Short Communication (NS-1)

TOXIC EFFECT OF *Ocimum sanctum* PLANT EXTRACT AGAINST *Acrida exaltata* (ORTHOPTERA : ACRIDIDAE) ADULTS

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ABSTRACT

*Ocimum sanctum* is a holy and medicinal plant for human beings. It performs various pharmacological activities against various diseases. *Ocimum sanctum* is an important medicinal plant and grows in house gardens and temples all over India. This plant is considered as one of the sacred plant species as it is rarely affected by diseases and pests. Basil, the “Royal Herb” in India is popularly known as Tulsi. Tulsi has been described as early as vedic period. Tulsi is the most sacred and holy plant of India dedicated to Hindu culture and Hindu ceremonies. Its leaves are used in worshipping of gods goddesses and are used as ‘Prasad’ (Holy food). Basil leaves contain a kind of bright yellow volatile oil which is useful against insects and bacteria. During the present investigation, it was observed the *Acrida exaltata* (orthoptera : Acrididae), adults were treated against different concentrations of *Ocimum sanctum* Leaves extract. The concentrations used to dip the maize leaves, upon which the insects feeds, were, 0.005%, 0.01%, 0.025%, 0.05%, 0.1%, 0.25%, 0.5% and 1.0% (v/v) respectively. Our results showed that the *Acrida exaltata* (Acrididae) adult indicated the maximum mortality 50.00% at 1.0% concentration of *Ocimum sanctum* (Leaves). Minimum mortality response around zero was observed in case of *Ocimum sanctum* (Leaves) at 0.005% concentration respectively.

**Key Words**: Plant extracts, *Ocimum sanctum*, *Acrida exaltata*, Soxhlet apparatus, Acrididae

INTRODUCTION

Insects compete with humans for food, adversely affect their dwellings as well as destroy all the fibers, which are basic requirements of human life and also affect human health. High incidences of insects damaging the crops have attracted the attention of entomologists for longtime to acquire their detailed Knowledge.
the battle between man and insect pest is being waged from times immemorial, with man changing his strategies of effective counter by insects producing new resistant strains. The use of chemicals for insect control started with the use of plant materials which touched its height of sophistication and modernization with the introduction of broad spectrum synthetic insecticides. Man often unknowingly interferes with the environment in such a way that he becomes the salve of his own creation. The conventional method of pest control i.e., the use of pesticides is hazardous for human population due to their inimical effect on the non-target species and environmental population etc. The effects of these pesticides soon started appearing and have come under controversy during the recent years because of poisoning of livestock, and wild life. Killing of beneficial organisms have been linked with the use of these pesticides. Widespread use of synthetic pesticides has led to the development of pesticidal resistance in a large number of insect pests. There is an urgent need for selective and effective pest control methods which can be easily included in the modern pest management concept, new bioactive products will be needed which are specific, eco-friendly to man and biodegradable, less prone to development of pest resistance and economical viable. Insecticides of plant origin provided a substantial answer to many of the problems particularly the environmental pollution and are eco-friendly in nature. Considerable attention in now being given to incorporate the use of naturally occurring insecticides to man’s armoury to combat noxious insect pest spp.

to evaluate the toxicity due to biocidal action, Acrida exaltata (Acrididae) adults were treated against different concentrations of Ocimum sanctum Leaves extracts, Now it is accepted that the above Ocimum sanctum leaves products have some interesting effects on the Acrida exaltata (Acrididae). However, Ocimum sanctum plant extracts have been used by a number of workers (ofuya and okuku, Srivastava and Neraliva, Umerie and Anaso, Sharma and khan). In comparison to the previous works, present study deals with the control methods using some commercially available Ocimum sanctum leaves extract.

MATERIAL AND METHODS

Breeding and maintenance of stock culture of Acrida exaltata (Orthoptera Acrididae)

Adults and nymphs of Acrida exaltata (Acrididae) were collected from the Naqvi Park, Aligarh. The culture of this pest was maintained in the insectary under controlled conditions, at 35°C and 60-70% relative humidity. They were maintained in cages. All the stages were fed on the fresh maize leaves and over crowding was avoided.

