

Fungal Diseases Associated with Mushroom Cultivation

Gurvinder Kaur¹ and Shweta Sharma²

¹School of Agricultural Sciences and Technology, RIMT University, Mandi Gobindgarh, Punjab

² Research Associate, ICAR- Directorate of Mushroom Research, Chhabaghat, Solan, Himachal Pradesh

SUMMARY

Button mushroom is an important edible fungus and widely cultivated in North India. It is often encountered by fungal diseases causing micro-organisms, including bacteria and viruses. Some of them cause huge losses by reducing the yield significantly or result in serious crop failures, depending upon the severity and stage of appearance.

INTRODUCTION

Mushrooms are globally cultivated and consumed. A consumer-driven shift is claiming for healthier products with an environmentally respectful background to cut down dependence on chemical fungicides. Mushrooms are grown indoors under controlled environmental conditions that facilitate the implementation of integrated disease management, combining chemical fungicides, biocontrol agents and accurate agronomical management to prevent outbreaks and disease dispersion. The most serious disorder of mushroom cultivation are fungal diseases that adversely affects the yield and mushroom quality.

Fungal Diseases

Fungal diseases are a major threat in mushroom cultivation a high percentage of products are lost due to lower productivity, decrease in quality and shortened life span.

Dry bubble

Lecanicillium fungicola is a devastating pathogen in the mushroom industry, which causes significant losses in the commercial production of mushroom. This mold causes dry bubble disease in commercially cultivated mushroom. Two distinct symptom syndromes are observed on the development stage of the sporophores at the time of infection. Infection of sporophores at the pin or button stage resulted in the development of typical dry bubbles, amorphous masses of sporophore tissue. In contrast, mature sporophores showed cracking and curling of the tissues and depressed, brown, necrotic areas. In advanced stages, a gray web of mycelium and conidia frequently covered the surface of infected sporophores.

Green mold

The commercial production of oyster mushroom has been seriously affected by green mold epidemics. The causal agents of green mold disease of cultivated oyster mushroom are *Trichoderma* spp. Symptoms of disease detected in compost and casing surface have been describe extensive sporulating green patches covering the substrates and generating brown spotting on mushroom caps (Gea *et al.*, 2017). The emergence of *Trichoderma* on the compost could be due to contamination during spawning. *Trichoderma* grows well on carbohydrates, and in this sense, seed grain is an important source of food and is very vulnerable. Once installed on the compost, the pathogen is able to colonize large areas since it is favored by the distribution of the seed grains in the compost mass (Kosanovic *et al.*, 2020).

Cobweb

Cobweb is a fungal disease of commercially cultivated mushrooms. Several members of the ascomycete genus *Cladobotryum* sp. have been reported as causal agents. White button mushroom is the most frequently cited host, but a wide range of cultivated edible mushrooms suffer cobweb. In particular, *Cladobotryum* spp. causes two types of cap spotting on infected mushrooms, dark-brownish spotting with an ill-defined edge and grey-yellowish spotting (Grogan & Gaze, 2000). The spotting can even appear post-harvest, and therefore the sale of the product must be conditioned (Adie, 2000). Brown spots are generated when a single spore lands on the mushroom surface and germinates. These spots usually provoke depression of the cap tissue. From the localized spots a parasitic mycelium emerges that eventually engulfs the whole basidiome. The grey yellowish spotting is

due to the interaction between parasitic mycelium and the host basidiomes; spots progressively discolour the mushroom tissue, which succumbs to wet rot (Adie, 2000).

CONCLUSION

Careful controlled cultivation of edible mushrooms can often be affected by some bacterial, fungal and viral diseases causes dramatic yield loss. These infections are initiated by the particular conditions under which the mushroom is grow such as warm temperatures, high humidity and a low aeration rate. The unhygienic conditions of mush-room cultivation provide a congenial atmosphere for many diseases and pests. Therefore, a clean environment is essentially required for mushroom production. The important considerations include previously cleaned implements and maintaining overall hygiene.

REFERENCES

- Adie, B.A.T., Grogan, H., 2000. The liberation of cobweb (*Cladobotryum mycophilum*) conidia within a mushroom crop. Proc 15th Int Cong on the Science and Cultivation of Edible Fungi. Maastricht, Netherlands. pp: 595-600.
- Gea, F.J.; Navarro, M.J. 2017. Mushroom Diseases and Control. In Edible and Medicinal Mushrooms: Technology and Applications; Zied, D.C., Pardo-Gimenez, A., Eds.; John Wiley & Sons Ltd.: Chichester, UK. pp. 239–259.
- Grogan, H.M., Gaze, R.H., 2000. Fungicide resistance among *Cladobotryum* spp. – causal agents of cobweb disease of the edible mushroom *Agaricus bisporus*. *Mycol Res.* 104: 357-364.
- Kosanovic, D., Grogan, H., Kavanagh, K. 2020. Exposure of *Agaricus bisporus* to *Trichoderma aggressivum* f. *europaeum* leads to growth inhibition and induction of an oxidative stress response. *Fungal Biol.*124, 814–820.