



PREVALENCE OF COMPETITOR MOULDS AND DISEASES IN STRAW MUSHROOM (*Volvariella volvacea*) BEDS AND THEIR MANAGEMENT



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ABSTRACT

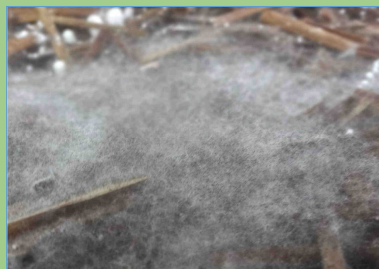
Odisha is the leading state in terms of straw mushroom production in India. However, a number of competitor moulds infest the beds at different stages of crop growth and bring down the productivity substantially. *Coprinus* spp., *Aspergillus* spp. and *Rhizopus* sp. are frequently encountered in mushroom beds both during summer and kharif seasons inhibiting the growth of *V. volvacea*. Bacterial button rot disease caused by *Pseudomonas* spp. is an emerging problem in the hot and humid coastal belt. Data from a comprehensive survey conducted in the leading mushroom growing districts of Khurda and Puri at 10 locations both in outdoor and indoor conditions revealed as many as eight competitor moulds contaminating the straw mushroom beds during the fruiting stage. *Coprinus* spp. was predominant of all in both outdoor and indoor farming situations. However, outdoor farming recorded more bed contamination (46.8 %) compared to the indoor one (27 %). Bacterial button rot disease was recorded to the tune of 9 and 13 % in outdoor and indoor situations respectively. Pre-soaking of the substrate with 2 % calcium carbonate solution for six hours was significantly superior among the treatments in giving a yield of 1016.67 g/bed with a corresponding biological efficiency of 14.52 %. Application of 4 % tamarind leaf extract was next in order in respect of yield (946.67 g/bed) and biological efficiency (13.52 %). Further, the intensity of *Coprinus* spp. was found to be low in the above mentioned treatments as compared to the untreated control.

INTRODUCTION

- ❖ *Volvariella volvacea*, commonly known as the straw mushroom is the most popular edible mushroom of Odisha with the annual production of 8,129 tonnes.
- ❖ It is largely cultivated outdoor as an intercrop in coconut plantations in the coastal ecosystem following conventional production technology with low biological efficiency (10 %).
- ❖ The mushroom beds are subjected to a number of destructive competitor moulds namely *Coprinus* spp., *Aspergillus* spp., *Penicillium* spp., *Rhizopus oryzae*, *Sclerotium rolfsii* and *Trichoderma harzianum* with substantial crop yield loss (38 %).
- ❖ Keeping in view the loss caused by the competitor moulds, an experiment was designed to evaluate the performance of few physico-chemical methods along with phyto-extract against the above mentioned contaminants.

MATERIALS AND METHODS

- ❖ An exhaustive survey was conducted in the leading mushroom growing districts of Khurda and Puri at 10 locations, both in indoor and outdoor situations to observe and record the contamination of straw mushroom beds with competitor moulds.
- ❖ Further, an experiment was laid out with 10 treatments including the untreated control with six replications. Cuboidal beds were raised using standard procedures. Treatments were imposed either during soaking of the substrate or after raising of beds and observations were recorded on incidence of competitor moulds and mushroom yield.



CONCLUSION

- ❖ Pre-soaking of the straw with calcium carbonate (2 %) for a period of six hours proved to be useful in suppression of contaminating moulds as well as improvement of yield standards.
- ❖ Application of phytoextract (Tamarind leaf extract @ 4 %) was also proved to be beneficial in yield enhancement of straw mushroom.

EXPERIMENTAL RESULTS

- ❖ The survey revealed as many as eight competitor moulds contaminating the straw mushroom beds during the fruiting stage. *Coprinus* sp. was predominant of all in both outdoor and indoor farming situations (Table 1).

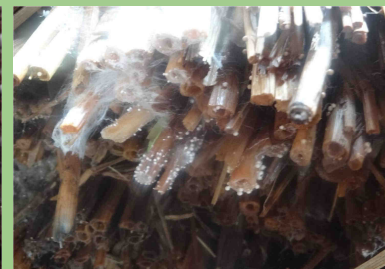
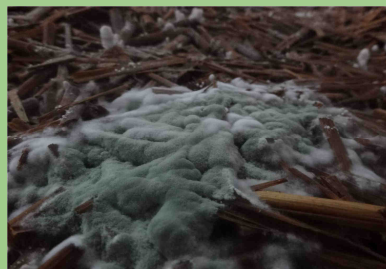
Table 1. Prevalence of competitor moulds and diseases in straw mushroom beds

Sl. No.	Competitor moulds/ disease	Per cent incidence (Indoor)	Per cent incidence (outdoor)	Mean per cent incidence
1	Aspergillus flavus	6.00	11.00	8.50
2	A. Niger	13.90	17.80	15.85
3	Coprinus spp.	27.00	46.80	36.90
4	Mucor sp.	2.90	2.00	2.45
5	Penicillium spp.	6.60	12.00	9.30
6	Rhizopus oryzae	11.70	8.00	9.85
7	Sclerotium rolfsii	12.00	16.00	14.00
8	Trichoderma sp.	5.80	5.00	5.40
9	Bacterial button rot (Pseudomonas spp.)	13.00	9.00	11.00
	Mean	10.98	14.17	12.58

- ❖ Pre-soaking of substrate with 2 % calcium carbonate solution for six hours was significantly superior among the treatments having given a biological efficiency of 14.52 %. Application of 4 % tamarind leaf extract was next in order with biological efficiency of 13.52 % (Table 2). The intensity of *Coprinus* was low in the aforesaid treatments in comparison to untreated control.

Table 2. Effect of different physical, chemical and biological agents on the incidence of *Coprinus* and yield of *Volvariella volvacea*

Sl. No.	Treatment	Days to pin head emergence	Days to first harvest	Weight of fruit bodies kg/100 kg substrate	Intensity of Coprinus
1	Control	8.00	13.00	9.00 (-)	+++
2	Benomyl (0.2 %)	10.00	15.00	10.38(+15.34)	+
3	Bleaching powder (0.02 %)	10.00	15.00	9.10(+1.11)	++
4	Streptocycline (0.01 %)	8.00	13.00	11.71(+30.15)	++
5	Benomyl (0.2 %) + Streptocycline (0.01 %)	9.00	15.00	13.47(49.73)	+
6	Benomyl (0.2 %) + Bleaching powder (0.02 %)	9.00	14.33	10.61(17.98)	+
7	Calcium carbonate (2.0 %)	9.000	13.66	14.52(61.37)	+
8	Formalin (500 ppm) + Bavistin (37.5 ppm)	10.00	15.00	9.28(3.17)	+
9	Boiled water (70-80°C)	7.00	13.00	11.28(25.39)	+
10	Tamarind leaf extract (4 %)	8.00	14.00	13.52(50.26)	+
	C.D. (0.05)	0.85	NS	-	-
	C.V. (%)	5.22	7.76	-	-



REFERENCES

- Mohapatra, K.B., Behera, B., Panda, S. and Dhal, N.K. 2007. Management of competitor fungi in paddy straw mushroom. Proceedings of National Symposium on Sustainable Pest Management for Safer Environment, 6-7 December, 2007, OUAT, Bhubaneswar, pp.122-123.
- Thakur, M.P. and Mohapatra, K.B. 2013. Tropical Mushroom: Present Status, Constraints and Success Story. Proceedings of Indian Mushroom Conference, 16-17 April, 2013, PAU, Ludhiana, pp.42-43.