

## ENVIRONMENTAL TOXICOLOGY: RESIDUAL TOXICOLOGY OF ETHER EXTRACTS OF NEEM SEED KERNEL AND BLACK PEPPER SEED AGAINST PULSE BEETLE, *CALLOSBRUCHUS MACULATUS* (FAB.)

Mosmee Meena\*  
Kamini Verma\*\*  
Surabhi Shrivastava\*\*\*

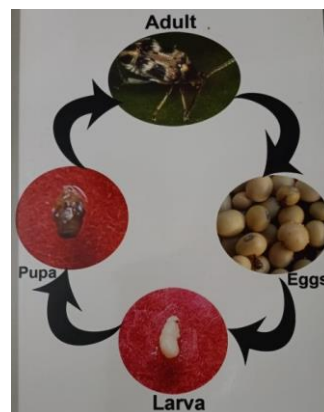
### ABSTRACT

Experiments were conducted to control *Callosobruchus maculatus* (Fab.) infesting the stored Cowpea seeds. In the present study, Ether Extracts of Neem seed kernel (N.S.K.E.) and Black Pepper seeds (B.P.S.E.) were found toxic against *Callosobruchus maculatus* in stored cowpea seeds. Thus, the study was aimed at the search of eco-friendly pesticides in Neem Seed Kernel and Black pepper seed Extracts in Ether at minimum 100% and 50% mortalities. 0.06% N.S.K.E. in Ether at minimum 100% mortality was found effective for 75 days while 0.02% N.S. K. E. in Ether causing about 50% mortality of *Callosobruchus maculatus* was found effective for 60 days. 0.18% B.P.S.E in Ether at minimum 100% mortality was found effective for 60 days while 0.07% B.P.S.E. in Ether causing 50% mortality of *Callosobruchus maculatus* was found effective for 45 days.

**Keywords:** *Callosobruchus maculatus*, Extract, Neem Seed Kernel, Black Pepper Seed, Residual Toxicity, Cowpea.

### Introduction

India is a thrust area for employment of the population and is an agriculture based Country. Pulses and cereals are main part of crop production in a agriculture. Pulses are damaged by many insect pests in storage. One such major pest attacking pulses is *Callosobruchus maculatus*. The use of various chemicals based management to control *Callosobruchus maculatus* would be hazardous to health. The use of Botanical pesticides has declined due to emergence of synthetic Organo-chlorine and Organo-phosphate insecticides. So, the application of botanical pesticides seems to be the next best alternative. Hence the present study is aimed to minimize the use of chemical pesticides, where all the eco-friendly plant based pesticides have been utilized as extracts in ether.



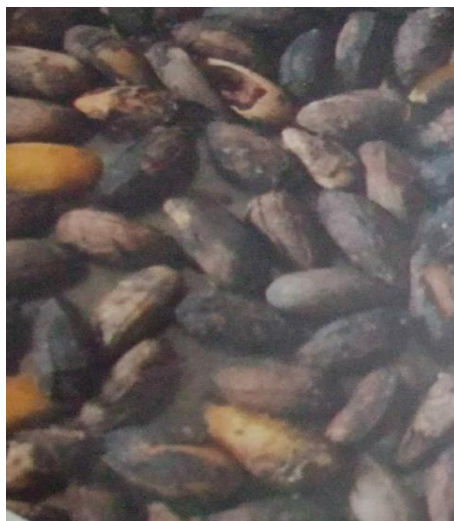
\* Assistant Professor, Janki Devi Bajaj Government Girls College, Kota, Rajasthan, India.  
\*\* Faculty Zoology, Maa Bharti Girls P.G. College, Kota, Rajasthan, India.  
\*\*\* Former Principal, Rajasthan Higher Education Services, Rajasthan, India.

### Materials and Methods

Neem seed kernel and Black pepper seed extracts were prepared in ether. Extraction was done in a Soxhlet apparatus for 8 hours over a heating mantle at 70 Degree Celsius temperature in petroleum ether. Thus, the Residual toxicity of NSKE and BPSE was worked out. 20 gm of cowpea seeds were treated with requisite dosages, 0.06% of NSKE at minimum 100% mortality rate and 0.02% of NSKE at minimum 50% mortality rate, while the dosages of Black pepper seed extracts at minimum 100% and minimum 50% mortality rates were 0.18% and 0.07% respectively. The mortality counts of *Callosobruchus maculatus* were recorded at 24 hours after their release, till minimum (about 5%) mortality was observed. For both plant products (NSKE and BPSE) experiments were done in triplicate.



