

## Evaluation of Larvicidal Efficacy of *Aloe Vera* Extract against *Musca Domestica*

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**Abstract:** In the present study, crude extract of *Aloe vera* have been screened for their larvicidal activity against *Musca domestica*. All the three instars larvae of housefly were treated with the different concentrations by dipping method for 24 and 48 hrs. The  $LC_{50}$  values of *Aloe vera* extract were found to be 32.67, 36 and 38.67 ppm in 24 hrs; 24, 25.67 and 28.33 ppm in 48 hrs on 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> instars respectively. The crude extract of *Aloe vera* was found to be more active in terms of larvicidal potential.

**Key words:** *Aloe vera*, instars, *Musca domestica*, larvicidal

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### I. Introduction

The order Diptera presents an array of insects which more than any other group poses the greatest challenge to human and veterinary health as vectors of diseases. One such insects, which share a close ecological niche with man is the housefly, *Musca domestica*. Apart from disease transmission, *M. domestica* soils man's food and usually constitutes a nuisance, particularly the adult stage [1]. House flies feed on liquid or semi-liquid substances beside solid material which has been softened by saliva or vomit. Because of their high intake of food, they deposit feces constantly, one of the factors that make the insect a dangerous carrier of pathogens. *Musca domestica* causes a serious threat to human and livestock health by transmitting many infectious diseases. In view of the severity of the problem, it is imperative that control of houseflies must be improved through the application of occupationally and environmentally safe natural pesticides [2]. Because of the safety to insect parasites, predators and other non-target organisms, low mammalian toxicity and short persistence in the environment as compared to the synthetic insecticides, many investigators recommended the use of plant extracts as pest control agents [3&4].

*Aloe vera* gel is used as an ingredient in commercially available lotion, yogurt, beverages, and some desserts. *Aloe vera* extracts have antibacterial and antifungal activities, which may help in the treatment of minor skin infections, such as boils and benign skin cysts and have been shown to inhibit the growth of fungi that cause tinea [5]. For bacteria, inner-leaf gel from *aloe vera* was shown to inhibit growth of *Streptococcus* and *Shigella* species in vitro [6]. In contrast, *aloe vera* extracts failed to show antibiotic properties against *Xanthomonas* species [7]. It has also been suggested that biofuels could be obtained from *Aloe vera* seeds. It is common practice for cosmetic companies to add sap or other derivatives from *Aloe vera* to products. *Aloe vera* has a long association with herbal medicine. *Aloe vera* may be effective in treatment of wounds [8].

The present paper deals with the possible effects of the plant *Aloe vera* extract, in larval treatments on this house fly, which is a serious pest for the animal and human health.

### II. Materials And Methods

Extract of *Aloe vera* was collected by cuttings of leaf part. Different concentrations 20, 40, 60, 80 and 100 ppm were made with water. Twenty number of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> instar larvae of *M. domestica* were selected separately for each set of treatment. Five numbers of glass beakers of 250 ml capacity were taken and labeled for different concentrations in addition to one for control. Larvae were treated by dipping method as explained Begum (Begum et al., 2010). Each experiment was conducted in triplicates along with the control group. Mortality of larvae followed by the exposure was recorded in 24hrs and 48hrs.  $LC_{50}$  was calculated using Karber's method [9].

### III. Results And Discussion

The results presented in (Fig no: 1 and 2) exhibit the toxicity of extract of *Aloe vera* against 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> instar larvae of *M. domestica*, in 24 and 48hrs with different concentration. The treatment of three instars larvae of *M. domestica* with different concentrations of the extracts of exhibited relatively lower percent mortality after shorter duration (24hrs) than that at longer duration (48hrs). *Aloe vera* leaves contain a range of biologically active compounds, the best-studied being acetylated mannans, polymannans, anthraquinone C-glycosides, anthrones and anthraquinones, and various lectins [10& 11]. The extract was found to be quite effective against *M. domestica* larvae as 100% mortality was observed at 100 ppm in all the three instars The  $LC_{50}$  of 1<sup>st</sup> instar was 32.67ppm at 24hrs short duration and 24 ppm at 48hrs long duration. The 1<sup>st</sup> instar was

sensitive then 2<sup>nd</sup> instar and the 2<sup>nd</sup> instar was sensitive compare then 3<sup>rd</sup> instar larvae. In this study it was proved. The LC<sub>50</sub> of 2<sup>nd</sup> instar was 36 ppm at short duration and 25.67 ppm at longer duration. The longer duration exhibited high mortality percentage in lower concentration. The LC<sub>50</sub> of 3<sup>rd</sup> instar was 38.67 ppm and 28.33 ppm at 24hrs and 48 hrs respectively. Compare to control all the stages shows singnifigant mortality percentage against Aloe vera extract.

