

ORIGINAL ARTICLE

Host Plants of the Mealybug *Nipaecoccus viridis* (Newstead, 1894) (Homoptera, Pseudococcidae) in Iraq with Detection of New Hosts

M. S. Abdul-Rassoul

Iraq Natural History Museum, Baghdad University, Iraq

E-mail: msabr_1942@yahoo.com

ABSTRACT

A record of 69 host plants of, *Nipaecoccus viridis* (Newstead, 1894) belonging to 36 plant families, comprising 23 fruit trees, 6 vegetable crops, 2 field crops, 2 oil crops, 31 trees and ornamentals and 6 weeds. Among these host plants, *Psidium* sp., *Cestrum nocturnum*, *Gardenia jasminoides*, *Pilea serpyllacea*, *Tamarix* sp., *Alhagi maurorum* are newly recorded for this pest in Iraq, but the main host plants like *Citrus* spp., *Morus alba* and *Ziziphus spina-christi* have never changed since the first outbreak noticed by the author in the early 1970.

Key words: Host plants, Homoptera, Pseudococcidae, New hosts, Iraq.

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INTRODUCTION

The mealybug, *Nipaecoccus viridis* (Newstead, 1894) (Homoptera, Pseudococcidae), is a widespread species throughout the tropics and subtropics and is a highly polyphagous pest, attacking about 190 species of herbaceous and woody plants in at least 44 families [1].

This mealybug is an exotic species that was noticed in Iraq during 1965- 1966 [2] and it was first determined for Iraq by [3] from citrus trees at Baghdad Province under the name *Nipaecoccus vastator* (Maskell, 1859), which synonymized by [4] as *Nipaecoccus viridis* [5].

Since that time, it has spread rapidly throughout Iraq infesting citrus and other field crops. It is now known to attack more than 61 species of plants [2, 3, 6, 7, 8]. Plant damage is caused by nymphs and adult females by feeding on the branches, twigs, shoots, leaves, flower buds and fruits resulting in stunting, distortion, chlorosis and defoliation [9].

The aim of this study was to survey and identify the recent host plants of the mealybug, *N. viridis* in Iraq.

MATERIALS AND METHODS

Survey on the host plants of the mealybugs, *Nipaecoccus viridis* in some location in Iraq was carried out during 2011 -2013. Mealybug infested plant parts collected and kept in plastic bags. The mealybugs removed from the leaves surface and were put in vials which contain 75% alcohol.

Mealybugs were mounted on microscope slides using the method given by [9], and the identification was carried out by the author using key provided by [10]. The new host records are denoted by an asterisk (*).

RESULTS AND DISCUSSION

The present study is discussing the recent status of mealybug; *Nipaecoccus viridis* host plants in various locations in Iraq during 2011-2013. The host plants list is based on the present study and previously published records shown in Table-1. The results revealed that there are 96 different plants species belonging to 36 plant families, of these 23 were fruit trees, 6 vegetable crops, 2 field crops, 2 oil crops, 31 trees and ornamentals and 6 weeds have been cited as host plants of *N. viridis* in Iraq.

According to the present study, the main host plants of the mealybug have never changed since the first outbreak noticed by the author in the early 1970, which includes: *Citrus* spp., *Morus alba* and *Ziziphus spina-christi*. These host plants are attacked in different proportions in all Iraqi provinces, in the northern provinces citrus is the main host, also pomegranate, grape vine and oleander are affected in Duhok, Arbil and Mosul [11], while in the central provinces the main host plants are: citrus, mulberry and *Ziziphus* and also ornamental plants some was infested for the first time in Baghdad nurseries. Lastly in the southern provinces, the main host plants still the same and guava was reported to be attacked for the first time in Basra.

The most heavily infested host was the white mulberry, *Morus alba*; the leaves of this plant were completely covered with clusters of cotton like masses with honeydew and sooty mold covered the plants.

The reduction of the infestation by this mealybug that was noticed recently is probably due to the effect of the natural enemies [7, 12, 13, 14] and probably other environmental factors.

The current study recorded *Psidium guava* (Myrtaceae) as a host plant for *N. viridis* for the first time in Iraq following [15] who recorded this mealybug on *P. guava* in southern Asia. On the other hand, our finding of this mealybug on *Gardenia jasminoides* (Rubiaceae); *Pilea serpyllacea* (Urticaceae); *Tamarix* sp. (Tamaricaceae); *Cestrum nocturnum* (Solanaceae) and *Alhagi maurorum* (Fabaceae) also reported here for the first time in Iraq and the world except *Tamarix* sp. also the following family Urticaceae are reported here for the first time in the world [1].

