



BIOACTIVITY OF SIX ACETONE PLANT EXTRACTS AGAINST THE GREEN PEACH APHID *MYZUS PERSICAE* SULZER (HOMOPTERA: APHIDIDAE)

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ABSTRACT

A study was carried out to test the aphicidal activity of the acetone leaf extracts of six plant species of the most widely spread plants in Jordan. SPSS 20 program was used to calculate LC50 and LC90 for these extract plants and Completely Randomized Design (CRD) experiment was carried out to test these six plant species against the green peach aphid (GPA) *Myzus persicae*. GPA was maintained in two cultures, in the Lab and in the green house for ten generations to get a susceptible population before conducting the bioassay. Acetone leaf extracts were obtained by soaking method and then concentrated and dried. Dipping bioassay method was used. Results were significantly different in the toxicity assessment and in the CRD experiment. The LC50 for the leaf extract of *Ricinus communis* was the lowest (1038 ppm) and for *Robinia pseudoacacia* was the second most toxic plant extract (1093 ppm) after 24 hours, while *Lantana camara* acetone leaf extract was the least toxic (7433 ppm). CRD experiment showed that *Ricinus communis* had 77.68% mortality rates followed by *Robinia pseudoacacia* which had 77.62%, respectively and were not significantly different. On the other hand *Solanum nigrum* caused the least mortality rate 43.6%, compared to the negative control and the positive control (Cypermethrin) which caused 1.78% and 93.32% mortality rates after 24 hours, respectively.

KEYWORDS:

Toxicity, Plant extract, Acetone, Green peach aphid

INTRODUCTION

World population is expected to increase to 9.8 billion people by 2050 from 7.3 billion people in 2015 [1]. This demographic increase requires demand on food and intensification of agriculture. This is accompanied with outbreaks in insect, diseases and weeds pests. Chemical pesticides have made great contributions to plant protection, but have also raised a number of ecological and medical problems.

Biopesticides have gained more attention, especially chemicals from plant origin which negatively affect the pests. These botanical products could be used as essential oils, extracts, or pure allelochemicals [2].

Botanical insecticides have many advantages over the synthetic ones, such as safety to the environment (non persistent), as some of them are volatile, composed of many constituents lowering the possibility of the development of resistance, and have many modes of action [3]. Wide range of chemicals for defense against colonization by insects and other herbivores can be synthesized by plants [2]. Over the years, six thousands plant species have been screened and more than 2500 plant species belonging to 235 families possessed biological activity against various categories of pests [4]. Some plant extracts are considered toxic to aphids [5]. Different types of secondary metabolites produced by plants which are believed to be the core in the natural plant defense, such as monoterpenes, sesquiterpene, lactons and triterpenes have been already commercialized [6]. Some plant derived products such as those in *Azadirachta indica* (Neem) could be used to control a wide range of pests. The Indian Neem tree oil extract has an insecticidal and miticidal effect and also could be used in the management of the plant pathogens [3].

Myzus persicae (Sulzer) (Homoptera: Aphididae) the green peach aphid, (GPA) is a cosmopolitan species of economic importance, an extremely polyphagous, an efficient vector of plant viruses, and transmitting more than 100 plant viruses. It has a wide range of genetic variations either in color, life cycle, in host-plant relationships or methods of resistance to insecticides [7]. The GPA has a striking capacity for rapid adaptation to insecticides, and developing resistance to many active compounds, as it has high reproductive rate and short generation time [8].

Resistance in GPA has been reported to 74 insecticides from various chemical groups as organochlorines, organophosphates, carbamates, neonicotinoids, and pyrethroids [9]. In Jordan, the green peach aphid has developed resistance to the commonly used insecticides from organophosphates and carbamates, particularly, in Jerash district and