

Efficacy of Neem Oil (*Azadirachta indica*) on Adult House Fly (*Musca domestica*)

¹Kanchan Chatterjee and ²Vandana Tewari

¹Associate Professor, ²Assistant Professor

¹Department of Zoology

Doon (P.G) College of agriculture science and Technology, Selaqui 248011, Dehradun Uttarakhand, India

Abstract:- This work is related to the study of the efficacy of Neem oil against housefly (*Musca domestica*). To evaluate the efficacy of neem oil flies were placed in 5 new cages in three replicates, each marked as 100,80,60,40 and 20 neem oil concentration. Mortality rate was observed in total 2 hours time. Lowest mortality rate was observed in 20% concentration solution of Neem oil and highest mortality rate was observed in 100% absolute Neem oil.

Keywords:- House fly (*Musca domestica*), Neem oil (*Azadirachta indica*),

I. INTRODUCTION

Houseflies are the most prevalent type of flies in the world, accounting about 90% of all flies in human habitation (Nmorsi et al. 2006). Houseflies are reported as vector for communicable disease that collects pathogens on their bodies. (Graczyk, et al. 2001) observed that houseflies are a major epidemiological factors responsible for spread of acute gastroenteritis and trachoma between infants and young children in developing countries and referred these flies play important role in transmission of nonsocomial infection with multidrug resistance bacteria in hospital environments and noted some of microorganisms can live inside or on the body surface of flies from 5-6 hours up to 35 days.

Housefly represents a pest of great economic importance in livestock and poultry production, contaminating animal products and transmitting a variety of pathogens to animals as well as neighbouring on livestock units, affecting the quality of life of these populations. Total economic loss due to house flies was estimated more than 400 million in 2013 (Scott et al. 2013).

the house fly is an important contributing factor in the dissemination of various infectious food-borne diseases (Olsen et al. 2001). On a conservative estimation, house flies are

associated with vectoring over 100 etiological agents of bacterial, protozoan and viral diseases (Fotedar 2001) (Kumar et al. 2012), such as typhoid, dysentery, diphtheria, leprosy, tuberculosis and intestinal parasites in humans and fowl cholera, anthrax in poultry and livestock (Iqbal et al. 2014). Their feeding habit and tendency to invade homes and other buildings are important factors in the spread of many intestinal diseases (Dhang 2014).

Chemical insecticides can affect different physiological systems in pests, However, improper use of chemical insecticides can produce poisoning of animals and humans, contaminate food and water, and destroy the biological control agents of flies (Crespo et al. 1998). A new environmental-friendly and high efficiency insecticide is needed because of the problems caused by traditional chemical insecticides. The control of pests, insects and diseases, either directly or indirectly, using natural plant products or botanicals, including essential oils, is promising (Regnault-Roger, 1997; Isman, 2006). The demand for chemical pesticides can be reduced by the use of bio-pesticides that will in term reduce the load of synthetic chemicals in the environment. They are relatively specific in their mode of action and easy to process and use (Bisseleua et al. 2008). Neem oil is a vegetable oil pressed from the fruits and seeds of the neem (*Azadirachta indica*), Formulations made of neem oil also find wide usage as a biopesticide for organic farming, as it repels a wide variety of pests.

II. MATERIALS & METHOD

The experiment essential oils i.e, Neem oil was purchased from the local market of Dehradun (Paltan Bazar). Studies on the use of Neem oil for housefly control are very limited. In the present study was to do an analysis of the oil for the control of houseflies in the laboratory condition with the optimization of dosage, following by testing and results. Liquid paraffin was used as a solvent for making the different concentrations of Neem oil.

➤ Preparation of Neem Oil Concentration For Insecticidal Test:

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|----|-----------------------------|---|--|
| a. | 100% Neem oil concentration | = | Absolute Neem oil (without solvent). |
| b. | 80% Neem oil concentration | = | 80ml of Neem oil in 20ml of Liquid paraffin. |
| c. | 60% Neem oil concentration | = | 60ml of Neem oil in 40ml of Liquid paraffin. |
| d. | 40% Neem oil concentration | = | 40ml of Neem oil in 60ml of Liquid paraffin. |
| e. | 20% Neem oil concentration | = | 20ml of Neem oil in 80ml of Liquid paraffin. |

The adult experimental insects (*Musca domestica*) were collected from the local poultry shops and brought to the laboratory. All flies were housed in standard cages of 40cm x 30 cm x 30 cm mesh sieve. The bottom was made of hardboard. single side had a long sleeve muslin cloth for cleaning and feeding purposes. The insects were reared at 30-32 °C at the laboratory. In order to evaluate the efficacy of neem oil in different concentrations, 20 house flies were placed in 5 new cages in three replicates, each marked as 100,80,60,40 and 20 neem concentration containing 100%, 80%, 60%, 40% & 20% concentrations of Neem oil. Each cage was sprayed with different concentration of neem oil in their respective labelled cages. 10 house flies were used for negative control as well as 10 house flies for positive control.

