Observation on some Pests of Super Family Coccoidea Infesting Fruit Trees in Western North Coast, Egypt

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ABSTRACT

Survey of the scale insects and mealy bugs associating with eleven species of deciduous and evergreen fruit trees was made in six localities at the Western North Coast of Egypt which represented three types of irrigation system. The chosen fruit trees species were as follows: Common fig, (*Ficus carica* L.); White mulberry, (*Morus alba* L.); Apple guava, (*Psidium guajava* L.); European olive, (*Olea europea* L.); Pomegranate, (*Punica granatum* L.); Apple, (*Malus domestica* Borkh.); Pears, (*Pyrus communis* L.); Apricot, (*Prunus armeniaca* L.); European plum, (*Prunus domestica* L.); Peach, (*Prunus persica* L.); and Almond, (*Prunus amygdalus* L.). Twenty-one species of scale insects and mealy bugs following eighteen genera belonging to six families of super family Coccoidea infesting previous eleven deciduous and evergreen species of fruit trees were collected and identified during December, 2007 - November, 2009.

INTRODUCTION

Scale insects and mealy bugs are phytophagous, feeding by sucking plant juices through set stylets. Individual species can infest one or more organ (leaves, fruit, branches, main stems, trunks or roots). They are widely distributed throughout the world with the exception of the cold extremes of the Arctic and Antarctic regions (Miller, 2005). They are considered by many authors to be part of the order Hemiptera, sub order Sternorryncha, super family Coccoidea (Gullan, 2001). They are generally small and cryptic creatures that cause major problems in agricultural and fruit ecosystems. They are commonly transported on plant materials and because of their small size and habit of feeding in concealed areas, they are frequent invasive species (Millar *et al.*, 2005) causing billions of dollars in damage annually (Kosztarab, 1990).

In addition to physical damage caused to the plants, many scale insects and mealy bugs such as long-tailed mealy bug *Pseudococcus*

longispinus and fig scale, *Ceraplastes rusci* are known to carry plant viruses (La Notte *et al.*, 1997). Some mealy bugs such as the pink hibiscus mealy bug infect toxic saliva which results in malformed leaves and shoot growth, stunty and occasionally death. Leaves show a characteristic curling similar to damage by viruses. Heavily infested plants have shortened internodes leading to a "bunchy top" appearance (Todd, 1999).

Therefore, it is very important to reestablish and renew a considerable back-ground about the occurring scale insects and mealy bugs on both deciduous and evergreen fruit trees at North Western coast of Egypt under dry and irrigation system.

MATERIALS AND METHODS

Ecosystems and Locations of study

In order to survey scale insects and mealy bugs associating with some deciduous and evergreen fruit trees in the western north coast of Egypt, several locations were chosen. These locations represent different types of irrigation as follows:

1) Rain-fed farms (dry ecosystem) at Burg el-Arab (50 km west of Alex), Merghem (30 km at desert road) and coastal ridge (30-35 km at coastal west of Alex.).
2) Semi-arid farms at Ikingi-Mariut area (40 km west of Alex.).
3) Irrigated farms at Bahig and el-Hammam (60 & 80 km west of Alex.).

Inspected fruit trees

Eleven of deciduous and evergreen fruit trees species were chosen for study were :

	Family	trees		area	Type
1	Moraceae	Common fig	*Ficus carica* L.	coastal ridge, Merghem Burg el-Arab El-Hammam Bahig	rain-fed irrigated
2		White mulberry	*Morus alba L.*	Burg el-Arab	rain-fed
3	Myrtaceae	Apple guava	*Psidium guajava* L.	Burg el-Arab coastal ridge, Merghem	irrigated
4	Oleaceae	European olive	*Olea europea* L.	Burg el-Arab, Coastal ridge, Merghem Ikingi- Mariutt Hammam Bahig	rain-fed semi-arid
5	Punicaceae	pomegranate	*Punica granatum* L.	Hammam	
6		Apple	*Malus domestica* Borkh		
7		Pears	*Pyrus communis* L.		
8		Apricot	*Prunus armeniaca* L.		irrigated
9	Rosaceae	European plum	*Prunus domestica* L	Burg el-Arab Hammam	
10		Peach	*Prunus persica* (L.) Batsch		
11		Almond	*Prunus amygdalus* L.		

