

POTENTIAL OF USING NEEM SEED KERNEL POWDER FOR THE CONTROL OF PULSE BEETLE *CALLOSOBRUCHUS CHINENSIS* INFESTING Khesari SEEDS IN STORAGE

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Investigation was carried out on the effect of the Neem Seed Kernel (NSK) powder as seed protectant against *Callosobruchus chinensis* (Coleoptera : Bruchidae). The test compound of different dosages was effecting in reducing the percentage of grain damage as compared to control. These seeds suggested that NSK powder to be pest effective, safer to predators, economically viable and socially acceptable by the farmers of the region.

Key words : Neem Seed kernel (NSK), *Callosobruchus chinensis*, Khesari (*Lathyrus sativus*).

INTRODUCTION

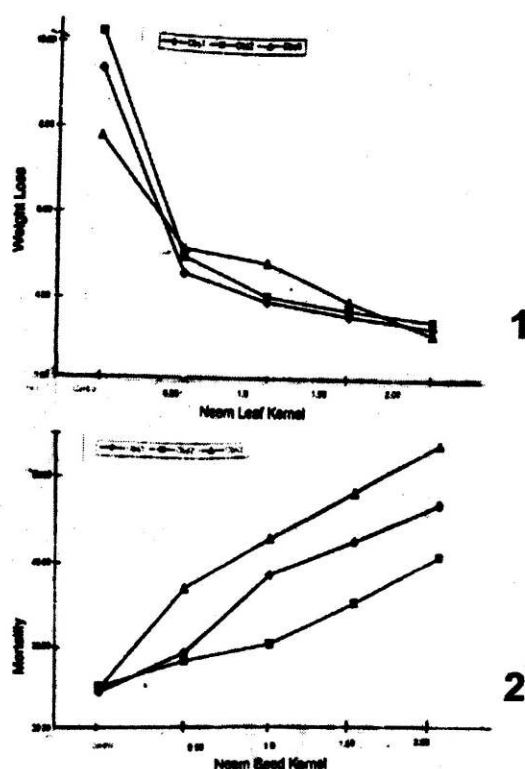
Negative effect of pesticides is a matter of great concern in the intensive agricultural regions of India, where there are widely used and poorly regulated. The chemical insecticides have been found very promising in suppressing the pest, but they are hazardous to mammals including man and domestic animals. Their use may, however, result into the development of high degree resistance to insects. In recent past, the use of indigenous plant materials has acquired an important position in the modern approaches of pest control, as they are comparatively safer to mammals due to their rapid biodegradable nature. An awareness concerning the role of biopesticides in agriculture, public health and human welfare is gaining increasing attention, both at national and international level. The present study was taken up with a view to assess locally available plant material for their ability to protect Khesari (*Lathyrus sativus*) from infestation by the pulse beetle *Callosobruchus chinensis*.

MATERIALS AND METHODS

Undamaged seeds of Khesari (100 g) were kept in glass jars (20 x 5 cm) and mixed with dried Neem Seed Kernel (NSK) powder using four different doses i.e. 0.50, 1.0, 1.5 and 2% w/w along with an untreated control in four replications. Ten pairs of *C. chinensis* were introduced in each jar, all jars were kept in room temperature of $28 \pm 2^\circ\text{C}$ and R.H. 70%. Observations on percentage seed damage, weight loss and percent mortality were made periodically during summer, rainy and winter seasons.

RESULTS AND DISCUSSION

The experimental observations have shown that the population growth of the pulse beetle *C. chinensis* (L.) reared in Khesari after treatment was significantly low and mortality high during summer and winter seasons. In rainy season the population was high with low mortality. The effect of seasons on population growth was also significant.



Figs. 1-2 : Effect of treatment with Neem Seed Kernel to infestation caused by *C. chinensis* in 40 days on Khesari dal; 1. On weight loss; 2. Percent mortality.

In the present set of experiment, after the application of Neem Seed Kernel (NSK) powder of different concentrations, the result showed significant reduction in damage as well as in insect population in treated grains. From the statistical analysis, it was observed that all the treatments were significantly superior to control in minimizing the pest. The treatment containing 2.0g/ 100g Khesari manifested highest toxicity and treatment containing 0.5 mg/ 100g showed least damage statistically. It was found that the effect of Neem Seed Kernel (NSK) powder increased with the increase in higher dose.

Considerable losses were observed in the weight of Khesari as a result of insect attack. Gradual decrease in weight/ volume ratio gives a fair index of degree of infestation. In view of the foregoing information and observation it showed that the treatment with Neem Seed Kernel powder even at high dose did not affect the appearance, taste, flavour, texture and overall acceptability. The present results when viewed in the light of existing works find support (Jotwani & Sircar, 1965 & 1967; Mathur & Yadav, 1978; Naqvi *et al.*, 1990; Singh & Pandey, 1996; Singh, 2006).

The results of the present study, however, makes the view that Neem Seed Kernel powder could be safe and promising source of naturally found insecticides against pulse beetle, *C. chinensis* which causes economic loss. During the experiment, the quality of grains was not observed to be damaged and hence its treatment has no negative point for

Table I : Effect on mixing Neem Seed Kernels (NSK) powder with seeds of Khesari (*Lathyrus sativus*) on the % weight loss and mortality due to infestation with *C. chinensis* (Means of four replications).

Treat- ments (%) W/ w	Seasons					
	Summer		Rainy		Winter	
	Loss in seed weight (%)	Mortality (%)	Loss in seed weight (%)	Mortality (%)	Loss in seed weight (%)	Mortality (%)
0.00	9.36	24.25	10.25	25.00	7.79	24.75
0.50	4.56	29.00	4.95	28.00	5.14	36.75
1.00	3.88	38.25	4.00	30.00	4.79	42.50
1.50	3.53	42.00	3.66	34.75	3.88	47.50
2.00	3.24	46.00	3.40	40.00	3.08	53.00
C.D.	0.6522393	2.2048498	0.2896403	1.6389149	0.1674594	3.4493524

consideration. However, the effectiveness of Neem Seed Kernel powder may be reduced after a certain period due to influence of other environmental factors like ventilation, light, temperature and humidity and as such a repetition to the treatment may be required to maintain the storage. On perusal of the results, it may be concluded that :

- It is cheapest of all extracts.
- Its preparation does not involve hazards.
- It can be prepared easily even by illiterate farmers in developing countries.
- It is relatively safer to parasitoids than other formulations.

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