Derna Academy Journal for Applied Sciences

E-ISSN: 3006-3159

DAJAS

Life Cycle of *Pseudospidoproctus hyphaniacus* (Hall1925) under the Conditions of the Al Kufra City.

[1*] **Safya Saad bunkhila**

Department of Zoology, Faculty of Science, University of Benghazi, Al Kufra, Libya

*Corresponding author: E-mail addresses: Safya.bunkhila@yahoo.com

Volume: 3 **Issue: 2** **Page Number: 173 - 177**

Key Words: Life cycle; *Pseudospidoproctus. hyphaeniacus*; Mealy bug; Al kufra; Libya.

Copyright: © 2024 by the authors. Licensee The Derna Academy for Applied Science (DAJAS). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) License (https://creativecommons.org/licenses/by/4.0/).

Received: 20\02\2025
Accepted: 03\04\2025
Published: 04\04\2025

https://doi.org/10.71147/f9chgt89

ABTRACT

Mealy-bug *Pseudospidoproctus hyphaniacus* (Hall1925) is (Homoptera, Coccoidea, Margarodidae). *P. hyphaeniacus* is found in Armenia, Azerbaijan, Egypt, India (Punjab), Iran, Libya, The adult female moves like the nymph, and covered with soft cottony powdery or white waxy material, while male with one pair of wing, vestigial mouth parts, Male and female of coccids go through very different post-embryonic development, therefore, Date palm mealy bug feed on the petiole base but rarely found on the leaflets cause a great damage and both, adults and nymphs of this species secrete honeydew copiously on which black sooty mould grows, this insect pest (*P. hyphaniacus*) is monophagous. The life cycle of *p. hyphaniacus* was studied on mango and potatoes under room condition between January, February and March of 2017 with mean temperature and relative humidity of 15˚C and 28 % RH, one females layed 227 eggs by 2nd February, 220 eggs hatched by 19th of March to give nymphs, which fail to produce the following nymphal stage and died in April. noted that this insect pest (*P. hyphaniacus*) is monophagous because it infests only date palms and no other hosts. In future, studies appropriate this insect pest and production management practices. The aims of the study are Determination of life cycle of Date palm mealy bug (*P-hyphnucus*) under Al kufra condition.

1. INTRODUCTION

Mealy-bug *Pseudospidoproctus hyphaniacus* (Hall 1925) is (Homoptera, Coccoidea, Margarodidae), (Hodgson, 2000), *P. hyphaeniacus* is found in Armenia, Azerbaijan, Egypt, India (Punjab), Iran, Libya, Saudi Arabia, United Arab Emirates, Oman, and Yemen (Kinawy, 2012, Martin, 1958, Bitaw, and Ben Saad, 1990). Male and female of coccids go through very different post-embryonic development; therefore, the adult females differ greatly from the adult males, it passes through 3 immature (nymphal) stages before finally molting into a stage that is rather nymph-like but develops ovaries and can reproduce. Female stages pass a piercing stylet-like mouthparts and lack wings, body of female adult usually are large flattened, reddish-brown color, Legs and antennae are present in all developmental stages.

The adult female moves like the nymph, and covered with soft cottony powdery or white waxy material, while male with one pair of wings, vestigial mouth parts (Hodgson, 2000, Morrison,1927). Neglected date palms and newly transferred offshoots usually subject to be infected by *Pseudospidoproctus hyphaniacus*. Date palm mealy bug feed on the petiole base but rarely found on the leaflets cause a great damage and both, adults and nymphs of this species secrete honeydew copiously on which black sooty mould grows leading to contamination of the dates thereby greatly decreasing their market value. On the green fronds, the presence of the honeydew secretions and the black sooty mould hinder the process of photosynthesis. It is interesting to note that the date mealy bug lives in symbiosis with a black ant species (Arab organization for agricultural development, 2012). noted that this insect pest (*P. hyphaniacus*) is monophagous because it infests only date palms and no other hosts. The aims of the study are Determination of life cycle of Date palm mealy bug (*P-hyphnucus*) under Al kufra condition.

