

# Oyster Mushroom Cultivation

## Part II. Oyster Mushrooms

### Chapter 8

#### Pest and Disease Management

## BROWN BLOTCH DISEASES

Brown blotch disease by bacterial pathogen causes significant crop loss. The disease is very common in mushroom houses in Korea. Various disease symptoms are observed on cultivation beds. Yellowing of fruiting bodies can be easily caused by environmental factors. A rapid change of humidity caused by too much ventilation is diagnosed as being conducive to bacterial brown blotch.

### Bacterial Brown Blotch Disease

#### Pathogens

- Major pathogen is *Pseudomonas tolaasii*. *Pseudomonas agarici* was also reported as causal agent, but the importance of that bacterium as a pathogen of brown blotch disease is questionable.

#### Symptoms

- Bacterial brown blotch has various symptoms (Fig. 1). The most typical symptom is a brown spot on the caps and stipes. The brown spots enlarge and coalesce with other spots, and the affected areas are sunken and covered with sticky material. At this stage a rotten fish smell is evident.
- Rarely, the entire fruiting body is discolored with a reddish brown color and appears water logged.
- Young fruiting bodies are covered by a clear, glossy material and stop growing.
- *Pseudomonas tolaasii* is isolated in all these diseased mushrooms, but it is still possible that mixed infections cause these various symptoms.

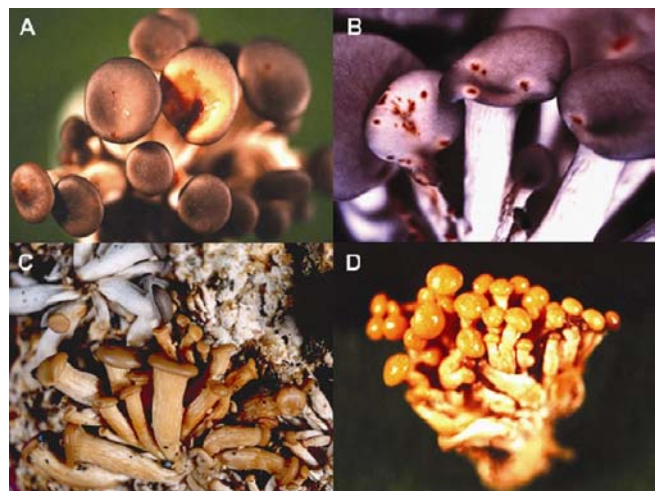


Figure 1. Symptoms of bacterial brown blotch disease on oyster mushroom

### Control measures

- Sanitation is the basic control measure for bacterial brown blotch. Follow the “**Basic Practices for Disease and Pest management.**”
- Pasteurize substrates thoroughly and use healthy spawn.
- Control mushroom flies. Mushroom flies are well known vectors of the pathogen.
- Try to maintain constant humidity and temperature in growing houses. Abrupt temperature and humidity changes increase the incidence of brown blotch.
- Free water on fruiting bodies makes the pathogenic bacteria grow rapidly. Try to avoid free water on mushroom surfaces by ventilating after watering.
- Do not water too much. Brown blotch is favored by excessive moisture.
- Chlorinated water is effective to prevent the brown blotch disease. Sodium hypochlorite (NaOCl) and calcium hypochlorite [Ca(OCl)<sub>2</sub>] are most commonly used. Recently Biospot<sup>®</sup>, sodium dichloroisocyanurate, has also become available. Active chlorine content varies among the different formulas and chlorine is well known to be vaporized easily. A routine use of 5 ppm chlorinated water (active chlorine concentration) prevents brown blotch incidence. If brown blotch is observed in mushroom bags or on mushroom beds, use 20 ppm chlorinated water.

### Fungal Brown Blotch Disease

#### Pathogen

-*Verticillium fungicola*. This pathogen is suspected, but the actual cause of the disease remains yet to be proved.

#### Symptoms

- Mushroom cap is partially or entirely discolored yellow to brown (Fig. 2a). The spots are not as clear as the spots caused by bacterial brown blotch.
- The shape of fruiting bodies become abnormal and mushrooms stop growing (Fig. 2b, 2c, 2d).



A. Discoloration



B. Abnormal growth



C. Stunted growth



D. Malformation

Figure 2. Symptoms of fungal brown blotch

**Control measures**

-Typical bactericide or chlorine disinfectant is not effective. Fungicides such as Sporgon, benomyl, and thiabendazole, are effective, which indicates the cause of disease is fungi rather than bacteria.