Survey and inspection were started from December, 2007 till February, 2010 in the different locations under investigation except El-Hammam (January, 2009 till December 2009 on fig, olive and pear trees). From each plant five trees were chosen to survey the scale insects and mealy bugs. The chosen trees were in the same age and similar in size, shape and height. Ten leaves and five small branches (15 cm long) (except fig) were picked monthly out at random from each direction of each tree. Leaves and branches were put in cloth bags and transported directly to the laboratory for classifying the detected species using a stereoscopic binocular microscope. The upper and lower surfaces of the leaves and all the branches were examined. The pre-adult (other than crawlers), adult (males and females) of the inspected insects were counted and recorded.

For classifying the inspected species of scale insects, slide preparations of adult females were made and examined microscopically at a power of 10-15 X and identified by Scale Insects and Mealy bugs Division, Plant Protection Institute, Agricultural Research Center, Egypt.

Results and Discussion

Table (1): The recorded scale insects and mealy bugs infesting eleven fruit trees species, its scientific name, common name, host plants, geographical distribution, occurrence date, localities and study observations during the period of study (Dec. 2007 – Feb. 2010).

	Insect	Common name	Reviewed geographical distribution	Reference	The present study Observations
Family: Asterolecanildae					
1	*Russellaspis pustulans pustulans* (Cockerell)	Pustual scale; Oleander scale; Oleander pit scale; pit scale & fig pit scale	Australia, Afrotropical, Nearctic, Oriental; Neotropical and palaearctic including Saudi Arabia; Palestine and Egypt	Mohammad *et al* ., 1997	▪ Attacked fig trees under both dry (0.4%) and irrigation (21.2%) systems at Burg el-Arab and el-Hammam localities, It is heavily infested branches from December to March.
			infested fig old branches under irrigation during winter and spring, Egypt	Gomaa *et al.*, 1991 Abdel-Razak, 2007	
Family: Cerococcidae					
2	*Pollinia pollini* (Costa)	ornate pit olive scale	USA, Italy, Spain, France, Greece, Turkey, Libya, Egypt and Lebanon	Bodenhiemer, 1929 and Habib, 1957	▪ Attacked olive branches all over the year in Burg el-Arab area
	agricultural quarantine		recorded on fig, mulberry and almond branches in Burg el-Arab, Egypt	Abdel-Razak (2007)	
Family: Coccidae					
3	*Ceroplastes rusci* (Linnaeus)	Fig wax scale	Mediterranean region (Algeria, Cyprus, Egypt, Greece, Israel, Italy, Lebanon, Morocco, Spain, Tunisia and Turkey)	Talhouk, 1975	▪ Infested fig trees in El-Gabal El-Akhdar, Libya in the autumn and winter. ▪ In Egypt, infests 6 species of studied fruit trees (fig, guava, mulberry, plum, pear and apricot)

	Insect	Common name	Reviewed geographical distribution	Reference	The present study Observations
			Afghanistan, Argentina, Australia, Brazil, France, Iran, Iraq, Japan, Portugal, Saudi Arabia, South Africa, Syria, UK. USA	Zipcode Zoo maps (2009)	▪ Infested fig branches, leaves and fruits at Burg el-Arab during June, in El-Hammam during January, June, August, November and in Coastal ridge during June- July while in Merghem it was found on leaves and fruits during April. ▪ Infested guava branches and leaves all over the year at Burg el-Arab under irrigation and Merghem during May. ▪ Infested mulberry, leaves during August at Burg el-Arab under rain-fed farm. ▪ Infested plum trees, during December in irrigated farm at Burg el-Arab. ▪ Infested pear trees all over the year except April-May and Sept–October
			Libya	Trotter (1913) & Damiano (1961)	
	carry plant viruses in addition to the physical damage			La Notte *et al.*, (1997)	
4	*Coccus longulus* (Douglas) *Coccus elongatus* Brain	Long brown scale	Australasian; Afrotropica; Nearctic; Oriental; Palaearctic and Neotropical zones	Zipcode Zoo maps (2009)	▪ Infested guava trees branches and leaves under irrigation farm at Burg el-Arab during June–August and at Merghem under dry system during May
			Egypt	Hall (1922) & Ezzat and Nada (1986)	
5	*Pulvinaria psidii* (Maskell)	Green shield scale; Guava mealy scale; Tooth paste scale	Australia, Congo, India, Malaysia, New Caledonia, New Guineu, Purtrico, South Africa, Srilanka, Tanzania, Uganda, USSR, Florida, California, Egypt, China, Newzeland	Hall, 1922	▪ Infested guava trees under irrigation at Burg el-Arab area during January-April and during July & August on leaves then migrate to fruits.
			Afghanistan, Algeria, Brazil,	Zipcode Zoo	

