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BIO-EFFICACY OF *COLOTROPIS PROCERA* AND LANTANA CAMARA AGAINST *SPODOPTERA LITURA* (TOBACCO CUT-WORM)

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Abstract

The use of pesticides such as organophosphates and carbamates for controlling various pests is an effective strategy for protecting crops. But these chemical pesticides pose serious threats to the environment and to non-target organisms due to its persistent nature. Use of natural pesticides based on Phytochemcials as active ingredients obtained from Botanical is a viable option and being popular due to their eco-friendly and non-toxicological properties. Calotropis proceraand Lantana camara is a weed having Different medicinal properties. Present study was designed to study the efficacy of two plants extracts viz., Calotropis proceraand Lantana camara only-aerial parts were taken against the *Spodoptera litura* (Third instar larvae), each was taken in different concentration in three replications of 24, 48 and 72 hours. After every interval of time the mortality percentage was detected. The percentage mortality was also studied with other solvents ie. hexane, aqueous, chloroform, ethyl acetate, methanol, polar, semipolar and non-polar solvents at different concentrations these collected data were carefully analysed using MS Excel and poloplur software. The LD_{50} and LD_{90} estimated using Hexane, Aqueous, Chloroform, Ethyl acetate, methanol extracts of C. procera were 7.02, 12.73, 5.48, 9.54, 8.28 and 21.08, 41.34, 16.10, 24.59, 35.15 respectively with fiducial limit of 5.82 to 9.00, 9.50 to 27.19, 3.53 to 8.54, 7.89 to 13.64, 6.46 to 13.04 and 14.30 to 47.89, 21.63 to 28.29, 9.73 to 128.03, 16.13 to 68.74, 19.06 to 179.25. The LD50 and LD90 limits estimated with Hexane, Aqueous, Chloroform, Ethyl acetate extract L. camara wire 7.89, 4.11, 5.02, 11.79, 9.23 and 54.14, 23.54, 26.74, 94.27, 31.68. Respectively with f iducial limits of 5.69 to 12.50, 1.59 to 8.73, 3.72 to 6.82, 8.01 to 23.91, 7.31 to 12.47 and 26.89 to 243.13, 10.29 to 1270.69, 16.33 to 67.12, 38.69 to 806.11, 20.72 to 69.33 respectively.

Keywords : *Spodoptera litura*, Lantana camara, Bio-efficacy, *Calotropis procera*

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Introduction

Wide spread use of chemical pesticides in agricultural and public protection has led to a magnificent scale of Environmental exposure.

The natural and monetary commitments of pollinator honey bees to farming creation have been compromised by the wrong and extreme utilization of pesticides (Tschoeke *et al*., 2019). Normal utilization of pesticides in present day horticulture and general well being activity frameworks has resulted in genuine environmental impact (Minelli and Rebeiro, 1996; Waliszewiski *et al*., 1999) as of late, the interest in the utilization of plant items has expanded, as a result of cost adequacy, and low mammalian poisonousness (Subramaniyam and Rosli, 2000).

In this specific circumstances, screening of common items has gotten in consideration of analysis around the globe (Kebede *et al*., 2010). Farmers and Researchers frequently Guarantee truthful utilization of plant materials in insect pests. Control including debris (Ajayi *et al*., 1987) vegetables oils (Sahayaraj, 2008) and powders of plant parts (Lajide *et al*., 1998). Plants with insecticidal properties are giving options in contrast to as of now utilized manufactured substance pesticides as a result of their richness of bio-active synthetics (Quin *et al*., 2010). These Bioactive synthetic compounds go about as fumigants (Choi *et al*., 2006), contact inject sprays (Tang *et al*., 2007), anti-agents (Islam *et al*., 2009) and Anti-feedarts (Gonzalez, Coloma *et al*., 2006) and may influence some natural boundaries, for example, development rate (Nathan *et al*., 2008), life length and proliferation (Isikber *et al*., 2006). Aerial parts of L. camara have likewise been explored for their insecticidal, anti-ovipositional and antifeedant activities against Allso-bruchus chinensis, petrol ether and methanol based extract of the plant showed 10-43% mortality of A. chinensis (Saxena *et al*., 1992). Chloroform based extracts of L. camara has been discovered to be altogether powerful against termite laborers (Kumar and Verma, 2006) and fluid concentrates have been deadly for fourth instars larvae of *Spodoptera litura* under lab conditions.

C. procera has various alkaloids, flavanoids, terpenes, terpenoids, furthermore, other inorganic components (Khanzaada, 2008). There are various reports asserting the insecticidal properties of plant concentrate and fundamental oils of C. procera (Begum and Sharma, 2013). Pesticidal compounds discovered in C. procera have been accounted for

to be powerful against insect pest (Ingle *et al*., 2017), fungi, microorganisms and nematodes (Chin *et al*., 2017). Plants inferred items have been utilized to repulse or killing mosquitoes and other home grown insect pests throughout of the word (Pavella, 2016).