Soxhlet Apparatus



Neem seed kernel



Black pepper seed

**Table: Residual Toxicity of deposits of Ether extracts of Neem Seed Kernel and Black Pepper seed at minimum 100% and 50% mortality of *Callosobruchus maculatus* (F.) at different intervals after spraying**

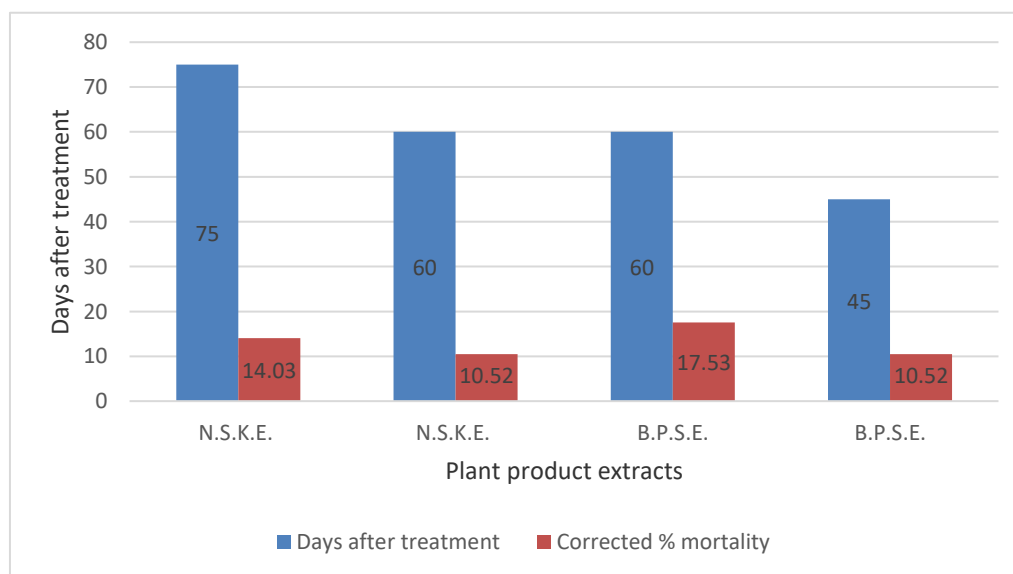
S. No.	Name of Plant Product	% Conc.	Residual Toxicity of Deposits at Intervals of															
			1 DAT		3 DAT		7 DAT		15 DAT		30 DAT		45 DAT		60 DAT		75 DAT	
			% M	C%M	% M	C%M	% M	C%M	% M	C%M	% M	C%M	% M	C%M	% M	C%M	% M	C%M
1	N.S.K.E.	90.0	93.33	92.97	90.0	89.47	86.66	85.95	80.00	78.94	65.00	63.15	41.66	38.58	33.33	29.82	18.33	14.03
2	N.S.K.E.	0.02	50.00	47.36	41.6	38.58	35.00	31.57	28.33	24.55	25.00	21.05	21.66	17.53	18.33	10.52	-	-
3	B.P.S.E.	0.18	90.00	89.47	85.0	84.21	71.66	70.16	60.00	57.89	45.00	42.1	28.33	24.55	21.66	17.53	-	-
4	B.P.S.E.	0.07	45.00	42.10	35.00	31.66	28.06	24.66	21.66	17.53	16.33	11.92	15.00	10.52	-	-	-	-

N.S.K.E.: Neem Seed Kernel extract

% M: Percent mortality

C % M: Corrected % mortality

**Graph: Residual toxicity of deposits of Ether Extracts of Neem seed kernel and Black Pepper Seed at minimum 100% and 50% mortality of *Callosobruchus Maculatus* (F.).**



B.P.S.E.: Black Pepper Seed extract

DAT: Days after treatment

N.S.K.E.: Neem Seed Kernel Extract

B.P.S.E.: Black Pepper Seed Extract

**Result and Discussion**

- Neem Seed kernel extract in ether (0.06%) at minimum 100% mortality was found effective for more than 75 days.
- NSKE in ether (0.02%) at minimum 50% mortality was found effective for 60 days.

- Black Pepper seed extract in ether (0.18%) at minimum 100% mortality was found more effective for 60 days in comparison to Neem seed kernel extract in ether at minimum 50% mortality.
- BPSE in either (0.07%) at minimum 50% mortality was found effective for more than 45 days.

### Conclusion

It has been estimated through various research works, based on chemical pesticides, that these chemicals are highly toxic to environment, crops and human as well as livestock health. The attempt to use ecofriendly pesticides of plant origin, can minimize the adverse impact of these chemicals towards our environment and agricultural pesticides.

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