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MANAGEMENT OF HOUSEHOLD PEST *MUSCA DOMESTICA* L. BY USING SOME PLANT EXTRACTS

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ABSTRACT
Regular use of synthetic insecticides are resulting in health hazards to human and also causing damage to environment. The significant fact is that almost far and wide occurrence of intolerable toxic remains in just about all constituents of ecosystems. Present study carried out to discover environment friendly, economical and efficient plant based insecticides, which are anticipated to be devoid of any residual or the collective toxicity to the human beings. The household insect housefly (*Musca domestica* L.*)* is considered for the investigation and based on traditional leads 08 plant species were examined. Considering the model protocols adulticidal assays and repellency tests were undertaken. These bioassay methods required to simulate actual ecological parameters which exist in nature to a certain level. The percentage mortality was found to increase with higher concentrations of plant extracts which indicates direct relationship between the dose and percent mortality. The plant *Argemone Mexicana* L. and *Pimpinella heyneana* (Wall.) Kurz.. were shown wide spectrum activity to control *Musca domestica* L. While some other species such as *Ocimum gratissimum*L.; *Pongamia pinnata* (L.) Pierre.; *Ricinus communis* L. ; *Trigonella foenum- graecum* L. and *Vitex negundo* L. have also shown the activity.

KEYWORDS: Household pests, *Musca domestica*, plant based insecticides,

INTRODUCTION

Household insects and pests are causing nuisance and controlling them is a big job as they nurture very rapidly. Several methods have been tried to manage these pests but none is found to be 100% effectual and even several synthetic ones have produced good results but most of the time their residues are being accumulated in water, food, milk, etc. and posing serious reason of worry. (Sharma, et al, 2011a; Scott, et. al., 2000).Control of pests by chemicals is the most accepted as it is quick and effective but drawback of these is insecticidal / pesticidal residue which is transmitted to humans and the animals. These residues remain active for many years in atmosphere. Moreover, chemical pesticides and insecticides show good results in the beginning but later on these become less effective due to the resistance generated by the insects / pests. Plant extracts which have insecticidal or insect repellent activities are easy to manufacture and use and above all, they are relatively safe for human, animals and their environment. (Aktar and Islam, 2015).Therefore, there is every need to find out alternative for the chemical pesticides.

It is estimated that in United States of America alone 200 deaths are occurring every year due to poisoning by insecticides (Srivastava, 2002). WHO estimated that each year there are more than 25 million cases of pesticide poisoning and about 20,000 unintentional deaths, primarily in developing countries (Devkumar and Dureja, 2002). Due to high pesticide residue level recently 130 containers of fresh grapes sent from India were rejected by Netherlands (Nag *et al*, 2004). Government of India has shown concern over the harmful effects of chemical insecticides/pesticides and has banned 23 chemical pesticides so far, 7 have been refused registration and 10 have been prohibited for their use in the country (Chandurkar, 2001). The World Wildlife Fund (WWF) has called for a global ban on the production and use of DDT by 2007 (Dureja 2000). Apart from residues, hazards like resistance, cross-resistance, nonspecific broad-spectrum effects, high persistence, secondary pest resurgence etc. are also attributed to conventional synthetic insecticide.

Natural or plant based insecticide or pesticide is used by humans since the time immemorial. A well-known example is Neem, which is used traditionally since ancient times (Sharma, 2011b) by different ethnic societies and today neem based insecticide/pesticides are well accepted throughout the world. Similarly there remains rich and diversified flora of India unexploited as a source of botanical pesticides/insecticides.

Hence present study was undertaken to find out eco-friendly, economical, and effective insecticides preparations, which are expected to be devoid of any residual or the cumulative toxicity to the end user.

MATERIALS AND METHODS

For present study plants were shortlisted based on the leads obtained from literature published on traditional indigenous practices and field work. The plant/plant materials were collected and dried under shade. Identification of plants materials was done using standard floras. Dried plant material grinded by using grinder to get coarse powder. Plant extracts in Soxhlet Apparatus prepared by using 16 parts of ethanol to 1part of the dried course plant powder. The extracts obtained stored at –18°Cforinvestigation or assay.

1. Houseflies collection and maintenance

- Adult houseflies were gathered by putting metal frame cage traps with small pieces of meat.
- Flies were reared in 30 x30 x 30 cm metal frame cages covered all sides by using muslin cloth. The muslin sleeves kept at both the back and front sides of cage for addition/removal of flies and for the giving of food, water and changing oviposition plates.
- In each cage 100-200 flies placed.
- Sucrose solution provided to adult flies as a food. Food and water were changed daily.

2. Adulticidal assay

- The houseflies were numbed with CO_2.
- 1 µl of ethanolic plant extracts was applied on the thorax of 3 to 4 day old adult housefly of mixed sexes selected randomly. While control flies were treated with ethanol.
- Ten flies were used for each treatment and treatment was repeated 4 times.
- A sequence of 5 concentrations of plant extracts (0.5; 1.0; 1.5; 2.0;2.5 %) was used.
- The treatment included four groups (10 flies in each group)of houseflies treated with ethanol alone to serve as controls.
- Each group of flies was kept in a petri plate for about 24 hrs after treatment and the number of dead flies was recorded.