Preparation of Ocimum sanctum Leaves Extracts

The Ocimum sanctum Leaves were collected from the university premises during spring season. The identification of these collected leaves was confirmed by the plant taxonomist of Department of Botany, Aligarh Muslim University, Aligarh. For screening the material for this biocidal activity, only Ocimum sanctum plant was
selected which were known for medicinal properties. From the freshly collected plant leaves were separated and shade dried. After drying they were powdered in an electric grinder. The residue so obtained was again subjected to same treatment as described by N. Bano. The grind plant material was subjected to extraction by soxhlet apparatus with pet. Ether solvent prepared Ocimum sanctum Leaves extract was rotatory evaporator (Heidolph, Germany) under optimum temperature and pressure. The maize leaves were dipped in different concentrations (0.005%, 0.01%, 0.025%, 0.05%, 0.1%, 0.25%, 0.5%, and 1.0%) of Ocimum sanctum leaves extracts. The insects were allowed to feed and mortality was counted during feeding period in case of Acrida exaltata (Acrididae).

![Diagrammatic representation of Tulsi extract](image)

**Fig. 1:** Diagramatic representation of Tulsi extract
RESULTS AND DISCUSSION

The observation made on comparative response on adult grasshopper, *Acrida exaltata* (Acrididae) of *Ocimum sanctum* leaves extracts. The data on mortality percentage from the laboratory trial is presented in Table 1.

Our results showed that the *Acrida exaltata* (Acrididae) adults indicated the highest mortality 50.00 at 1.0% concentration of *Ocimum sanctum* (leaves). The data on mortality percentage from the laboratory trial is presented in Table 1. Similar performance of *Ocimum sanctum* plant extract has been reported by Singh et al.\(^8\) The results suggested that at high concentration of *O. sanctum* leaf extract show greater repellent activity in all net containing mosquitoes. However, low concentration of extract show greater activity in small net but poor in large net. From the above it can be concluded that high concentration of *O. sanctum* leaf extract can be used for prepartion of mosquitos’ repellent formulation without side effects.

Least mortality response around zero, was observed in case of *O. sanctum* leaf at 0.005% concentration respectively. Ahlawat and Srivastava\(^9\) have been found associated with yellow-net vein symptoms in Tulsi, *Ocimum sanctum*. The disease was graft and whitefly, *Bemisia tabaci* transmitted but not by mechanical inoculations. Tulsi is a new host for its vector, *B. tabaci* during adverse climate. Sharma et al.\(^10\) also studied the toxic effect of Tulsi (*Ocimum sanctum*) extracts against *Dysdercus koenigii* (Fab.) adults under laboratory conditions. It was found that highest mortality 79% at 1.0% concentration of *Ocimum sanctum* (leaves). Least mortality response was zero.\(^10\)

The result obtained in present investigation are in conformity with those reported by Srivastva and Niraliya\(^5\), Ofuya and Okuku\(^4\), and Abe and Matsud\(^11\), (*Momordica charantia*), and Umerie and Anaso.\(^6\)

Plant extracts have a number of appealing qualities. Unlike synthetic insecticides plant origin insecticides are renewable\(^12\). They are much less hazardous and in certain cases, safe, though may appear costly, would ultimately be cheaper than synthetic insecticides. Farmers can formulate their own insecticide for use, looking into the advantages of plant extracts for management of insect pest.\(^13\)

<table>
<thead>
<tr>
<th>Name of extracts</th>
<th>Percent Mortality at various concentrations</th>
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<tbody>
<tr>
<td></td>
<td>0.005%</td>
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<tr>
<td><em>Ocimum sanctum</em></td>
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<tr>
<td>(Leaves)</td>
<td>0.00</td>
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Table 1: Toxic effect of *Ocimum sanctum* plant extract against *Acrida exaltata* (orthoptera : Acrididae) adults.
CONCLUSION
In the present investigation as shown in the Table 1 in that Acrida exaltata (Acrididae) adults indicated the maximum mortality 50.00% at 1.0% concentration of Ocimum sanctum (Leaves). At present insect pests by and large are being managed by synthetic insecticides, it is strongly felt that in future we may not be able to use these to the same extent, partly due to their ever increasing cost and partly due to hazards involved in use plant origin pesticide, now called as the plant extracts, totally supposed to be ecofriendly and fulfilling the requirements of the present agricultural needs and probably are on the top in minimizing the losses as well as the better yield of the respective pests.10

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