

DESCRIPTION OF THE DIFFERENT STAGES IN THE LIFE  
CYCLE OF THE DATE PALM SCALE INSECT, *Parlatoria blanchardi*  
TARGIONI TOZZETTI (Homoptera, Diaspididae)

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### ABSTRACT

The different stages of *P. blanchardi* were described. The egg is oblong, whitish yellow and averages 285 microns long and 110 microns wide. After hatching, the 1<sup>st</sup> instar, crawler that gets out from beneath the scale is also oblong yellowish white in color and measures 250 microns long and 125 microns wide. The female passes through two nymphal instars, while the male passes through four. For this reason, the main taxonomic characters of the different nymphal instars in both sexes were studied in details. In the adult stage, sex is clearly distinguished. The female becomes semicircular, elongated, and apterous, while the male is elongated and winged. *P. blanchardi*, like most insects of this group, protect itself with an armoured scale composed of exuviae and other secreted materials. After the last nymphal moult, the male usually emerges from beneath the scale, while the female remains motionless.

**Key words:** Scale insect; Date palm; Description; Homoptera; Diaspididae.

### INTRODUCTION

*P. blanchardi* is a world wide major pest of palm tress, *Phoenix dactylifera*, and other Arecaceae, commonly known in Egypt due to the favorable climatic conditions for its development. The biology and ecology of the insect in the USA were studied by Ferris (1937) and by Benassy and Soria (1964) in Tunesia Chang and Tao (1963) gave a key distinguish this species it from two others of genus *Parlatoria*.

In Egypt, the insect was observed for the first time in 1937 (Hosny, 1943). Abdel-Fatah *et al.* (1978), and Ghabbour (1982) gave a brief description of the morphology and biology of the different stages of *P. zizphus* which attack citrus trees. Swailem *et al.* (1985) carried out some biological studies on *P. zizyphus*. Ghabbour and Mohammed (1996) showed some aspects of the bionomics and structures of diaspidid in Egypt. Granara and Claps (2003) mentioned that *P. banchaordi* has been recorded from date palm and other hosts belonging to the plant family Palmaceae. Thus the limited information in this respect ensured the importance of conducting further investigations to provide more details of structures. This will help to meet the ideas of several authors that some morphological structures in males in the superfamily coccoidea could be of taxonomic value.

### MATERIALS AND TECHNIQUES

The experiments were carried out in the laboratories of the Faculty of Agriculture, University of Cairo at Giza during 2007. Highly infested leaves were selected from a date palm tree in this area and transferred to date palm seedlings transplanted in pots in the laboratory to start a new brood. By this

artificial infestation the hatched crawlers usually settle on the leaves of seedlings. These nymphs were daily observed and all changes were recorded. Some of these insects at different stages of development were individually mounted on glass slides using Hoyer's medium for further examination under the microscope.

## RESULTS AND DISCUSSION

**A. Egg stage (Fig. 1,A) :** The egg is oblong, whitish yellow turning to pinkish as it develops. It measures 285 microns long and 110 \*microns wide.

### B. Nymphal stage:

**First nymphal instar (Crawler) (Fig. 1,B):** The crawlers leave the scale after hatching, move for 12-48hours before settling on leaf preferring the upper surface. It is oblong, yellowish white and measures 250 microns long and 125 microns wide. The crawler has 3 pairs of developed legs, a pair of 5-segmented antennae and 2 simple eyes. Before secreting the new scale, it folds its appendages underneath its body. The secretion takes the shape of white filaments forming final shape of a white cover or cap. Which gradually increases in size reaching 320 microns long and 200 microns wide.

### Second nymphal instar (Fig. 1,C):

#### 1- Female:

**Scale:** After the first moult the scale darkens in colour and becomes more convex, measuring 460 microns long and 335 microns wide. The scale continues to enlarge reaching about 940 microns long and 620 microns wide at the end of the stage and the scale then appears in whitish colour with clean white anterior portion and a black area at the posterior end.

**Body:** the body turns to pinkish white and becomes oval with flat margins measuring 425 microns long and 315 microns wide. A pair of weak antennae and legs appear and sclerotized pygidium is distinct with two anterior scars.

#### 2- Male:

**Scale:** Almost similar to that of the female with a white waxy area close to the posterior end. It measures 470 microns long and 340 microns wide and becomes more elongated at the end the stage.

**Body:** Also similar to that of the female except for two dark spots on the head. It measures 430 microns long and 330 microns wide.

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\* All mean measurements are approximated.

After the second moult, the female attains the adult stage, while the male passes through four instars before attaining the adult stage.

### Third nymphal instar (prepupa) (male only):

**Scale:** flat white with a broad posterior end measuring 940 microns long and 350 microns wide.

**Body:** The colour turns to pink with a blush interacted appearance; and measures 730 microns long and 255 microns wide. The genital area becomes well developed (Fig. 1,D)

### Fourth nymphal instars (Pupal stage) (male only) (Fig.2,A):

**Scale:** White elongated parallel sided scale measuring 940 microns long and 350 microns wide.

**Body :** Whitish yellow and distinguished into three regions.

The head carries 2 pairs of antenna and two dark eyes, The thorax is divided into three segments bearing two wing buds and three pairs of legs. The abdomen is not clearly segmented having a conical stylus.

