

Efficacy of botanicals as seed protectant against *Caryedon serratus* (Olivier) in stored groundnut and effect on germination



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SUMMARY

Among the different eight plant materials tested for their efficacy against *Caryedon serratus* adults, rhizome powder of turmeric at 5 per cent (W/W) proved to be the most effective plant material as it recorded the lowest number of *C. serratus* adults emerged after 60 days of seed treatment, followed by neem leaf powder at 5 per cent. None of the plant materials tested at doses had hampered the germination of groundnut kernels during the storage periods up to 180 days.

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The Saurashtra region of the Gujarat state of India is one of the most important zones of groundnut production and export contributing about 40 per cent of the total production in the country. In Gujarat the only primary pest, *C. serratus* of stored pods has become a major problem in 1990s. Now, due to bruchid, farmers are unable to store their produce. A good post harvest pest management based on good storage practices is the most vital solution. The need for alternatives to chemical measures for the protection of stored products is also strongly felt. Though approach like application of botanicals has come up into vogue. Keeping in view the above facts, the present study was undertaken to find out the best botanical.

MATERIALS AND METHODS

Eight different plant materials, namely citrus, *Eucalyptus*, jatropha, mint, neem, nerium, papaya, rhizome powder of turmeric were collected and dried under shade and powdered in electric grinder. All the botanicals were used as leaf powder except turmeric which was used as rhizome powder. Known quantity (750g) of kernels were kept in plastic

container of 1 kg capacity in which known quantity (all the plant materials @ 1, 3 and 5 g except mint @ 1, 1.5 and 2.5 g) of plant materials were added. Plastic containers were shaken manually to obtain uniform layer of powder on kernels. The plastic containers were covered with lid and stored in laboratory up to 6 months for experimental purpose. A control was also run simultaneously. Three samples, each of 50 g kernels were drawn from each dose of botanical materials as well as control (untreated kernels) and were kept separately in wide mouth cylindrical glass jar (7.00 × 5.5 cm). Five pairs of 1 to 2 days old adults were released in each glass jar. These were then kept in BOD incubator at 30 ± 1°C temperature for 60 days.

Observations were recorded for the emergence of first generation beetles at 60 days after release of adults. The effectiveness of each treatment was determined by comparing the number of F1 progeny with those observed in untreated control during the same period. Also observations on adult emergence were recorded at 120 and 180 days after the seed treatment. The germination test of groundnut kernels was carried out 60, 120 and 180 days

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after treatment under laboratory conditions as well as under field conditions.

RESULTS AND DISCUSSION

The results presented in Table 1 revealed that rhizome powder of turmeric at 5 per cent proved

significantly superior than the rest of treatments as the lowest number *i.e.* 2.35 of *C. serratus* adults was emerged after 60 days seed treatment, followed by neem leaf powder at 5 per cent which recorded 2.46 of *C. serratus* adults. The neem at 5 per cent showed its effectiveness up to 120 days after seed treatment as they

Table 1 : Adult emergence in different botanicals against *C. serratus* in stored groundnut

