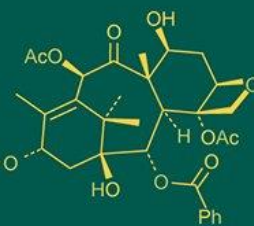
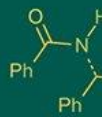


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2026): 5.29
IJABR 2026; SP-10(1): 1316-1320
www.biochemjournal.com
Received: 27-11-2025
Accepted: 30-12-2025

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Mushroom cultivation in Chhattisgarh: Present status, production potential, livelihood opportunities and future prospects: A review

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DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i1p.9367>

Abstract

Mushroom cultivation has emerged as an important enterprise for agricultural diversification, nutritional security, employment generation and utilization of agricultural residues in India. Chhattisgarh has considerable potential for mushroom production because of the availability of paddy straw, suitable seasonal climatic conditions, a large rural and tribal population, and increasing interest in low-investment agricultural enterprises. Paddy is the dominant crop in the state, generating substantial quantities of straw that can serve as a substrate for the cultivation of oyster and paddy straw mushrooms. Among cultivated mushrooms, oyster mushroom (*Pleurotus* spp.) is particularly suitable for small and marginal farmers because of its comparatively simple production technology, short production cycle and ability to grow on locally available lignocellulosic residues. Paddy straw mushroom (*Volvariella volvacea*) and milky mushroom (*Calocybe indica*) also have potential under warm climatic conditions, whereas button mushroom (*Agaricus bisporus*) can be commercially produced during favourable winter conditions or under controlled environments.

Research and extension programmes undertaken by Indira Gandhi Krishi Vishwavidyalaya (IGKV), Krishi Vigyan Kendras and ICAR institutions have contributed to the dissemination of mushroom production technology in Chhattisgarh. Demonstrations among tribal communities have shown the potential of oyster mushroom cultivation to utilize paddy straw and generate supplementary livelihood opportunities. However, constraints such as limited availability of quality spawn, inadequate technical knowledge, contamination, short shelf life, weak market linkages, insufficient processing facilities and seasonal production continue to restrict expansion. The present review examines the status and scope of mushroom cultivation in Chhattisgarh, suitable species, production technologies, utilization of agricultural residues, socio-economic significance, role of women and self-help groups, major constraints, value addition opportunities and strategies for future development. Strengthening spawn production, farmer training, cluster-based production, cold-chain infrastructure, processing and organized marketing could transform mushroom cultivation into a significant rural enterprise in Chhattisgarh.

Keywords: Mushroom cultivation, Chhattisgarh, oyster mushroom, paddy straw, tribal farmers, livelihood, value addition, agricultural waste

1. Introduction

Mushrooms are edible macrofungi valued for their nutritional, medicinal and economic importance. Commercial mushroom production represents an efficient biological system in which agricultural residues can be converted into nutritious food and valuable organic manure. Unlike conventional field crops, mushroom cultivation requires relatively little land and can therefore be adopted by landless households, small farmers, rural youth and women. The mushroom industry in India has gradually diversified from predominantly seasonal button mushroom production to the cultivation of oyster, milky, paddy straw and other specialty mushrooms. Recent Indian research emphasizes the potential for further expansion through improved production technologies, diversification of cultivated species, processing and development of organized markets.

Chhattisgarh is particularly suitable for the promotion of mushroom-based enterprises. Agriculture in the state produces large quantities of crop residues, especially paddy straw. Instead of considering this biomass merely as agricultural waste, it can be used as a substrate for mushroom cultivation.

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Another important characteristic of Chhattisgarh is the presence of a substantial rural and tribal population. Small-scale mushroom units require comparatively limited land and can be established near households. Consequently, mushroom cultivation can complement existing agricultural activities without requiring major changes in the farming system.

Research and demonstrations conducted in Chhattisgarh provide evidence for this potential. Under the Farmer FIRST Programme, oyster mushroom production units were introduced among tribal households in Kasdol block. Farmers received hands-on production training with technical support involving IGKV, Raipur, and locally available paddy straw was utilized as the growing substrate. Thus, mushroom production in Chhattisgarh should be viewed not only as a horticultural activity but also as a component of agricultural diversification, waste recycling, entrepreneurship, women empowerment and rural livelihood development.

