

Scale insects (Hemiptera: Coccoidea) infesting apple, apricot, pear trees and their abundant parasitoids in Egypt

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ABSTRACT

Scale insects are the major pests infesting apple, apricot and pear trees in Egypt. The aim of the present work is to study a survey of scale insects infesting apple, apricot, pear trees and their abundant parasitoids in Egypt. A survey of scale insects infested apple, apricot, pear trees and their abundant parasitoids were carried out all over Egypt during 2009-2011. The results indicated that apple, apricot and pear trees were infested by 19, 10 and 10 scale insect species and associated with 12, 6 and 8 parasitoid species, respectively.

Key words: Scale insects, apple, apricot, pear trees, Egypt

INTRODUCTION

Scale insects are the major pests infesting apple, apricot and pear orchards in Egypt. Abd-Rabou (2003) and Bakr *et al.* (2009) reviewed the scale insects infested different crops in Egypt. Scale insects feed on plant sap. Scale feeding slowly reduces plant vigor, heavily infested plants grow poorly and suffer dieback of twigs and branches. An infested host is occasionally so weakened that it dies. Scales often secrete a sticky honeydew which supports the growth of black sooty molds.

Eleven armored scale insect species attacking 62 host plant species including apple, apricot and pear (Hammad and Moussa, 1973). The host of *Parlatoria oleae* (Colvee) (Hemiptera: Diaspididae) was apple (El-Minshawy *et al.*, 1974). *Russellaspis pustulans* (Cockerell) (Hemiptera: Asterolecaniidae) attacked apple trees in Egypt (Mangoud, 1994). The parasitoids attacking scale insects in Egypt studied by Priesner and Hosny (1940), Hafez (1988), Abd-Rabou (1997, a, b, 1999, 2000, 2001, 2001a), Awadallah *et al.* (1999) and Evans and Abd-Rabou (2005).

The aim of the present work is to study a survey of scale insects infesting apple, apricot, pear and their abundant parasitoids in Egypt.

MATERIALS AND METHODS

A survey on scale insects infested apple, apricot, pear trees and their abundant parasitoids were carried out all over Egypt during 2009-2011. Infested plants with scale insects were examined in the field, using a pocket lens. Leaves, stems and twigs were collected and placed separately in paper bags for further examination in the laboratory. Identification of scale insects was made by examining its adult in Canada Balsam, according to Abd-Rabou (2001). Thereafter, the leaves and twigs were kept in a closed paper bags and transferred to the laboratory for further examination and counting. Each leaf was stored in a well-ventilated emergence glass tube and monitored daily for parasitoid emergence.

RESULTS AND DISCUSSION

As shown in Table (1) the apple trees were infested by 19 scale insect species: 11 species belonging to Family Diaspididae, three species belonging to family Pseudococcidae, three species belonging to family Margarodidae and one species of families Asterolecaniidae and Coccidae. During the present work 12 parasitoid species recorded associated with aforementioned scale insects. Table (2) showed that apricot trees infested by 10 scale insect species: 7 species belonging to Family Diaspididae and one species of families Asterolecaniidae, Coccidae and Pseudococcidae. The present work 6 parasitoid species recorded associated with aforementioned scale insects.

Table 1: List of scale insects infesting apple trees and their abundant parasitoids in Egypt

