

Exploring The Potential of Mushrooms as A Natural Cure for Hepatitis

Aditya^{1*}, Neeraj^{2*}, J.N. Bhatia³

^{1,2}Department of Agriculture and Environmental Sciences, National Institute of Food Technology Entrepreneurship and Management, Kundli-131028 (NIFTEM-K), Sonapat, Haryana (*An Institute of National Importance of India*).

³Retired Professor (Plant Pathology), CCS HAU, Hisar, Haryana.

*Address all correspondence to: Department of Agriculture and Environmental Sciences, National Institute of Food Technology Entrepreneurship and Management, Kundli 131028, Haryana, India (*An Institute of National Importance of India*); adityabhatia29@gmail.com
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Introduction

Hepatitis, which is liver inflammation, presents a considerable health concern on a global scale, often necessitating treatment with medications that may carry adverse effects. This has stimulated the exploration of alternative therapeutic avenues. In recent years, mushrooms have emerged as a subject of interest due to their perceived health-promoting properties, particularly in supporting liver function. This article aims to delve into the potential of mushrooms as a treatment option for hepatitis, shedding light on their medicinal attributes and plausible therapeutic uses. This article highlights the potential of mushrooms to provide a natural and potentially safer method for managing hepatitis. By knowing about the various mycochemical compounds found in mushrooms and their proven ability to protect the liver, the aim is to understand how mushrooms work and establish their role in treating hepatitis. This offers hope for better patient outcomes and reduced dependence on conventional medications that may have side effects.

Understanding hepatitis

Hepatitis, whether viral or non-viral in origin, can lead to liver damage and compromise overall health. Viral hepatitis, including hepatitis B and C, affects millions of people worldwide and can progress to chronic liver disease, cirrhosis, or even liver cancer if left untreated. Hepatitis involves inflammation of the liver, triggered by various factors such as viral infections, autoimmune diseases, toxins or excessive alcohol consumption (Divya *et al.*, 2021). This inflammation leads to damage to liver cells, impairing their function and compromising the liver ability to metabolize nutrients, filter toxins and produce essential proteins. In severe cases, hepatocytes may undergo necrosis or apoptosis, contributing to liver tissue destruction. Chronic hepatitis, particularly hepatitis B and C, can progress to fibrosis and cirrhosis, further impairing liver function and increasing the risk of complications such as liver failure and cancer. The immune response plays a crucial role in clearing the virus in viral hepatitis but can also contribute to ongoing inflammation and liver damage (Gao *et al.*, 2002). Early detection,

appropriate medical intervention and lifestyle changes are essential for managing hepatitis and preventing long-term complications. Conventional treatments often involve antiviral medications, which may come with adverse effects and are not accessible to everyone. Thus, the exploration of natural remedies such as mushrooms presents a compelling avenue for research and potential treatment options.

- There are several types of hepatitis, each caused by different viruses and presenting with varying severity and modes of transmission:
 1. **Hepatitis A:** This type is caused by the hepatitis A virus (HAV) and is usually transmitted through ingestion of contaminated food or water. Hepatitis A typically resolves on its own and does not lead to chronic liver disease.
 2. **Hepatitis B:** Caused by the hepatitis B virus (HBV), hepatitis B can be transmitted through contact with infected blood, unprotected sex or from mother to child during childbirth. Chronic hepatitis B infection can lead to serious liver complications such as cirrhosis and liver cancer (Divya *et al.*, 2021).
 3. **Hepatitis C:** Hepatitis C is caused by the hepatitis C virus (HCV) and is usually spread through contact with infected blood. Chronic hepatitis C infection can lead to liver damage over time and increase the risk of liver cancer and cirrhosis.
 4. **Hepatitis D:** Also known as delta hepatitis, hepatitis D is caused by the hepatitis D virus (HDV). It only occurs in individuals who are already infected with hepatitis B, as HDV can only replicate in the presence of HBV. Hepatitis D can lead to more severe liver damage than hepatitis B alone.
 5. **Hepatitis E:** Caused by the hepatitis E virus (HEV), hepatitis E is typically transmitted through ingestion of contaminated water. While hepatitis E is usually acute and resolves on its own, it can be particularly dangerous for pregnant women and individuals with pre-existing liver disease.
 6. **Hepatitis F and G:** These are lesser-known types of hepatitis. Hepatitis F was initially reported but later turned out to be a laboratory contamination and hepatitis G was identified but has not been definitively linked to any disease.