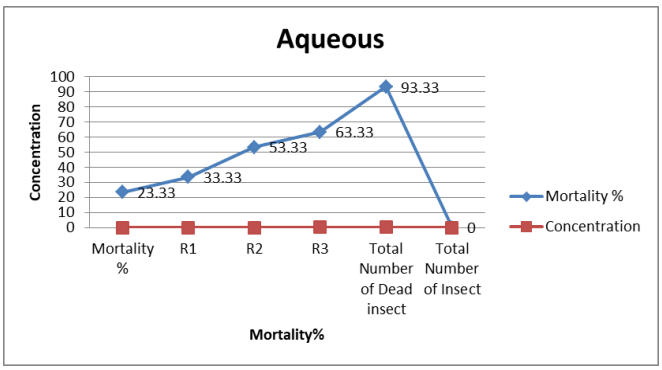
Lantana camara do not have antifeedant activity at all concentrations (Oraon Priti Kumari and Thakur Anand Kumar, 2022).

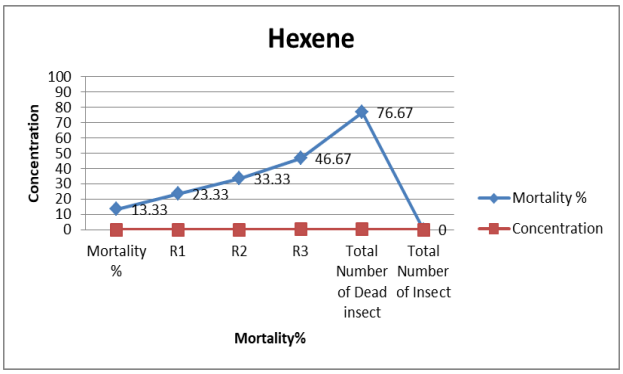
Material and Methods

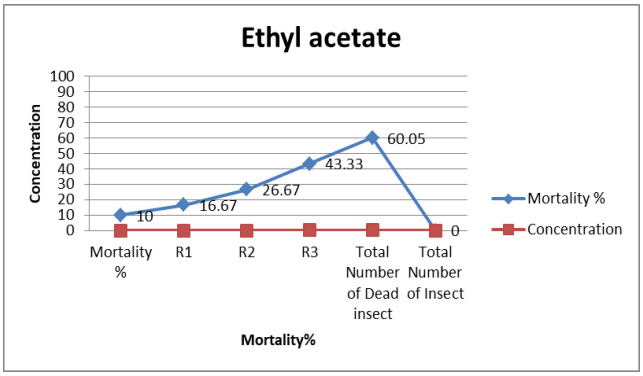
The Aerial parts of the Lantana camara and Clotropis procera were collected randomly from the fields of Chaudhary Charan Singh University, Meerut, Uttar Pradesh, India. The plant samples collected were washed, dried and then grounded. To powder of aerial parts was extracted thrice with 300ml methanol and concentrated by Rotary vacuum evaporator (Buchi-Rotavopour R-200/R-205) at 70ºc and evaporated to dried crude extract and stored at 4ºC in an air tight bottle. Other solvents i.e., Hexane, Aqueous, Chloroform, Ethyl acetate, Methanol having polar, non-polar and semi-polar activities were also utilized for mortality study.

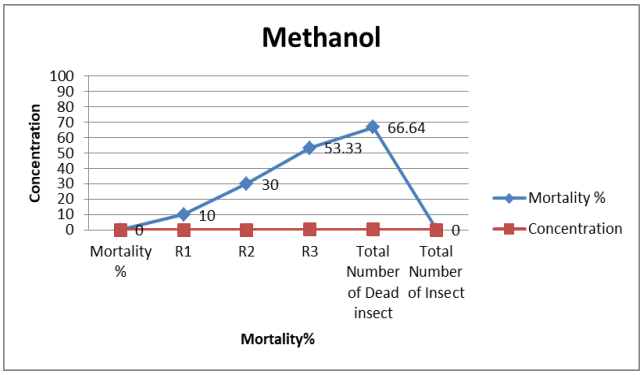
Result & Discussion

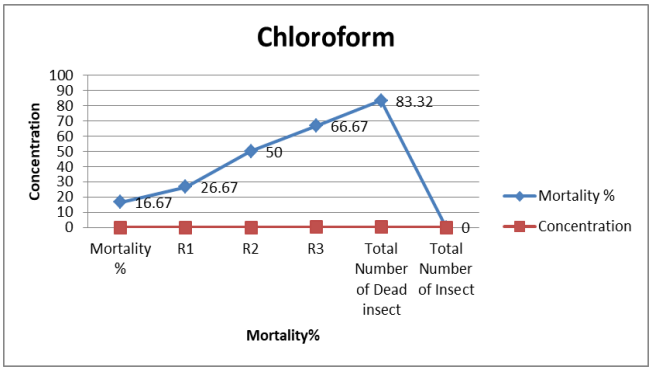
During this study work the mortality percentage was observed at all respective doses against *Spodoptera litura* (Third instar larvae) after that we observed significant mortality action comparison against control. The result shows that C. procera showed maximum mortality rate of *Spodoptera litura* by chloroform extract (86.67%) followed by Hexane, Methanol, Ethyl acetate and Aqueous solution. Likewise, in case of Lantana camara, the maximum mortality rate was observed in Aqueous solution (93.3%), followed by chloroform, hexane, ethyl acetate and methanol solution at different concentrations as show in Tables-1.











Conclusion

Laboratory and field trial evaluations of plants Extracts revealed that the chloroform fraction of *C. procera* and *L. camara* in combination showed synergistically enhanced activity at very low dosed (2.0% and 1.25%) and has promising potential as insecticidal activities for the management of *Spodoptera litura*. The combination of *C. procera* and *L. camara* can be applied for integrated pest management (IPM).

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