

**NEW RECORDS OF THE SOFT SCALE INSECTS HOSTS
ASSOCIATED WITH THE PROMISING PARASITOID,
SCUTELLISTA CAERULEA (FONSCOLOMBE)
(HYMENOPTERA:PTEROMALIDAE) IN EGYPT**

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Abstract

Scutellista caerulea (Fonscolombe) (Hymenoptera : Pteromalidae) is one of the most promising parasitoid of soft scale insects of the world and Egypt. The present work dealt with the host range and distribution of this species in Egypt during 2005-2010. The result indicated that the recorded species was associated with 8 soft scale insect species in 9 governorates, two of them as recorded here as a new host insects for the first time in Egypt. These are *Ceroplastes rusci* (L.) and *Coccus hesperidum* L. (Hemiptera : Coccidae). An updating list of parasitoids of soft scale insects in Egypt and a key of these parasitoids were also included.

INTRODUCTION

Scutellista caerulea (Fonscolombe)) (Hymenoptera : Pteromalidae) is an egg parasitoid of many scale insects. The adult female oviposits in gravid scales. The parasitoid larva consumes 400-500 scale eggs to complete its development (Saad *et al.*, 1977). The parasitoid, *S. caerulea* has been used widely in the biological control of olive scales (El-Minshaway *et al.*, 1978 and Luck (1981). It is the most important enemy attacking *S. coffeae* in Egypt (El-Minshawy and Saad .1977 and Abd-Raou, 2006). Many Egyptian workers recorded this parasitoid associated with different soft scale species in different locations in Egypt, e.g. Priesner and Hosny (1940), El-Minshawy and Saad (1977), Abu El-Khair (1999), Abd-Rabou (2001 a,b,c, 2004, 2006) and Abd-Rabou and Hafez, (2001) .

The aim of the present work is to study the soft scale insect host range and distribution of *S. caerulea* as well as updating and key of the parasitoids of soft scale insects in Egypt.

MATERIALS AND METHODS

Samples of soft scale insects were collected from different host plants in Egypt throughout the period of study during 2005 and 2010. Leaves, leaflets, stems and fruits from different hosts were stored in well-ventilated glass tubes for one week for

monitoring of emergence the adult parasitoid and for identification. Gravid females of soft scale insects (as well as insect species other than these soft scales) were eliminated through stereoscopic examination. Soft scale insects and the parasitoid, *S. caerulea*, available specimens found in Entomological Collection, Plant Protection Research Institute, as well as those available in literature were considered; in the meantime samples collected by the author from different localities were recorded.

RESULTS AND DISCUSSION

I. Host Range and distribution of soft scale insects associated with the parasitoid, *Scutellista caerulea*

Table (1) showed that the recorded parasitoid, *Scutellista caerulea* was associated with 8 species of soft scale insects in 9 governorates . Two of them as a new host soft scale insect. These are *Ceroplastes floridensis* Comstock, *Ceroplastes rusci* (L.), *Coccus hesperidum* L. (new record here), *Kilifia acuminata* (Signorat), *Parasaissetia nigra* (Nietner), *Saissetia coffee* (Walker), *Saissetia oleae* (Olivier) and *Waxiella mimosae* (Signoret).

This parasitoid was recorded for the first time in Egypt by Priesner and Hosny, 1940 associated with *W. mimosae* on *Acacia nilotica*, *Albizzia lebbek*, *Ficus carica*, also *P. nigra* on *Ficus sycamorus* and *S. coffeae* on olive in Lower and Upper Egypt . Abu El-Khair (1999) and Abd-Rabou (2001b,c) recorded this parasitoid associated with *S. coffeae*, *S. oleae* and *C. floridensis*. Abou El-Khair (1999) recorded *S. caeruleae* associated with different species of soft scale insects in Alexandria . Also, *S. caeruleae* was recorded attacking *C. floridensis* infested citrus trees in Beheira governorate (Abd-Rabou,2001c). This parasitoid was reared from *K. acuminata* (Abd-Rabou and Hafez, 2001). In olive groves infested with *S. oleae* recorded this parasitoid (Abd-Rabou, 2004). Later Abd-Rabou (2006) recorded this parasitoid associated with *K. acuminata*, *C. floridensis*, *P. nigra*, *S. coffeae* and *S. oleae*.

