

Short Communication

Scale insects recorded on ornamental plants in urban areas of Kermanshah, Iran

Massumeh Shirazi, Hassan-Ali Vahedi*, Ali-Naghi Mirmoayedi, Sayed Mohammad Masoumi and Khatereh Jalilvand

Department of Plant Protection, Agricultural College, Razi University, Kermanshah, Iran.

Accepted 21 May, 2012

Scale insects (Hemiptera: Coccoidea) are serious pests of ornamental plants, and are becoming increasingly important in urban areas in Iran. Here, we report on the results of an initial survey of scale insects found on ornamental plants in Kermanshah City, Iran. A total of 15 species of scale insects were recorded: 7 Diaspididae, 3 Pseudococcidae, 3 Coccidae, and 2 Eriococcidae. Of these, three species, *Diaspidiotus gigas* (Thiem and Gernek), *Chortinaspis subterranean* (Lindinger) and *Acanthacoccus insignis* (Newstead) are new records for Iran. In addition, five other species are new to Kermanshah.

Key words: Coccoidea, ornamental plants, Kermanshah, new records.

INTRODUCTION

Ornamental plants are widely used in urban areas for environmental management. The most obvious use is to control soil erosion by wind and water. Apart for their use as ground cover on eroded areas to reduce dust and glare, ornamental plants are also used to alleviate air pollution, heat buildup and noise pollution (Baiyewu et al., 2005).

Scale insects cause various problems on ornamental trees and shrubs. Large populations of scale insects can kill branches and even the whole trees due to large volumes of plant sap they consume thereby weakening the plants (Hanson and Miller, 1984). In addition, the sugar-rich honeydew produced by the Coccoidea provides a perfect medium for the growth of sooty mould (Ulgenturk and Canakcioglu, 2004).

Even though coccoids are common and economically important pests, the scale insect fauna of Iran has been poorly studied [ScaleNet search (Ben-Dov et al., 2010)]. In the middle of the last century, Kaussari published many papers on armoured scales (Diaspididae) plus a

monograph on the subtribe Aspidiotina, tribe Aspidiotini (Diaspididae) (Kaussari and Farahbakhsh, 1968). The first complete list of scale insects in Iran was published by Bodenheimer (1944), who reported 89 species. Much later, Kozár et al. (1996) published a more extensive checklist of 185 species. Moghaddam (1998), in her MSc thesis, surveyed the armoured scale fauna in Fars province (southern Iran) and found 36 species in 21 genera. Later, Moghaddam (2004) provided a list of Iranian scale insects in the Hayk Mirzayans Museum, including 70 species in 10 families. Recently, Takagi and Moghaddam (2005) studied twelve armoured scale insects occurring in Iran. Moghaddam (2006) studied the mealybug fauna of southern Iran, found 17 mealybug species. Moghaddam and Tavakoli (2010) worked on forestry scale insects in central Zagros region (Ilam, Lorestan, Kermanshah and Hamadan provinces) and recorded 48 species in 10 families, in central Zagros region (Ilam, Lorestan, Kermanshah and Hamadan provinces). Torabi et al. (2010) undertook the first survey

*Corresponding author. E-mail: vnassah@yahoo.com. Tel: +98 918 331 3235. Fax: +98 831 832 1083.

Table 1. Scale insect species found in Kermanshah, Iran.