Treatments	Concen. (%)	No. of adults emerged days after treatment		
		60	120	180
Citrus	1	11.28*(3.35)**	13.52 (3.67)	12.03 (3.46)
	3	10.30 (3.20)	12.81 (3.57)	11.55 (3.39)
	5	08.39 (2.98)	11.04 (3.32)	10.71 (3.27)
	Mean	09.99 (3.16)	12.46 (3.52)	11.43 (3.38)
<i>Eucalyptus</i>	1	11.57 (3.40)	13.70 (3.70)	11.62 (3.40)
	3	09.21 (3.07)	11.59 (3.40)	10.79 (3.28)
	5	08.34 (2.88)	10.88 (3.29)	09.18 (3.02)
	Mean	09.71 (3.11)	12.06 (3.47)	10.53 (3.24)
<i>Jatropha</i>	1	11.04 (3.32)	12.67 (3.50)	11.96 (3.45)
	3	10.79 (3.28)	11.57 (3.40)	11.07 (3.32)
	5	08.73 (2.95)	09.88 (3.14)	09.37 (3.06)
	Mean	10.16 (3.18)	11.37 (3.37)	10.80 (3.28)
Mint	1	09.88 (3.14)	14.23 (3.77)	11.49 (3.38)
	1.5	09.81 (3.13)	13.29 (3.64)	10.66 (3.26)
	2.5	08.71 (2.95)	12.92 (3.59)	09.18 (3.02)
	Mean	09.46 (3.07)	13.48 (3.67)	10.45 (3.32)
Neem	1	10.54 (3.24)	12.81 (3.57)	11.61 (3.40)
	3	09.23 (3.03)	10.45 (3.23)	10.58 (3.25)
	5	06.09 (2.46)	07.43 (2.73)	08.79 (2.96)
	Mean	08.62 (2.93)	10.23 (3.19)	10.33 (3.21)
<i>Nerium</i>	1	11.13 (3.33)	13.35 (3.65)	12.32 (3.54)
	3	10.54 (3.24)	12.00 (3.46)	11.92 (3.45)
	5	09.77 (3.12)	11.01 (3.31)	10.49 (3.23)
	Mean	10.48 (3.23)	12.12 (3.48)	11.58 (3.40)
Papaya	1	11.23 (3.35)	13.63 (3.69)	13.36 (3.65)
	3	10.22 (3.19)	12.98 (3.60)	12.47 (3.53)
	5	09.43 (3.07)	10.61 (3.25)	11.42 (3.37)
	Mean	10.29 (3.20)	12.41 (3.52)	12.41 (3.52)
Rhizome powder of turmeric	1	08.97 (2.99)	10.93 (3.30)	11.65 (3.41)
	3	06.92 (2.63)	09.01 (3.00)	10.56 (3.24)
	5	05.55 (2.35)	07.54 (2.74)	09.94 (3.15)
	Mean	07.15 (2.67)	09.16 (3.02)	10.72 (3.27)
Control	-	12.63 (3.55)	16.63 (4.07)	14.01 (3.74)
Botanicals (B) S. E. ±	-	0.15	0.18	0.15
Botanicals C.D. (P=0.05)	-	0.44	0.52	0.43
Concentrations (C) S.E. ±	-	0.09	0.11	0.09
Concentrations C.D. (P=0.05)	-	0.27	0.32	0.26
Control Vs rest S. Ed.	-	0.28	0.34	0.28
C.D. at 5 % for control Vs rest	-	0.57	0.68	0.57
Control Vs rest C.V. %	-	4.90	4.69	4.17

* Square root transformation

** Figures in parentheses are retransformed values

registered 2.73 number of adults emerged and it was at par with rhizome powder of turmeric at 5 per cent as they registered 2.74 number of adults emerged. The results further showed that all the concentrations of rhizome powder of turmeric proved significantly superior than corresponding concentrations of rest of treatments against *C. serratus* after 60 and 120 days of seed treatment.

All the treatments failed to impart their considerable effectiveness (>50 per cent) against *C. serratus* adult emergence at 1, 3 and 5 per cent after 60, 120 and 180 days of seed treatment except only two botanicals, rhizome powder of turmeric and neem leaf powder at 5 per cent concentration after 60 and 120 days of seed treatment. Irrespective of different concentrations of eight different plant materials, among the botanicals rhizome powder of turmeric was found significantly superior as lowest numbers *i.e.* 2.67 of *C. serratus* adults were emerged, followed by neem leaf powder recorded lower numbers *i.e.* 2.93 of *C. serratus* adults after 60 days after seed treatment.

The perusal of results revealed that rhizome powder of turmeric at 5 per cent proved to be the best plant material, followed by neem leaf powder at 5 per cent to prevent the successful emergence of *C. serratus* adults after 60 days seed treatment. Joshi and Ghorpade (2001) reported that the neem leaf powder @ 10 g/kg was effective in reducing the groundnut kernel damage by *C. serratus* and same report was made by Manjula (2003) at 5 per cent.

The percentage of germination in different treatments varied from 90.0 to 97.5, 73.4 to 90.4, 70.3 to 84.2 and 80.0 to 93.0, 73.4 to 94.9, 70.0 to 76.8 per cent at 60, 120 and 180 days after storage in laboratory and under field conditions, respectively. Thus, it can be stated that there was no adverse effect of any of the plant materials tested at all the concentrations on germination of groundnut kernels. From the results it can be concluded that all the plant materials proved safer from germination point of view.

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REFERENCES

Joshi, V.B. and Ghorpade, S.A. (2001). Evaluation of some plant products and chemicals against *Caryedon serratus* (Olivier) infesting stored groundnut. *J. Insect Sci., Ludhiana*, **14** (1/2): 88-89.

Manjula, K. (2003). Management of groundnut bruchid, *Caryedon serratus* (Olivier) with botanicals in stored groundnut. *Pest Manage. & Econ. Zool.*, **11** (2): 115-118.
