

PARASITIDS ATTACKING *AONIDIELLA AURANTII* (MASKELL) (HOMOPTERA: DIASPIDIDAE) WITH EMPHASIS ON PARASITOID FAUNA OF THIS SPECIES IN BAHARIA OASIS

SHAABAN ABD-RABOU

Plant Protection Research Institute, ARC, Dokki, Giza

(Manuscript received 26 February 2009)

Abstract

During the present work, samples of different host plants heavily infested by red scale insect *Aonidiella aurantii* (Maskell) (Homoptera: Diaspididae) and associated with the parasitoid species at different locations in Egypt during 2004-2008 were collected. Preservation, isolation and identification of the parasitoids were conducted. The results indicated that, thirteen species were recorded in Egypt. This work also includes red scale parasitoids survey in Baharia Oasis. Key to the parasitoids of *A. aurantii* and key to the genus *Comperiella* (Hymenoptera: Encyrtidae) from Egypt are included.

INTRODUCTION

Organophosphorus insecticides have been used commercially for the control of scale insects in Egypt throughout many years (Coll and Abd-Rabou, 1998). Red scale *Aonidiella aurantii* (Maskell) (Homoptera: Diaspididae) is a serious pest on different economic crops (Miller and Kosztarab, 1979). The main injury caused by this insect is the ingestion of plant sap. Severely infested plants grow poorly and may drop leaves prematurely and suffer dieback of twigs and branches. The parasitoids of *A. aurantii* have been attracted many authors, El-Minshawy and Osman, 1974, Moursi and Mesbah, 1985; Abd-Rabou, 1997, Abd-Rabou, 1999a and Abd-Rabou, 1999b and recently by Abd-Rabou and Attia (2006).

The present work dealt with the parasitoids of *A. aurantii* with emphasis on parasitoids of this species in Baharia Oasis.

MATERIALS AND METHODS

During 2004-2008, leaves and twigs heavily infested by red scale, *A. aurantii* in different parts of Egypt were collected and transferred to the laboratory for parasitoids emergence and identification. Identification of the parasitoid followed mounting the specimens through the method of Noyes (1982). Identification of the parasitoid followed by the keys of Prinsloo (1996) and Abd-Rabou (1999 a,b). The collection also was conducted in all locations in Baharia Oasis.

RESULTS AND DISCUSSION

I. List of parasitoids attacking *Aonidiella aurantii*

This list includes thirteen species of parasitoids, 12 species belonging to family Aphelinidae and one species from Family Encyrtidae.

Family: Aphelinidae

1. *Aphytis africanus* Quednau

Material examined: 5 ♀♀, 6 ♂♂, El-Minya 25.IV. 2003 ex. *Aonidiella aurantii* (Maskell).

Remarks: Abd-Rabou and Hayat (2003) collected this species for the first time in Egypt.

2. *A. azai* Abd-Rabou

Material examined: 25 ♀♀, 6 ♂♂, El-Minya, 24. IV. 2005, ex. *A. aurantii* on *Citrus* sp.

Remarks: Abd-Rabou (2004a) collected this species for the first time in Egypt.

3. *A. chrysomphali* (Mercet)

Material examined:, 15 ♀♀, Gharbiya, 20.IX.2006, ex. *A. aurantii* on *F. nitida*.

Remarks: This species was recorded for the first time in Egypt by Abd-Rabou and Hayat (2003).

4. *A. coheni* DeBach

Material examined: 7 ♀♀, El-Arish (North Sinai), 25. X.2006, ex. *A. aurantii* on *F. nitida*.

Remarks: This species was recorded for the first time in Egypt by Hafez (1988).

5. *A. lingnanensis* Comepre

Material examined: 7 ♀♀, Behira, 11.X. 2007 ex. *A. aurantii* on *Citrus* sp.

Remarks: Hafez (1988) recorded this species as the most common species of *A. aurantii* on *Citrus* sp.

6. *A. sinaii* Abd-Rabou

Material examined: 13 ♀♀, 4 ♂♂, South Sinai, 15.X 2008 ex. *A. aurantii* on *F. nitida*.

