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PESTICIDAL EFFECT OF ALOE VERA EXTRACTS ON SOME LARVAE OF CROP DAMAGINING PESTS

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ABSTRACT: Plant and animals are complimentary to each other's, since the starting of civilization, when a hunter man converted himself into a cultivator he gained vast knowledge about plants and their characteristical varieties. The plant were used by human being for their food, shelter, medicines etc. Since the beginning of Ayurved the Ayurvedic vaidys have choosen the medicinal plants which were used by ancient human being traditionally. In our Vadic literatures the worship of Herbs, Shrubs and Tree have been conducted. Due to rapid deforestation, industrialization and urbanization most of the useful diversity of plants are gradually going towards endangered, some of them have been lost. Such the plants are not important only for medicinal use, but they are also important in the prevention of dangerous insects, pests, fungus and other harmful biotic for crops, vegetables, other stored food materials and animals.

Promising results obtained on larvicidal effects of acetone extracts of medicinal plants, Aloe Vera on 6th instars larvae of confused crop damaging pest, confusion indicated a great potential for its exploitation as insecticide. The development of larvae was completely inhibited at 1mg dose of Aloe Vera leaf extract, as there was no emergence of adult at this dose. Most of the adults emerging from such pupae showed deformed adults & died within a week after emergence without egg laying.

Keywords: *Aloe vera* Extracts, Larve and Crop Damaging.

INTRODUCTION

The nature is ours, but not ours alone. If there is a way to protect his agricultural produces from pests, no farmer will like to kill the pests. Fukoka, the Father of Natural Farming says that there exists always a relationship between plants and pests. Any attempt to control the pests without understanding the relationship among them is futile. Pest management is not a simple problem in chemical farming. Great efforts are always made to reduce the damages done by the pests. Different types of pesticides are used to control the pests at different stages. i. e, systemic pesticides for sucking pests, penetrating pesticides for stem borers, vaporizing pesticides for pests that hide in safe places within plant and so on. But every pesticide is sold with a certificate that it will kill only the elected insects, leaving their predators undisturbed.

Natural products, mainly plants and their derivatives are gaining importance in the recent past for use against noxious insect pests due to reason not only the resistance against conventional synthetic insecticides but also problems like environmental pollution, toxicity, bioaccumulation & biomagnifications especially through different trophic levels in the ecosystem. Some plants and their products have insecticidal, larvicidal and insect growth regulatory effects which are introduced in the pest control strategy (Jamil et. Al. 1988, Chiranjivi & Shudhakar 1996, Omotoso 2004, Sharma et. al. 2008).

The use of plant products in treating grains is also becoming popular among farmers in India & abroad, because plants have wide spectrum of actions, safe to apply, have no harmful effects on the mankind and other flora & fauna and they are also easy to process. Omotoso & Oso (2005) have evaluated the insecticidal and insect productivity reduction capacities of medicinal plant Aloe vera on Raphidipulpa foveicollis larvae.

MATERIAL AND METHOD:

Healthy plants of Aloe vera grown at the own residential garden at Rewa used in all experiments of this present work.

Preparation of plant extract-:

In the present investigation the extract was prepared with organic solvent ethanol (Annapurna 1989). The air dried plant materials have been powdered mechanically. The dry powder (100 gm.) was extracted thoroughly with dry ethanol and kept aside overnight to settle the main pigment at the bottom leaving brown liquid. The extract was kept in vacuum desiccators for dryness the ethanol was evaporated completely to dryness under vacuum leaving brown powder, which re-dissolved in ethanol. This extract was then used for further investigations.

Collection of pests and their identification -:

During the present study one agricultural pest larvae *Raphidipulpa foveicollis* (Luthear) Red pumpkin beetle have been selected, collected and identified of pest was done with the help of Entomology department Agricultural College Rewa.

Preparation of dilutions of collected plant extracts-: The dilutions of extracts have been prepared by adding the distilled water. 0%, 25%, 50%, 75% and 100% of dilutions have been made by the mixing of distilled water in following manner-

(1) 0 ml. (control) no extracts have been added there is only distilled water.
(2) 25 ml. of extracts and 75 ml. of distilled water used as 25%.
(3) 50 ml. of extracts and 50 ml. of distilled water used as 50%
(4) 75 ml. of extracts and 25 ml. of distilled water used as 75%
(5) 100 ml. of extracts and 0 ml. of distilled water used as 100%

The various concentrations of diluted extract have been spread over the collected pest larvae. In the glass petrydishes counted numbers of ten pest larvae have been kept in the triplicate to get proper results, with a control.

OBSERVATION-:

The different type of plant solution has sprayed on pest larvae of crop and observation of motility has been recorded. The experiment replicated during three different duration 12 hrs, 24 hrs and 48 hrs in data sheet.

RESULTS:-

1- Mortality of Raphidopalpa foveicollis larvae with plant Aloe vera:-
In the case of *Raphidipulpa foveicollis* Red pumpkin beetle larvae mortality recorded were 33.05% (Table No.1).

