Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 03, Issue: 05 (SEP-OCT, 2023)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Major Diseases of Mushroom

(*Rajendra Prasad Jat[1], Mukesh Kumar Poonia[2] and Sita Ram Bijarnia[2])
[1]Young Professional, DGR, RRS, Bikaner
[2]Ph.D. Scholar, Swami Keshwanand Rajasthan Agriculture University, Bikaner
*Corresponding Author's email: jakharrajendra461@gmail.com

Mushrooms have been used by humans for millennia. The 'mushroom' that first drew man's attention to fungi. As early as 5000 BC, man,' the hungry food creature,' soon discovered that these mushrooms were edible and human use of mushrooms. The commonly cultivated mushrooms include Agaricus, Lentinus, Flammulina, Pleurotus and Volvariella. The mushroom belongs to Basidiomycota division (Randive 2012). The mushroom is a saprophytic fungus that grows on dead and decaying organic matter. The mushroom as an excellent food source to alleviate malnutrition in developing countries due to their flavour, texture, nutritional value and high productivity per unit area. The demand for cultivating mushrooms is growing by the day, as people become more aware of its palatability and high nutritional worth. But diseases cause heavy losses in commercial mushroom farms worldwide. The output and productivity of commercial mushroom farming can be severely harmed by disease outbreaks. Intensive cultivation of edible mushrooms is commonly afflicted by fungal, bacterial, and viral infections which frequently result in significant production losses.

Major Diseases of Mushrooms

1. Fungal diseases:

a. Soft mildew or cobweb: Cladobotryum dendroides is an causal organism. Symptoms: Most common symptom includes the elongation of the stalk with a small, tilted cap (drumstick). Deterioration of the mycelium (die back) is common which increases with the time resulting in bare patches of the crop. Sometimes small brown mushrooms develop which often open prematurely. Affected fruiting bodies have a water-soaked appearance (watery stripe) which are found to be totally waterlogged when squeezed.

b. White plaster mould: Scopulariopsis fumaroles is a causal organism. Symptoms: Closely resembles brow plaster mould initially but later changes to pink shade. Too much water in the composting anaerobic peak heat leads to the growth of fungus.

c. Dry bubble Pathogen: Verticillium fungicola Common name: Verticillium disease, brown spot, fungus spot, dry bubble. Dry bubble is most common and serious fungal disease of mushroom crop. If it is left uncontrolled, disease can totally destroy a crop in 2-3 weeks. Symptoms: Muddy brown, often sunken spots on the cap of the mushrooms and greyish, white mouldy growth seen on cap, if infection takes place in an early stage, typical onion shaped mushrooms are produced, remain small. Later stage mushroom becomes dry.

d. Green Mould Pathogen: Trichoderma viride, T. hamatum, T. harzianum T. koningii, Penicillium cyclopium, Aspergillus spp. Common name: Trichoderma spot, Trichoderma blotch, Trichoderma mildew, Green mould One of the most common and destructive disease in mushroom cultivation is the green mould which induce significant quantitative and qualitative losses. Symptoms: Pure white growth of mycelium appear on casing surface or in

compost which resembles to mushroom mycelium. Later on mycelial mat turns to green colour because of heavy sporulation of causal agent which is a characteristic symptom of the disease.

e. Wet Bubble: The disease is caused by Mycogonenperniciosa. Symptoms: The disease is characterized by the development of white mycelial growth on fruiting bodies of button mushroom. It spreads and covers the entire cap. The sporophores are eventually reduced to a white, soft and foul smelling mass. The disease is also characterized by the development of distorted mass of mushroom tissues called as "sclerodamoid mass", which initially are white and fluffy but become brown with age and then decay. Sclerodamoid mass develops as a result of infection at pinhead stage. The characteristic symptom of the disease is also the presence of amber liquid droplets on the surface of distorted mushrooms (Munshi et al., 2010). The early development of the disease can also be attributed with the use of of infected casing soil or spawn (Fletcher et al., 1989).

f. False truffle disease: is caused by Pseudobalsamia microspora or Diehliomyces microspore. This disease is more prevalent in summer. Symptoms: The fruiting body of this fungus appears in mushroom beds as a round, cream-coloured, wrinkled and convoluted surface depicting brain-like appearance. The mushrooms in bed and top of casing soil are characteristically small (resembling fused pinheads). These bodies on maturity turn reddish brown and release spores. Lack of ventilation and high humidity are the main factors favouring the appearance of this disease. The only control measures are to minimize temperature fluctuations and provide adequate ventilation. The spawn run temperature and cropping bed temperature should not exceed 22°C. High humidity in mushroom houses should be avoided.