2. Importance of Mushroom Cultivation in Chhattisgarh

The significance of mushroom cultivation in Chhattisgarh can be understood from agricultural, nutritional, environmental and socio-economic perspectives.

2.1 Availability of Paddy Straw

Chhattisgarh is widely associated with paddy-based farming systems. After harvesting and threshing, considerable quantities of straw become available. Paddy straw is an important substrate for several cultivated mushroom species, particularly oyster mushroom and paddy straw mushroom.

The utilization of straw for mushroom production creates an opportunity to convert a relatively low-value crop residue into a higher-value food commodity. The spent substrate remaining after mushroom production can subsequently be composted and utilized as organic manure.

The Farmer FIRST experience in Kasdol demonstrated this principle by utilizing post-harvest paddy straw for oyster mushroom production among resource-poor tribal farmers.

Mushroom	Scientific name	General suitability
Oyster mushroom	<i>Pleurotus</i> spp.	Highly suitable for low-cost cultivation
Paddy straw mushroom	<i>Volvariella volvacea</i>	Suitable for warm and humid periods
Milky mushroom	<i>Calocybe indica</i>	Suitable for relatively high temperatures
Button mushroom	<i>Agaricus bisporus</i>	Winter/controlled production
Specialty mushrooms	Various species	Future commercial potential

3.1 Oyster Mushroom

Oyster mushroom is among the most appropriate mushrooms for promotion in Chhattisgarh. Species of *Pleurotus* can utilize a range of lignocellulosic agricultural wastes.

Major advantages include simple cultivation technology, relatively low initial investment, short production duration, suitability for small-scale enterprises and compatibility with paddy straw.

Research conducted in Raipur and Dhamtari districts has also examined adoption of oyster mushroom production technology. A 2023 study involving stakeholders in Chhattisgarh used the ADOPT framework to evaluate likely adoption of oyster mushroom production as a livelihood activity.

2.2 Low Land Requirement

Mushroom production differs fundamentally from conventional agriculture because mushrooms can be grown vertically in racks, bags or beds inside simple production structures. This characteristic is important for small and marginal farmers.

A small room or low-cost shed can accommodate a substantial number of production bags. Consequently, mushroom cultivation offers an enterprise opportunity even where agricultural land availability is limited.

2.3 Employment Generation

Mushroom enterprises generate employment through several activities, including:

1. Collection and preparation of substrate;
2. Spawn production and distribution;
3. Bag preparation and spawning;
4. Crop management;
5. Harvesting and grading;
6. Packaging and transportation;
7. Drying and processing; and
8. Marketing of fresh and processed products.

The enterprise is therefore suitable for rural youth, women, self-help groups, farmer producer organizations and small entrepreneurs.

2.4 Nutritional Importance

Edible mushrooms are generally recognized as nutritious foods containing useful quantities of protein, dietary fibre, minerals and vitamins while being relatively low in fat. Their incorporation into household diets can therefore contribute to dietary diversification.

For rural communities, a decentralized mushroom production system can simultaneously generate income and provide nutritious food at the household level.

3. Major Mushroom Species Suitable for Chhattisgarh

The climatic diversity of Chhattisgarh provides opportunities for cultivation of different mushroom species at different times of the year.

3.2 Paddy Straw Mushroom

Paddy straw mushroom (*Volvariella volvacea*) is another promising species because it grows under relatively warm and humid conditions and utilizes paddy straw.

Its cultivation can potentially be promoted during warmer periods when climatic conditions are less favourable for some oyster mushroom strains.

However, its relatively short shelf life requires rapid marketing, local consumption or development of suitable processing and preservation systems.

3.3 Milky Mushroom

Milky mushroom (*Calocybe indica*) has considerable potential for diversification of mushroom production in warmer regions. It is adapted to relatively high-temperature conditions compared with button mushroom.

The introduction of milky mushroom can help extend the mushroom production calendar beyond the cooler months. Development of locally adapted strains and standardized production packages would further improve its prospects in Chhattisgarh.

3.4 Button Mushroom

Button mushroom (*Agaricus bisporus*) is commercially important but requires more sophisticated management than low-cost oyster mushroom production. Compost preparation, casing and environmental management are critical components.