Table No. (1) - Mortality of Raphidipulpa foveicollis larvae with plant Extracts.

Plant Name	Mortality Mean Value (in %)
Aloe vera	33.05%

2- Mortality (Mean value in %) of Raphidipulpa foveicollis larvae in relation to different concentration-

The mortality recorded at different concentration of plant extract were as at 0% concentration (Control) mortality was 0%, at 2% extract conc. It was 19.99 %, at 50% conc. It was 32.13 %, at 75% conc. Mortality was 45.31% and at 100% latex con. 63.76% mortality has been recorded.

The highest average pest mortality was recorded 63.76% in case of 100% extracts conc. and lowest at 0% conc. It was 0% Table no.2).

Table no. 2 -Mortality (in %) of Raphidopalpa foveicollis larvae in different concentration of Aloe vera plant extract.

Concentration	0%	25%	50%	75%	100%
Mean Mortality	0	19.99	32.13	45.31	63.76

3- Mortality (Mean value in %) of larvae Raphidopalpa foveicollis at different duration-:

The mortality in relation to different duration were recorded as 31.72% after 12 hrs time span. 31.53% after 24hrs and 33.46% after 48 hrs. The highest average pest mortality percentage has been recorded after 48 hrs as it was 33.46% and lowest 31.53% after 24 hrs time span (Table No. 3).

Table no. 3 - Mortality (Mean value in %) of *Raphidopalpa fovecollis* larvae at different duration.

Sr. No.	Duration (In hrs)	Pest mortality (In %)
1.	12	31.72
2.	24	31.53
3.	48	33.46

4- Effect of different concentration of plant extracts Aloe vera on larvae of Raphidopalpa foveicollis.

Where the treatment combination were concerned with plant species extract and their different concentrations, the 0% mortality obtained at o% concentration (control), at 25% conc. of plant extract conc. It was 23.68% at 50% extract conc. It was 30.48% at 75% extract conc. It was

45.64% and at 100% plant extract conc. Mortality was recorded 65.46%.

5. Effect of Aloe vera plant extract on Raphidopalpa fovecollis larvae at different duration.

In the case of plant species Aloe vera pest mortality were recorded 31.59 after 12 hrs, it was 33.96% after 24 hrs and it was 33.50% after 48 hrs.(Table no.4).

Table No. 5 - Effect of plant species Aloe vera extract on Raphidopalpa foveicollis larvae at different duration.

Plant species	12 Hours	24 Hours	48 Hours
Aloe vera	31.59	33.96	33.50

6- The effect of plant species Aloe vera extract and their different concentration at different duration on Raphidopalpa fovecollis larvae mortality-:

In the case of Aloe vera the pest mortality was recorded 0% at 0% concentration(control) of plant extract, after 12 hrs, 24 hrs and 48 hrs. at 25% conc. The pest mortality was recorded 21.15%, after 12 hrs, 23.44% after 24 hrs and 26.44% after 48hrs. At 50% conc. It was 33.02 % after 12 hrs, 28.21% after 24 hrs and 30.22% after 48hrs. In case of 75% conc. Of plant extract it was 43.08% after 12 hrs, 46.92% after 24 hrs and 46.92% after 48 hrs. Where in case of 100% conc. of plant extract mortality was recorded 61.22% after 12 hrs, 71.23% after 24 hrs and 63.93% after 48 hrs.

The highest average mortality obtained 71.23% at 100% conc. of plant extract after 24 hrs time span and lowest was 0% in case of all duration.

Table No. 6- The effect of plant extract of Aloe vera and their different concentration at different duration on *Raphidopalpa foveicollis* larvae mortality.

Plant species	Concentrations (%)	Duration- 12 hrs.	Duration- 24 hrs	Duration- 48 hrs
Aloe vera	0%	0.0	0.0	0.0
	25%	21.15	23.44	26.44
	50%	33.02	28.21	30.22
	75%	43.08	46.92	46.92
	100%	61.22	71.23	63.93

DISCUSSION:-

Agriculture in India has been long history dating back to ten thousand years. Today, India rank second worldwide in farm output and about 70% of Indian are directly of indirectly associated with agriculture.

Several pressures have accelerated the search for more environmentally and toxicologically safe and more selective and efficacious pesticides. Most commercially successful pesticides have been discovered by screening compounds synthesized in the laboratory for pesticidal properties. The average number of compounds that must be screened to discover a commercially viable pesticide has increased dramatically, so that new discovery strategies must be considered. Increased emphasis on reduced-tillage agriculture will make adequate control of weeds more dependent on chemical control. New herbicides will be needed to fully meet this challenge. The increasing incidence of pesticides resistance is also fueling the need for new pesticides. Furthermore, most synthetic chemicals that have been commercialized as herbicides are halogenated hydrocarbon with relatively long environmental half-lives and more suspect toxicological properties than most natural compounds. Thus, natural compounds have increasingly become the focus of those interested in discovery of pesticides.

