

Project title: Chemical examination and value addition of edible mushroom *Astraeus hygrometricus*

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Year of Project duration: 2016-2019

Funding agency's full name : Indian Council of Forestry Research & Education, Dehradun.

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**Overview of project :** Mushrooms, one of the non wood forest products, hold potential for poverty alleviation and food security. *Astraeus hygrometricus* (AH), commonly known as 'Earth Star' 'Rugra', 'Matitara', or 'Phutphut', is one of the edible mushrooms growing wild in the forests of Jharkhand, West Bengal, Odisha, Madhya Pradesh and Uttarakhand. The project aimed to enhance AH's utility by studying its chemical and nutritional composition. Research unveiled AH's nutritional and therapeutic benefits, but its limited shelf life hinders marketability. Therefore, a canning method for preserving quality of its fruit bodies for 360 days was also developed. This method proved simple, economical, and suitable for local adoption, boosting income opportunities for tribal communities. AH's nutritional and medicinal attributes position it as a promising nutraceuticals in contributing to livelihoods and human health.

**Objectives :** To carry out chemical examination of wild grown edible mushroom *Astraeus hygrometricus* to determine its nutritional and chemical composition. Efforts for its value addition will also be made.

**Significant findings / outcome** The nutritional profile of *Astraeus hygrometricus* fruit bodies, including moisture, carbohydrates, protein, fat, fibers, ash, pro vitamin D2, digestibility, energy values, fatty acids, and minerals, was analyzed. Various taste components, amino acids, and nucleotides were identified. GC-MS and LC-MS analyses identified 36 chemical constituents in the extracts. The polysaccharide's molecular structure was determined. Canning of the fruit bodies in 20% brine with 0.1% citric acid extended shelf life to 360 days without compromising their quality.

**Conclusion :** The comprehensive analysis of *Astraeus hygrometricus* fruit bodies provided valuable insights into their nutritional, chemical, and taste attributes. The identification of numerous chemical constituents, including sterols, triterpenoids, and fatty acids, enriched our understanding. The established preservation method enhances shelf life of the fruit bodies, promoting their utilization and marketability. Overall, this study contributes significantly to advancing scientific knowledge and promoting the use of wild edible mushrooms.

**Extension aspect / Practical utility of the findings :** The project's findings have broad practical implications for diverse stakeholders, from researchers to entrepreneurs, NGOs, and local communities involved in harvesting *Astraeus hygrometricus*. Entrepreneurs can leverage the results for value-added products like dietary supplements, antioxidants, mushroom extracts, and more. The insights into flavor, nutrition, and chemistry benefit culinary, pharmaceutical, and scientific communities. The data supports further research, fostering collaboration between scientists and SFDs for sustainable cultivation of the mushroom. Educational materials can popularize the mushroom's benefits, aiding the mushroom value chain and promoting health awareness through various channels.

Any 01 or 02 Images /Graphics (jpeg/png) of the research project  
( note : a single image / graphics can be designed to communicate the overall message of the research finding)



**Edible fruit bodies**



**Local communities gather young forest fruit bodies, contributing to their income through sales in the local market.**

***Astraeus hygrometricus***