Table 1. Host soft scale insects of the parasitoid, *Scutellista caerulea* with host plant, distribution and references records

Host soft scale Insect	Host Plant	Distrubution	References
<i>Ceroplastes floridensis</i> Comstock	<i>Citrus</i> sp.	Behira, Sharqyia	Priesner & Hosny, 1940 , Abd-Rabou,2001c ,2006 and Present Work
<i>Ceroplastes rusci</i> (L.),	<i>Citrus</i> sp.	Beni- Suef	Present Work
<i>Coccus hesperidum</i> L.	<i>Citrus</i> sp.	Giza	Present Work
<i>Kilifia acuminata</i> (Signorat),	Mangefra indica	Ismailia , Qayubiya	Abd-Rabou & Hafez, 2001, Abd-Rabou, 2006 and Present Work
<i>Parasaissetia nigra</i> (Nietner),	<i>Ficus sycamorus</i>	Upper Egypt	Priesner and Hosny, 1940 and Present Work
<i>Saissetia coffee</i> (Walker),	<i>Olea</i> sp.	Lower Egypt, Alexandria	Priesner & Hosny, 1940, El-Minshawy & Saad (1977), Abd-Rabou, 2006 and Present Work
<i>Saissetia oleae</i> (Olivier)	<i>Olea</i> sp.	Alexandria , El-Arish	El-Minshawi <i>et al.</i> , 1978 , Abd-Rabou (2004) and Present Work
<i>Waxiella mimosae</i> (Signoret)	<i>Acacia nilotica</i> , <i>Albizzia</i> <i>lebbek</i> , <i>Ficus carica</i> ,	Upper Egypt, Qena	Priesner and Hosny, 1940 and Present Work

III. Key of the parasitoid species attacking soft scale in Egypt:

Key to Species modified from Abd-Rabou (2001a)

1. Hind wing basally narrow and stalk-like marginal fringe of wings usually very long; stigmal vein rudimentary; wings and legs long and slim; body generally non-metallic ***Alaptus* sp.**
- Hind wing basally narrow and other characters different2
- 2(1). Mesopleuron large, convex, horizontal and without a female groove, middle tarsi with at least the basitarsus with a double row of short, thick, peg-like spines beneath, prepectus not large, notaulal lines rarely present, antenna with 1-7 funicle segment.....3
- Mesopleuron impressed, often grooved.....18
- 3(2). Fore wing shortened, clearly not reaching apex of gaster6
- Fore wing normal or over nearly reaching apex of gaster4
- 4(3). Scutellum without such a group of setae, ovipositor and gonostyli hardly protruding caudally ***Microterys flavus* (Howard)**
- Scutellum with a subapical group of dark coarse setae arranged in a more or less compact bundle.....5
- 5(4). Mesoscutum with a distinct transverse depression in its posterior one-third, either mesoscutum with a more or less distinct bundle of setae in middle or posterior margin or pronotum has a line of stiff black bristle, sides of propodeum and mesopleura posteriorly more or less dark metallic ***Diversinervus elegans* Silvestri**
- Mesoscutum without a transverse posterior depression, neither mesoscutum with a median bundle of setae nor posterior margin or pronotum with a line of stiff black bristles..... ***Cheiloneurus* sp.**
- 6(3). Scutellum without a distinct tuft or bundle of setae or scale-like setae....7
- Scutellum with a group of coarse, long dark setae arranged in a more or less compact tuft or bundle or with two or more scale-like setae marginal vein shorter than stigmal vein, antenna with scape longer than the basal three funicle segments combined ***Encyrtus inflex* (Embleton)**
- 7(6). Hypopygium not reaching more than two-third along gaster, scape tending to be subrectangular, the flattened part of upper edge more than one-half as long as the straight part of the lower edge..... ***Paraceraptocherus africanus* Giralut**
- Hypopygium reaching apex of gaster.....8
- 8(7). Fore wing with postmarginal vein not longer than stigmal vein.....9

