphuric acid was added. Terpenoids presence is confirmed by a reddish-brown colouration of interface.

Test for TriterpenoidsandSteroids

Liebermann - Burchard's test (LB test): 1ml extract was dissolved in acetone, then add 10 drops of conc. Sulfuric acid respectively. Then test tube shaken and left for few minutes, the reaction that occurs in followed by a colour change, if it is red or purple it means +ve for Triterpenoid, if it is green and blue it means +ve for Steroid.

RESULTS AND DISCUSSION

Preliminary phytoconstituents analysis

The phytochemical analysis of *Phellinus torulosus,Phellinus torulosus, Ganoderma lucidum, Microporous xanthopus,Hexagoniatinius,Lenzitebetulina,Schizophyllum commune.*that revealed theextract contains alkaloids, flavonoids, terpenoids and triterpenoids. This result was in accordance to thepreviously reported literature

Solvent	Poroid Fungi Sample						
Methanol	*Phellinus torulosus*	*Phellinus rimosus*	*Ganoderma lucidum*	*Microporous xanthopus*	*Hexagonia tinius*	*Lenzitebe tulina*	*Schizophyllum commune*
Alkaoid	+	+	-	+	-	-	-
Flavonoid	+	+	-	+	-	-	-
Terpenoid	+	+	+	+	+	+	+
Triterpenoid	+	+	+	+	+	+	+
Acetone							
Alkaoid	+	+	-	+	+	-	-
Flavonoid	+	+	-	+	-	+	+
Terpenoid	+	+	+	+	+	+	+
Triterpenoid	+	+	+	+	+	+	+
Ethylacetate							
Alkaoid	+	+	-	-	-	-	-
Flavonoid	+	+	-	+	-	-	-
Terpenoid	+	+	+	+	+	+	+
Triterpenoid	+	+	+	+	+	+	+
Ethanol							
Alkaoid	+	+	-	-	-	-	-
Flavonoid	+	+	-	+	-	+	+
Terpenoid	+	-	+	+	+	+	+
Triterpenoid	+	+	+	+	+	+	+
D.W.							
Alkaoid	-	-	-	-	-	-	-
Flavonoid	+	+	-	+	-	-	-
Terpenoid	-	-	-	+	-	+	+
Triterpenoid	-	-	-	-	-	+	+

Conclusion

The phytochemical analysis of the selected fungal species (*Phellinus torulosus, Phellinus rimosus, Ganoderma lucidum, Microporous xanthopus, Hexagoniatinius, Lenzitebetulina, and Schizophyllum commune*) revealed the presence of bioactive compounds such as alkaloids, flavonoids, terpenoids, and triterpenoids. The results varied depending on the solvent used (methanol, acetone, ethyl acetate, ethanol, and distilled water), with methanol and acetone being the most effective solvents for extracting these phytoconstituents. The presence of these compounds suggests that these fungal species have potential medicinal and therapeutic applications, warranting further investigation.

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