Research Note

BURKHOLDERIA CEPACIA CAUSAL AGENT OF BACTERIAL BLOTCH OF OYSTER MUSHROOM[1]

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J. Agric. Univ. P.R. 82(1-2):109-110 (1998)

Oyster mushrooms (*Pleurotus* spp.) are considered the easiest and least expensive to grow among all the cultivated species (Stamets, 1993). Worldwide oyster mushroom production increased from 169,000 metric tons in 1987 to 909,000 in 1990 (Stamets, 1993). At the University of Puerto Rico, Mayagüez Campus, we have been defining cultivation requirements, adaptability to our tropical environment and resources, as well as management strategies to grow *Pleurotus* spp. in a sustainable manner without pesticides.

Diseases have been reported worldwide where mushrooms are cultivated, and bacteria are one of the pathogens that deteriorate edible mushrooms (Fahy and Persley, 1983). *Pseudomonas* spp. are the most common bacteria reported in edible mushrooms (Fahy and Persley, 1983). In Puerto Rico, Hepperly and Ramos-Dávila (1986) reported *Pseudomonas aeruginosa* causing a basal rot in *Volvariella volvacea*.

In our mushroom production laboratory, moist lesions were observed on the basidiocarps of oyster mushrooms (*P. sajor-caju* and *P. ostreatus*). The lesions were yellow, watersoaked and soft (Figure 1). In time, lesions spread all over the basidiocarp and caused tissue deterioration and necrosis. Yield and quality losses due to this condition varied between 10 and 20%. It was most prevalent on production units that were exposed to higher humidity (RH>95%) during primordia and basidiocarp development. Temperature in the production rooms was 26 ± 2°C. Drops of exudate from the lesions were observed with bacterial swarming. Mushrooms stored in the refrigerator also showed blotch symptoms.

Basidiocarps with symptoms were cut, surface disinfested with diluted bleach (10%) and plated in Tryptic soy agar (TSA). Other samples were placed in 2 ml of sterile distilled water, teased and streaked with a sterile loop on plates with TSA medium and incubated for 48 h at 28°C. Single bacterial colonies were isolated and purified in TSA and King's B media. Neither fungal nor other organisms were associated with the lesions.

All bacterial colonies had the same visual morphologic characteristics. Colonies observed on TSA were smooth, cream-yellow, and slightly translucent. Colonies on King's B were yellow and opaque, wrinkled and slightly elevated. King's B medium turned light yellow. No fluorescence was produced, and all cultures were gram negative.

The bacteria was identified by using the API Rapid NFT method. BIOLOG method was conducted for confirmation. From these tests, the isolated bacteria was identified as *Burkholderia cepacia* (UPR-1) (*Pseudomonas cepacia*) (Yabuuchi et al., 1992).

[1]Manuscript submitted to Editorial Board 15 April 1997.

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FIGURE 1. Blotch symptoms on basidiocarps of oyster mushrooms (*Pleurotus sajor-caju*).

Koch's postulates were completed by inoculating healthy detached basidiocarps from symptomless production units with 24 h bacterial culture. A drop of 0.025 ml of the bacterial culture broth containing approximately 10^8 cfu/ml was placed on the basidiocarp surface. Controls were selected and treated the same, except that sterile distilled water replaced the bacterial inoculum. All mushrooms were placed in lidded glass dishes that served as humidity chamber, and incubated at 28°C. All treatments were made in duplicates having four basidiocarps per chamber. Two other tests had five replicates per treatment and five basidiocarps per chamber. Characteristic lesions and symptoms, as described above, were observed 24 h after inoculation. No symptoms were observed in the controls. The test bacteria was then reisolated as previously described.

LITERATURE CITED

Fahy, P. C. and G. J. Persley, 1983. Plant Bacterial Diseases. Academic Press. 393 pp.

Hepperly, R. P. and E. Ramos-Dávila, 1986. Bacterial basal rot of straw mushrooms. *J. Agric. Univ. P.R.* 70(3):219-221.

Stamets, P., 1993. Growing Gourmet & Medicinal Mushrooms. Ten Speed Press, Berkely, CA. 554 pp.

Yabuuchi, E., Y. Kosako, H. Oyaizu, I. Yano, H. Hotta, T. Hashimoto, T. Ezaki and M. Arakawa, 1992. Proposal of *Burkholderia* gen. nov. transfer of seven species of the genus *Pseudomonas* homology group II to the new genus, with the type species *Burkholderia cepacia* (Palleroni and Holmes 1981) comb. nov. *Microbiol. Immunol.* 36:1251-1275.