Throughout history, plant products have been successfully exploited as insecticides, insect repellents, and insect antifeedants. Probably the most successful use of a plant product as an insecticide is that of pyrethroids. The insecticidal properties of the several Chryanthemum species were known for centuries in Asia. Even today, powers of dried flowers of these plants are sold as insecticides. After elucidation of the chemical structures of six terpenoid easters (pyrethrins) responsible for the insecticidal activity of these plants, many synthetic analogs have been patented and marketed. Synthetic pyrrethroids have better photostability and are generally more active than their natural counterparts.

Another plant terpenoid, camphene, was a very successful herbicides in its polyhalogenated from. Sold as Toxaphrenereg., this product was the leading insecticides in the United States before it was removed from the market. Although this product was a mixture of over two hundred chlorinated forms of camphene, certain specific compounds in the mixture were found to be much more active than the mixture on a unit weight basis. Many other terpenoids have been demonstrated to have insecticidal or other insect-inhibiting activities. For instance, azadirachtin and other terpenoids of the limonoid group from the families Meliaceae and

Rutaceae are potent growth inhibitors of several insect species.

Physostigmine, an alkaloid from Physostigma venenosum was the compound upon which carbamate insecticides were designed. Furoquinoline and beta-carboline alkaloids such as dictamine, harmaline, respectively, are potent photosensitizing compounds that are highly toxic to insect larvae in sun light. The relative high cost toxicity to mammals, and limited efficacy have limited the use of natural alkaloids insecticides.

Preparation of roots from the genera Derris, Lonchocarpus, and Tephrosia, containing rotenone were commercial insecticides in the 1930s. Rotenone is a flavonoid derivative that strongly inhibits mitochondrial respiration. No other phenolic compound has been used commercially as an insecticides, although the content of certain phenolic compounds in plants tissues have been correlated with host plant resistance to insects and many have been demonstrated to be strong insect growth inhibitors and antifeedants.

Control of insects can be achieved by means other than causing rapid death. Plants produce many compounds that are insect repellents or act to alter feeding behavior, growth and development ecdysis(molting), and behavior during mating and oveiposition. Most insect repellents are volatile terpenoids such as terpenen-4-ol. Other terpenoids can act as attractants. In some cases, the same terpenoid can repel certain underirable insects while attractants more beneficial insects. For instance, geraniol will repel houseflies while attracting honey bees. Compounds from many different chemicals classes have been reported to act as insect antifeedants. Thus, polygodial a sesquiterpenoid from Polygonum hydropiper, is a potent inhibitor of aphids feeding. Several plant-derived steroids that are close analogues of the insect molting unrelated terpenoids inhibit molting by unknown mechanisms. Plant terponoids that act as locomotor excitants juvenile hormone mimics have been found to effectively sterilize insects. Plants contain a myriad of compounds with potential for development in controlling insects.

CONCLUSION:

The relationship between life and disease the plant is older as the history of mankind itself, plant play vital role for existences of life in the universe. It is evident that human being started using plant part from the very beginning and found that majority of plants was suitable as food as well as various needs of life. But present scenario need extensive research for search of novel herbal pesticides which can replace older plant product and the synthetic products and which can increase the possibility to vanish the hunger from the earth. Botanical pesticides are good alternative to chemical pesticides, because botanical pesticides are eco-friendly, economic, target specific and biodegradable. The use of botanicals in pest management is not only useful for suspension of pest population but will be also helpful to maintain the sound ecological balance, which will help mankind to cope with the threat to Global warming.

REFERENCES:

1. Chiranjive C & Sudhakar TR 1998. Effect of indigenous plant materials on the fecundity, adult emergence & development of pulse beetle C. chinesis in black gram, Journal of Research, Andhra Pradesh Agriculture University 24 3(4) 57.
2. Jamil. K, Rani U & Thyagarajan G 1984. International pest control July/August 1984, 106-108.
3. Jamil. K, Subhashini. S. & Jyoti KN 1988. New insect growth regulatory compound for the control of Indian Rice moth Corcyra cephalonica. 57(18), 1002-1003.
4. Omatoso, OT 2004. Evaluation of some plant powders as toxicants and antifeedants in the control of maize damage by the maize weevil, *Sitophilus zeamais* Motschulsky in storage. Ultra scientist of Physical sciences. 16(2) : 221-230.
5. Omatoso, OT & Oso AA 2005, Insecticidal & insect productivity reduction capacities of *Aloe vera* and *Bryophyllum pinnatum* on *Tribolium castaenum* Herbst. African Journal of Applied zoology & Environmental Biology 7, 95-100.
6. Annapurna (1989). Antimicrobial activity of leaf extracts of Polyalthia longifolia. Phytopatho. Z., 106:183-185.