	Insect	Common name	Reviewed geographical distribution	Reference	The present study Observations
			Indonesia, Israel, Japan, Mexico, Spain, Sudan, Taiwan, Tunisia, UK, USA	maps (2009)	
	main pest of guava trees in Alexandria district			Moursi (1974)	
6	*Saissetia coffeae* (Walker) *Saissetia hemisphaerica* Hall	Brown scale; hemisphaerical scale	Australasian; Afrotropical; Nearctic; Oriental; Palaearctic and Neotropical regions	Zipcode Zoo maps (2009)	▪ Infested olive trees, (branches and leaves) all over the year at Burg el-Arab under rain-fed and El-Hammam under irrigation, and in coastal ridge, it disappeared during May. ▪ Infested fig (branches and leaves) during July-November at Burg el-Arab under dry system while it infested guava (branches & leaves) during June under irrigation system.
			Egypt	Hall (1922) and Ezzat & Hussien (1969)	
7	*Saissetia oleae* (Olivier)	Black scale, Mediterranean black scale; olive scale; olive soft scale	Australasian; Afrotropical; Nearctic; Oriental; Palaearctic and Neotropical	Zipcode Zoo maps (2009)	▪ Collected from olive tree in Libya during February 2008. ▪ In Egypt Infested olive (branches and leaves) under dry, semi-irrigated and irrigated systems at Burg el-Arab; Iking-Maruit; El-Hammam and Bahig. But it was disappeared during 2009 at El-Hammam. ▪ Infested fig trees at Burg el-Arab under rain-fed during February, July-November. ▪ Under irrigation system infested guava trees during March-June, while infestef pear trees during May, July and November.
			Egypt	Hall (1922)	
Family: Diaspididae (Armored scale insects)					
8	*Aonidiella*	California red	Australasian; Afrotropical;	Zipcode Zoo	▪ Infested olive branches and leaves at El-

	Insect	Common name	Reviewed geographical distribution	Reference	The present study Observations
	aurantii (Maskell)	scale; Red scale; Citrus red scale	Neearctic; Oriental; Palaearctic and Neotropical zones	maps (2009)	Hammam under irrigation system all over the year, and there was not any infestation under dry system at Burg el-Arab.
			Egypt	Hall (1922)	
			main pest of citrus		
9	*Aspidiotus nerii* Bouche *Aspidiotus hederae* Signoret	Ivy scale; Oleander scale	Australasian; Afrotropical; Nearctic; Oriental and Palaearctic zones	Zipcode Zoo maps (2009)	▪ Infested olive leaves at Burg el-Arab under dry system all over the year while at El-Hammam under irrigation during Feb.-Oct. ▪ In 2008, it represented 2.8% of total count increased in 2009 to 19.4% while it was not recorded on olive at El-Hammam area
10	*Hemiberlesi a lataniae* (Signoret)	Latania scale; Quince scale; palm scale; Grape vine aspidiotus	all regions of the world : Australasian; Afrotropical; Nearctici oriental; Palaearctic and Neotropical zones	Zipcode Zoo maps (2009)	▪ Recorded on five fruit trees species; olive, fig, guava, mulberry and pomegranate ▪ On olive it founded in both dry and irrigated farms at Burg el-Arab and El-Hammam all over the year. ▪ Infested fig trees, (leaves and fruits) all over the period of fruiting in Burg el-Arab & coastal ridge (dry farms), and El-Hammam & Bahig (irrigated) ▪ Infested guava leaves all over the year at Burg el-Arab under irrigation ▪ Infested mulberry during August only at Burg el-Arab. ▪ Infested pomegranate leaves during December at El-Hammam under irrigation system.
			Libya	Damiano (1961)	
	Recorded on fig trees (branches, leaves and fruits) all over the year at Burg el-Arab (rain –fed)			Mourad *et al.*, (2008)	
11	*Hemiberlesi a rapax*	Greedy scale	Australasian; Afrotropical; Oriental;; Palaearctic and	Zipcode Zoo maps (2009)	▪ Infested plum trees during 2009 winter in Libya.