Remarks: This species was recorded for the first time in Egypt by Abd-Rabou (2004b).

7. *Coccobius* sp

Material examined: 2 ♀♀, El-Minya, 15.III.2006 ex. *A. aurantii*. On citrus (PPRI).

Remarks: This species was recorded for the first time in Egypt, associated with *A. aurantii* by Abd-Rabou (1999 a).

8. *Encarsia aurantii* (Howard)

Material examined: 3 ♀♀, Marsa Matruh , 13.X. 2004, ex. *A. aurantii* on *Ficus nitida* .

Remarks: This species was recorded for the first time in Egypt by Hafez (1988).

9. *E. citrina* (Craw)

Material examined: 5 ♀♀, North Sinai (El-Arish), 23. X. 2008, ex. *A. aurantii*, on *Citrus* sp.

Remarks: This species was recorded for the first time in Egypt by Priesner & Hosny (1940).

10. *E. lounsburyi* (Berlese & Paoli)

Material examined: 15 ♀♀, Beni-Suef, 14. XI. 2007, ex. *A. aurantii* on *Citrus* sp.

Remarks: This was recorded for the first time in Egypt by Priesner & Hosny (1940)..

11. *Marietta leopardina* Motschulsky

Material examined: 9 ♀♀, Ismailia, 17. VI. 2000, ex. *A. aurantii* on *F.nitida*.

Remarks: This species was recorded for the first time in Egypt by Priesner and Hosny (1940).

12. *M.picta* (Andre)

Material examined: 8 ♀♀, Alexandria , 2. V. 2008, ex. *A. aurantii* on *Citrus* sp.

Remarks: This species was recorded for the first time in Egypt as a hyperparasitoid associated with *A. aurantii* by Abd- Rabou (1999a).Later , Abd-Rabou(2001) also recorded this hyperparasitoid species.

Family: Encyrtidae

13. *Habrolepis aspidioti* Compere & Annecke

Material examined: 12 ♂♂, Minyufiya, 29. VIII. 2004, ex. *A. aurantii* on *Citrus* sp.

Remarks: This species was recorded for the first time in Egypt by Priesner and Hosny (1940).

II. Key to the parasitoids of *Aonidiella aurantii*

This key includes thirteen species of *A. aurantii* parasitoids. These are : Family: Aphelinidae. *A. africanus* , *A. azai* , *A. chrysomphali* , *A. coheni* ,*A. lingnanensis*, *A.*

sinaii, *Coccobius* sp., *Encarsia aurantii*, *E. citrina*, *E. lounsburyi*, *M. leopardina*,
M. picta. Family: Encyrtidae. *Habrolepis aspidioti*.

Key to species modified and Adopted from Abd-Rabou(1999b)

1. Often less than 1 mm. in length, antennae usually with three to eight segments, rarely with nine, mesoscutum with parapsidal sulci always developed, fore wing with marginal vein extremely long, ovipositor never protruding strongly.....**2**
- Often 0.5-6 mm. in length, antennae with five to twelve segments, mesoscutum with parapsidal sulci seldom developed, fore wing with marginal vein relatively short, ovipositor rarely protruding strongly caudally, male funicle two segmented *Habrolepis aspidioti*
- 2.1.** Antennae 7-9 segmented, fore wing without linea calva**3**
- Antennae 4-6 segmented, fore wing generally with linea calva**6**
- 3.2.** Antennae 7-segmented, if antennal formula 1,1,3,2; then either fore wing with linea calva or axillae very small, not projecting forewards Antennal formula 1,2,3,2; propodeum not distinctly longer than metanotum; mesoscutum with numerous setae; submarginal vein with 4 or more setae..... *Coccobius* sp.
- Antennae 8 or 9-segmented, if 7-segmented then not with the formula 1,1,4,1; linea calva absent and axillae large, strongly projecting forewards.....**4**
- 4.3.** Stigmal vein of fore wing with an evident asetose area proximally.....*Encarsia aurantii*
- Stigmal vein of fore wing without an evident asetose area proximally. At least one small seta proximal to the stigmal vein.....**5**
- 5.4.** Submarginal vein of fore wing with one seta.....*Encarsia lounsburyi*
- Submarginal vein of fore wing with two setae.....*Encarsia citrina*
- 6.2.** Propodeum short, subequal to metanotum, without crenulae.....**7**
- Propodeum long, considerably longer than metanotum, bearing marginal crenulae.....**8**
- 7.6.** Antennal scape nearly twice as long as wide, with 2 oblique fuscous bands; fore wing board, less than twice as long as wide with a slightly different pattern.....*Marietta picta*
- Antennal scape twice as long as wide, with a single band; fore wing narrow, not less than twice as long as wide, with pattern Apex of fore wing without infusate band in middle, mesoscutum 4 setae..... *Marietta leopardina*
- 8.6.** Propodeal crenulae large and overlapping.....**9**
- Propodeal crenulae (large or small) non-overlapping.....**12**