Species	Family	Abundant Parasitoids	Date
1. <i>Aspidiotus hederae</i> (Vallot)	Diaspididae	<i>Aphytis chrysomphali</i> (Mercet)	June, 2010
2. <i>Dynaspidotus britannicus</i> (Newstead)	Diaspididae	<i>Aphytis lingnanensis</i> Comepre	November, 2011
3. <i>Hemiberlesia rapax</i> (Comstock)	Diaspididae	<i>Encarsia citrina</i> (Craw)	August, 2010
4. <i>Hemiberlesia latania</i> (Signort)	Diaspididae	<i>Encarsia citrina</i> (Craw)	September, 2010
5. <i>Icerya aegyptiaca</i> (Douglas)	Margarodidae	Non	October, 2010
6. <i>Icerya purchasi</i> Maskell	Margarodidae	Non	June, 2010
7. <i>Icerya seychellarum</i> (Westwood)	Margarodidae	Non	July, 2009
8. <i>Kilifa acuminata</i> (Signoret)	Coccidae	<i>Coccophagus scutellaris</i> (Dalman)	November, 2010
9. <i>Lepidosaphes beekii</i> (Newman)	Diaspididae	<i>Aphytis lingnanensis</i> Comepre	July, 2009
10. <i>Lepidosaphes gloverii</i> (Packard)	Diaspididae	<i>Aphytis mytilaspidis</i> (Le Baron)	October, 2009
11. <i>Lepidosaphes pallidula</i> (Williams)	Diaspididae	<i>Aphytis chrysomphali</i> (Mercet)	August, 2010
12. <i>Lepidosaphes ulmi</i> (Linnaeus)	Diaspididae	<i>Encarsia citrina</i> (Craw)	June, 2010
13. <i>Maconellicoccus hirsutus</i> (Green)	Pseudococcidae	<i>Leptomastix flava</i> Mercet	June, 2010
14. <i>Melanaspis inopinata</i> (Leonardi)	Diaspididae	<i>Pteroptrix aegyptica</i> Evans & Abd-Rabou	October, 2011
15. <i>Mycetaspis personata</i> (Comstock)	Diaspididae	<i>Encarsia citrina</i> (Craw)	June, 2011
16. <i>Parlatoria oleae</i> (Colvee)	Diaspididae	<i>Aphytis maculicornis</i> (Mercet)	July, 2009
17. <i>Planococcus ficus</i> (Signoret)	Pseudococcidae	<i>Neoplatycerus kempticus</i> Trjapitzin and Triapitsyn	September, 2010
18. <i>Planococcus citri</i> (Risso)	Pseudococcidae	<i>Leptomastix abnormis</i> (Girault)	June, 2011
19. <i>Russellaspis pustulans</i> (Cockerell)	Asterolecaniidae	<i>Metaphycus asterolecanii</i> (Mercet)	August, 2010

Table 2: List of scale insects infesting apricot trees and their abundant parasitoids in Egypt

Species	Family	Abundant Parasitoids	Date
1. <i>Aonidiella aurantii</i> (Maskell)	Diaspididae	<i>Encarsia citrine</i> (Craw)	October, 2009
2. <i>Aonidiella orientalis</i> (Maskell)	Diaspididae	<i>Pteroptrix aegyptica</i> Evans & Abd-Rabou	August, 2010
3. <i>Aulacaspis rosae</i> (Bouche)	Diaspididae	<i>Habrolepis aspidioti</i> Compere & Annecke	June, 2010
4. <i>Aulacaspis tubercularis</i> Newstead	Diaspididae	<i>Habrolepis aspidioti</i> Compere & Annecke	September, 2011
5. <i>Chrysomphalus dictyospermi</i> (Morgan)	Diaspididae	<i>Pteroptrix aegyptica</i> Evans & Abd-Rabou	July, 2009
6. <i>Coccus longulus</i> (Douglas)	Coccidae	<i>Metaphycus lounsburyi</i> (Howard)	October, 2011
7. <i>Ferrisia virgata</i> (Cockerell)	Pseudococcidae	<i>Blepyrus insularis</i> (Cameron)	July, 2010
8. <i>Hemiberlesia latania</i> (Signort)	Diaspididae	<i>Habrolepis aspidioti</i> Compere & Annecke	September, 2009
9. <i>Melanaspis inopinata</i> (Leonardi)	Diaspididae	<i>Encarsia citrina</i> (Craw)	November, 2011
10. <i>Russellaspis pustulans</i> (Cockerell)	Asterolecaniidae	<i>Metaphycus asterolecanii</i> (Mercet)	October, 2011

While Table (3) showed that pear trees infested by 10 scale insect species: 8 species belonging to Family Diaspididae and one species of Families Coccidae and Pseudococcidae. Also during the present work 8 parasitoid species recorded associated with aforementioned scale insects.

Table 3: List of scale insects infesting pear trees and their abundant parasitoids in Egypt

Species	Family	Abundant Parasitoids	Date
1. <i>Aonidiella aurantii</i> (Maskell)	Diaspididae	<i>Encarsia citrina</i> (Craw)	July, 2009
2. <i>Hemiberlesia rapax</i> (Comstock)	Diaspididae	<i>Pteroptrix aegyptica</i> Evans & Abd-Rabou	June, 2010
3. <i>Lepidosaphes beckii</i> (Newman)	Diaspididae	<i>Aphytis lingnanensis</i> Comepre	September, 2010
4. <i>Lepidosaphes gloverii</i> (Packard)	Diaspididae	<i>Encarsia citrina</i> (Craw)	June, 2010
5. <i>Melanaspis inopinata</i> (Leonardi)	Diaspididae	<i>Aphytis chrysomphali</i> (Mercet)	October, 2011
6. <i>Mycetaspis personata</i> (Comstock)	Diaspididae	<i>Aphytis sinaii</i> Abd-Rabou	October, 2010
7. <i>Parasaissetia nigra</i> (Nietner)	Coccidae	<i>Microterys flavus</i> (Howard)	July, 2010
8. <i>Parlatoria oleae</i> (Colvee)	Diaspididae	<i>Aphytis chrysomphali</i> (Mercet)	September, 2011
9. <i>Parlatoria oleae</i> (Colvee)	Diaspididae	<i>Aphytis diaspidis</i> (Howard)	November, 2010
10. <i>Planococcus citri</i> (Risso)	Pseudococcidae	<i>Leptomastidea abnormis</i> (Girault)	September, 2009

