



E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2016; 4(5): 262-264
© 2016 JEZS
Received: 09-07-2016
Accepted: 10-08-2016

Hussein Ali Salim
Directorate of Diyala
Agriculture, Ministry of
Agriculture, Iraq

Khani Omar Mosa
Directorate of Diyala
Agriculture, Ministry of
Agriculture, Iraq

Hussein Ali Khalid
Directorate of Diyala
Agriculture, Ministry of
Agriculture, Iraq

Hiba Salman Gasam
Directorate of Diyala
Agriculture, Ministry of
Agriculture, Iraq

Hadi Sabar Faihan
Directorate of Diyala
Agriculture, Ministry of
Agriculture, Iraq

Correspondence
Hussein Ali Salim
Directorate of Diyala
Agriculture, Ministry of
Agriculture, Iraq

Biological activity of some aqueous plant extracts against *Vanessa cardui* Linnaeus (Lepidoptera: Nymphalidae)

Hussein Ali Salim, Khani Omar Mosa, Hussein Ali Khalid, Hiba Salman Gasam and Hadi Sabar Faihan

Abstract

Laboratory experiment carried out in Directorate of Diyala Agriculture, plant pathology Lab during 2016. Aqueous extracts of three plants, namely Neem (*Azadirachta indica*), Nerium (*Nerium oleander*) and Eucalyptus (*Eucalyptus* sp) with insecticide (Confidor 200 SL) were tested against caterpillars of *Vanessa cardui* in plastic Jars. Neem and confidor were reduced the larval population about (83.3, 83.3%), (100, 96.6%) and (100,100%) after 14,21and 28 days respectively also Neem, confidor and Nerium were decreased the days to arrival 100 percent of mortality after (21, 28 and 35 day) respectively.

Keywords: *Vanessa cardui*, *Azadirachta indica*, *Nerium oleander*, *Eucalyptus* sp and biological activity

1. Introduction

Vanessa cardui (the painted lady butterfly) is a serious pest of corn, alfalfa, sunflowers, beans and soybeans^[11]. This species is also known for large fluctuations in population size over time which can be caused by exhaustion of food supplies^[8]. The increasing information on hazardous effects of synthetic insecticides on plants and about 450 pest species of insects and mites have developed resistance to major synthetic pesticides, these has alarmed scientists to seek some alternative ways, which are ecofriendly^[5]. Botanical insecticides are one of the best alternatives for these hazardous chemicals. They are plant-derived insecticides, either naturally occurring plant materials or the products simply derived from such plants^[6]. Species of plants like *Azadirachta indica*, *Nerium oleander* and *Eucalyptus* sp are known to possess insecticidal properties, the compounds from these plants have useful activities like repellence, toxicity, feeding and oviposition deterrence and insect growth regulator activity etc.^[9]. The aim of our study was to evaluate the biological activity of some aqueous plant extracts like *A. indica*, *N. oleander*, *E. sp* against caterpillars of *V. cardui*.

2. Material and Methods

The present study was conducted during 2016 at plant pathology Lab in Directorate of Diyala Agriculture, Iraq

2.1 Collection of plant materials

Azadirachta indica (Neem kernel cake powder) was collected from Allahabad district, India. *Nerium oleander* and *Eucalyptus* sp leaves were collected from Baqubah district Diyala province, Iraq.

2.2 Preparation of aqueous extractions

100 g of dried Neem kernel cake powder was mixed with distilled water in an electric blender then filtered through a muslin cloth. The fresh leaves of *Nerium oleander* and *Eucalyptus* sp were washed separately to remove residual dust then were pulverized with distilled water by electrical blender; the solutions were passed through the muslin cloth twice then squeezed through a muslin cloth. This extracts were considered as stock solutions. The concentration of 10% was made by mix 100 ml from stock solution to each plant material with 900 ml from distilled water.