	Insect	Common name	Reviewed geographical distribution	Reference	The present study Observations
	(Comstock)		Palaearctic regions		▪ Infested three fruit trees species under irrigation system, Apple and Pear at Burg el-Arab all over the year and apricot in El-Hammam during January-April and September-December.
			Egypt	Ezzat (1958)	
	important quarantine insect pest in Egypt			Gill (1997); Claps *et al.*, (2001) and Foldi (2001).	
	Infests pear trees all over the year at Burg el-Arab under dry system.			Mesbah *et al* (2008)	
12	*Diaspidiotus perniciosus* (Comstock) *Quadraspidiotus perniciosus* Borchseniu	California scale, Chinese scale; Pernicious scale; Round pear scale and San Jose scale (SJS)	Ausralasian; Oriental; Palaearctic except Egypt regions	Zipcode Zoo maps (2009)	▪ It isn't recorded in Libya ▪ under irrigation system on five fruit trees species namely, apple, plum, pear, apricot and peach ▪ infested apple branches, leaves and fruits at Burg el-Arab all over the year except August – October, but on plum, it disappeared in February and November – December
	Infests pear and apples at Burg el-Arab, all over the year, and plum during spring and summer, Egypt			Moursi (2001) & Moursi *et al.*, (2008)	
13	*Lepidosaphes conchiformis* (Gmelin) *Lepidosaphes ficus* Fernald	Fig oystershell scale; Fig scale; Greater fig mussel scale; Mediterranean fig scale; Pear oystershell	many regions of the world	Zipcode Zoo maps (2009)	▪ Infested fig (branches, leaves and fruit) at all inspected localities under both irrigation and dry farms all over the year.
			libya	Martin (1959) and Damiano (1961)	
			Egypt	Hall (1922); Ezzat (1958); Ezzat and Nada (1986)	

	Insect	Common name	Reviewed geographical distribution	Reference	The present study Observations
		scale and Red oystershell scale			
	It is a main pest of fig branches in the rain-fed farm system in the Egyptian western desert.			Moursi (1991)	
	infests fig trees all over the year under both irrigation and rain –fed farms at Burg el-Arab area.			Abdel-Razak(2007)	
14	*Leucaspis riccae* (Targioni – Tozzetti)	White olive scale	Israel, Syria, Italy, Yugoslavia, Uzbekistan, Tunisia, Sicily, Morocco, Malta, Cyprus, Argentina, Turkey, Egypt, Algeria, France, Greece and Iran	Zipcode Zoo maps (2009)	▪ Infested olive trees all over the year in rain-fed and semi irrigated farms at Burg el-Arab, Merghem; Costal ridge and Iking-Mariut. ▪ During the season of 2007 represented 43.3% of the total count of coccoidial species, but it was 23.5% by 2008.
	ne of the serious pests of olive leaves and fruits in the western desert and its stages are commonly seen on leaves all over the year.			Moursi and Mesbah (1985)	
15	*Mercetaspis halli* (Green) *Nilotaspis halli* Ferris	Hall scale	USA, Pakistan, Afghanistan, Crete, Cyprus, Greece, Egypt, Iran, Iraq, Israel, Russia, Saudi Arabia, Syria and Turkey	Zipcode Zoo maps (2009)	▪ Infested almond (branches and leaves) all over the year in Burg el-Arab under rain-fed system by low level infestation.
			Egypt	Green (1923) & Moursi (1996)	
	heavily infested winter buds failed to open in spring.			Berlinger *et al.*, (1996)	
16	*Parlatoria oleae* (Clovee)	Olive parlatoria scale; Olive	Egypt, Sudan, Morocco, Tunisia, Libya, Saudi Arabia, Lebanon, Syria, Jordan and	Zipcode Zoo maps (2009)	▪ Infested six fruit trees in Burg el-Arab area, under rain-fed farms. Olive, (branches and leaves) during November-

