

# Relative Toxicity, Regression Equation, LC<sub>50</sub> and LC<sub>90</sub> Values of Various Neem Formulation Against *Papilio Demoleus* Linn

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## Abstract

The neem based pesticides showed their toxicity as 1.5158, 1.33757 and 1.0272 times. Respectively more than Nimbicidine where as the toxicity of Achook was 0.6643 times less than compared with Nimbicidine. the LC<sub>90</sub> values in this case have also been calculated which resulted 5.0435, 6.001, 6.0304, 6.0393, and 9.0102 for Neemazal, Bioneem, Neemgold, Nimbicidine and Achook, respectively.

**Keywords:** Toxicity, LC 50, LC 90, Pesticides.

## Introduction

Several million tonnes of food grains and fruits are either damaged or lost for want of scientific knowledge due to improper management in storage, and lack of strategic management of fruit crops in the field which are to be coped up to avoid substantial loss at their various Stages. Amongst the major storage pests, almond moth (*Cadrapautella* Walker), feeds on varieties of cereals {external feeder and cereal products, fruits, condiments, cotton seeds, Gate and other nuts etc. (Srivastava & Singh 1997), is a noxious insect inflicting heavy toll.

Values of botanicals, in this direction, appears to meet the open challenge in the armoury of protection scientist as these natural products are biodegradable having known mammalian toxicity and adverse effect on the quality and sanctity of environment.

## Material & Method

Feeding dry mango chipps (60 gm.) were mixed with different neem based formulations viz. Neemazal. Bioneem. Neemgold, Nimbicidine and Achook. After the solvent was evaporated, dry mango chipps were transferred into three tubes of each concentration. In control experiment. 20 gm. dry mango chipps were treated with solvent only. ten larvae were use in.

Each replication, after one month each tube was weighed and the amount of consumed food was estimated. All the neem based pesticides were tested at the concentration of their LC<sub>50</sub> value against the test insect.

Per cent feeding inhibition (Antifeeding index A.F.I.) was also calculated by following formula as also adopted by Abivardiand Benz (1964).

$$\text{Antifeeding index} = \frac{C-T}{C} \times 100$$

Where,

C= consumed quantity in control.

T = consumed quantity in treatment.

The experiments were conducted in a Complete Randomized Block Design (CDR) and data were computed to signify the results.

## Result & Discussion

The overall efficacy of all different neem based Pesticides against *P. demoleus* was found in the following descending order.

**Neemazal>Bioneem>Neemgold>Nimbicidine>Achook**

The value of relative toxicity of different experimental neem based formulation have been calculated by taking it. Nimbicidine as unity (Table 1) The neem based pesticides showed their toxicity as 1.5158, 1.33757 and 1.0272 times. Respectively more than Nimbicidine where as the toxicity of Achook was 0.6643 times less than compared with Nimbicidine. In the present study, Neemazal proved as most toxic amongst all neem based pesticides used against the larvae of *P. demoleus*, followed by formulation of bioneem, neemgold, nimbicidine and achook respectively. The LC<sub>90</sub> values (table- 1<sup>st</sup>) in this case have also been calculated which resulted 5.0435, 6.001, 6.0304, 6.0393, and 9.0102 for Neemazal, Bioneem, Neemgold, Nimbicidine and Achook, respectively. Similar also found Malik, M.M et al (1984), Bambarker, Sunil (1990) Abbott, W.S. 1925, Cupp, E.W. and J. O'neal (1973), Gupta, Mridula *et. al.* (1995), Gupta, Maridula *et. al.* (1994), Gupta, G.P. *et. al.* (2005) Effect of plant lectins on growth and development of American bollworm (*Helicoverpa armigera*), Hennebarry, T.J. and Kishaba, A.N. (1966), Janakiraman, S. and Gupta, G.P. (2002) Effect of modified artificial diet and insecticidal proteins on growth and development of tobacco cutworm (*Spodopteralitura*), Mala, S. and Muthalagi, S. (2008), Effect of Neem oil Extractive (ONE) on repellency, mortality, fecundity, development and biochemical analysis of *Pericalliaricini* (*Lepidoptera: Arctiidae*), M.M. H. Khan (2019), Mohamed, M. J. and Kareem, A. A. (2010), Effect of leaf extracts of medicinal plants on feeding, larval growth and defecation of woolly-bear caterpillar, *Pericalliaricini* (F.) (*Arctiidae: Lepidoptera*) on castor beans, Radwan, H.S.A. *et. al.* (1986), Saxena, A, *et. al.* (2001) Effects of certain insect growth regulator on the growth and development of *Pericalliaricini* Fab. (*Lep.:Arctiidae*) and Simmonds *et. al.* (1995).Gujar, G.T. and Mehrotra, K.N. (1990).