2.3 Insect bioassay

Caterpillars of *Vanessa cardui* were collected from field of wheat in project of wheat researches in Galybia district, Diyala province, Iraq (fig 2); this is consider first registration in infection of wheat plants by this insect in Iraq, Symptoms of infection represented by feeding of Caterpillars on the leaves chlorophyll. Ten caterpillars two weeks old were introduced to each plastic Jar (8.5 cm diameter x 16 cm depth) covered with muslin cloth under laboratory conditions (fig 3), Fresh cabbage leaves were treated by leaf-dip method in the aqueous extracts and kept in jars after drying while other leaves were left untreated as control. The number of dead caterpillars was counted every 7 days during the bioassay; caterpillars percentage mortality was calculated through Abbott’s formula [1]. Three replications were set up for each treatment.

$$\text{Mortality \%} = \left(1 - \frac{n \text{ in T after treatment}}{n \text{ in Co after treatments}}\right) \times 100$$

Where: n = Insect population, T = treated, Co = control

2.4 Statistical analysis

The experiment was conducted in completely randomized design (CRD) and the data was analyzed by one way Analysis of Variance (ANOVA) [4].

3. Results and Discussion

After 7 and 35 days the results revealed that no significant

difference in reduction the larval population of *Vanessa cardui* among treatments whereas maximum significantly increased in mortality of caterpillars % in *Azadirachta indica* and Confidor (83.3, 83.3%), (100, 96.6%) and (100,100%) after 14,21 and 28 days respectively from other treatments. *Azadirachta indica* was reduced the time in number of days to arrival 100% mortality (21 day) followed by Confidor (28 day) and *Nerium oleander* (35 day) as compared with *Eucalyptus* sp and Control (0 days) (Table 1 and fig1). This result according to [3] reported that feeding deterrent activity of aqueous extract of *Azadirachta indica* against the larvae of *Plutella xylostella* (Linn.). [7] Reported that larval mortality above 80 per cent with the aqueous extract of *Azadirachta indica* against *Spodoptera frugiperda*. [10] Reported that leaf aqueous extract of Neem had a significant antifeedant effect and reducing mean cabbage leaf area consumption of *Pieris brassicae*. [12] Also found that aqueous extract of *N. indicum* produced strong antifeedant effect against *Aphis gossypii*. in the present study, it was found that extract of *Azadirachta indica*, *Nerium indicum* and *Eucalyptus* sp. protect the cabbage leaves over control against larvae of *Pieris brassicae*. Extract of *Nerium oleander* at concentration of 1000 part per million caused adult’s mortality 90%, 89% and 72% of *Aphis craccivora*, *Acyrtosiphon solani* and *Aphis gossypii* respectively [2]. Based on the results and data that obtained and discussed as above, it can be said that aqueous extracts of *Azadirachta indica* and *Nerium oleander* were highly effective against Caterpillars of *Vanessa cardui*.

Table 1: Effect of concentrations (10%) of *Nerium oleander*, *Eucalyptus* sp, *Azadirachta indica* and Confidor on mortality % of *Vanessa cardui* caterpillars and number of days to arrival 100% mortality after different intervals

Treatments		Mortality of caterpillars %					No. of days to arrival 100% mortality
		Intervals					
Common name	Scientific name	7 Days	14 Days	21 Days	28 Days	35 Days	
Nerium	<i>Nerium oleander</i>	23.3	46.6	70.0	83.3	100.0	35
Eucalyptus	<i>Eucalyptus</i> sp	26.6	26.6	56.6	86.6	90.0	0
Neem	<i>Azadirachta indica</i>	40.0	83.3	100.0	100.0	100.0	21
Confidor 200 SL		56.6	83.3	96.6	100.0	100.0	28
Control		10.0	23.3	56.6	80.0	90.0	0
CD 0.05		N.S	36.07	23.01	13.2	N.S	1.4