	Insect	Common name	Reviewed geographical distribution	Reference	The present study Observations
		scale and Plum scale	Iraq		March and Almond (fruits) during November
			Egypt	Hall (1922) and Ezzat (1958).	• Under irrigation infested Apple tree during December- February; plum, all over the year; pear, during Sept.-Dec and peach during April-December
Family: Monophlebidae					
17	*Icerya aegyptiaca* (Douglas)	Egyptian fluted scale; Bread fruit mealy bug, Egypt icerya, Egyptian cushion scale	Asia, Burma, Ceylon, China, Hong Kong, India, Israel, Malaya, Pakistan, Phillppine islands, Sarawak, Taiwan, Thailand; Africa: Egypt, Ivory coast, Kenya, Somalia, Sudan, Tanzania; Australia and Pacific islands	CABI (2010)	▪ Infested Guava (branches and leaves) during June-July in Merghem and coastal ridge under dry system
			Argentina, Japan and Srilanka	Zipcode Zoo maps (2009)	
18	*Icerya seychellarum seychellarum* (Westwood)	Common white mealy bug; Iceplant scale and Seychellarum bug	Australasian; Afrotropical; Oriental; Palaearctic (just in Japan) and Neotropical	Zipcode Zoo maps (2009)	▪ Infested fig, leaves under rain-fed farms at Burg el-Arab during August, and coastal ridge during June ▪ Infested guava and pear, leaves all over the year at Burg el-Arab under irrigation, and in rain-fed farm and except January, September and November) under semi-irrigation system at Iking-mariout ▪ Infested pear during June in Merghem and coastal ridge ▪ Infested mulberry trees leaves at Burg el-Arab in dry farm during August.
	prohibited by agricultural quarantine in Egypt				

	Insect	Common name	Reviewed geographical distribution	Reference	The present study Observations
					▪ Infested apple trees all over the year except May-June and December
Family: Pseudococcidae					
19	*Planococcus citri* (Risso)	Citrus mealy bug; Common mealy bug, Grape mealy bug and Dompolan-mealy bug	all the world regions (Nearctic; Oriental; Palaearctic; Neotropica and Afrotropica)	Zipcode Zoo maps (2009)	▪ Infested fig trees during July- August at Burg el-Arab, Merghem and coastal ridge under rain–fed and at Burg el-Arab,(0.8% & 2.8% of total count during 2008 & 2009). ▪ Infested guava tree, during May-July and October at Burg el-Arab under irrigation system, and in rain-fed farm at Merghem and coastal ridge during May–July. ▪ Infested plum trees leaves At Burg el-Arab in irrigation farm, in June.
			Egypt	Hall (1926)	
			Libya	Martin (1959) & Damiano (1961)	
20	*Pseudococcus longispinus* (Targioni-Tozzetti)	Longtailed mealy bug; Long tailed mealy bug and Long-tailed mealy bug	all over the world regions	Zipcode Zoo maps (2009)	▪ Infested olive trees (branches and leaves) in rain-fed farm and almond trees in irrigated farms during July-October at Burg el-Arab.
			Egypt	Hall (1922), Ben-Dov (1994) and Abdel-Razak (2007)	
21	*Maconellicoccus hirsutus* (Green)	Pink hibiscus mealy bug	Australia, Bangladesh, China, Egypt, Hong Kong, India, Japan, Kenya, Lebanon, Malaysia, Oman, Pakistan, Saudi Arabia, Srilanka, Sudan, Taiwan, United Arab Eirates, USA, Yemen,Tunzania, Zambia.	Zipcode Zoo maps (2009)	▪ attack guava branches and leaves (leaf curling) at Burg el-Arab area in irrigation farm during August
			all over the world regions	Miller, 1999	

Table (2): The main scale insects infesting olive trees and their percentages of total coccoidial count during (2007-2008 & 2008-2009)at Burg el-Arab and El-Hammam area.