3. Repellent assay

- Filter papers treated by ethanolic plant extract and few with ethanol as a control were permitted to dry for 10 minutes.
- Filter papers then hold at one corner and turned round to form a cone then joined together.
- Small opening, sufficient to allow a fly to move through made at the top of each cone.
- Then the cones were placed upside down over glass jars to form cone traps.
- Small amount of Jaggery / sugar placed in each glass jar to serve as an attractant.
- Jars were exposed for half an hour in a cage containing 100flies of mixed sexes. The flies were starved overnight before use.
- The number of houseflies trapped in the treated and a control jar was recorded.
- Each test was repeated for 4times..The observations were recorded periodically for repellent activity.

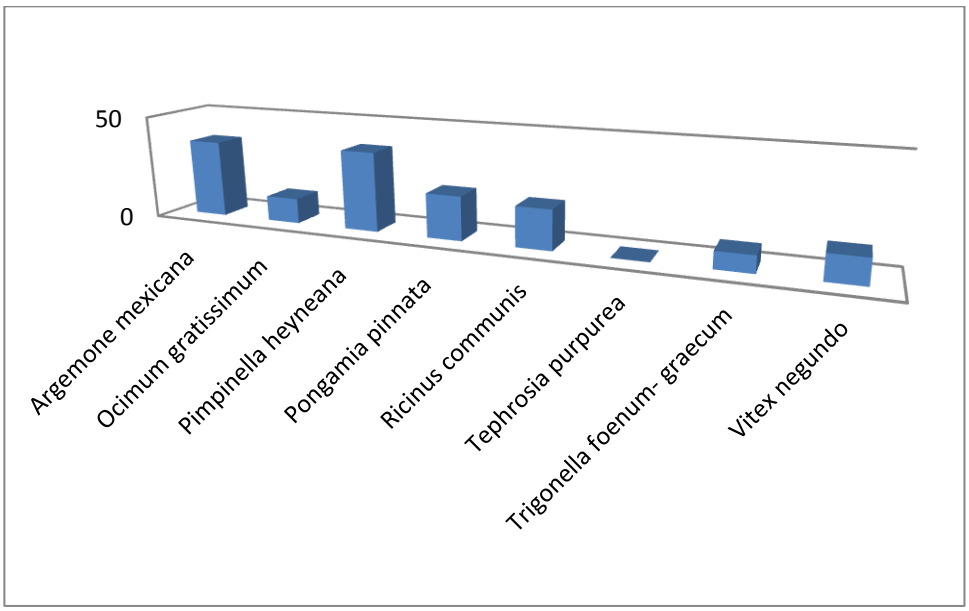
RESULTS AND DISCUSSION

Adulticidal Assay: As shown in (Table 1 and Graph 1) the percentage mortality was found to increase with higher concentrations of plant extracts which shows direct relationship between the dose and percent mortality. For example, *Argemone mexicana*L. plant sap gave 37% mortality, *Pimpinella heyneana*whole plant extract gave38%. *Pongamia pinnata* (L.) Pierre. seeds gave 21%; *Ricinus communis*L. seeds gave 19% mortality; *Ocimum gratissimum*L. plant and *Vitex negundo* L. leaves gave 12%; *Trigonella foenum- graecum*L. plant show 08% mortality. While *Tephrosia purpurea* (L.) Pers. plant does not shown any activity

Repellent assay: Repellency of plant extracts in Housefly was studied and the plant extracts repelled the flies have been shown with +Ve sign in the table and that houseflies were repelled by the extracts more than the controls. For example Whole plant extract *Argemone mexicana*L., *Ocimum gratissimum*L., *Pimpinella heyneana* (Wall.) shown positive activity. While other extracts do not show notable activity.

Table 1: Different concentrations of plant extracts against House flies

Plant name	Plant part	% mortality at different concentrations					Repulsion
		Conc. 0.5	Conc. 1.0	Conc. 1.5	Conc. 2.0	Conc. 2.5	
CONTORL	-	00	00	00	00	00	-Ve
Argemone mexicana L.	Plant juice	07	09	10	23	37	+Ve
***Ocimum gratissimum* L.**	Whole plant	00	00	00	01	12	+Ve
Pimpinella heyneana (Wall.) Kurz.	Whole plant	24	37	45	51	38	+Ve
Pongamia pinnata (L.) Pierre.	Seed,	00	00	00	11	21	-Ve
*Ricinuscommunis*L.	Seed oil	00	00	07	13	19	-Ve
Tephrosia purpurea (L.) Pers.	Whole plant	00	00	00	00	00	-Ve
Trigonella foenum- graecum L.	Whole plant	03	05	05	08	08	-Ve
Vitex negundo L.	Leaves	02	02	05	09	12	-Ve



Graph 1. Percentage mortality at 2.5% conc

CONCLUSION

The production and use of plant origin pesticides are increasing rapidly. To make them more effective proper researches on production is needed to popularize biopesticides. As far as environmental safety is concern, there is a need to create awareness to change over to plant based insecticide/pesticide.

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