Table (1) Host Plant Species of *Nipaecoccus viridis* in Iraq

Host Plant Name	Common Name	Family Name	Reference
Fruit trees			
<i>Citrus aurantifolia</i> (Chritm.) Swi	Lime	Rutaceae	(7)
<i>Citrus aurantium</i> Linn.	Sour orange	=	(3)
<i>Citrus grandis</i> Osbeck	Shaddock	=	(3)
<i>Citrus limon</i> Burm.	Lemon	=	(3)
<i>Citrus bergamia</i> Risso	Sweet Lemon	=	(3)
<i>Citrus medica</i> Linn.	Citron	=	(3)
<i>Citrus nobilis</i> Lour.	Tangerine	=	(3)
<i>Citrus paradise</i> Macf.	Grapefruit	=	(3)
<i>Citrus reticulate</i> Blanco	Mandarin	=	(7)
<i>Citrus sinensis</i> (Linn.)	Sweet Orange	=	(3)
<i>Cydonia oblonga</i> Miller	Quince	Rosaceae	(2)
<i>Ficus carica</i> Linn.	Fig	Moraceae	(3)
* <i>Psidium guajava</i> Linn.	Guava	Myrtaceae	Present study
<i>Morus alba</i> Linn.	White Mulberry	Moraceae	(3)
<i>Morus nigra</i> Linn.	Black Mulberry	=	(8)
<i>Olea europea</i> Linn.	Olive	Oleaceae	(2)
<i>Phoenix dactylifera</i> Linn.	Date palm	Palmae	(2)
<i>Prunus armeniaca</i> Linn.	Apricot	Rosaceae	(2)
<i>Punica granatum</i> Linn.	Pomegranate	Punicaceae	(3)
<i>Pyrus communis</i> Linn.	Pear	Rosaceae	(3)
<i>Pyrus malus</i> Linn.	Apple	=	(2)
<i>Vitis vinifera</i> Linn.	Grape Vine	Vitaceae	(3)
<i>Zizyphus spina-christi</i> (Linn.)	Zizyphus	Rhamnaceae	(3)
Vegetable crops			
<i>Apium graveolens</i> Linn.	Celery	Umbelliferae	(3)
<i>Lagenaria siceraria</i> (Mol.) Standley	Bottle gourd	Cucurbitaceae	(2)
<i>Lycopersicon esculentum</i> Mill.	Tomato	Solanaceae	(3)
<i>Solanum elongata</i> Linn.	Egg Plant	=	(8)
<i>Solanum tuberosum</i> Linn.	Potato	=	(2)
Field crops			
<i>Corchorus capsularis</i> Linn.	Jute plant	Malvaceae	(8)
<i>Gossypium</i> spp.	Cotton	Malvaceae	(2)

Oil crops			
<i>Helianthus annuus</i> Linn.	Sun flower	Asteraceae	(2)
<i>Ricinus communis</i> Linn.	Caster bean	Euphorbiaceae	(2)
Trees and ornamentals			
<i>Antigonon leptopus</i> Hook. & Arn.	Coral vine	Polygnaceae	(6)
<i>Asparagus sprengeri</i> Regel.	Asparagus	Liliaceae	(3)
<i>Cactus</i> sp.	Cactus	Cactaceae	(6)
<i>Callistemon</i> sp.	Bottle brush	Myrtaceae	(2)
<i>Catalpa</i> sp.	Catalpa	Bignoniaceae	(2)
* <i>Cestrum nocturnum</i> Linn.	Night Queen	Solanaceae	Present study
<i>Chrysanthemum</i> sp.	Chrysanthemum	Asteraceae	(3)
<i>Dalbergia sissoo</i> Roxb.	Indian Rosewood	Fabaceae	(2)
<i>Dianthus caryophyllus</i> Linn.	Carnation	Caryophyllaceae	(2)
<i>Fritillaria</i> sp.	Fritillaria	Liliaceae	(2)
* <i>Gardenia jasminoides</i> J.Ellis	Cape jasmine	Rubiaceae	Present study
<i>Geranium</i> sp.	Geranium	Geraniaceae	(6)
<i>Iampatiens walleriana</i> Hook. f.	Balsam	Balsaminaceae	[8]
<i>Lagerstroemia indica</i> Linn.	Crepe myrtle	Lythraceae	(2)
<i>Lantana camara</i> Linn.	Lantana	Verbenaceae	(2)
<i>Myrtus communis</i> Linn.	Myrtle	Myrtaceae	(3)
<i>Nerium oleander</i> Linn.	Oleander	Apocynaceae	(2)
<i>Pelargonium</i> sp.	Geranium	Geraniaceae	(3)
* <i>Pilea serpyllacea</i> (Kunth.) Liebn.	Pilea	Urticaceae	Present study
<i>Protulaca grandiflora</i> Hook	Rose-moss	Portulacaceae	(8)
<i>Punica granatum nana</i> (Linn.)	Pomegranate	Punicaceae	(3)
<i>Rosa canina</i>	Roses	Rosaceae	(3)
<i>Salvia splendens</i> Ker-Gawl.	Salvia	Labiatae	(3)
<i>Sesbania sesban</i> (Linn.) Merr.	Sesbania	Fabaceae	(2)
<i>Tagetes erecta</i> Linn.	Marigold	Asteraceae	(2)
* <i>Tamarix</i> sp.	Tamarisk	Tamaricaceae	Present study
<i>Tamarindus indicus</i> Linn.	Tamarind	Fabaceae	(2)
<i>Verbena</i> sp.	Verbena	Verbenaceae	(3)
Weeds			
* <i>Alhagi maurorum</i> Linn.	Alhagi	Fabaceae	Present study
<i>Cyndon dactylon</i> Pers.	Bermuda grass	Poaceae	(3)
<i>Euphorbia helioscopia</i> Linn.	Sun spurge	Euphorbiaceae	(2)
<i>Euphorbia prostrate</i> Ait.	Ait spurge	=	(8)
<i>Ipomea</i> sp.	Ipomea	Convolvulaceae	(6)
<i>Prosopis furcta</i> (Banks and Sol.) J.F.Macbr.	Mesquite	Fabaceae	(2)
<i>Solanaum nigrum</i> Linn.	Black Nightshade	Solanaceae	(2)
<i>Sonchus</i> sp.	Thistle	Asteraceae	(2)
<i>Zygophyllum fabago</i> Linn.	Syrian beacaper	Zygophyllaceac	(6)

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