9.8. Club shorter, less than 3x as long as broad; ovipositor sheaths about 0.4x of mid tibia; (Propodeal crenulae relatively smaller, less elongate and more oblique. (Thoracic sterna dusky)*Aphytis africanus*
 - Club about 3x as long as broad; ovipositor sheaths about 0.5x of mid tibia**10**

10.9. Thoracic sterna immaculate, club 3.1. times as long as wide.....*Aphytis azai*
 - Thoracic sterna dusky**11**

11. 10. Body setae slender and pale; mid lobe usually with 10-12 setae; fore wing proximad of linea calva with 30-50 setae *Aphytis lingnanensis*

- Body setae relatively coarser and darker; mid lobe with 12-14 setae; fore wing proximad of linea calva with 50-70 setae. *Aphytis coheni*

12.8. Propodeum 6-8x as long as metanotum. *Aphytis chrysomphali*

- Propodeum short, less than 4x as long as metanotum ***Aphytis sinaii***

III. Parasitoids attacking *Aonidiella aurantii* in Baharia Oasis:

Results indicated that the only parasitoid species collected from Markaz Bawiti in Baharia Oasis (Fig.1) was *Comperiella lemniscata* Compere & Annecke (Hymenoptera: Encyrtidae).

Material examined: 25♀♀, Baharia Oasis (Bawiti), VII. 2008, ex. *A. aurantii* on *Ficus nitida*

Remarks: This species was recorded for the first time in Egypt as a parasitoid associated with *A. aurantii* by Abd-Rabou and Attia (2006).



Fig. 1. Map Baharia Oasis adopted from www.egyptmyway.com/contactforms.html (2008).

IV. Key to Genus *Comperiella* Howard in Egypt

This key includes two species of Genus *Comperiella*. These are : *Comperiella bifasciata* Howard and *C. lemniscata* Compere & Annecke .

KEY TO SPECIES

1. Lateral ocelli one ocellus diameter apart and tibial spur of middle leg subequal to basitarsus..... ***Comperiella lemniscata***
-Lateral ocelli two ocellar diameters apart and tibial spur of middle leg distinctly longer than basitarsus ***Comperiella bifasciata***

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طفيليات الحشرة القشرية الحمراء مع التركيز على طفيلياتها

فى الواحات البحرية

شعبان عبدربه

معهد بحوث وقاية النباتات - مركز البحوث الزراعية - نقي - جيزة

تضمن هذا العمل تجميع عينات مصابة بالحشرة القشرية الحمراء و متطفل عليها فى أماكن مختلفة فى مصر خلال ٢٠٠٨-٢٠٠٤ وتم عزل و تحضير عينات الطفيليات بأستخدام المفاتيح التصنيفية المتخصصة لتعريف الطفيليات. أتضح من نتائج التعريف أن هذه الآفة متطفل عليها ١٣ طفيل . هذا العمل تضمن أيضا حصر لطفيليات هذه الآفة فى الواحات البحرية . تم عمل مفتاح تصنيفى لطفيليات هذه الآفة و مفتاح تصنيفى لجنس كومبريلا فى مصر .