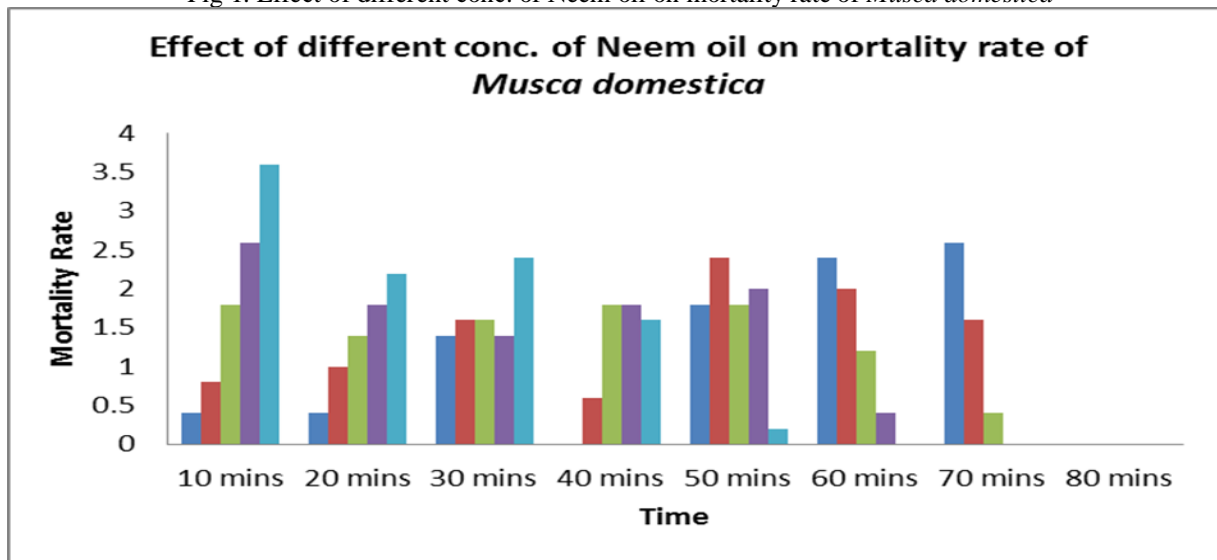
In negative control houseflies were sprayed with distilled water and in positive control sprayed with commercial insecticide (Hit). The acute mortality test was carried out for two 2 hours. The mortality rate was observed in relation to time and the observations were noted accordingly.

III. RESULT AND DISCUSSION

Mortality rate observed in total 2 hours time. In the different concentrations of Neem oils used 20%, 40%, 60%, 80% and 100% (absolute), lowest mortality rate was observed in 20% concentration solution of Neem oil. And highest mortality rate was observed in 100% absolute Neem oil.

Table 1. Mean mortality Rate

Time	Mean mortality Rate				
	20% conc.	40% conc.	60% conc.	80% conc.	100% conc.
10 mins	0.4±0.21	0.8 ±0.17	1.8±0.17	2.6±0.17	3.6±0.32
20 mins	0.4±0.21	1.0±0.39	1.4±0.17	1.8±0.17	2.2±0.33
30 mins	1.4±0.21	1.6±0.35	1.6±0.35	1.4±0.35	2.4±0.17
40 mins	0.0±0.6	0.6±0.21	1.8±0.4	1.8±0.17	1.6±0.39
50 mins	1.8±0.43	2.4±0.21	1.8±0.17	2.0±0.48	0.2±0.17
60 mins	2.4±0.35	2.0±0.56	1.2±0.17	0.4±0.17	
70 mins	2.6±0.5	1.6±0.45	0.4±0.21		
80 mins					
90 mins					
100 mins					
110 mins					
120 mins					

Fig 1. Effect of different conc. of Neem oil on mortality rate of *Musca domestica*

IV. CONCLUSION

Neem oil contains many active compounds like azadirachtin which is one of the most active compounds (Isman et al. (1990)). Neem oil is used for good repellent for mosquitoes as well. Other compounds present in neem oil such as Epoxyazadirachtin, Azadirone, Azadiradione, Azadirone, epoxyazadirachtin and Gedunin (Azmi et al. 1993.) are may also be effective on mortality rate of house flies. Rao and Subrahmanyam found that Azadirachtin at 1.66 µg/g of final instar larvae of *S. gregaria* caused 50% adult moult inhibition. Yasmin et al. determined the toxic dose of RB-a (Neem extract) against adults of *Drosophila melanogaster* by the contact method and calculated LC50 as 0.01% at 24 hours of post treatment from the mean values on log probit graph paper. Similar reports are given by Akhtar et al., Bidmon et al., Islam, Naqvi Jehan et al. and Naqvi et al.. These findings are generally in accordance with the present report and we can conclude that neem products may be used as population controlling agents for *Musca domestica* as they are cheaper and biodegradable, producing minimal pollution. More research is needed in the area of natural origin chemicals to be used as effective pesticides.

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