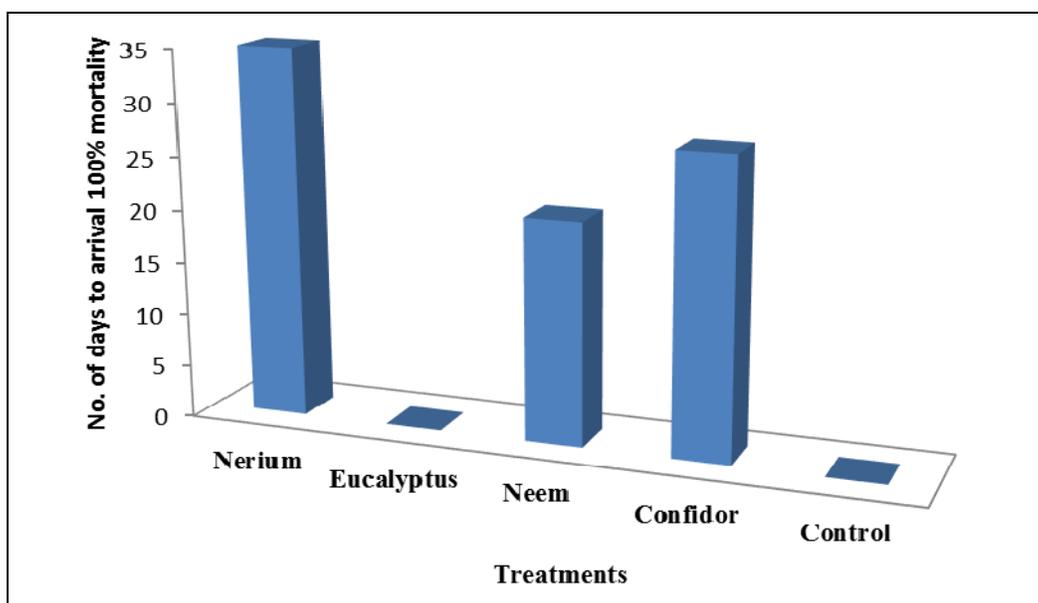


Fig 1: Effect of concentrations (10%) of *Nerium oleander*, *Eucalyptus* sp, *Azadirachta indica* and Confidor on No. of days to arrival 100% mortality of *Vanessa cardui* caterpillars after different intervals



A. Caterpillar

B. Pupa

C. Adult

Fig 2: Stages of life cycle of *Vanessa cardui*



Fig 3: Plastic jars of laboratory assay

4. References

1. Abbott W. A method of computing the effectiveness of an Cypermethrin. *J Econ. Entomol.* 1925; 18:265-267.
2. Al-Dowri O, Ibrahim A, Tawfik K. Activity of *Nerium oleander* extracts against aphid species. *J Iraqi Sci.* 2005; 10(1):94-97.
3. Charleston DS, Kfir R, Vet LEM, Dicke M. Behavior response of diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae) to extract derived from *Melia azedarach* and *Azadirachta indica*. *Bulletin of Entomological Research.* 2005; 95(5):457-465.
4. Fisher RA, Yates. *Statistical method for research workers.* Oliver and boyd ltd. Edinburgh and London, 1968, 10.
5. Georghiou GP. The magnitude of the resistance problem. In: *Pesticide resistance, strategies and tactics for management.* National Academy Press, Washington D C, 1986, 11-44.
6. Gupta Shalini, Sharma AK, Sirohi Anil. Neem: A botanical Pesticide. *Indian Farmers' Digest,* 2005; 32:35-36.
7. Hernandez CR, Vendramin JD. Bioactivity evaluation of aqueous extracts of Meliaceae to *Spodoptera frugiperda* (Smith). *Revista de Agricultura (Piracicaba).* 1997; 72(3):305-318.
8. Klots AB. *A field guide to the butterflies of North America, East of the Great Plains.* The Peterson Field Guide Series. Houghton Mifflin Co., Boston, Massachusetts, 1951, 349.
9. Mordue AJ. Present concepts of mode of action of azadirachtin from neem. In: *Neem: Today and in the New Millennium* (Koul, O. and Wahab, S. eds.), Kluwar Academy Publishers, Dordresch, Boston, London, 2004, 229-242.
10. Singh K, Sharma PL, Singh KL. Evaluation of antifeedant and repellent qualities of various neem (*Azadirachta indica*) formulation against *Pieris brassicae* Linn. larvae on cabbage and cauliflower. *Research and Development Reporter.* 1987; 4(1):76-78.
11. Williams CB. The migrations of the painted lady butterfly, *Vanessa cardui* (Nymphalidae), with special reference to North America. *J Lepidopterists Soc.,* 1970; 24:157-175.
12. Zhou Tian Mu, Chen Jian Qun, Zhang Peng Fei, Wang You Hong. The influence of four kinds of plant extracts on the feeding behaviors of *Aphis gossypii*. *Acta-Phytophylacica-Sinica.* 2004; 31(3):252-258.