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Research Note :

Effect of indigenous plant products and oils against the pulse beetle *Callosobruchus chinensis* (Linn.) on stored black gram

J.ALICE R.P.SUJEETHA*, N.MUTHURANI AND L.NADARAJAN
Dept. of Entomology, Pt. J.N. College of Agriculture & Research Institute, KARAIKAL (PUDUCHERRY) INDIA

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Blackgram is considered to be an ancient crop and cultivated in India since time immemorial. Pulses belong to the sub family Fabaceae. Pulses suffer a great deal of damage during storage due to attack by the pulse beetle *Callosobruchus chinenis* (Linn.) (Bruchidae; Coleoptera).They are known to cause quantitative and qualitative losses to the stored pulses in India. Even though, infestation begins in the field, serious damage is caused during storage. The grain damage is as high as 69.39 per cent under storage conditions (Singh *et al.*, 2001).

Synthetic insecticides have played a major role in pest control and caused serious ecological problems such as bio-magnification, resistance, resurgence etc. To overcome these problems, our plant kingdom is bestowed with huge array of phyto chemicals. Phyto chemicals possess a wide spectrum of biological properties against insects. Botanicals and vegetable oils can be used to keep

Table 1 : Effect of plant products and oils against the pulse beetle *Callosobruchus Chinensis* Linn. on stored blackgram

Treatments	45 days	90 days	120 days	150 days	Over all mean
Cator oil @ 1%	1.67 (0.42)^{a}	2.67 (0.47)^{ab}	4.00 (0.67)^{ab}	4.67 (0.75)^{ab}	3.25 (0.61)^{b}
Gingelly oil@1%	3.67 (0.67)^{bc}	3.00 (0.49)^{ab}	5.67 (0.81)^{b}	4.67 (0.75)^{ab}	4.25 (0.71)^{b}
Neem oil @ 1%	0.00 (0.00)^{a}	0.67 (0.16)^{a}	2.00 (0.39)^{a}	3.00 (0.58)^{a}	1.42 (0.33)^{a}
NSKE powder 3%	3.33 (0.63)^{bc}	5.00 (0.74)^{abc}	3.33 (0.63)^{ab}	5.33 (0.78)^{ab}	4.25 (0.71)^{b}
Neem leaf powder 3%	5.33 (0.78)^{c}	2.67 (0.44)^{ab}	7.67 (0.93)^{bc}	8.33 (0.96)^{b}	6.00 (0.82)^{bc}
Pungam leaf powder@1%	12.00 (1.11)^{d}	19.00 (1.29)^{cd}	16.33 (1.23)^{c}	18.00 (1.26)^{c}	16.33 (1.23)^{d}
Malathion 50 EC@0.05%	2.67 (0.55)^{ab}	3.33 (0.51)^{ab}	3.67 (0.67)^{ab}	8.00 (0.92)^{b}	4.42 (0.71)^{b}
Ash @ 3%	9.33 (1.01)^{d}	6.67 (0.87)^{bc}	5.67 (0.77)^{b}	19.67 (1.30)^{c}	10.33 (1.01)^{c}
Control	15.00 (1.18)^{d}	72.00 (1.84)^{d}	91.33 (1.96)^{d}	91.00 (1.96)^{d}	67.33 (1.75)^{e}
CD Value	0.20**	0.56**	0.31**	0.24**	0.26**

Values in parentheses are log (X+1) transformed values
Mean followed by same letters in a column are not significant different by DMRT
** - Significant at 1% level

* Author for Correspondence

the stored pulses free from pulse beetle attack. The present study was taken up with a view to assess locally available botanicals and oils for their ability to protect black gram seeds from infestation by the pulse beetle.

Laboratory experiment was conducted during 2006-07 in a completely randomised design with nine treatments and three replications at PAJANCOA & RI, Karaikal, U. T.. of Puducherry. The treatments included were castor oil, gingelly oil and neem oil @ 1 per cent; NSKE powder, Neem leaf powder, pungam leaf powder, Ash @ 3 per cent ; Malathion 50 EC @ 0.05 per cent and control.

The plant products were dried under shade and then ground it in an electric grinder, sieved and then used, where as oils were used as such. To a plastic container 250 g of black gram seeds were kept and ten pairs of freshly emerged adults were released in each container and it was covered it with a muslin cloth. The set up was kept under the room temperature and humidity for six months. Fifty seeds randomly sampled from each bottle were examined under the microscope for number of eggs laid upto five month . The data were statistically analysed after suitable transformations.

The results as revealed in Table 1 show that fecundity was significantly higher in control than rest of the treatments. Significant differences among the different treatments were noticed at 45th, 90th, 120th and 150th days. At 45th days no eggs were laid in the neem oil 1 per cent followed by NSKE 3 per cent (3.33). Similar trend was noticed at 90th, 120th and 150th days also. The over all mean revealed that neem oil 1 per cent (1.42) was considered to be the best treatment followed by castor oil 1 per cent (3.25), NSKE powder 3 per cent (4.25) and gingelly oil 1 per cent (4.25) as against (67.33) in control.

The present findings are in line with (Singh and Yadav, 2003; Tandon *et al.*, 2004). It is evident from the present studies that, locally available oils and botanicals neem oil 1 per cent, NSKE powder 3 per cent and Gingelly oil 1 per cent were effective in reducing the oviposition and give protection to black gram seeds upto five months against the pulse beetle.

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