Species	Host plants	Location	Sampling date
Diaspididae			
<i>Diaspidiotus gigas</i> ** (Thiem and Gerneck)	<i>Populus</i> sp., <i>Salix babylonica</i> and <i>Salix</i> sp.	Agriculture College 3 Rahe Shariati Farhangian phase 2	15 June, 10 30 June, 10 9 June, 10
<i>Leucaspis pusilla</i> * (Loew)	<i>Pinus</i> sp.	Park Kohestan	24 June, 09
<i>Melanaspis inopinata</i> (Leonardi)	<i>Fraxinus</i> sp., <i>Nigella</i> sp. and <i>Gleditschia caspica</i>	Bisoton	15 September, 09
		Markaz Tahgigat Park Shirin	6 September, 09 13 May, 10
<i>Mercetaspis halli</i> (Green)	<i>Amygdalus</i> sp. and <i>Fraxinus</i> sp.	Park Kohestan,	18 May, 10
		Pardis Razi	18 June, 10
		Agriculture College	15 June, 10
<i>Parlatoria oleae</i> * (Colvee)	<i>Cerasus microcorpa</i>	Tahgigat Keshvarzi	6 July, 10
<i>Salicicola kermanensis</i> (Lindinger)	<i>Salix</i> sp. and <i>Populus</i> sp.	Bulvar Shahid Avini	7 June, 10
		Razi University	9 June, 10
<i>Chortinaspis subterranean</i> ** (Lindinger)	<i>Bromus tomentellus</i>	Karambast village	18 June, 10
Psudococcidae			
<i>Planococcus vovae</i> (Nassonov)	<i>Cypress</i> sp.	Park Fadak	10 March, 10
<i>Planococcus ficus</i> * (Signoret)	<i>Platanus orientalis</i>	Park Kohestan	22 July, 09
<i>Phenacoccus</i> sp.	<i>Euphorbia helioscopia</i>	Agriculture College	27 August, 09
Coccidae			
<i>Coccus hesperidum</i> (L.)	<i>Ficus benjamina</i>	Park Lale	25 April, 10
<i>Parthenolecanium corni</i> * (Borchsenius)	<i>Salix</i> sp.	Bag Abrisham	30 May, 10
<i>P arthenolecanium persicae</i> (Fabricius)	<i>Aceraceae</i> sp.	Pardis Razi	23 August, 09
Eriococcidae			
<i>Eriococcus spurious</i> * (Modeer)	<i>Ulmus densa</i>	Tag Bostan	3 May, 10
<i>Acanthococcus insignis</i> ** (Newstead)	<i>Cynodon dactylon</i>	Songhor	4 May, 10

*First record for Kermanshah; ** First record for Iran.

of scale insects fauna in Kermanshah, western Iran, and recorded 27 species in 6 families.

The objective of this study was to survey the scale insect species and their distribution and host plants (shade and ornamental trees) in the city of Kermanshah, Iran and determine which are likely to be economical important species.

MATERIALS AND METHODS

Coccoid samples on infested plants were collected in different locations within Kermanshah city during 2009 to 2010. The specimens were removed from the host plants and placed either in 75% ethyl alcohol or in plastic bags and taken to the laboratory

of the Department of Plant Protection, College of Agriculture, Razi University. The location, date and the host plant of each sample were recorded. Later, all specimens were mounted on microscope slides using the methodology of Hodgson and Henderson (2000). Some effort was made to identify each sample using a compound light microscope and the relevant literature. The Diaspididae specimens (both mounted and unmounted material) were sent to Prof. S. Tagaki for definitive identification (personal communication) and the remaining specimens were sent to Dr C. Hodgson (personal communication).

RESULTS AND DISCUSSION

A total of 118 samples of scale insects were collected from various ornamental species (11 species of trees, 6

shrubs and 3 species of herbaceous plants). The scale insects belonged to 4 families: Diaspididae (7 species in 7 genera), Coccidae (3 species in 2 genera), Eriococcidae (2 species in 2 genera) and Pseudococcidae (2 species in 2 genera) (Table 1).

Among these species, the armoured scale *Parlatoria oleae* (Colvee) on *Cerasus microcorpa*, the mealybug *Planococcus vovae* (Nassonov) on *Cupressus arizonica* and *Thuja orientalis*, and the felt scale *Eriococcus (Acanthococcus) spuriosus* (Modeer) on *Ulmus densa* all occur in large populations throughout the region and are likely to be economically important. Additionally, this study found that *P. oleae* and *Melanaspis inopinata* (Leonardi) are both widely distributed on Rosaceae. The main pest of conifers in urban areas, in Kermanshah, is the small pine scale, *Leucaspis pusilla*, which infests the needles on the lowest branches of *Pinus* sp. *Planococcus vovae* (Nassonov) and *Planococcus ficus* (Signoret) are common on Cupressaceae and Platanaceae in central city parks.