The medicinal properties of mushrooms:

Mushrooms have long been valued in traditional medicine systems for their medicinal properties. Rich in bioactive compounds such as polysaccharides, terpenoids, phenols and flavonoids, mushrooms exhibit various pharmacological effects, including antioxidant, anti-inflammatory, immunomodulatory and hepatoprotective properties. These bioactive compounds contribute to mushrooms ability to scavenge free radicals, reduce inflammation, modulate immune responses and protect liver cells from damage, making them potential candidates for treating hepatitis (Khatun *et al.*, 2012; Divya *et al.*, 2021).

Mushrooms targeting hepatitis:

Several species of mushrooms have shown promise in scientific studies for their hepatoprotective effects and potential in managing hepatitis. Among them, species like Reishi (*Ganoderma lucidum*), Turkey tail (*Trametes versicolor*), Maitake (*Grifola frondosa*), Shiitake (*Lentinula edodes*), Elm oyster (*Hypsizygus ulmarius*) and Cordyceps (*Cordyceps sinensis*) have been extensively studied for their therapeutic properties (Fig. 1.). These mushrooms contain bioactive compounds that inhibit viral replication, reduce liver inflammation, promote liver regeneration and enhance immune function, thereby addressing various aspects of hepatitis pathogenesis (Wasser, 2011; Raut, 2020).





Figure 1: Mushrooms that have demonstrated potential effects in protecting the liver and managing hepatitis.

Research evidence and clinical trials:

Numerous preclinical studies and clinical trials have investigated the efficacy of mushrooms in hepatitis management. For instance, research on reishi mushroom extract has demonstrated its antiviral activity against hepatitis B and C viruses, as well as its ability to reduce liver enzyme levels and improve liver function in hepatitis patients (Gao *et al.*, 2002). Similarly, turkey tail mushroom extract has shown promising results in clinical trials for its immunomodulatory effects and ability to enhance the efficacy of conventional hepatitis treatments (Wasser, 2011).

Mushrooms offer potential therapeutic benefits in the management of hepatitis through various mechanisms. These include their antioxidant properties, which can combat oxidative stress and protect liver cells from damage, along with their immunomodulatory effects that may enhance the body's ability to fight off infections (Aditya *et al.*, 2024a; Aditya *et al.*, 2024b). While direct antiviral activity against hepatitis viruses remains unclear, certain mushrooms exhibit antiviral effects against other viruses. Additionally, mushrooms containing anti-inflammatory compounds can alleviate liver inflammation, while those supporting liver detoxification processes aid in toxin elimination (Aditya *et al.*, 2022; Aditya *et al.*, 2023). Furthermore, modulation of liver enzymes and promotion of beneficial gut bacteria by mushrooms contribute to overall liver health (Raut, 2020; Aditya and Jarial, 2023).

Challenges and future directions:

Despite the fact that research on the therapeutic use of mushrooms for the treatment of hepatitis shows promise, there are still significant challenges to be overcome in order to fully unravel their mechanisms of action and maximise their therapeutic efficacy. For the purpose of determining whether or not therapies derived from mushrooms are safe and effective, it is absolutely necessary to develop standardised extraction methods, dosage protocols and rigorous clinical trials. In addition, there is an urgent requirement for ongoing research into the synergistic potentials of combining different species of mushrooms or integrating them with conventional treatments in order to improve the results of therapeutic interventions.

Conclusion:

Mushrooms have garnered significant interest as a potential source of natural remedies for hepatitis due to their rich composition of bioactive compounds and proven hepatoprotective qualities. Their diverse array of compounds, including antioxidants, immunomodulators, anti-inflammatory agents and liver-detoxifying substances, provide a multifaceted approach to supporting liver health. These properties make mushrooms a promising avenue for the development of alternative and complementary therapies for managing hepatitis. However, further research is crucial to fully understand and harness the therapeutic potential of mushrooms in hepatitis treatment. By continuing to explore their mechanisms of action and conducting clinical trials, ongoing research globally can unlock the comprehensive benefits of mushrooms and ultimately translate these findings into effective treatments for individuals affected by hepatitis worldwide. The ongoing research studies underscore the importance of investing in mushroom research as part of the broader effort to address the global burden of hepatitis.

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