2. METHOD

Experiment:

To monitor developmental stages of the mealy-bug *P-hyphnucus* under Al kufra condition, weather,(Al-Kufra metrological station), mango and potatoes seedling were selected as a host, 10 replicates were used for each plant, 5 females of insect from each field infected trees were used Fig (1). Observation on survival and molt of the crawlers were recorded daily under microscope until the become adults. developmental time of each instar way recorded based on an observed exuviae Daily monitoring of crawlers. also eggs were observed the were separated along with the host plants and observed until the hatched. The study was conducted between January and March 2017 in the room condition when maximum and minimum temperature and mean relative humidity of the study area ranged of from (15.4 to 16.6 to 22.2 C) and (34 to 29 to 22% RH respectively).

3. RESULT

Monitoring of immature stages development:

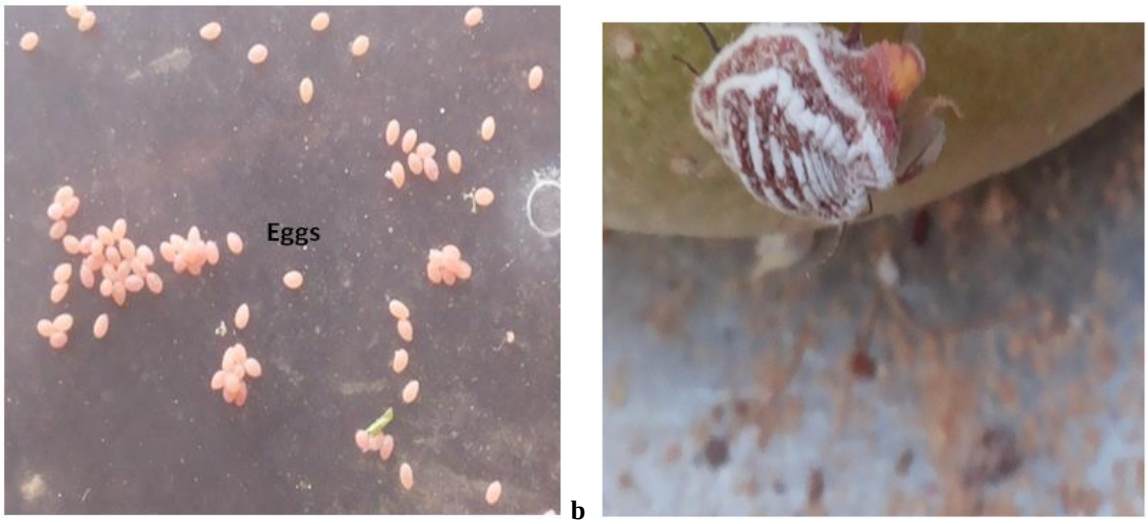
Body of female adult usually are large in size flattened with 4-5mm, length, reddish brown color while adult males winged, being 1mm, length, with dark red body. Adult females were monitored daily under Al kufra condition from 25th Jan to 29th Mar 2017, Male Date palm *P. hyphaniacus* fertilized two females in the field recorded in 2nd Fab., at 5pm figure (2). Adult female layed around 227 eggs, were light orange in color and oval shaped, by the 27th Feb at room condition, temperature were 15˚C and relative humidity 28% which produced crawlers (Nymphs), body light orange color, However the egg hatching were varied in time, since the maximum number 220 eggs hatched by the 19th of March, to continues growth until 29th March figure (3), development stages were recorded until the appearance of first instars', followed by death of all progeny.

4. DISCUSSION

Fertilization of *p. hyphaeniacus* under field condition has taken place on 2nd February while egg laying on 27th February, eggs hatches by 19th March under laboratory, which coincide with Spring season, in which date palm trees has high level of sap giving good chance for small crawlers to feed and growth. Although females were raved on differ host potato and mango. eggs were succeeded to hatch and produce the first crawlers, this result were in accordance with result documented by (Tanwar *et al*. 2010, Abu Thuraya, 1979), who reported that female laying egg around 100 to 600 eggs hatch, with the highest fecundity at around 25˚C, average of 362 eggs per female at 16.59 and 35.61 ˚C, (Kriegler *et al*. 1954 & Al kassah, 2009). We should make this point clear that all progeny were dead, which could be due to differences in host plant. Since eggs ladyed and hatch to crawlers away from the main host, even though point might explain the fact that *P. hyphaeniacus* are monophagous species, which in accordance with many studies documented that most species belong to Margarodidae were monophagous documented by. (Plant Health Australia, 2010, Smith *et al*. 1997, Williams 1985, Goblae *et al*., 2006; Hassan, N. A. *et al*. 2012).