Research at IGKV has specifically examined the possibilities of button mushroom cultivation in Chhattisgarh. A 2020 investigation documented commercial button mushroom systems in the state and reported the presence of automated production units in Raipur and Durg districts, demonstrating that commercial-scale production is technically possible where suitable infrastructure is available.

Button mushroom therefore offers opportunities for larger commercial enterprises, whereas oyster mushroom may be more accessible to resource-limited rural households.

4. General Oyster Mushroom Production Technology

Oyster mushroom cultivation can be promoted as a low-cost technology using locally available paddy straw.

4.1 Substrate Selection

Good-quality, dry and disease-free paddy straw should be selected. Straw should not contain excessive moisture or visible fungal contamination.

Other agricultural residues may also be evaluated depending on local availability.

4.2 Substrate Preparation

The straw is generally chopped into manageable pieces and subjected to appropriate soaking and pasteurization or other recommended treatment.

The objective is to provide sufficient moisture while reducing competing microorganisms.

4.3 Spawning

After treatment and removal of excess water, the substrate is inoculated with good-quality mushroom spawn.

Spawn quality is one of the most important factors determining successful production. Contaminated or old spawn can substantially reduce yield.

4.4 Bag Filling

The spawned substrate is packed in suitable cultivation bags. Bags can then be placed or hung inside a clean production room.

4.5 Spawn Run

During this stage, mushroom mycelium colonizes the substrate. Appropriate temperature, humidity, cleanliness and ventilation should be maintained according to the cultivated species or strain.

4.6 Fruiting

After successful colonization, suitable environmental conditions are provided for fruiting body formation.

Adequate relative humidity and fresh-air exchange are particularly important.

4.7 Harvesting

Mushroom clusters should be harvested at the appropriate maturity stage. Timely harvesting helps maintain quality and marketability.

5. Mushroom Cultivation as a Tribal Livelihood Enterprise

Mushroom production has particular relevance for tribal and resource-poor households in Chhattisgarh because it can utilize locally available resources without requiring large land holdings.

The Farmer FIRST Programme experience in Kasdol is an important example. Four model mushroom production units were introduced among tribal communities to support farm women and rural youth. Hands-on training was provided, and paddy straw available after crop harvest was used as the substrate.

Such models have several advantages:

- Utilization of locally available biomass;
- Supplementary household income;
- Employment during relatively less busy agricultural periods;
- Involvement of women and youth;
- Improvement in household nutritional diversity; and
- Development of micro-enterprises.

Therefore, mushroom cultivation can be integrated with tribal livelihood programmes rather than promoted solely as an isolated commercial crop.

6. Role of Women and Self-Help Groups

Mushroom cultivation is particularly appropriate for women-led enterprises because many production activities can be performed close to the household.

Women can participate in substrate preparation, spawning, bag management, harvesting, drying, packaging, processing and direct marketing.

A group-based model can further reduce individual risks. Self-help groups can collectively purchase spawn and packaging material, establish common production rooms and coordinate marketing.

An SHG-based mushroom cluster may include

Spawn supplier → SHG production units → collection centre → grading/packaging → local retail/institutional buyers → consumers

The development of such clusters could improve consistency of supply and strengthen farmers' bargaining capacity.

7. Environmental Importance and Agricultural Waste Management

One of the strongest arguments for mushroom cultivation is its role in circular agriculture.

Paddy crop → Paddy straw → Mushroom substrate → Mushroom production → Spent mushroom substrate → Compost/vermicompost → Crop production

This cycle enables agricultural biomass to be reused instead of wasted.

The Chhattisgarh Farmer FIRST experience specifically highlighted the use of paddy straw remaining after harvest for mushroom cultivation.

Spent mushroom substrate can be further explored for composting, vermicomposting and other agricultural applications, creating an integrated zero-or low-waste production system.

8. Economics and Entrepreneurship Potential

The profitability of mushroom cultivation depends on species, substrate costs, spawn price, yield, labour, infrastructure, market price, spoilage and marketing channels.

Low-cost oyster mushroom cultivation is particularly attractive because the principal substrate—paddy straw—is locally available in many farming areas.

