American Journal of Bioscience and Bioengineering
2019; 7(1): 16-18
http://www.sciencepublishinggroup.com/j/bio
doi: 10.11648/j.bio.20190701.13
ISSN: 2328-5885 (Print); ISSN: 2328-5893 (Online)

Effect of Aloshar (*Calotropic percera*) Extract on House Flies (*Musca domestica*) Under Situation of Zalingei

Taha Mohammed Sharief Mohammed[1], Ahmed Elzain Eldoma Hussien[2]

[1]Department of Horticulture, University of Zalingei, Zalingei, Sudan
[2]Department of Biology, University of Zalingei, Zalingei, Sudan

Email address:
taha1226@gmail.com (T. M. S. Mohammed)

To cite this article:
Taha Mohammed Sharief Mohammed, Ahmed Elzain Eldoma Hussien. Effect of Aloshar (*Calotropic percera*) Extract on House Flies (*Musca domestica*) Under Situation of Zalingei. *American Journal of Bioscience and Bioengineering.* Vol. 7, No. 1, 2019, pp. 16-18.
doi: 10.11648/j.bio.20190701.13

Received: February 27, 2019; **Accepted**: April 3, 2019; **Published**: April 26, 2019

Abstract: In the present study, the use of environmentally friendly and biodegradable natural insecticides of plant origin has received a great attention as agents for disease vector control. The main objective of this work is encouraging the use of natural product pesticide friendly to environment. The ethanolic extract of leaves flowers from the Sudanese plant *Calotropis procera* (Asclepiadaceae) were tested against house fly. The obtained results indicated that the crude latex extracted by ethanol, butane and distilled water from both leaves and flowers were more efficient than leaves or flower only. Ethanol and butane have a significant effect on house fly mortality.

Keywords: *Calotropis procera*, Ethanolic Extract, Toxicity, Mortality

1. Introduction

House fly, *Musca domestica L.* is found in all countries of the world but is more adaptable in warm areas like Sudan. It is considered one of the most important pests which cause health problems in the environment as it accompanies humans during their daily activity everywhere, both indoors and outdoors, on work sites or in rest places causing much disturbance to them [1].

The common housefly *Musca domestica* L. (Diptera: Muscidae) is a well-known cosmopolitan pest of both farm and home that possesses a serious health threat to human beings and livestock by transmitting many infectious diseases like dysentery, cholera, diarrhea and typhoid because it acts as important mechanical carriers of several pathogenic bacteria such as *Shigella dysenteriae*, *Vibrio cholerae*, *Escherichia coli* and *Salmonella typhi* [2]. Therefore, they become very important in public health concern.

Chemical insecticides are commonly used for their control. Nevertheless, the widespread and inappropriate application of chemical insecticides produce the risk of developing pest resistance, side effects to non-target species, and long lived residues in the environment [3, 4]. With a greater awareness of the hazards associated with the use of synthetic organic insecticides, there has been an urgent need to explore suitable alternative products for pest control. Screening of plant extracts for deleterious effect on insects is one of the approaches in the search of novel biological insecticides. Insecticidal activity of many plants against several insects has been demonstrated. Seed as well as foliar extracts of several plants have been reported to have toxic and potent growth reducing activity to insects. The deleterious effect of plant extracts or pure natural/ synthetic compounds on insects can be manifested in several manners including toxicity, mortality, antifeedant, growth inhibitor, suppression of reproductive behavior and reduction of fecundity and fertility [5]. House fly, *Musca domestica L.* is found in all countries of the world but is more adaptable in warm areas like Sudan. It is considered one of the most important pests which cause health problems in the environment as it accompanies humans during their daily activity everywhere, both indoors and outdoors, on work sites or in rest places causing much disturbance to them [1]. The use of chemical pesticides is a risk factor. Besides many insect-vectors and reservoirs of diseases have developed resistance to a wide range of insecticides [6]. So, many authors, [7] worldwide screened the effect of the different indigenous medicinal plants and herbs in pest control.

The objectives of this study were to evaluate the effect of *Calotropis procera* as natural product of a plant on reduction of house under situation of central Darfur state. By this experiment, we wanted to determine the suitable solution for extraction.

2. Materials and Methods

Leaves and flower of *Calotropis procera* were collect at the evening and stored for 12days for drying at the laboratory the Department of Biology, University of Zalingei, Central Darfur, Sudan. The dried plant part were grounded were subjected to distilled water, ethylene and butane for extraction. Each experiment was conducted in triplicates along with the control group. Mortality of the insect followed by the exposure was recorded in 24hrs and 48hrs. LC50 was calculated using Karber's method [8].

2.1. Collection and Processing of Plants Sample

Fresh leaves and flowers of *C. procera* were collected from around the University of Zalingei. Leaves and flowers were properly cleaned and shade dried for 12 days at 32-35°C and relative humidity 50- 60%. The dried leaves and flowers were powdered mechanically using commercial electrical stainless steel blender (Remi Anupam Mixie Ltd., India). The samples were stored in air tight container at room temperature in dark for further analysis.