Host plant	Year	Locality	Total count	% of main pests						
				S. coffee	*S. oleae*	*A. aurantii*	*A. nerii*	*H. lataniae*	*L. riccae*	*P. oleae*
Olive	2007-2008	Burg el-Arab	6881	29.2	1.6	0.0	2.8	20.5	43.3	2.6
	2008-2009	Burg el- arab	8367	30.6	0.4	0.0	19.4	24.5	23.5	1.6
		Hammam	10780	7.5	0.0	57.3	0.0	35.2	0.0	0.0

Table (3): The main scale insects and mealy bug infesting fig trees and their percentages of total coccoidial count during (2007- 2008 & 2008-2009) at Burg el- Arab and El-Hammam area.

Host plant	Year	Locality	Total count	% of main pests			
				R. pustulans	*H. lataniae*	*L. conchiformis*	*P.citri*
Fig	2007-2008	Burg el-Arab	9832	0.4	12.0	86.8	0.8
	2008-2009	Burg el-Arab	7512	0.4	28.5	68.3	2.8
		Hammam	5280	21.2	5.5	73.3	0.0

Table (4): Distribution of coccoid species on the inspected host plants, plant part infested, localities and infested periods in the western north coast of Egypt (Dec. 2007 – Feb. 2010).

Coccoid species	Host plants	Infested plant parts			Localities		Date
		Branches	Leaves	fruits	Site	system	
Russellaspis pustulans pustulans	Fig	*	*		B	D	All over the year
		*	*		H	I	
Pollinia pollini	Olive	*			B	D	All over the year
	Fig	*	*	*	B	D	June
		*	*	*	H	I	Jan., June, Aug., Nov.
			*	*	M	D	April
		*	*	*	C.r.	D	June-July
Ceroplastes rusci	Guava	*	*		B	I	All over the year
		*	*		M	D	May
	Mulberry		*		B	D	August
	Plum		*		B	I	December
	Pear	*	*		B	I	Nov.-March & June-July
	Apricot		*		B	I	December
Coccus longulus	Guava	*	*		B	I	June – Aug.
		*	*		M	D	May
Pulvinaria psidii	Guava		*	*	B	I	Jan – April & July – Aug.
Saissetia coffeae	Olive	*	*		B	D	All over the year
		*	*		H	I	
		*	*		C.r	D	Except May
	Fig	*	*		B	D	July – Nov.
	Guava	*	*		B	I	June
		*	*		B	D	June – Dec.
Saissetia oleae	Olive	*	*		H	I	Jan, June& Nov.
		*	*		I.M	S.I	June
		*	*		Bah.	I.	May
	Fig	*			B	D	Feb., July-Nov
	Guava		*		B	I	Mar-June
	Pear	*			B	I	May, July, Nov
Aonediella aurantii	Olive	*	*		H.	I.	All over the year
Aspidiotus nerii	Olive		*		B	D	All over the year
			*		H	I.	Feb.- Oct.
	Fig	*			B&M	D	August
	Guava				B	I	
Hemiberlesia lataniae	Olive	*	*	*	B	D	All over the year
		*	*	*	H.	I	
	Fig	*	*	*	B	D	
		*	*	*	H.	I	
		*	*	*	C.r	D	
		*	*	*	Bah.	I	