Commercial success, however, should not be assessed only on production cost. Fresh mushrooms are perishable commodities. A grower producing high yields may still face losses if the crop cannot be sold immediately.

Therefore, a successful enterprise requires simultaneous planning of:

Production + Harvesting + Packaging + Processing + Marketing

Value addition can reduce dependence on fresh mushroom sales.

Potential products include dried mushroom, mushroom powder, soup mixes, pickle, ready-to-cook products and other processed foods subject to applicable food-safety requirements.

9. Institutional Support in Chhattisgarh

Institutional support is essential for the development of the mushroom sector.

9.1 Indira Gandhi Krishi Vishwavidyalaya

IGKV, Raipur has played an important role in mushroom research, training and technology development. Research associated with the university has addressed oyster mushroom adoption as well as possibilities for button mushroom cultivation in Chhattisgarh.

9.2 ICAR Institutions

ICAR institutions can contribute through research, demonstration, farmer training, entrepreneurship development and scientific validation of mushroom technologies.

The ICAR-National Institute of Biotic Stress Management, Raipur, has been involved in the Farmer FIRST mushroom initiative among tribal communities in Chhattisgarh.

9.3 Krishi Vigyan Kendras

KVKs can act as district-level centres for:

Farmer training, demonstrations, spawn-related technical guidance, entrepreneurship development, exposure visits and advisory services.

A coordinated network linking universities, ICAR institutions, KVKs, horticulture departments, SHGs and FPOs could accelerate technology dissemination.

10. Major Constraints in Mushroom Production

Despite its potential, mushroom cultivation in Chhattisgarh faces several constraints.

10.1 Quality Spawn Availability

Timely access to fresh and contamination-free spawn is essential. Expansion of production requires a reliable spawn supply network.

10.2 Technical Knowledge

Mushroom production is highly sensitive to hygiene, moisture, temperature, ventilation and contamination. Inadequate technical knowledge can result in crop failure.

10.3 Contamination

Poor sanitation during substrate treatment, spawning or crop management can encourage competing moulds and other contaminants.

10.4 Temperature Management

Climatic conditions vary considerably throughout the year. Selection of species and strains according to seasonal temperature is therefore necessary.

10.5 Short Shelf Life

Fresh mushrooms are highly perishable. Delays between harvest and marketing can result in deterioration and financial losses.

10.6 Weak Organized Marketing

Expansion of production without corresponding market development may create oversupply in localized areas.

Market assessment should therefore precede large-scale commercial expansion.

10.7 Lack of Processing Infrastructure

Drying and processing facilities can substantially increase shelf life. However, small producers may not individually have the capital or equipment required.

Common processing facilities operated by SHGs, FPOs or clusters could address this problem.

11. Value Addition and Marketing Opportunities

Value addition represents one of the most important future areas for Chhattisgarh's mushroom sector.

Instead of selling the entire crop fresh, surplus mushrooms can be processed into shelf-stable products.

Potential value-added products include:

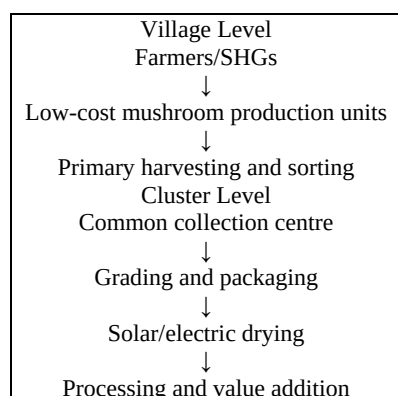
- Dehydrated mushroom;
- Mushroom powder;
- Mushroom soup powder;
- Mushroom pickle;
- Mushroom seasoning;
- Ready-to-cook mushroom products;
- Mushroom-based snacks; and
- Other formulated foods.

Local marketing can be developed through vegetable markets, supermarkets, hotels, restaurants, hostels, institutional kitchens and direct consumer networks.

Branding products produced by women's SHGs or tribal producer groups could provide an additional market identity.

12. Proposed Mushroom Development Model for Chhattisgarh

A cluster approach could be particularly effective.