The grapevine scale *Parthenolecanium persicae* (Fabricius) occurs in small populations throughout the urban area on *Acer* sp., and is likely to be economically important, only in seedling nurseries and on young trees.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the help of Prof. Sadao Takagi (Hukuzumi 3-3-4-16, Toyohira-ku, Sapporo, 062-0043 Japan) for identification of Diaspididae specimens and Dr Chris Hodgson (Department of Biodiversity and Biological Systematics, The National Museum of Wales, Cathay's Park, Cardiff) for identification of Coccidae, Pseudococcidae and Eriococcidae and his comments on this draft. Lastly, thanks to Vahid Vahedi for helping with this manuscript.

REFERENCES

- Baiyewu RA, Amusa NA, Olayiwola (2005). Survey on the use of ornamental plants for environmental management in southwestern Nigeria. Res. J. Agric. Biol. Sci. 1: 237-240.
- Ben-Dov Y, Miller DR, Gibson GAP (2010). ScaleNet, Classification. 10 May 2010. - [http:// www.sel.barc.usda.gov/scalenet/classif.htm](http://www.sel.barc.usda.gov/scalenet/classif.htm).
- Bodenheimer FS (1944). Notes on the Coccoidea of Iran, with description of new species. Bulletin de la Societe Fouad 1er d Entomologie, 27:25-60.
- Hodgson CJ, Henderson RC (2000). The Coccidae (Insecta: Hemiptera: Coccoidea). Fauna New Zealand 41:1-264.
- Hanson PF, Miller JC (1984). Scale insects on ornamental plants: A biological control perspective. J. Arboric. 10(9):259-264.
- Kaussari M, Farahbakhch GH (1968). Monographie des Coccoidea Tribu Aspidiotini, Sous-tribu Aspidiotina au rang de Famille Diaspididae. Agricultural Ministry (Daftare Tamarkoze Tahghighat va Hamahangie Keshavarzi). (in Persian) 155 pp.
- Kozár F, Fowjhan MA, Zarabi M (1996). Check-list of Coccoidea and Aleyrodoidea (Homoptera) of Afghanistan and Iran, with additional data to the scale insects of fruit trees in Iran. Acta. Phytopathol. Entomol. Hung. 31:61-74.
- Moghaddam M (1998). Fauna of armoured scales. (Homoptera: Diaspididae) of Fars Province. M.Sc. Thesis (Entomology), Shiraz University, Shiraz, Iran. 143 p.
- Moghaddam M (2004). Insects of Iran: the list of Coccoidea in the Insect Museum of Hayk Mirzayans in Plant Pests and Diseases Research Institute, Hemiptera: Diaspididae and Phoenicococcidae. Plant Pests and Diseases Research Institute, Insect Taxonomy Research Department. pp. 11-53.
- Moghaddam M (2006). The mealybugs of southern Iran (Hem.: Coccoidea: Pseudococcidae). J. Entomol. Soc. Iran 26:1-11.
- Moghaddam M, Tavakoli M (2010). Scale insects of the central Zagros region in Iran (Hemiptera: Coccoidea). Appl. Entomol. Phytopathol. 77:27-46.
- Takagi S, Moghaddam M (2005). New or noteworthy armoured scale insects occurring in Iran (Homoptera: Coccoidea: diaspididae). Insecta Matsumurana. 61:43-47.
- Torabi M, Vahedi HA, Hodgson C (2010). Preliminary survey of the scale insects fauna in Kermanshah, western Iran. Entomologia Hellenica 19:153-162.
- Ulgenturk S, Canakcioglu H (2004). Scale insect pests on ornamental plants in urban habitats in Turkey. J. Pest Sci. 77:79-84.