Coccoid species	Host plants	Infested plant parts Branches	Leaves	fruits	Localities Site	system	Date
	Guava	*	*		B	I	
	Mulberry		*		B	I	August
	Pomegranate		*		H	I	Dec.
	Apple	*	*		B	I	
Hemiberlesia rapax	Pear	*	*		B	I	All over the year
	Apricot	*	*		H	I	Jan - April & Sept-Dec.
	Apple	*	*	*	B	I	Except Aug-Oct
	Plum	*	*		B	I	Except Feb. & Nov.,Dec.
Diaspidiotus perniciosus		*	*	*	B	I	
	Pear	*	*	*	H	I	All over the year
	Apricot	*			H	I	Jan- April & Sep-Dec.
	Peach	*	*		B	I	April – Dec.
		*	*	*	B	D	
		*	*	*	M	D	
Lepidosaphes conchiformis	Fig	*	*	*	C.r	D	All over the year
		*	*	*	H.	I	
		*	*	*	Bah.	I	
			*	*	B	D	
			*		M	D	
Leucaspis riccae	Olive		*		C.r	D	All over the year
			*		I.M	S.I	
Mercetaspis halli	Almond	*	*		B	D	All over the year
	Olive	*	*		B	D	Nov – March
	Apple	*	*		B	I	Dec. – Feb.
Parlatoria oleae	Plum	*	*		B	I	All over the year
	Pear	*			B	I	Except sep-Dec
	Peach	*			B	I	April , Dec.
	Almond	*	*	*	B	D	November
Icerya aegyptiaca	Guava	*	*		M	D	June & July
		*	*		C.r	D	June
			*		B	D	August
	Fig		*		C.r	D	June
			*		B	I	All over the year
Icerya Seychellarum	Guava		*		M	D	June
			*		C.r	D	June
	Apple	*	*		B	I	Except May, June, Dec.
	Mulberry		*		B	D	August
	Pear	*	*		B	I	All over the year
		*	*		I.M	S.I	Except Jan, Sep , Nov.
Planococcus citri	Fig	*	*		B, M, C.r	D	July & Aug.
		*			H	I	July-, sep

Coccoid species	Host plants	Infested plant parts Branches	Leaves	fruits	Localities Site	system	Date
	Guava		*		B	I	May – July, Oct.
			*		M.	D	May
			*		C.r	D	June – July
	Plum		*		B	I	June
Pseudococcus longispinus	Olive	*	*		B	D	July – Oct.
Maconellicoccus hirsutus	Guava	*	*		B	I	August

B = Burg el-Arab. H = Hammam Bah = Bahig, C.r = Coastal ridge M = Merghem I.M = Iking-Mariut I = Irrigated S.I = Semi irrigated D = Dry .

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الملخص العربى

دراسات على بعض الآفات الحشرية التابعة لفوق عائلة كوكويديا التى تصيب أشجار الفاكهة فى الساحل الشمالى الغربى لمصر

حسن مصباح – خديجة مرسى- نجدة السيد- رشا عبد الفتاح- أحمد صالح و مريم حمد بوابيض

فى هذه الدراسة تم إجراء حصر للحشرات القشرية والبق الدقيقى المرتبطة بإحد عشر نوع من أشجار الفاكهة المتساقطة الأوراق والمستديمة الخضرة [التين (*Ficus carica* L.)، التوت الأبيض (*Morus alba* L.)، الجوافة (*Psidium guajava* L.)، الزيتون (*Olea europea* L.)، الرمان (*Punica granatum* L.)، التفاح (*Malus domestica* Borkh.)، الكمثرى (*Pyrus communis* L.)، المشمش (*Prunus armeniaca* L.)، البرقوق (*Prunus domestica* L.)، الخوخ (*Prunus persica* L.) واللوز (*Prunus amygdalus* L.)] فى ست مناطق [برج العرب، مرغم، الحمام، بهيج، كينج مريوط والساحل الشمالى] تتميز بثلاث أنماط مختلفة من وسائل الرى [مطرية، مروية ونصف جافة] بمنطقة الساحل الشمالى الغربى.

وقد تم حصر وتصنيف 21 نوع من الحشرات القشرية والبق الدقيقى التى تتبع 18 جنس وتنتمى إلى ست فصائل من فوق فصيلة كوكويدى تصيب أنواع الفاكهة المتساقطة الأوراق والمستديمة الخضرة موضع الدراسة خلال الفترة من ديسمبر 2007 إلى فبراير 2010 .