

**SCIENTIFIC LIST AND KEY FOR THE PARASITOIDS OF  
*PULVINARIA TENUIVALVATA* ( NEWSTEAD)  
( HOMOPTERA:COCCIDAE)ON SUGAR CANE IN EGYPT**

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**Abstract**

The sugarcane soft scale, *Pulvinaria tenuivalvata* ( Newstead) (Homoptera: Coccidae) one of the most important pests on sugarcane in Egypt. The present work deals with the parasitoids of this pest under the Egyptian condition . The results indicated that this species was recorded associated with 15 parasitoid species belonging to three hymenopterous families of order: Aphelinidae (4 spp. in 3 genera), Encyrtidae ( 10 spp. in 7 genera) and Pteromalidea ( one species). Two encyrtid species were recorded for the first time in Egypt, that are *Metaphycus anneckeii* Guerrieri and Noyes and *Metaphycus* sp. A taxonomic key of the fifteen species are constructed to facilitate the identification of the present parasitoids.

**INTRODUCTION**

Ali *et al.* (1997) and Watson & I. Foldi (2001) identify and recorded *Pulvinaria tenuivalvata* (Newstead) (Homoptera: Coccidae) for the first time in Egypt as a misidentification name [*Saccharolecanium krugeri* (Zehntner)] in Egypt. The occurrence, distribution and host range of the sugarcane soft scale insect, *P. tenuivalvata* in Upper Egypt studied by Ali *et al.* (2000). While Azab *et al.* (2003) studied light and scanning of all stages the sugarcane soft scale by using the electron microscopic. Besheit *et al.* (2002) evaluated the influence of the infestation by the soft scale insect on sugarcane stalk weight, juice quality and sugar yield in Upper Egypt. Furthermore, El-Serawy (2001) achieved the ecology, biology and natural enemies of the red striped soft scale, *P. tenuivalvata*, a pest of sugarcane in Egypt. Hindawy *et al.* (2002) recorded *Coccophagus scutellaris* (Dalman) (Hymenoptera : Aphelinidae ), as a new record parasitoid attacking the sugar cane soft scale in Egypt.

The aim of this work is to record and revise the parasitoids of *P. tenuivalvata* as well as construct a key for the parasitoid species. This species is commonly known as sugarcane scale, sugarcane soft scale and red striped soft scale as common names for this pest.

## MATERIALS AND METHODS

Samples of the sugar cane soft scale insect were collected on sugarcane from different locations in Egypt during 2005- 2006.

The preservation of the Chalcidoidea species are better to mount on slide and cards mounts. Since body colour is likely to fade during clearing process, it might be necessary to note the colour and sculpture either from dried or freshly collected specimens preserved in alcohol. The smaller size the softness and of the less sclerotized bodies, make the specimens almost useless for study if you preserved its in alcohol for long periods. The techniques of slide mounting after Abd-Rabou (1998) as follows: Dried specimens are soaked in glacial acetic acid (7 drops) mixed with chloral phenol (5 drops) in small watch glasses, and after 48 hours specimens should be satisfactorily cleared, the cleared specimens are then mounted in Hoyer's medium and after drying for about two weeks under 40 °C, the slide cover is ringed with a suitable sealer. The terminology of the morphology of adult Chalcidoidea used is mainly according to Hayat (1983) .

## RESULTS AND DISCUSSION

### I. List of the parasitoids attacking *Pulvinaria tenuivalvata*, with new records:

#### Family: Aphelinidae

1. *Ablerus chionaspidis* ( Howard) (El-Serawy & Guerrieri, 2005) and collected during the present work.
2. *Coccophagus orchaceus* Howard [Abd-Rabou & Abd- El-Samea, 2006,(misidentification as *Encarsia bifasciifacies* Hayat in Abd-Rabou & El-Samea,2005)]
3. *C. scutellaris* (Dalman) (El-Serawy & Guerrieri, 2005) and collected during the present work.
4. *Marieta leopardina* ( Mot.) (El-Serawy & Guerrieri, 2005)

#### Family: Encyrtidae

5. *Cerapterocerus mirabilis* (Westwood) (El-Serawy & Guerrieri, 2005) and collected during the present work.
6. *Cowperia alfieri* (Mercet) (El-Serawy & Guerrieri, 2005)
7. *Diversinervus elegans* Slivestri (El-Serawy & Guerrieri, 2005) and collected during the present work.
8. *Mahencyrtus comara*( Walker) (El-Serawy & Guerrieri, 2005)
9. *M.citricola* ( Annecke & Mynhardt) (El-Serawy & Guerrieri, 2006)

10. *Metaphycus flavus* (Howard) (El-Serawy & Guerrieri, 2006) and collected during the present work.
11. *Metaphycus anneckei* Guerrieri and Noyes New record for the first time during this work.
12. *Metaphycus* sp. ( New record )New record for the first time during this work.
13. *Microterys flavus* (El-Serawy & Guerrieri, 2005) and collected during the present work.
14. *Parechthrodryinus coccidiphagus* (Mercet) (El-Serawy & Guerrieri, 2006) and collected during the present work.

#### **Family: Pteromalidae**

15. *Pachyneuron muscarum* (Linnaeus) (El-Serawy & Guerrieri, 2005) and collected during the present work.

