

## **SURVEY OF HOST PLANTS OF MEALYBUGS (HEMIPTERA: PSEUDOCOCCIDAE) IN EGYPT, INCLUDING NEW HOST RECORDS**

**SHAABAN ABD-RABOU<sup>1</sup> AND THIBAUT MALAUSA<sup>2</sup>**

1. *Plant Protection Research Institute, ARC, Dokki, Giza, Egypt. E-mail: shaaban59@yahoo.com*
2. *Institut National de la Recherche Agronomique, UMR 1301 INRA/UNSA/CNRS. Equipe BPI. 400 route des Chappes. BP 167, 06903 Sophia Antipolis cedex. France E-mail: tmalusa@sophia.inra.fr*

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### **Abstract**

Mealybugs (Hemiptera: Pseudococcidae) are widely spread pests of crops and ornamentals and cause high economic loss on a wide variety of plants. In order to improve and update our knowledge of mealybug species occurrence in Egypt, we reviewed the literature reporting infestations of mealybugs in Egypt and performed a complementary field survey throughout Egypt. Mealybugs infestations are observed on 181 plant species and belonging to 133 genera and 79 families. The mealybug species most commonly recorded are (i) *Planococcus citri* (Risso), *Planococcus ficus* (Signoret), *Maconellicoccus hirsutus* (Green), *Dymicoccus trisponosus* (Hall) and *Ferrisia virgata* (Cockerell) with 65, 26, 18, 13 and 12 host plant species, respectively. The rest of the mealybugs species ranged between 1-10 host plant species. The complementary field survey performed in this study revealed 32 host plants, including eighteen new host records in Egypt.

### **INTRODUCTION**

Mealybugs (Hemiptera: Pseudococcidae) are widely spread pests of crops and ornamentals. They cause high economic loss on a wide variety of plants by direct damage to tissue and virus transmission. Moreover, their control is generally difficult because (i) they are often hidden on the aerial part of plants or on the roots, (ii) their identification is very difficult and even impossible at certain stages of development, and (iii) some species have evolved resistance to insecticides making it difficult to choose appropriate control methods (Charles et al. 1993). Pseudococcidae comprise one of the largest groups in the superfamily Coccoidea: 1,947 species and subspecies placed in 288 genera worldwide (Ben-Dov, 1994). Several species are of great economic importance as they are destructive pests to crops such as vine, cassava, rice, citrus, avocado, coffee, sugarcane and pineapple, as well as various ornamental plants. So far, 49 species have been recorded in Egypt (Mohammad and Ghabbour, 2008).

The objective of this study is to survey host plant species (and their distribution) that are attacked by mealybugs in Egypt.

### MATERIALS AND METHODS

We reviewed the literature reporting infestations of crops and ornamentals in Egypt and performed a complementary survey across Egypt during 2006-2009. This sampling was done in 27 governorates. The governorates vary greatly in area and climatic conditions. The focus of the sampling was on wild and cultivated plant species in agricultural production areas. Moreover, sampling was performed monthly to avoid biases related to differences in seasonal dynamics of mealybug populations. Infested plants infested were examined in the field using a pocket magnification lens. Infested leaves, flowers or fruiting structures were collected and placed separately in paper bags for further examination in the laboratory. Identification of taxa was then made by examining adult mealybugs that were slide-mounted in Canada balsam, following the methods described in Abd-Rabou, 1997. Identification was performed using the identification key from Abdulgawwad (1983).

### RESULTS AND DISCUSSION

In the literature, Mealybugs infestations are reported on 118 plant species belonging to 133 genera in 79 families in Egypt (Table 1). The species most commonly recorded are (i) *Planococcus citri* (Risso), *Planococcus ficus* (Signoret), *Maconellicoccus hirsutus* (Green), *Dymicoccus trisponosus* (Hall) and *Ferrisia virgata* (Cockerell) with 65, 26, 18, 13 and 12 host plant species, respectively. Other mealybug species displayed between 1 and 10 host plant species. Our complementary field survey in 27 governorates revealed 32 host plants, about 15% of the hosts being new host records for Egypt. Survey was conducted in all Egyptian governorates and about 41 location new records in Egypt. Overall, this survey indicates that mealybugs infest many of the most economically important plants in Egypt, e.g., citrus, grape, apricot, guava, eggplant, sugarcane, and other vegetable crops and ornamental plants. In addition, numerous species of weeds and other wild plants are infested by mealybugs and may serve as bridgeheads to start infestations on economically important plants at the beginning of the cropping season.

Overall, this survey revealed 48 species of mealybugs in Egypt, infesting 181 plant species belonging to 133 genera in 79 families. This survey will serve as basis for further investigations of mealybug infestations in Egypt. These further researches will notably couple morphological and molecular characterization techniques in order to disentangle complexes of very morphologically similar taxa.

