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Research Article

CONTROL OF INSECT PEST, *SPODOPTERA LITURA* F. BY ENVIRONMENT, ECOFRIENDLY BIOPESTICIDES FROM PLANTS

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ABSTRACT

Indiscriminate use of chemical insecticides a serious problem to pollute the environment (Soil, water, and air). The *Spodoptera litura F*., also known as tobacco caterpillar, is one of the worst polyphagous insects and attack large number of impressive 73 host plants species, and other insect pests keeping in view of the above points, to use of safer plant origin potential insecticides friendly to environment for control of insect pests. Tobacco cut worm *Spodoptera litura* Fab. Is among the major polyphagous bugs that seriously restrict creation. A significant issue is that bug bother all throughout the planet have created protection from numerous insect poisons. Bugs have a very much evolved resistant framework incorporating humoral and cell protections. The bug safe framework is primarily represented by the exercises of phenol oxidase chemical just as haemocytes that are intense against intruders and poisons. Any compound that can meddle with these protections will seriously impede the bug natural wellness. Insect detoxification proteins additionally assume a vital part in the improvement of opposition against insect sprays. A decrease in these compound levels will bring about a decrease of insect spray opposition levels. Impact of fifteen plant species insecticidal effectively are tried against tobacco caterpillar, *Spodoptera litura* F. All the arrangement materials were separated with acetone/petrol either solvent or tried at the various fixations. Out of these 10 plants removes vows to be wellspring of insecticidal movement to the tried bug bothers.

Keywords: *Spodoptera litura*, Caterpillar, Insect, Polyphagous, Plants.

INTRODUCTION

Crop protection is an essential and vital aspect to crop production; insect pests are main enemies for agriculture field, stored products, warehouses, in houses and livestock. Bugs' creepy crawlies making harm cultivable harvests and food items by taking care of, fertility and parasitizing live stocks, additionally being an annoyance to human wellbeing. Several pests have developed resistance; natural enemies are destroyed, and previously innocuous insects have become major pests; high chemical residues have been detected in the produce even mother milk and our soil, air, water system have been polluted. Create number of problems to consumers to health even cancer like infection reported by pesticides to human(Hong *et al*., 2018; Tak *et al*., 2016).

These problems force us to resort to use of refer botanical pesticides. The rich flora and fauna help to investigate the chemistry of natural products, whose pesticidal/insecticidal values could be exploited to control the broad spectrum of insect pests. These biodegradable natural products of diversified structures necessitate the synthesis of similar analogues. Natural products are alternative to synthetic pesticides. Auxiliary plant metabolites assume a significant part in giving insurance to plants against herbivore insect bothers. Keeping in view the expanding significance of bio pesticides, the unrefined

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concentrates from various plants are being researched for insecticidal exercises(Park *et al*., 2016).

MATERIALS AND METHODS

Fifteen insecticidal plants were selected from our preliminary test for detailed study. These plant materials were collected in large quantity and washed with tap water, dried in conceal, and powdered with homegrown processor. The grind samples were extracted in Soxhlet apparatus till the extract become colourless with solvent acetone for *Acorus calamus* (rhizomes). *Cyperus rotundas* (rhizomes), *Cimicifirga foetida* (leaves). *Linum usitatissimum* (immature fruits), and *Solanum xanthocarpum* (seeds). Petroleum ether (bp 40-60 °C for *Argimone mexicana* (seeds), *Allium sativum* (bulbs), *Centratherum authelminticum* (seeds). *Diospyros indica* (mature fruits). *Gynandropsis gynandra* (seeds). *Márrenia diandru* (matura fruits). *Ocamum basilicum* (seeds), *Taget indica* (leaves). *Verbena officinalis* (leaves) and *Zingiber officinale* (rhizomes). The extracts thus obtained were taken in weighed porcelain dish separately and the solvent was completely evaporated on the steam water bath(Kim *et al*., 2015).

Laboratory reared 4th instar larvae of Spodoptera litura were starved for 24 hr. at 27+1 °C before releasing them on treated cauliflower leaf pieces of 6 cm^2. Acetone and petroleum ether separates were detailed as emulsion utilizing 0.5% Triton X-100 and 5% benzene as emulsifier and dis-solvable individually. All the plant materials were tested at 0.1, 0.5, 1.0, 1.5 and 2% concentrations. Fresh undamaged leaf pieces were dipped in each concentration and left under electric fan to dry the extract. The leaves were then kept in petri dishes on wet filter paper along with larvae. Three replications (2 larvae piece) were made for each treatment. A set of control for each experiment was treated with emulsified water only. The area consumed by the larvae after 24 hr. in each replication was measured with the help of planimeter and the information from there on were exposed to probate examination and compared based on respective ED50 values.

RESULTS AND DISCUSSION

The results reveal that the five plants extracts viz, *M. diandra, S. xanthocarpum, A. mexicana, C. anthelminticum and C. foetida* exhibited very lowest feeding deterrence whereas *O. basilicum, C. rotundus* and *Z. officinale* showed highest mortality for *S. liyura* larvae. The ED50 value of these plants extracts ranging from 0.002 to 8.36 %. Based on percentage mortality of larvae, the following descending order of plants was observed- *O. baxilicum* and *C. rotundus, Z officinale. D. indica: L. usitatissimum, V. officinale: G. gyandra, A. sativum A. calamus, 1. indica; M. diandra: S. xanthocarpum, A. mexicana, C. anthelminticunt, C. foetida* respectively. In view of the present findings obtained on the mortality of *S. litura* larvae with these plant extracts have been shown promising mortality activity over control. Earlier the test of

insecticidal activity has been done by many research workers with *Cocculus trilobus, Clerodendrin tricotomum* (Oliveira *et al*., 2018) and *Azadirachta indica* (Pavela & Benelli, 2016) and (Wang *et al*., 2017) plants against the test insect, but no information is available on the mortality activity of these test plant extracts. So far further work is in progress to determine the mortality activity of these plant materials against other insect pests.

CONCLUSION

Effects of fifteen plant species as insecticides movement are tried against tobacco caterpillar, *Spodoptera litura* F. All the plant materials were removed with acetone/petroleum ether dis-solvable and tried at five unique fixations. Out of these concentrates just five plant separates have exceptionally low insecticidal action and other leftover concentrates vow to be a powerful wellspring of taking care of obstacle action to the tried insects' bothers.

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