**Adult stage:****1- Female:**

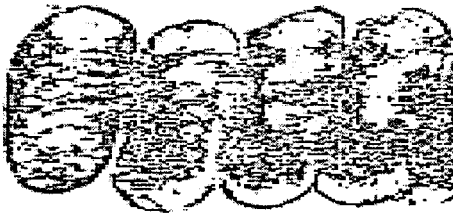
**Scale:** Large and light brown with a whitish waxy area at the end, measuring 1.2 mm. long and 0.6 mm. wide. At the final stage the scale attains a shieldy shape (Fig. 2,B1).

**Body** Whitish yellow turning to pink, oblong, and measures 880 microns long and 545 microns wide. Two lobes appear on the head, one on each side, the pygidium is weakly sclerotized but a membranous body is generally obvious. (Fig. 2,C).

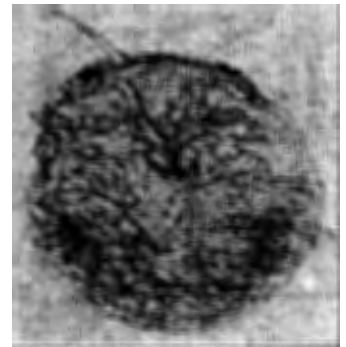
**2- Male :**

**Scale:** No secretion is added after the second moult. The scale is very similar to that of the prepupa and pupa (Fig. 2,B2).

**Body :** Delicate and fusiform. Clearly distinguished into three body regions with yellowish brown color and measuring 0.82 mm. long and 0.32mm. wide. The head with a pair of black compound eyes and a pair of segmented antennae; 0.4 mm long. The thorax is clearly divided into 3 segments with 3 pairs of well developed legs; a pair of transparent anterior wings; and a pairs of small halteres. The abdomen is 9 segments, with genitalia at the posterior area; a penis pointed and surrounded by two caudal processes. (Fig.2,D).



A



B



C



D

Fig. (1): *P.blanchardi* A- eggs B- first nymphal instar (Crawler) C- Second nymphal instar D- Third nymphal instar (Prepupal stage).

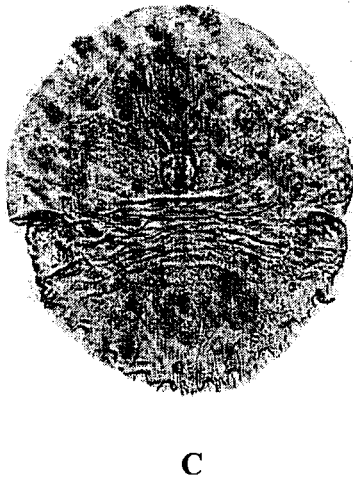
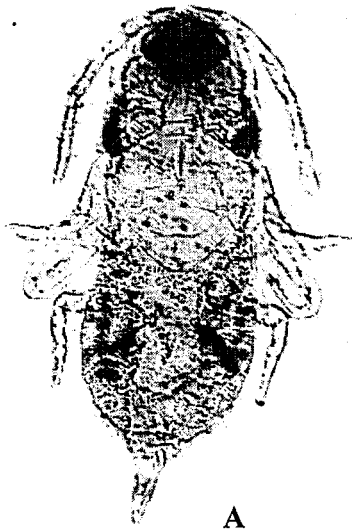


Fig. (2): *P.blanchardi* A- pupal stage, B- Adult scales 1- female 2- male, C- adult female, D- Adult male

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### وصف مورفولوجي لمختلف اطوار دورة حياة حشرة النخيل القشرية

#### *Parlatoria blanchardi* Targioni Tozzetti (Homoptera, Diaspididae)

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أجريت الدراسة المورفولوجية والمورفومترية على حشرة النخيل القشرية تحت ظروف المعمل ووضحت الدراسة ان البيض بيضاوي الشكل ذو لون ابيض مصفر متوسط طول ٢٨٥ ميكرون ومتوسط عرض ١١٠ ميكرون بعد الفقس يخرج العمر الاول الزاحف لطور الحورية من تحت القشرة حيث انه موجب الاستجابة للضوء بيضاوي الشكل أصفر مبيض اللون ذات مقاسات طول ٢٥٠ ميكرون وعرض ١٢٥ ميكرون في المتوسط. متوسط الطول للحورية في العمر الثاني ٤٢٥ ميكرون والعرض ٣١٥ ميكرون، في حين ان متوسط طول القشرة ٤٦٠ ميكرون والعرض ٣٣٥ ميكرون وتزداد هذه المقاسات لتبلغ في نهاية هذا العمر متوسط ٩٤٠ ميكرون في الطول و ٦٢٠ ميكرون في العرض. تمر الانثى بعمرين حوريين في حين يمر الذكر باربعة اعمار للحورية (عمرين للحورية ثم طور ما قبل العذراء ثم طور العذراء) ولهذا السبب تمت دراسة الصفات التقسيمية لمختلف الاعمار لكلا الجنسين بالتفصيل.

الجنسان البالغان مختلفان تماما كلا منهما عن الاخر فقشرة الانثى بيضاوية وأكبر حجماً من قشرة الذكر وذات لون بني فاتح أم قشرة الذكر فهي مطولة واصغر حجماً من قشرة الانثى وذات لون ابيض اما الانثى اسفل القشرة تظهر بشكل دائري مطاول عديمة الاجنحة في حين يكون الذكر مطاول ومجنح وحشرة النخيل القشرية - كمعظم الحشرات القشرية - تحمي نفسها بقشرة صلبة مكونة من جلود الانسلاخ ومواد افرازية اخرى.