General Management Practices of Fungal Diseases

The best and common approaches to combat the diseases and environmental control measures of mushrooms are as follows:

1. Any mushroom crop-related action should always be performed on the newer crops before the older ones.
2. Store casing materials in areas where they won't get contaminated.
3. Before watering or harvesting, remove all afflicted mushrooms. On the mushroom farm, pay great attention to irrigation and tools management.
4. Do not move nozzles or hoses from old to new mushroom-growing crops unless they have been disinfected first.
5. Use only new or disinfected collector boxes that have not been polluted by contaminated crops.
6. Don't make the crop cycle any longer than it needs to be.
7. Once the crop cycle is finished, thoroughly clean and disinfects the mushroom farm.

Bacterial Diseases

Some bacteria have a vital role in the successful production of mushrooms, but others can cause serious disorders. World-wide, the most common and most investigated bacterial disorder is Bacterial blotch (Pseudomonas tolaasii), which discolours and sometimes disfigures the developing or more frequently the mature mushrooms, even after marketing. There is some evidence that pathogenic bacteria can be present within apparently healthy mycelium with no obvious effect on mycelial growth. Symptoms may then develop when mushrooms are produced.

1. Brown blotch: The disease is caused by Pseudomonas tolaasii. Brown blotch is the most common bacterial disease of commercial mushrooms, and it causes considerable economic losses each year through quality reduction. Symptoms: The symptoms most often observed include pale yellow areas or blotches on the cap that later turn golden yellow, yellow-brown

or chocolate brown. The stem (stipe) also may be affected. Occasionally, the caps will have an overall dingy off-color with rapid deterioration and discoloration after harvest. Symptoms occur more frequently on mushrooms that remain wet for a long time and in places where they touch one another. The symptoms can be confused with those of other diseases, such as Verticillium spot. Main source of infection is infection in soil and separate through flies, mites should be there.

2. Wet Spot/Sour rot: Bacillus spp. Heat resistant endospores. Symptom: A dull gray to mucus-like brownish slime characterized by a strong but foul odour variously described as smelling like rotting apples, dirty socks or burnt bacon.

3. Mummy disease Pathogen: Pseudomonas aeruginosa. Symptoms: Fruit bodies have tilted caps and curved stalk. Base of the stem enlarged and tissue of the mushroom becomes spongy giving mummified appearance.

Management of bacterial diseases

The best and common approaches to combat the diseases and environmental control measures of mushrooms are as follows: The best approaches to combat the disease are to adhere to stringent cleanliness and environmental control measures (Gea and Navarro, 2017):

a. Wipe the culture surface clean of all carpophores.
b. Increase evaporation from the culture surface and the carpophores' surface.
c. When composting, stay away from low temperatures.
d. Remove any remaining water on the fruiting bodies' surface.
e. After irrigation, run a 2-hour drying cycle.
f. Maintain a precise temperature control so that the dew point is not reached. Temperature swings should be avoided.
g. Prevent casing material flooding during the crop cycle.
h. Keep all tools in a clean environment.

References

1. Amin, Z., Wani, F. F., Gulzar, H., Dar, W. A. and Sheikh, P. A. (2008). Diseases of White Button Mushroom (Agaricus bisporus)- A Potential Threat to Mushroom Industry. International Journal of Current Microbiology and Applied Sciences, 10(02): 2076- 2085.
2. Fletcher, J.T. and Gaze, R. H. (2008). Fungal diseases of mushroom and their control. A colour handbook. United Kingdom.
3. Gea, F. J., Navaro, M. J. (2017). Mushroom Diseases and Control. Edible and Medicinal Mushrooms: Technology and Applications, First Edition. Centro de Investigación, Experimentación y Servicios del Champiñón (CIES), Quintanar del Rey (Cuenca), Spain.
4. Koehler, P.G., Oi, F.M. and Aparicio, M.L. (1994). Springtails. Gainesville: Univ. of Fla. Coop. Ext. Service, Inst. of Food and Agric. Sciences.
5. Munshi, N. A., Dar, G. H., Ghani, M. Y., Kauser, S., and Mughal, N. (2010). Button Mushroom Cultivation. Communication and Publication Centre SKUAST-K.1: 1-28. 6. Randive, D.S. (2012) Cultivation and study of growth of oyster mushroom on different agricultural waste substrate and its nutrient analysis. Adv. App. Sci. Re., 3: 1938-1949.
6. Singh, P., Pande, S. K., Kumar, K., Shukla, A. and Singh, S. (2020). International Journal of Current Microbiology and Applied Sciences, Special Issue-11: 1494-1501.