2.2. Extraction of Plant Extracts

The dried leaves and flowers of *C. procera* were extracted with 1 litre of 90% ethylene, butane and distilled water. The extracts were concentrated at 50°C and the residue obtained was stored at 4°C.

2.3. Statistical Analysis

All values in the table are given as mean ± standard error of mean (SEM) of three independent experiments. Graph pad software was used to analyze the data.

3. Result and Discussion

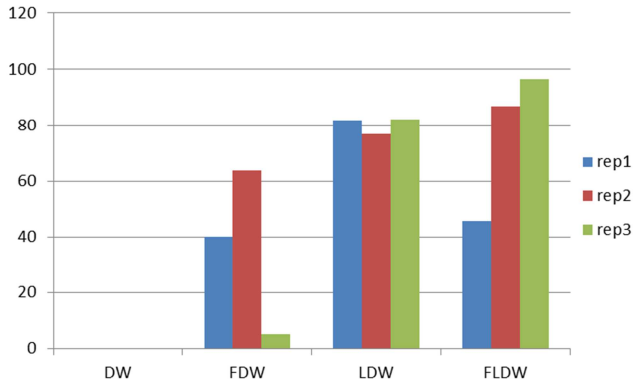

Figure 1. *Shows the effect of extraction by distilled water.*

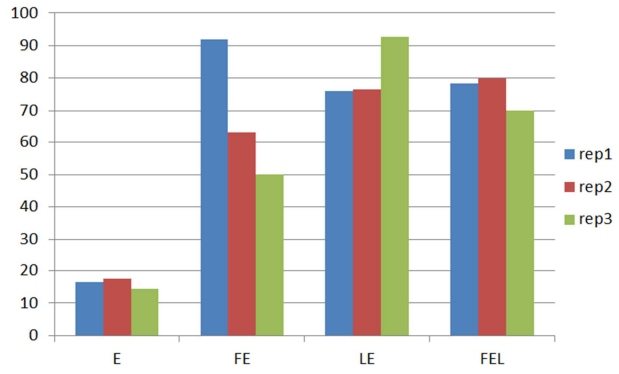

Figure 2. *Shows the effect of extraction by ethanol.*

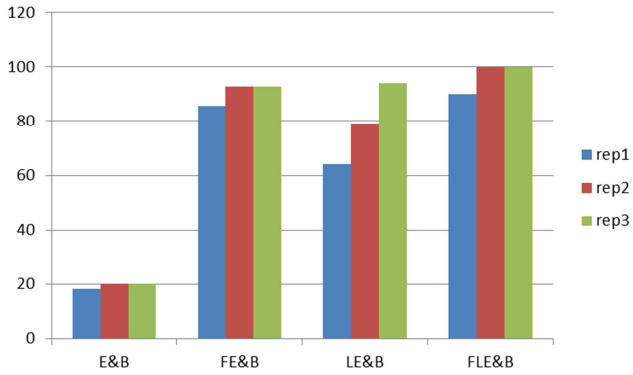

Figure 3. *Shows the effect of extraction by ethanol and butane.*

The results presented in (Figure 1, 2 and 3) exhibit the toxicity of flowers and leaves extract of *Calotropics procera against M. domestica*, showed a significant effect in insect mortality.

Flowers and leaves extract showed a better result than flowers or leaves. Ethanol and butane as a solvent showed a significant effect while distilled water hasn't any effect on house fly mortality. Earlier authors reported that the bio insecticides, particularly those are derived from plant origin, have been increasingly evaluated in controlling the population of insects pest [9-12]. Natural products of plants origin are alternative agents for insect control because they constitute a rich source of bioactive chemicals. Numerous studies have been drawn by considering the toxic effects of plant extracts and dipterans [13] and [14]]. The botanical extracts from the plant leaves, roots, seeds, flowers, and bark in their crude form have been used as conformist pesticides for centuries [15] and [16]. *Musca domestica* has been reported to be prone to infection by numerous fungi [17] and [18]. Approximately of these naturally infecting pathogens like *B. bassiana* and *M. anisopliae* are midst the utmost infectious pathogens to adult houseflies [19]. These results were corroborate with the findings of Begum et al. [20] who reported good larvicidal activity of crude ethanolic extracts of *Calotropis procera* and *Annona squamosa* against *M. domestica* with LC50 values of 282.5 and 550 ppm, respectively.

4. Conclusion

The result of present investigation reveals the insecticidal potentials of the tested botanical extract against the house fly *M. domestica*. The leaf extract of *Calotropis procera* was very promising; furthermore, all these plant materials can be easily collected from the natural vegetation. Therefore, plant originated insecticides can be used as sustainable pesticide in a housefly control programme. These findings have emphasized the need to explore the possibility of using plant based pesticides and reduce the chemical hazards in the environment. Further studies on these plants, including mode of action, synergism with the biocides under field condition are needed. Also isolation of the active compounds from these plants and further trial assay in the field are required.