Fig. 1. Developmental stages of *P. hyphaniacus* on seedling of potato and Mango

Fig. 2. fertilized between male and female of *Pseudasproctus hyphaeniacus*



C

Fig. 3. (a). eggs shaped are very small, oval and light orange color, (b). ovipositor shaped, (c). first instar nymphs on potato seedling are crawlers and pink to brown colored.

5.CONCLUSION

Through the experiment, obtained on eggs and the first stages of date mealy bugs on potatoes and mango seeding, concluded that this type of p. *hyphaeniacus* prefers only date palm trees and no other hosts. In future, studies appropriate this insect pest and production management practices.

6. REFERENCES

Abu-Thuraya, N. H. (1979). A list of date palm pests in Saudi Arabia., Plant Protection Res., Div Res. Dept. Ministry of Agric. and Water, Riyadh.

Al-kassah, A. (2009). Ecological study on *Pseudaspidoproctus hyphaeniacus* on date palm trees in Jalo, Aujla and ejkara region. Dep. zoological college, Omar Al-Mukhtar Uni-Libya. Master degree thesis person-communication.

Arab organization for agricultural development, (2012). Department of date palms plant disease, p 1-352. Bitaw, A. A., & Ben Saad, A. A. (1990) . Survey of date palm trees insect pests in Libya. (In Arabic; Summary In English). Arab Journal of Plant Protection.8(2):72-76.

Goble, H. W. R. T, Wukusch. & M. Sabourin. (2006). Scale insects and mealy bugs on House plants (Homoptera :coccidae ,Diaspididae , Pseudococcidae). Laboratory services Division university of Guelph. Web : www . guelphlabser vices. Com.

Hassan, N. A., Radwan, S. G., & El-Sahn, O. M.N. (2012). Common scale insects (Hemiptera:Coccoidea) in Egypt. Egypt. Acad. J. Biolog. Sci., 5(3): 153 -160. www.eajbs.eg.net.

Hodgson, C. J. (2000). Preliminary phylogeny of some nonmargarodid Coccoidea (Hemiptera) based on adult male characters. Bollettino di Zoologia Agrariae di Bachicoltura, 33(2001), 129–137.

Kinawy, M. (2012). Major Arthropod Pests of Date Palm in Arab cuntries. First Regional Conference on Management of Date Palm Pests. Al Ain, United Arab Emirates.

Kriegler, P. J. (1954). Bydrae tot die kennis van *Planococcus citri* (Risso) (Homoptera: Pseudococcidae) M.Sc. Thesis, University of Stellenbosch, South Africa.Martin, H. (1958). Pests and diseases of date palm in Libya. FAO Plant Prot. Bull. 6(8): P 120- 123.

Morrison, H. (1927). Descriptions of new genera and species belong to the coccid family Margarodidae. *Proceedings of the Biological Society of Washington* 40, 99–109.

Health Australia. (2010). plant plan Australian Emergency Plant pest response plan. Version 2. Canberra, ACT. www.planthealthaustralia.com.au/plantplan. Smith,

D., Beattie., G. A. C., & Broadley, R. (1997). Citrus Pests and Their Natural Enemies: Integrated Pest Management in Australia. Information series Q197030. Queensland Department of Primary Industries, Brisbane.Tanwar,

R. K. P. Jeyakumar., & S. Vennila. (2010). Papaya mealy bug and its management strategies. National Centre for Integrated Pest Management New Delhi, Web: www.ncipm. org. in.

Williams, D. J.(1985). Australian Mealy bugs. British Museum (Natural History), London.