

Bioefficacy of *Beauveria Bassiana* (Entomo-Pathogen) Against Termites in *Saccharum officinarum* Linn.

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Abstract

An experiment was conducted by the department of zoology, G F college, Shahjahanpur during the crop season 2016-18 showed that the application of *Beauveria bassiana* (10^{8-9} s/gm) was effective treatment against termites, statistically at par to (T3) and significantly superior ($P > 0.05$) to untreated control. Hence, application of *Beauveria bassiana* culture @ (10^{8-9} s/gm) may be used for effective control of termites in sugarcane crop.

Keywords: Termites, sugarcane, *Beauveria bassiana*, control.

Introduction

Termites are a very serious pest of sugarcane crop in Uttar Pradesh under moisture stress condition. Their Eggs are kidney shaped, creamy white in colour and hatching period is 30 to 60 days Nymphal moult 8 to 9 times and full grown in 6 to 12 month. Termite colonies are reported earlier 4 to 6 feet (1.2 to 1.8 m) deep in the soil. Termites damage starts just after planting of setts through cut ends and root bands in the soil. It has been reported by several scientists that 30-60 percent sett buds were damaged by termites, resulting yield loss of about 33 percent (*Teotia et.al. 1963, Roonwal, 1981*). Singh and Singh (2002) have reported 30-35 percent bud damage due to termites in sugarcane. Various control measures have been recommended time to time (*Singh, et al., 1998, Mill, 1992*). Chaudhary, et al (1986) has reported that application of insecticides at the time of planting over cane setts was found effective though the effectiveness varied among chemicals.

To date control measures for termites have included several chemicals, which are toxic to non target organism and source of environmental pollution. To overcome these problems biological control of termites is required. Therefore, the present investigation was taken up to find out the effect of *Beauveria bassiana* on the infestation of termites in sugarcane.

Materials and Methods

The culture of *Beauveria bassiana* was carried out on an artificial medium prepared in laboratory of Sugarcane Research Institute, Shahjahanpur (U.P.). The artificial medium based culture of *Beauveria bassiana* at different intensity were used as under-T1 –culture of *B. bassiana* @ 10^5 s/gm. T2 –culture of *B. bassiana*@ 10^6 s/gm.T3 –culture of *B. bassiana*@ 10^7 s/gm. T4 –culture of *B. bassiana*@ 10^8 s/gm. T5 –culture of *B. bassiana*@ 10^9 s/gm. T6 –Control (untreated)

Preparation of solid medium (Selective) for SDYA medium mother culture

Constituents	
Dextrose	40 gm
Peptone	10 gm
Yeasts	05gm
Agar	20 gm

This medium will be filled in 04 conical flasks (250 ml capacity). The mouth of each conical flask will be covered with aluminum foil before autoclaving. The autoclaving of this medium will be done at 121°C for 20 minutes. Then it will be cooled at 85°C . Then the antibiotic streptomycin will be added to the medium before inoculation to avoid bacterial contamination and shakewell. This medium is poured in Petri plates @ 15 ml/ Petri plates. It can be poured in test tubes @ 3 ml/test tube for maintaining mother culture (Pure culture). In Petri plates the medium is inoculated by the pure culture of *B.bassiana* and these Petri plates are kept at room temperature for 15 days for full growth. Simultaneously, the slants are also inoculated with the above

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pure culture for storage of pure culture for longer period. The experiment was conducted in 4 replicas.

Table
Effect of Beauveria bassiana against termites (2016-18), Shahjahanpur

Treatments (applied at planting)	Germ %	% incidence of termites			No. of tillers/h a	NMC/ h a	Yield t/ha
		Sett basis	End basis	Eye bud basis			
T1 –Sorghum based culture of <i>B. bassiana</i> @ 10.0 kg/ha (10 ⁵ s/gm).	32.82	21.0	11.0	11.66	230132	115 413	71.8 4
T2 –Sorghum based culture of <i>B. bassiana</i> @ 10.0 kg/ha (10 ⁶ s/gm).	36.17	18.0	12.0	9.66	260733	121 385	77.9 6
T3 –Sorghum based culture of <i>B. bassiana</i> @ 10.0kg/ha (10 ⁷ s/gm).	36.95	12.0	8.5	6.66	275409	127 543	85.9 2
T4 –Imidacloprid 200 SL @ 400 ml/ha.	42.92	8.0	5.0	3.66	283695	130 710	91.8 4
T5 –Regent 0.3% gr @ 20.0 kg/ha.	41.95	5.0	3.0	1.99	289297	135 089	94.9 9
T6- Control (untreated)	31.27	44.0	29.5	24.66	210179	107 080	67. 96
	56.774 5 NIL	3.783 8.061 58	2.893 486.1 66	2.323 4.951 98	11141.2 23741.8	867. 48 848. 62	3.72 7.94

Results and discussion

It is evident from data depicted in table that during 2016-18 the percent germination ranged between 32.82 (T1) to 42.92 (T4) as compared to minimum 31.27 in control (T6). Percent incidence of termite was recorded minimum 5.0, 3.0 & 1.99 (T5) followed by 8.0, 5.0 & 3.66 (T4) and 12.0, 8.5 & 6.66 (T3) against maximum 44.0, 29.5 & 24.66 in untreated control (T6) on sett, sett end and sett bud basis, respectively. Tillers, millable canes/ha and yield t/ha was recorded maximum 289297, 135089 & 94.99 in T4 followed by 283695, 130710 & 91.84 (T4) and 275409, 127543 & 85.92 (T3) against minimum 210179, 107080 & 67.96 in untreated control (T6). The above findings are in conformity with the findings of Singh et al, 1997 and Rana, et al., 2007, Singh, et al., 1997, Singh, et al., 2005.

On the basis of our findings it is concluded that T3 (soil application of *Beauveria bassiana*, @ 10 kg/ha (10⁷) are equally effective in minimizing the incidence of termites and enhancing yield and yield contributing characters significantly. Thus, soil

application of *Beauveria bassiana*@ 10.0 kg/ha (10^7) may use for the management of termite's without interrupting the environment.

Aim of study

Aim to evaluate the bio- efficacy of *Beauveria bassiana* against Termites in *Saccharum officinarum* Linn.The different Treatments evaluated for their laboratory efficacy against Termites. *Beauveria bassiana* is an economically important Pathogen of *Saccharum officinarum* within this context.

The aim of this Study was -

1. To develop a sustainable eco friendly approach for the elimination of Termites.
2. To asses the efficacy of the entomopathogenic fungus *Beauveria bassiana*.
3. To determine the correct dosage of *Beauveria bassiana* against Termites.
4. To determine the increase in yield of Sugarcane crop by application of *Beauveria bassiana*.

Conclusion

In the present study The application of *Beauveria Bassiana*@10.0Kg/ha. may use for the management of termites without interrupting the environment.

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