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RESEARCH NOTE

Dose response of *Nomuraea rileyi* (Farlow) Samson against *Spodoptera litura* (Fabricius) on groundnut

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ABSTRACT

A laboratory experiment was conducted to determine the effective dose of *N. rileyi* against *S. litura* infesting groundnut at Junagadh Agricultural University campus, Junagadh during *Kharif* 2010. The results revealed that *Nomuraea rileyi* @ 6.0 g/litre proved to be the most effective dose among nine doses tested against the larvae of *Spodoptera litura*. The lower concentration 2.0 g/litre showed comparatively poor effect but better than untreated control. The mortality increased with the increase in the doses of this mycoinsecticide.

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Groundnut is one of the important oilseed crops. Among the different insect pests infesting this crop in Gujarat, *S. litura* is considered as a key foliage pest of groundnut due to its polyphagous nature. The caterpillars are found feeding voraciously on leaves, branches, flowers and pegs resulting in marked reduction of yield. To overcome these problems, it is highly necessary to explore effective method of insect control without having harmful effects and can be well suited in the Integrated Pest Management programme. In this context, an alternative strategy like use of biopesticides has come up into vogue during the last two decades. Therefore, in the present study, efforts have been made to determine the effective dose of *N. rileyi* against *S. litura*.

The laboratory experiment on groundnut (var. GG-20) was conducted at Department of Entomology laboratory, Junagadh Agricultural University, Junagadh during *Kharif* 2010. A laboratory trial in CRD was conducted to determine effective dose of *N. rileyi* against *S. litura*. For this purpose, fresh groundnut leaves were collected from the unsprayed groundnut field, washed properly with clean water and air-dried were used for the study. The spray of each treatment was applied to groundnut leaves separately with the help of atomizer. Care was taken to obtain the uniform coverage of treatment. Treated leaves were allowed to dry under ceiling fan for 5 minutes. In each treatment one day starved 10 third instar larvae were released in plastic containers (8 cm × 4.5 cm) containing fresh pieces of groundnut leaves for feeding up to 24 hours. Each treatment was replicated thrice. After 24 hours larvae were provided with fresh untreated pieces of groundnut leaves.

Mortality counts were recorded 3, 5, 7 and 10 days after the treatment. Data on larval mortality were converted into corrected per cent mortality. The zero and cent per cent value were removed by using the formula (1/4n) x 100 and [1-(1/4n)] x 100, respectively (Bartlet, 1947; Gomez and Gomez, 1984) where 'n' is number of larvae per treatment. The data thus obtained were transformed into angular and then they were analyzed statistically (Bartlet, 1947).

The data on per cent mortality of *S. litura* larvae (Table 1) recorded after three, five, seven and ten days of application revealed that *N. rileyi* @ 6.0 g/litre recorded significantly higher larval mortality as it recorded 67.85, 78.76, 92.41 and 97.50 per cent mortality, respectively. The rest of the treatments *viz*., *N. rileyi* @ 5.5 g/litre, 5.0 g/litre, 4.5 g/litre, 4.0 g/litre, 3.5 g/litre, 3.0 g/l and 2.5 g/litre remained next best in larval mortality as they registered 61.35, 58.99, 53.82, 48.85, 44.23, 38.14 and 35.34 per cent mortality after three days, 70.60, 67.08, 64.01, 61.15, 57.68, 51.78 and 49.85 per cent mortality

Table 1 : Larval mortality in third instar of *S.litura* due to different doses of *N. rileyi*

Sr. No.	Dose (g/litre)	Larval mortality (%) (days after spray)				
		3	5	7	10	Mean
1.	2.0	32.79 (29.33)	40.55 (42.27)	44.96 (49.93)	47.66 (54.63)	41.49 (44.04)
2.	2.5	36.48 (35.34)	44.91 (49.85)	50.69 (59.87)	52.75 (63.37)	46.21 (52.11)
3.	3.0	38.14 (38.14)	46.02 (51.78)	53.19 (64.10)	57.00 (70.33)	48.59 (56.09)
4.	3.5	41.69 (44.23)	49.42 (57.68)	57.78 (71.57)	60.15 (75.22)	52.26 (62.18)
5.	4.0	44.34 (48.85)	51.44 (61.15)	60.15 (75.23)	62.96 (79.34)	54.72 (66.14)
6.	4.5	47.19 (53.82)	53.14 (64.01)	61.36 (77.02)	64.79 (81.86)	56.62 (69.18)
7.	5.0	50.18 (58.99)	54.99 (67.08)	66.49 (84.09)	69.18 (87.37)	60.21 (74.38)
8.	5.5	51.56 (61.35)	57.17 (70.6)	69.54 (87.78)	73.24 (91.69)	62.88 (77.86)
9.	6.0	55.46 (67.85)	62.55 (78.76)	74.01 (92.41)	80.9 (97.5)	68.23 (84.13)
10.	Control	9.10 (2.50)	9.10 (2.50)	9.10 (2.50)	9.10 (2.50)	9.10 (2.50)
	S.Em.±	0.81	1.12	1.25	1.11	
	C.D. (P=0.05)	2.40	3.30	3.70	3.29	
	C.V.%	3.47	4.12	3.97	3.34	

* Angular transformation. Figures in parentheses are original values

after five days, 87.78, 84.09, 77.02, 75.23, 71.57, 64.10 and 59.87 per cent mortality after seven days and 91.69, 87.37, 81.86, 79.34, 75.22, 70.33 and 63.37 per cent mortality after ten days, respectively. The *N. rileyi* @ 2.0 g/litre resulted lower larval mortality (29.33, 42.27, 49.93 and 44.04 %) and found comparatively less toxic.

Looking to the results of *N. rileyi* toxicity in relation to concentration on 3rd instar larvae of *Spodoptera* indicated that *N. rileyi* @ 6.0 g/litre proved to be the most effective, followed by 5.5 g/litre, 5.0 g/litre, 4.5 g/litre, 4.0 g/litre, 3.5 g/litre, 3.0 g/litre and 2.5 g/litre. The lower concentration 2.0 g/litre showed comparatively poor effect but better than untreated control.

Kulkarni and Lingappa (2002) and Gundannavar *et al.* (2005) reported the pathogenicity of *N. rileyi* to important lepidopterous pests that the cumulative mortality of larvae increased with the increase in concentration and exposure period. Manjula and Murthy (2005) also reported the pest mortality increased with increasing *N. rileyi* spore concentration, although 1×10^7 spores/ml was more effective than the higher concentrations (1×10^8 and 1×10^9) in later instars. Gundannavar *et al.* (2008) found that the fungus, *Nomuraea rileyi* performed better at its higher concentration (10^8 conidia/ml) compared to lower concentrations *viz*., 10^7, 10^5, 10^3 and 10^2 conidia/ml. Thus, the present findings are more or less similar to the results reported by earlier workers.

The study concluded that *N. rileyi* @ 6.0 g/litre proved to be the most effective dose among all the developmental stages of *H. armigera*.

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