- Fore wing with postmarginal vein longer than stigmal vein, fore wing hyaline, head, dorsum of thorax and mesopleurum with distinctive deep punctate sculpture, scutellum never with apical flange
.....***Blastothrix erythrosethus* Walker**
- 9(8). Scape not more than three times as long as broad10
Scape more than three times as long as broad16
- 10(9) Mesoscutum or scutellum or both at least partly yellow, orange or pale orange brown.....11
- Mesoscutum and scutellum completely dark, not yellow, orange or pale brown, clava strongly obliquely truncate and clearly longer than funicle
..... ***Baeoanusia oleae* Silvestri**
- 11(10) Maxillary palpi 2-segmented.....12
- Maxillary palpi 3 or 4 segmented, labial palpi 3-segmented.....13
- 12(11) Antennal scape 3.6 times as long as the greatest wide
.....***Metaphycus africanus***
- Antennal scape 2.5 times as long as wide.....
..... ***Metaphycus helvolus* (Compere)**
- 13(11) Maxillary and labial palpi 3-segmented.....14
- Maxillary palpi 4-segmented and labial palpi 3-segmented15
- 14(13) Legs with annualr darkish spots on tibiae, antennal scape at least 2.5 times as long as the greatest width..... ***Metaphycus lounsburyi* (Howard)**
- Legs without annualr darkish spots on tibiae, antennal scape about 3.5 times as long as the greatest width ***Metaphycus flavus* (Howard)**
- 15(13) Scape more than 2.5 times as long as wide, ovipositor only slightly longer than or subequal in length to middle tibia.....
***Metaphycus zebratus* (Mercet)**
- Scape 2.5 times as long as wide, ovipositor shorter than in length to middle tibia..... ***Metaphycus anneckeii* Guerrieri and Noyes**
- 16(9) Fore wing with marginal vein absent, scape more than three times as long as broad***Cowperia* sp.**
- Fore wing with marginal vein present.....17
- 17(16) Ovipositor exserted, pedicel subtriangular, shorter than F1, clava not or hardly longer than F1..... ***Bothriophryne acaciae* (Risbec)**
- Ovipositor not exserted, scape more than three times as long as broad..... ***Parechthrodryinus coccidiphagus* (Mercet)**

- 18(2) Tarsi 4-segmented, the gaster distinctly constricted at its junction with propodeum, scutellum with distinct submedian grooves, mesoscutum usually with a median groove..... ***Tetrasticus ceroplastae* Girault**
- Tarsi 5-segmented, if rarely some trasi 4-segmented than gaster broadly sessile.....19
- 19(18) Gaster subsessile, broadly attached with the propodeum, petiole strongly transverse.....20
- Gaster distinctly constricted at its junction with propodeum, the petiole some times distinct, female antenna with 9, scutellum very long, at least twice as long as mesoscutum, extending well over the gaster.....
.....***Scutellista caerulea* (Fonscolombe)**
- 20(19) Antennae at most with 6-segmented, fore wing generally with linea calva, mesopleurn large undivided21
- Antennae at most with 7-segmented, fore wing generally without linea calva.....22
- 21(20) Antennal scape flattened and expanded beneath, not more than twice as long as wide.....***Marietta picta* (Andre)**
- Antennal scape slender, or moderately flattened not less than twice as long as wide..... ***Marietta leopardina* Motschulsky**
- 22(20) Antennae 7-segmented, axillae large23
- Antennae 8-segmented, axillae small.....26
- 23(20) Scutellum with 3 pairs of setae.....24
- Scutellum with numerous setae.....25
- 24(23) First funicle segment 3 times as long as pedicel, stigmal vein swollen...
..... ***Coccophagus bivittatus* Compere**
- First funicle segment 1.3 times as long as pedicel, stigmal vein not swollen..... ***Coccophagus lycimnia* (Walker)**
- 25(23) Fore coxa yellow, first funicle segment more than twice as long as wide, first club segment longer than wide.....***Coccophagus scutellaris* (Dalman)**
- Fore coxa black..... 26
- 26(22) Scutellum largely yellowish white ***Coccophagus qenai* Abd-Rabou**
- Scutellum largely Black ***Coccophagus ishii* Compere**
- 27(22) Submarginal vein 2 setae***Encarsia citrina* (Craw)**
- Submarginal vein 3 setae***Encarsia aurantii* (Howard)**

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تسجيل جديد للحشرات القشرية الرخوة كعائل لطفيل أسكيوتيلستا كاريولى فى مصر

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

طفيل أسكيوتيلستا كاريولى أحد أهم الطفيليات التى تتطفل على الحشرات القشرية الرخوة فى مصر و العالم . تضمن هذا العمل المدى العائلى و التوزيع الجغرافى لهذا الطفيل أثناء الفترة من 2005-2010 . وقد أظهرت النتائج مصاحبة طفيل أسكيوتيلستا كاريولى 8 أنواع من الحشرات القشرية الرخوة التى تنتشر فى 9 محافظات حيث سجل اثنين منهم لأول مرة فى مصر وهما :

Coccus hesperidum L. و *Ceroplastes rusci* (Linnaeus)

بالإضافة الى ذلك تم عمل تحديث لقائمة الطفيليات التى تتطفل على الحشرات القشرية الرخوة فى مصر الى جانب عمل مفتاح تصنيفى لهذه الطفيليات.