**Table 1. The relative toxicity, regression equation, LC<sub>50</sub> and LC<sub>90</sub> values of various neem formulations against *Papilio demoleus* Linn.**

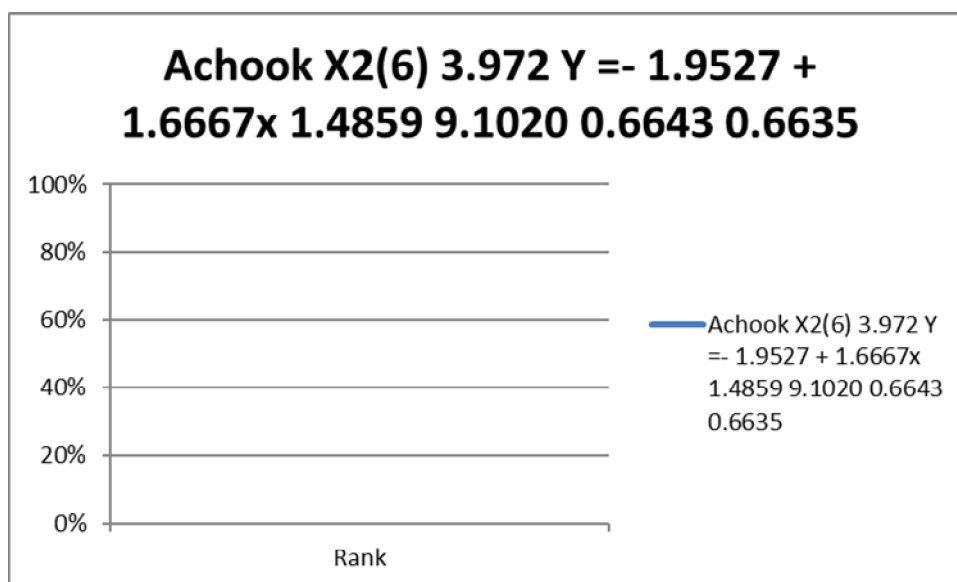
Formulations	Heterogeneity	Regression equation		LC <sub>50</sub>	LC <sub>90</sub>	Relative	toxicity	Rank
						LC <sub>50</sub>	LC <sub>90</sub>	
Neemazal	X <sup>2</sup> (6) 3.5385	Y= 0.4993	+ 1.4419x	0.6512	5.0435	1.5158	1.1974	I
Bioneem	X <sup>2</sup> (6) 6.1456	Y = - 1.9688	+ 1.7814x	0.7175	6.001	1.3797	1.0061	I]
Neemgold	X <sup>2</sup> (6) 2.9203	Y =- 1.3219	+ 1.6067x	0.9609	6.0304	1.0272	1.0014	II
Nimbicidine	X <sup>2</sup> (6) 2.5291	y=. 1.5077	+ 1.6292x	0.9871	6.0393	1.0000	1.0000	IV
Achook	X <sup>2</sup> (6) 3.972	Y =- 1.9527	+ 1.6667x	1.4859	9.1020	0.6643	0.6635	V

Y= Probit kill, X= Log Concentration

X<sup>2</sup>(6)=Neem based formulation & log Concentration

LC<sub>50</sub>= Concentration calculated to give 50 per cent mortality

LC<sub>90</sub>= Concentration calculated to give 90 per cent mortality



**Figure 01. The relative toxicity, regression equation, LC<sub>50</sub> and LC<sub>90</sub> values of various neem formulations against *Papilio demoleus* Linn.**

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