The aforementioned list includes 15 parasitoid species recorded associated with *P. tenuivalvata*. These species belonging to three families, Aphelinidae (3 genera), Encyrtidae ( 7 genera) and Pteromalidea( one genus), two of them recorded here as the first records in Egypt .These are *Metaphycus anneckei* Guerrieri and Noyes and *.Metaphycus* sp.

#### **II. Key to the parasitoids of *Pulvinaria tenuivalvata* on sugarcane in Egypt**

1. Mesopleuron impressed and with a femoral groove.....2  
    Mesopleuron large and without a femoral groove.....7
2. Tarsi four-segmented, scutellum with distinct submedian grooves, mesoscutum usually with a median groove.....*Tetrastichus* sp.  
    Tarsi five-segmented.....3
3. Gaster distinctly constricted at its junction with propodeum; antenna with 9; scutellum very long, at least twice as long as mesoscutum, extending well over gaster ..... *Pachyneuron muscarum*  
    Gaster sessile, broadly attached with the propodeum ..... 4
4. Antennae 7 segmented, fore wing generally without linea calva, all coxae black, femora dark except apices and bases yellow ..... 5  
    Antennae 6 segmented, fore wing generally without linea calva, antennal scape with the band short, extending caudad from about middle of ventral margin.....*Marietta leopardina*
5. Mesoscutum with 1 or 2 setae, marginal fringe 0.5 times as long as the width of disc..... *Aberus chionaspidis*  
    Mesoscutum with numerous setae.....6

6. Scutellum with three pairs of setae..... *Coccophagus orchaceus*  
 Scutellum with numerous setae ..... *Coccophagus scutellaris*
7. Fore wing normal at least very nearly reaching apex of gaster .....8  
 Fore wing shorter, clearly not reaching apex of gaster ..... 11
8. Scutellum without such a group of setae, ovipositor and gonostyli hardly protruding caudally ..... *Microterys flavus*  
 Scutellum with a subapical group of dark coarse setae arranged in a more or less compact bundle.....9
9. Antenna with all segments distinctly broadened and flattened .....*Cerapterocerus mirabilis*  
 Antenna with pedicel and flagellum more or less cylindrical, scape occasionally broadened and flattened.....10
10. Mesoscutum with a distinct transverse depression, body yellow, sides of propodeum and mesopleura posteriorly more or less dark metallic ..... *Diversinervus elegans*  
 Mesoscutum without a transverse depression .....*Cheiloneurus* sp.
11. Scape not more than three times as long as board ..... 14  
 Scape more than three times as long as board ..... 12
12. Marginal vein of forewing absent ..... *Cowperia alfieri*  
 Marginal vein of forewing present .....13
13. Propodeum medially at least one – fifth as long as scutellum and usually with some irregular carinae present medially..... *Mahencyrtus comara*  
 Propodeum medially at least on – sixth as long as scutellum and usually without carinae. .... *Parechthrodrinus coccidiphagus*
14. Maxillary and labial palpi 3-segmented, scape about 3.5 as long as the greatest width.....*Metaphycus flavus*  
 Maxillary palpi 4-segmented and labial palpi 3-segmented, scape about 2.5 as long as the greatest width .....*Metaphycus anneckeii*

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قائمة علمية و مفتاح تصنيفى لطفيليات الحشرة القشرية الرخوة

***Pulvinaria tenuivalvata***

على قصب السكر فى مصر

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تضمن هذا العمل الحالى تجميع عينات مصابة بحشرة القصب القشرية الرخوة والطفيليات المصاحبة لها على قصب السكر من أماكن مختلفة فى مصر أثناء الفترة من ( ٢٠٠٥-٢٠٠٦ ) وتم عزل وتحليل و تحضير عينات الطفيليات لتعريفها بأستخدام المفاتيح التصنيفية المتخصصة لتعريف الطفيليات. أتضح من نتائج التعريف أن هذه الآفة يتطفل عليها ١٥ نوعا موزعة على ثلاث فصائل : أفيليندى أربعة أنواع فى ثلاثة ( ٣ أجناس) و أنسيرتيدي ( ٨ أجناس ) و بيتيروماليدي ( جنس واحد) وتم تسجيل نوعين جديدين على الفونة المصرية. وهم *Metaphycus annecki* Guerrieri and Noyes و *Metaphycus sp.* وبالأضافة الى هذا فقد تم عمل مفتاح تصنيفى يساعد فى تعريف عدد ١٥ نوعا من طفيليات هذه الآفة فى مصر. وهذه الطفيليات هى:

**Family: Aphelinidae**

1. *Ablerus chionaspidis* ( Howard)
2. *Coccophagus orchaceus* Howard
3. *C. scutellaris* (Dalman)
4. *Marieta leopardina* ( Mot.)

**Family: Encyrtidae**

5. *Cerapterocerus mirabilis* ( Westwood)
6. *Cowperia alfieri* (Mercet)
7. *Diversinervus elegans* Slivestri
8. *Mahencyrtus comara* ( Walker)
9. *M.citricola* ( Anneck & Mynhardt)
10. *Metaphycus flavus* (Howard)
11. *Metaphycus annecki* Guerrieri and Noyes
12. *Metaphycus sp.*
13. *Microterys flavus*
14. *Parechthrodryinus coccidiphagus* (Mercet)

**Family: Pteromalidae**

15. *Pachyneuron muscarum* (Linnaeus)