Market Level

Local market + Raipur/Bilaspur/Durg-Bhilai markets + hotels/restaurants + institutional buyers + organized retail
The model can be supported by a centralized spawn laboratory and technical advisory system.

13. Research Priorities

Future mushroom research in Chhattisgarh should focus on:

1. Identification of high-yielding oyster mushroom strains suitable for local climatic conditions.
2. Standardization of seasonal production calendars.
3. Evaluation of locally available agricultural and forest residues as substrates.
4. Improvement of biological efficiency and product quality.
5. Low-cost temperature and humidity management systems.
6. Development of improved preservation and drying technologies.
7. Studies on spent mushroom substrate utilization.
8. Economic evaluation of SHG and FPO-based mushroom enterprises.
9. Consumer preference and market-demand studies.
10. Development of value-added mushroom products.
11. Strengthening decentralized spawn production.
12. Assessment of milky and paddy straw mushrooms for warm-season production.
13. Evaluation of protected and climate-controlled button mushroom production.
14. Digital advisory systems for disease and contamination management.
15. Development of mushroom-based integrated livelihood models for tribal regions.

14. Future Prospects

The future of mushroom production in Chhattisgarh depends on shifting from isolated production demonstrations to an integrated value-chain approach.

The state has three important advantages: abundant agricultural biomass, availability of rural labour and institutional expertise in agricultural research and extension. Oyster mushroom can continue to serve as an entry-level enterprise for small farmers and SHGs. Paddy straw and milky mushrooms can help diversify warm-season production, whereas button mushroom has potential for organized commercial enterprises equipped with environmental-control infrastructure.

Further expansion should focus on district-level production clusters supported by reliable spawn laboratories, trained entrepreneurs, common processing facilities and established markets.

Research in Raipur and Dhamtari indicates continued interest in understanding and promoting adoption of oyster mushroom technology, while IGKV research on button mushroom demonstrates the feasibility of more intensive production systems in the state.

A particularly promising direction is the development of "Paddy-Mushroom-Organic Manure" integrated farming models, where paddy straw is converted into mushrooms and the spent substrate is returned to agricultural production as organic material.

15. Conclusion

Mushroom cultivation has substantial potential to contribute to agricultural diversification, rural employment, nutritional security and sustainable utilization of crop residues in Chhattisgarh. The state's paddy-based agricultural economy provides abundant straw that can be converted into valuable mushroom products.

Oyster mushroom is especially promising for small farmers, women, SHGs, rural youth and tribal communities because of its relatively simple cultivation technology and compatibility with locally available paddy straw. Paddy straw and milky mushrooms offer possibilities for production during warmer periods, whereas button mushroom represents an opportunity for organized and technologically advanced enterprises.

Evidence from tribal livelihood demonstrations in Chhattisgarh indicates that mushroom production can successfully integrate agricultural waste utilization with supplementary income generation.

However, future development requires more than production training. Reliable spawn availability, technical support, contamination management, processing, cold-chain facilities, value addition and organized marketing must be developed simultaneously.

A coordinated strategy involving IGKV, ICAR institutes, KVKs, government departments, FPOs, SHGs and private entrepreneurs could establish mushroom cultivation as a significant component of sustainable rural development in Chhattisgarh.

References

1. Mooventhan P, Kumar J, Dixit A, Sharma KC, Sivalingam N, Gupta AK, *et al.* Oyster mushroom cultivation for resource poor tribal farmers. *Indian Hortic.* 2019;64(3):27-31.
2. Verma HP, Mooventhan P, Pandey PK. Farmers' uptake of oyster mushroom production through ADOPT model. *Indian Res J Ext Educ.* 2023;23(2):36-41.
3. Patle B. Exploring Possibilities of Button Mushroom Cultivation in Chhattisgarh [thesis]. Raipur (India): Indira Gandhi Krishi Vishwavidyalaya; 2020.
4. Verma HP, Sukdeve EK, Khaparde R. The effect of population level and technology toward the oyster mushroom production. *Asian J Agric Ext Econ Sociol.* 2023;41(9):389-397.
5. Thakur MP, Singh HK, Shukla CS. Current status and future prospects of mushroom cultivation and research in India: A review. *CABI Agric Biosci.* 2025;6:1-18.