Eleven armored scale insect species attacking 62 host plant species including apple, apricot and pear (Hammad and Moussa, 1973). The host of *P. oleae* was apple (El-Minshawy *et al.*, 1974). *R. pustulans* attacked apple trees in Egypt (Mangoud, 1994).

Abd-Rabou (1997b) recorded that the parasitoid, *Aphytis chrysomphali* (Mercet) associated with five armored scale insects in different locations in Egypt. *Aphytis diaspidis* (Howard) was recorded for the first time in Egypt by Priesner & Hosny (1940).

Hafez (1988) recorded *Aphytis lingnanensis* Comepre as the most common species of *A. aurantii* on *Citrus* sp. Priesner & Hosny (1940) recorded *Aphytis mytilaspidis* (Le Baron) for the first time in Egypt from all over the Nile Delta. *Aphytis sinaii* Abd-Rabou was collected in a few numbers by Abd-Rabou (2004). *Encarsia citrina* (Craw) was recorded for the first time in Egypt by Priesner & Hosny (1940). Abd-Rabou (1997a) mentioned that *E. citrina* should be considered a promising candidate for utilization in biological control of armored scale insects in Egypt. This species was reared from 8 species of diaspidid scale insects and maximum parasitism rates ranged between 23 and 65%. *Pteroptrix aegyptica* (Evans & Abd-Rabou) was recorded for the first time in Egypt by Evans and Abd-Rabou (2005). *Habrolepis aspidioti* (Compere & Annecke) was recorded for the first time in Egypt by Priesner and Hosny (1940). This species reported as an effective parasitoid on different armored scale insects in different locations in Egypt (Abd-Rabou, 1997c). *Blepyrus insularis* (Cameron) was recorded for the first time in Egypt by Awadallah *et al.* (1999). *Leptomastidea abnormis* (Girault) was recorded for the first time in Egypt by Abd-Rabou and its reared from *M. hirsutus* with maximum parasitism rate was 21% (Abd-Rabou, 2000). *Leptomastix dactylopii* Howard was recorded for the first time in Egypt and its was reared from *M. hirsutus* with maximum parasitism rate was 8% (Abd-Rabou, 2000). *Coccophagus scutellaris* (Dalman) collected for the first time in Egypt by Priesner and Hosny (1940). *Metaphycus lounsburyi* (Howard) was recorded for the first time in Egypt by Abd-Rabou (1998). *Microterys flavus* (Howard) was recorded for the first time in Egypt and the rate of parasitism of this species on *C. floridensis*, averaged 0.8 and 2.4% during the two years under considerations,

respectively. Maximum parasitism rates reached 3.4 and 8.0% during Mid Nov. and early Nov., respectively (Abd-Rabou, 2001b). *M. flavus* was mass reared and released at monthly intervals in olive groves infested with *S. oleae* at three localities in Egypt and percentages of parasitism increased after releasing from 11 to 35% (Abd-Rabou, 2004).

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ARABIC SUMMARY

الحشرات القشرية التي تصيب التفاح و المشمش و الكمثرى والطفيليات السائدة عليها في مصر

شعبان عبد ربه و نها أحمد و هدى بدارى
معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقي – جيزة

الحشرات القشرية من الحشرات الهامة التي تصيب التفاح و المشمش و الكمثرى في مصر. الهدف من هذا العمل دراسة حصر الحشرات القشرية التي تصيب التفاح و المشمش و الكمثرى والطفيليات السائدة عليها في مصر وقد تم عمل دراسة حصر للحشرات القشرية على التفاح و المشمش و الكمثرى والطفيليات السائدة عليها في مصر في الفترة من 2009 الى 2011 وقد أشارت النتائج الى أن أشجار التفاح و المشمش و الكمثرى تصاب ب 19 و 10 و 10 أنواع من الحشرات القشرية و سجلت مصاحبة ل 12 و 6 و 8 طفيليات على الترتيب.