

Effect of combination of grains in media on the sporulation of *Beauveria bassiana* (Balsamo) Vuill.

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ABSTRACT

Laboratory experiments were conducted to study the effect of combination of grains in media on the sporulation of *Beauveria bassiana* (Balsamo) Vuill. Among the different combination of grains tested, rice in combination with pearl millet, sorghum, finger millet, maize (3:1), pearl millet + sorghum (1:3), maize + pearl millet (1:3) were superior to finger millet + pearl millet (1:3).

Key words : Agricultural products, Mass production, Entomopathogenic fungi.

INTRODUCTION

Entomopathogenic fungi particularly, white muscardine, *Beauveria bassiana* (Balsamo) Vuill. have been reported to be useful to control insect pest (Sandhu *et al.*, 2001). The use of entomopathogenic fungi, due to their amenability to mass production, has potential in future strategies of pest management. *Beauveria bassiana* has one of the largest host list among the imperfect fungi. A number of successful commercial products based on conidia/spores of fungal pathogens have already been developed and sold internationally (Jenkins *et al.*, 1998). The present studies were undertaken to evaluate the different culture media for the growth and sporulation of an isolate of *B. bassiana* obtained from Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore.

MATERIALS AND METHODS

The influence of different cereal nutritive substrates in combination was studied against *B. bassiana* in six different experiments including five preliminary experiments separately. The treatments were rice alone, rice + cereals at ratios 3:1, 1:1 and 1:3 (experiment 1); pearl millet alone, pearl millet + cereals at ratios 3:1, 1:1 and 1:3 (experiment 2); sorghum alone, sorghum + cereals at ratios 3:1, 1:1 and 1:3 (experiment 3); finger millet alone, finger millet + cereals at ratios 3:1, 1:1 and 1:3 (experiment 4) and maize alone, maize + cereals at ratios 3:1, 1:1 and 1:3 (experiment 5).

Fifty gram of each media of different combinations were prepared in three replicates as in previous experiment. Aliquots of 10 µl containing 10^5 spores were dispensed using micropipette and the cultures were incubated at $25 \pm 0.5^\circ\text{C}$ for 15 days. The observations on

conidia yield, productivity ratio and the computation of cost was done as described earlier.

In the sixth experiment, media that yielded maximum conidia of *B. bassiana* or that gave the highest cost benefit ratio based on media cost were compared. Three replicates of each media was prepared and compared for the different parameters.

RESULTS AND DISCUSSION

Rice in combination with other grains :

Multiplication of *B. bassiana* in medium containing rice alone or rice + pearl millet (3:1) was significantly higher ($2.53\text{--}2.62 \times 10^9$ conidia/g) than other combinations (Table 1). Combination of rice with finger millet and maize significantly reduced the spore yield. The productivity ratio of various media was not better than rice alone in this experiment. Combination of rice + pearl millet (3:1), rice + sorghum (3:1) and rice + pearl millet (1:3) were marginally lower than rice alone (0.93-0.97) considering the productivity factor (Table 1). The required quantity of media to produce 1.5×10^{12} spore units was lower in rice alone (0.51 kg) and rice + pearl millet (3:1) (0.59 kg) than others. Among the different treatments, the highest cost/benefit ratio was recorded in the combination of rice + pearl millet (1:3) (1:1.40) followed by rice + sorghum (1:3) (1:1.25).

Sorghum in combination with other grains :

Combination of sorghum and rice (1:3) resulted in 2.58×10^9 conidia/g which was significantly superior to sorghum alone (2.08×10^9 conidia/g) or its combination with other grains in differing ratios (Table 2). Of the remaining treatments, sorghum + rice (1:1) was found to be the next effective treatment recording 2.35×10^9 conidia/g.