

Evaluation of Some Food Grains for Mass Production of *Nomuraea rileyi*, an Entomopathogenic Fungus

Key words : Maize, *N.rileyi*, Ragi, Rice, Sporulation, Sorghum, Wheat.

Nomuraea rileyi (Hyphomycetes) is being considered as a possible biological control agent as it causes infection in a variety of lepidopterous caterpillars. In India, *N. rileyi* has been reported on *Spodoptera litura*, *Helicoverpa armigera* and many other larvae. It occurs in epizootic form in the humid regions. *N. rileyi* is easily multiplied at a low cost and it is obviously a best candidate for exploitation at the field level. Locally available food grains viz., sorghum, bajra, maize, rice, ragi and wheat were tested as the substrates for mass production *N. rileyi* by following the procedure suggested by Vimala Devi (1994). Thirty grams of each crushed substrate was taken in 250 ml conical flask and was added 27.5 ml of 1.0 per cent yeast extract solution. The contents were allowed to soak overnight at room temperature. Then the flasks were autoclaved at 15 psi pressure at 121°C for 20 minutes. The flasks were cooled and clumps of substrate were broken with sterile glass rod. One millilitre of spore suspension of 1×10^8 conidia ml⁻¹ concentration of *N. rileyi* was inoculated into each conical flask containing different grain substrates under aseptic conditions in the laminar air flow. The flasks were well agitated for proper distribution of spores and were maintained at 25°C in a incubator to obtain full sporulation. Each flask was considered as one replication by maintaining 5 replications for each grain type. After attaining full growth and sporulation (15 days), 1 gram of grain media was taken in a test tube and 10 ml of distilled water with 0.05 per cent Tween 20 was added, mixed with glass rod and the suspension was filtered through double layered muslin cloth. From this 1 ml suspension was transferred into another test tube and 9 ml distilled water was added. Neubaur haemocytometer was used for taking spore count under a compound microscope.

Crushed sorghum was found significantly superior to others, as it recorded higher sporulation

of 2.4×10^9 spores gm⁻¹. Rice occupied next position with 2.1×10^9 spores gm⁻¹ (Table). Maize and Bajra also produced considerably good sporulation when compared to other two grains (1.6×10^9 and 1.4×10^9 spores gm⁻¹ respectively). Ragi and wheat grains produced comparatively lower spore quantity i.e. 1.2×10^9 and 1.0×10^9 spores gm⁻¹. The observations indicates higher natural favourism of sorghum and rice to reproductive growth of *N.rileyi*.

The present results are in relation with the following earlier reports. According to Kians *et al.* (1991) *N. rileyi* sporulation was considerably high with sorghum and rice which may be due to higher proportion of starch (75%) and amylose (16-33%). Vimala Devi (1994) obtained 1.4×10^9 spores ml⁻¹ of *N. rileyi* within 8-9 days with the use of crushed sorghum and yeast. According to her, use of sorghum involves low cost and also rapid method than utilization of SMAY medium. Gopalakrishnan and Mohan (2000) documented that among the food grains used, sorghum and rice were most suitable media for mass production of *N. rileyi*. Kulkarni and Lingappa (2002) reported that crushed sorghum and rice grains with one per cent yeast extract resulted in faster and higher spore yield of *N. rileyi* over maize, bajra, ragi and wheat. Prasad (1989) recorded maximum sporulation of *B. bassiana* with rice substrates.

Preez *et al.* (1985) documented that hydrolysis of starch in sorghum and rice results in the release of glucose (65-125 gl⁻¹) and maltose (50-120 gl⁻¹). Rice and finger millet gave considerable higher spores of *N. rileyi* according to Tincilley *et al.* (2004). The growth and sporulation of *N. rileyi* was high on the polished rice grains (Silva and Loch, 1987). Good sporulation of *B. bassiana* with broken sorghum was due to rich C : N ratio (Lakshmikantha, 1997).

N. rileyi Sporulation on different food grains

Grains	*Spore count gm ⁻¹
Sorghum	2.4 x 10 ^{9a}
Bajra	1.4 x 10 ^{9cd}
Maize	1.6 x 10 ^{9c}
Rice	2.1 x 10 ^{9b}
Ragi	1.2 x 10 ^{9de}
Wheat	1.0 x 10 ^{9e}
'F' test	**
SEM ±	0.1
CD at 5%	0.29

* Mean of five replications ** Significant at 0.05%
 Values indicated by the same alphabet are not significantly different.

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