Internat. J. Agric. Sci. Vol.3 No.2 June, 2007 : 171-175

# Effect of combination of grains in media on the sporulation of Nomuraea rileyi (Farlow) Samson

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## ABSTRACT

Laboratory experiments were conducted to study the Effect of combination of grains in media on the sporulation of *Nomuraea rileyi* (Farlow) Samson. Of the different combinations studied, rice alone favoured significantly the maximum sporulation of  $4.49 \times 10^8$  conidia/g. Rice + sorghum and rice + pearl millet (3:1) were the next effective treatments (4.16-4.25 conidia/g).

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

## **INTRODUCTION**

*Nomuraea rileyi* is a slow growing fungus with a preference for maltose as the carbon source (Glare, 1987). In India, natural occurrence of this fungus has been reported on a variety of insects (Vimala Devi, 1999). Although the entomopathogenic fungus. *N. rileyi* was first described more than 100 years ago, no attempt was made to mass-produce and use it for biological control until 1955 (Samson, 1974). Conidiation of *N. rielyi* occurs readily on semi-synthetic media in general. *N. rileyi* could be multiplied on polished rice grains (Silva and Loch, 1987). However, only a few isolates sporulate on cereal grains although mycelial growth occurs readily. Taking into consideration, an attempt has been made to develop a mass production medium for the fungus using agricultural products.

#### MATERIALS AND METHODS

The influence of different cereal nutritive substrates in combination was studied against *N. rileyi* 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  $10 \,\mu$ l containing  $10^5$  spores were dispensed using micropipette and the cultures were incubated at  $25 \pm 0.5^{\circ}$ 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 *N. rileyi* 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

Of the different combinations studied, rice alone favoured significantly the maximum sporulation of  $4.49 \times 10^8$  conidia/g. Rice + sorghum and rice + pearl millet (3:1) were the next effective treatments (4.16-4.25 conidia/g). The productivity ratio of various media was not better than rice alone. Among the combinations studied, rice + sorghum, rice + pearl millet, (3:1) and rice + sorghum (1:1) were better than others but not equal to rice. The quantity of media required to produce  $1.5 \times 10^{12}$ spore units ranged from 3.34-3.60 kg in the above treatments. Of them, media composition with rice alone or rice + sorghum (3:1) required minimal quantities to achieve the projected yield. Cost of media for production of  $1.5 \times 10^{12}$  spore units was however, lower in rice + sorghum (1:3), rice + pearl millet (1:3) (1:1.16) and rice + sorghum (1:1) (1:161) (Table 1). Treatments involving in rice + pearl millet (1:3) and rice + sorghum (1:1) were also cost-effective (Table 1).

#### Sorghum in combination with other grains

The evaluation showed that combination of sorghum + rice either at 1:3 or 1:1 was significantly superior to sorghum alone and its combination with other cereals in varying proportions. A maximum of  $4.07-4.10 \times 10^8$