

Evaluation of oyster mushroom strains for resistance to *Pseudomonas tolaasii* by inoculation in spawned substrates

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Abstract Bacterial brown blotch disease, caused by *Pseudomonas tolaasii*, has been one of the most serious bacterial diseases of the oyster mushroom. Resistance to disease has been a priority in breeding programs for the oyster mushroom. In this study, a set of 37 *Pleurotus ostreatus* strains was tested for resistance to the pathogen *P. tolaasii* by two methods, with inoculations on pileus and spawned substrate under controlled environmental conditions. The results showed that the protocol with inoculation on spawned substrate was sensitive and adequate for testing resistance of oyster mushroom to brown blotch disease. According to the disease severity of fruiting bodies with inoculation on spawned substrates, strain ACCC50618 was resistant; ACCC50236 was moderate resistant; and the others were susceptible to the pathogen *P. tolaasii* (ACCC 01267). However, it was difficult to differentiate the resistance of *P. ostreatus* strains to *P. tolaasii* by inoculation on the pileus. This is the first report about resistance evaluation of *P. ostreatus* to brown blotch disease.

Keywords *Pleurotus ostreatus* · Bacterial brown blotch disease · *Pseudomonas tolaasii* · Resistance · Evaluation · Inoculation

Introduction

Pleurotus ostreatus (Fr.) Kumm, commonly known as oyster mushroom, has been a commercially important edible mushroom in many countries of the world, with China the major producing and exporting country. The production of the oyster mushroom in China in 2010 reached 4 million tons in fresh weight.

Bacterial brown blotch disease, caused by the bacterium *Pseudomonas tolaasii*, has been one of the most serious bacterial disease for the oyster mushroom (Zhang et al. 2007b; Zhang et al. 2007a). The disease was firstly found on *Agaricus bisporus* nearly 100 years ago (Tolaas 1915). It has been reported that the disease could also affect *Lentinula edodes*, *Flammulina velutipes*, and *Pleurotus eryngii*, and other species (Akihiko et al. 1995; Han et al. 2012; González et al. 2009). The disease often occurred over a large geographical area. The disease incidence differed from year to year. Once the disease occurred in a farm, it was very difficult to control before all of the substrate bags were removed from the farm. The most typical symptom was characterized with brown spots or blotches on the pileus. If moisture conditions favoured the disease, the brown spots and blotches enlarged and coalesced with others; the affected areas were sunken and covered with sticky material. However, the disease affected only the top external layers of the pileus tissues

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