
ABSTRACTS (MASTER THESIS)

Evaluation of the nutritional requirement for the culture of a termite mushroom, *Termitomyces albuminosus* (Berk.) Heim

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Introduction

Termitomyces eurhizus (Berk.) Heim is widely distributed in the tropical and subtropical region from Africa to Southeast Asia. This fungus is one of the termite mushrooms, living symbiotically in the fungus-garden of the nest of termites classified into Macrotermitinae. In Japan, *T. eurhizus* is only found in Ishigaki Island, Iriomote Island and the limited area of Naha City of Okinawa's main Island, Okinawa Prefecture, in the presence of *Odontotermes formosanus* Shiraki.

Termite mushrooms are rare seasonal products, because they can only be harvested during a special period. To date, no artificial production of termite mushrooms have been accomplished mostly due to limited knowledge on their nutritional requirement.

In order to achieve artificial production of *T. eurhizus*, strain-dependent nutritional requirement of this species was evaluated in this study.

Materials and methods

Thirty-three strains of *T. eurhizus* : 27 strains collected in Okinawa Prefecture, Japan (T1-22 and T24-28), 2 strains from American Type Culture Collection (ATCC) and 4 strains from National Institute of Technology and Evaluation's Biological Resource Center (NBRC) were obtained, and they were used for the first screening test. All strains were cultivated on 7 plate media at 26 °C in the dark, and mycelial growth was measured at 10, 15, 20, 25, 30, 35, 40, 45 and 50 days post inoculation. From the results of this screening, six strains were selected for the next experiments by their low specificity to the media and rapid mycelial growth.

The selected strains were cultivated on hay extract media with (HA-a) and without (HA-b) 0.2% (w/v) K₂HPO₄. These strains were also evaluated for their growth on four Matsutake media, with different carbohydrate sources: glucose, sucrose, maltose and xylose. These strains were inoculated with 7 mm-diameter pre-cultured agar media, and the plates were incubated at 26 °C in the dark. Mycelial growth was measured at 10, 15, 20, 25, 30, 35, 40, 45 and 50 days post inoculation as well as the first screening test.

Results and discussion

There was no difference in mycelial growth of 6 strains between two HA media : HA-a with 0.2% K₂HPO₄ and HA-b without K₂HPO₄. This suggested that *T. eurhizus* did not require any additional phosphate to grow on HA. *T. eurhizus* may have low phosphate requirement.

When using Matsutake media with different carbohydrate sources, no difference in mycelial growth was observed for glucose, sucrose and maltose. On the other hand, the slower mycelial growth was obtained in the xylose-containing medium. Further experiments with a variety of oligosaccharides and polysaccharides are required to select favorable carbon sources for *T. eurhizus*.

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