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Mite Pest of Mushroom Cultivation and Their Management

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Abstract

Mushroom is highly proteinaceous food having many beneficial impacts on human health. Mite species like *Tyrophagus* spp, *Tarsonemus myceliophagus*, *Pygmephorus* are reported from mushroom cultivation having the potentiality to cause severe yield loss if proper management option has not taken. Sanitation, use of good quality compost and application of disinfectants are considered as key components for mite management in mushroom cultivation.

Introduction

Mushrooms are very nutritious products that can be generated from lignocellulosic waste materials (wheat straw, rice straw, etc). that are rich in crude fiber and protein. In fact mushrooms also contain low fat, low calories and good vitamins. In addition mushrooms posses multi-functional medicinal properties. A range of mite species has been reported from mushroom causing huge damage by infecting the fruiting bodies and mycelium. Mite damage on the fruiting bodies shows up as small cavities in the stem and cap similar in appearance to bacterial pit disease. Mycelium feeding mite group cause high yield losses. Mushroom mites because of their small size are often noticed when they are present in large number and cause substantial yield loss. Mite species which may be found as pests associated with mushroom cultivation are discussed below briefly.

Mite Pests

1. *Tyrophagus* spp.: They are slow moving, translucent mite species having long hairs on their body. These mites are profusely found in mushroom cultivation causing pit like structure on cap and stalks. These pits thereafter suffer from bacterial attack leads to decomposition which breaks down tissues just below the surface and result in the skin collapsing leaving an open pit. These mites also attack on the mycelium and cause crop losses when they are found in large number. Organic debris found accumulating around the farm provides breeding place for these mites. These mites also have a hypopus stage which is resistant to adverse condition (Kheradmand *et al*., 2007).

2. *Tarsonemus myceliophagus* Hussey: This mite is considered as important pest of mushrooms which is cannot observe through naked eyes. Mites on feeding mushrooms become rounded and obtain a reddish brown shade. In case of severe infestation, the whole area of mushrooms may be detached from the growing surface. The base of the stripe is damaged and discolored into reddish brown. Life cycle is completed in 8 days at 24 °C and 12 days at 22 °C. Single female usually

lays about 1 egg per day and longevity may be extending up to 21 days. If large number of mite populations can be found during spawning, the consequence of their activity can be rather significant (Hussey and Gurney, 1967).

3. Red Pepper mite (*Pygmephorus* spp.): This red color mite is not considered as primary pest of mushroom but their presence indicate that the quality of organic matter used in mushroom production was very poor or not up to the mark. These mites reproduce very fast, single female can lay up to 160 eggs within 5 days. They are yellowish brown in color and normally 0.25 mm in length with a flattened appearance. Red pepper mites promote the spreading of green moulds not only in the infected rooms, but also on the whole farm. Their presences in large number worsen the mushrooms and bring unpleasant sensations.

Other Mite Pests of Mushroom

Tyroglyphus longoir, *Rhizoglyphus* spp., *Histiogaster* spp., *Schwieba* spp., *Luciaphorus auricularia*, *Brennandania lambi* are found occasionally in mushroom cultivation (Clift and Teffolon, 1981).

Figure 1: Mite infestation in mushroom

Management Strategies of Mushroom Mite Pests

Following general measure should be taken into consideration for the management of mite pests in mushroom cultivation:

- High quality composting and compost pasteurization for the purpose of obtaining selective mediums for mushroom mycelium.
- Maintaining strict hygienic conditions on the farm.
- Thorough cleaning of all machinery, equipment and rooms that were used during the spawning process and spawn run.
- Maintain an environment that favors mushroom growth over its competitors (collembolans, sciarid and phorid flies) and mites with proper temperature and relative humidity.
- Controlling flies and other mite dispersing agents.
- Do not stretch the growing cycle beyond acceptable crop capability. For example going from 4 to 3 or even 2 flushes can help reduce the insect and mite pests by adjusting the time they have to develop.
- Steaming the rooms in the end of the cultivation cycle thoroughly including containers and shelves to exclude any possibility for the mites to survive.
- Using disinfectants to clean all working surfaces and implements.
- Screening of windows, doors and ventilators with 20 mesh screens will check the entry of mites from the outside environment.
- Immediate removal of spent compost from the farm.
- Use citronella oil as a deterrent.

Conclusion

Mite infestation on mushroom results in great yield reduction by destroying their fruiting body and mycelium. Application of good quality compost is the prerequisite for removing the mite problem and selection of best acaricides having less toxic to human beings should be taken into consideration. Exposure of phytoseiid mite species as a biological control agent can be done as alternative to chemical pesticides.

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