Acknowledgements

We are here acknowledged the staffs of the laboratory of biology, faculty of education, University of Zalingei, who are assisting the scientist in different way of having good knowledge

References

[1] Albarrak, A. S. (2009) Comparative studies on house fly (Musca domestica), population in different animal farms in relation to attractants and control at hail province, saudi arabia, Pak. Entomol. 31(2): 142-148.

[2] Greenberg, B. Flies and Disease. Biology and Disease Transmission. Vol. II. 1973. New Jersey: Princeton University Press, USA.

[3] Kristensen, M. and Jespersen, J. B., 2003. Larvicide resistance in Musca domestica (Diptera: Muscidae) population in Denmark and establishment of resistant laboratory strains. Journal of Economic Entomology, 96: 1300-1306.

[4] Nivsarkar, M., Cherian, B. and Padh, H., 2001. Alphaterthienyl: A plant-derived new generation insecticide. Current Science, 81: 667-672.

[5] Taskin, V., Kence, M. and GöÇmen, B., 2004. Determination of malathion and diazinon resistance by sequencing the MdaE7 gene from Guatemala, Colombia, Manhattan, and Thailand housefly (*Musca domestica* L.). Russian Journal of Genetics, 40: 377-380.

[6] WHO (1986): Resistance of Vectors and Reservoirs of Diseases to pesticides, WHO Expert Committtee, 10th Report, World Health Organization, Geneva.

[7] Morsy. T. A.; Shoukry, A.; Mazyad, S. A. M. and Makled, K. A. (1998): The effect of the volatile oils of *Chenopodium ambrosioides* and Thymus vulgaris against the larvae of Lucilia sericata (Meigen). J. Egypt. Soc. Parasitol., 28(2): 503-510.

[8] Karber, G. (1931) Beitrag zur kollektiven Behandlung pharmakologischer Reihenversuche. Arch. für Experimentelle Pathologie und Pharmakologie. 162: 480-483.

[9] Siriwattanarungsee S, Sukontason KL, Olson JK, Chailapakul O, Sukontason K. Efficacy of neem extract against the blowfly and housefly. Parasitology Research. 2008; 103: 535-544.

[10] Rashmi A Morey, Abhay J Khandagle. Bio-efficacy of essential oils of medicinal plants against housefly, *Musca domestica* L. Parasitology Research. 2012; 111: 1799- 1805.

[11] Alexenizer M, Dorn A. Screening of medicinal and ornamental plants for insecticidal and growth regulating activity. Journal of Pest Science. 2007; 80: 205-215.

[12] Kamaraj C, Bagavan A, Rahuman AA, Zahir AA, Elango G, Pandiyan G. Larvicidal potential of medicinal plant extracts against *Anopheles subpictus* Grassi and *Culex tritaeniorhynchus* Giles (Diptera: Culicidae). Parasitology Research (in press), 2009. doi:10.1007/s00436008-1306-8.

[13] Abdel Fattah AK, Hussein KT, Shoukry KK. Biocidal activity of two botanical volatile oils against the larvae of *Synthesiomyia nudiseta* (Wulp) (Diptera: Muscidae). Egyptian Academic Journal of Biological Sciences. 2009; 2(1): 89-10.

[14] Malik A, Singh N, Satya S. House fly (*Musca domestica*): a review of control strategies for a challenging pest. Journal of Environmental Science and Health B. 2007; 42: 453-469.

[15] Bagavan A, Kamaraj C, Rahuman AA, Elango G, Zahir AA, Pandiyan G. Evaluation of larvicidal and nymphicidal potential of plant extracts against *Anopheles subpictus* Grassi, *Culex tritaeniorhynchus* Giles and *Aphis gossypii* Glover. Parasitology Research 2009; 104: 1109-1117

[16] Kumar S, Wahab N, Warikoo R. Bio efficacy of *Mentha piperita* essential oil against dengue fever mosquito *Aedes aegypti* L. Asian Pacific journal of tropical biomedicine. 2011; 1(2): 85-88.

[17] Barson G, Renn N, Bywater AF. Laboratory evaluation of six species of entomopathogenic fungi for the control of the house fly (*Musca domestica* L.), a pest of intensive animal units. Journal of invertebrate pathology, 1994; 64(2): 107-113.

[18] Watson DW, Rutz DA, Long SJ. Beauveria bassiana and Sawdust Bedding for the Management of the House Fly, *Musca domestica* (Diptera: Muscidae) in Calf Hutches. Biological Control. 1996; 7(2): 221-227.

[19] Siri A, Scorsetti AC, Dikgolz VE, Lastra CL. Natural Infections Caused by the Fungus *Beauveria bassiana* as a Pathogen of *Musca domestica* in the Neotropic. BioControl. 2005; 50(6): 937-940.

[20] Begum N, Sharma B, Pandey RS. Evaluation of insecticidal efficacy of *Calotropis procera* and *Annona squamosa* ethanol extracts against *Musca Domestica*. Journal of Fertilizers and Pesticides. 2011; 1: 101.