The medical and veterinary pest *Musca domestica* L. has developed resistance to most insecticides used against it. For this reason, there is a constant search for new alternative control tools [12, 13 & 14]. Plant products become more interesting. Many plants have been reported about their potential insecticidal actions on larvae and/or adults of house flies via crude extracts or extracted active compounds [15]. Extracts from the *Azadirachta indica* A. (Juss, Meliaceae) seeds [16], leaves of *Acalypha indica*, *Carica papaya* and *Santalum album* [17] were also tested in the same insects musca domestica as insecticidal agents.

*Calotropis gigantea* gave the highest larval retention activity and it increased with leaf extract concentration. *Peganum harmala* powder prolonged the larval duration, hindered larval/pupal transformation and incomplete emergence of imago from puparia as reported by Ahmed *et al.*, [18]. Successful or complete adult emergence rates were consistently lower with all plant based diets than with control experiment at leaf concentration [17].

#### IV. Tables And Figures

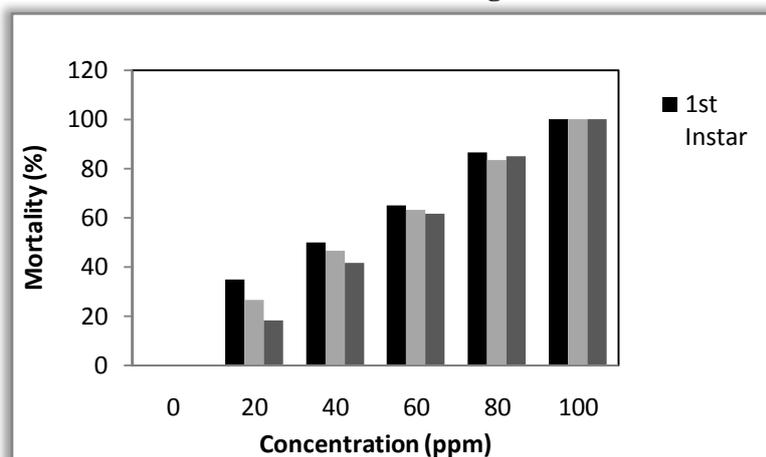


Figure 1: Mortality of larvae on Aloe vera extract at different concentration for 24hrs

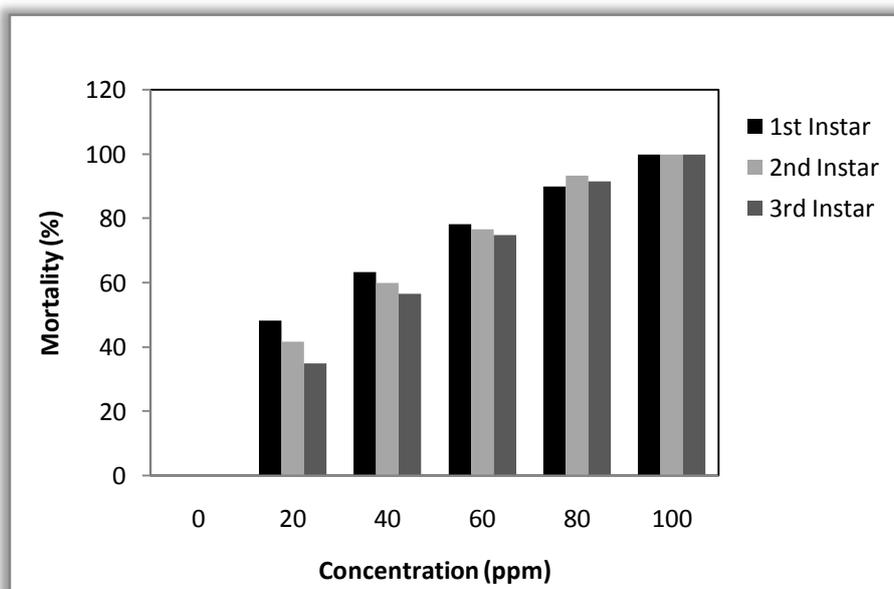


Figure 2: Mortality of larvae on *Aloe vera* extract at different concentration for 48hrs

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