Table 1. Host plant of Mealybugs in Egypt

Species	Host plants		Location	References
	Species	Family		
<b>1. Amonostherium arabicum Ezzat</b>	<i>Mattiola</i> sp.	Brassicaceae	Alexandria	Ezzat, 1960
<b>2. Antonina graminis (Maskell)</b>	<i>Cynodon dactylon</i> (L.)	Poaceae	Giza	Present work
	<i>Cynodon dactylon</i> (L.)	Poaceae	Minufiya	Present work
	<i>Cynodon dactylon</i> (L.)	Poaceae	Alexandria	Abou-Elkhair, 1999
<b>3. Antonina natalensis Brain</b>	<i>Panicum turgidum</i> (Forssk.)	Poaceae	Suze	Ezzat, 1962
<b>4. Antonina panica Hall</b>	<i>Panicum turgidum</i> (Forssk.)	Poaceae	Suze	Ezzat, 1962
<b>5. Brevennia rehi (Lindinger)</b>	<i>Cynodon dactylon</i> (L.)	Poaceae	Alexandria	Abou-Elkhair, 1999
<b>6. Chaetococcus phragmitis (Marchal)</b>	<i>Phragmites communis</i> L.	Poaceae	Giza	Ezzat, 1962
<b>7. Crisicoccus delottoi Ezzat</b>	<i>Limonium</i> sp.	Plumbaginaceae	Eastern Desert	Ezzat, 1962
<b>8. Crisicoccus mangrovicus Ben-Dov</b>	<i>Avicennia marina</i> (Forssk.)	Acanthaceae	Sinai	Ben-Dov, 1975
<b>9. Dysmicoccus boninsis (Kuwana)</b>	<i>Artemisia herba alba</i> Asso.	Compositae	Assuit	Ezzat, 1960b
	<i>Cladium mariscus</i>	Cyperaceae	Daquahliya	Ezzat, 1960b
	<i>Convolvulus</i> sp.	Convolvulaceae	Gharbiya	Ezzat, 1960b
	<i>Imperata cylindrical</i>	Graminae	Alexandria	Ezzat, 1962
<b>10. Dysmicoccus brevipes (Cockerell)</b>	<i>Andropogon</i> sp.	Graminae	Fayoum,	Ezzat, 1960b
	<i>Andropogon sorghum</i>	Graminae	Calro	Ezzat, 1960b
	<i>Arachis hypogaea</i>	Leguminoseae	Giza	Ezzat, 1960b

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Canna</i> sp.	Cannaceae	Fayoum,	Ezzat, 1960b
	<i>Cyperus</i> sp.	Cyperaceae	Cairo	Ezzat, 1960b
	<i>Oxalis</i> sp.	Oxaliaceae	Daquahliya	Ezzat, 1960b
	<i>Phoenix</i> sp.	Palmaceae	Assuit	Ezzat, 1960b
	<i>Zea mays</i>	Graminae	Fayoum	Ezzat, 1962
<b>11. <i>Dymicoccus trisponosus</i> (Hall)</b>	<i>Ambrosia maritime</i>	Cyperaceae	Nag Hamadi	Ezzat, 1960b
	<i>Ambrosia maritime</i> L.	Compositae	Qena	Ezzat, 1960b
	<i>Andropogon halepensis</i> (L.)	Poaceae	Beheira	Ezzat, 1960b
	<i>Andropogon halepensis</i>	Poaceae	Minufiya	Ezzat, 1960b
	<i>Arundo donax</i> L.	Poaceae	Cairo	Ezzat, 1960b
	<i>Bidens pilosa</i> L.	Asteraceae	Giza	Ezzat, 1960b
	<i>Carex comans</i> Bronze	Cyperaceae	Daquahliya	Ezzat, 1960b
	<i>Chenopodium</i> sp.	Chenopodiaceae	Gharbiya	Ezzat, 1960b
	<i>Codium mariscus</i>	Poaceae	Qualubiya	Ezzat, 1960b
	<i>Cynodon dactylon</i> (L.)	Poaceae	Giza	Ezzat, 1960b
	<i>Cyperus</i> sp.	Cyperaceae	Gharbiya	Ezzat, 1960b
	<i>Cyperus</i> sp.	Cyperaceae	Qena	Ezzat, 1960b
	<i>Hordeum vulgare</i> L.	Poaceae	Giza	Ezzat, 1960b
	<i>Imperata cylindrical</i>	Graminae	Sharquiya	Ezzat, 1960b

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Panicum colonum</i> L.	Poaceae	Beheira	Ezzat, 1960b
	<i>Panicum colonum</i> L.	Poaceae	Qena	Ezzat, 1960b
	<i>Panicum viride</i> L.	Poaceae	Giza	Ezzat, 1960b
	<i>Panicum viride</i> L.	Poaceae	Beheira	Ezzat, 1960b
	<i>Saccharum officinarum</i>	Poaceae	Daquahliya	Ezzat, 1962
	<i>Saccharum officinarum</i> L.	Poaceae	Qena	Ezzat, 1960b
	<i>Zea mays</i> L.	Poaceae	Gharbiya	Ezzat, 1960b
	<i>Zea mays</i>	Poaceae	Sharquiya	Ezzat, 1960b
	<i>Panicum colonum</i> L.	Poaceae	Beheira	Ezzat, 1960b
	<i>Panicum colonum</i> L.	Poaceae	Qena	Ezzat, 1960b
<b>12. <i>Erimococcus limonistri</i> (Priesner &amp; Hosny)</b>	<i>Limoniastrum monopetalum</i> (L.)	Asteraceae	Marsa Matrouh	Ezzat, 1965
<b>13. <i>Euripersia artemisiae</i> (Hall)</b>	<i>Artemisia monosperma</i> Delile	Euphorbiaceae	Suez	Present work
<b>14. <i>Ferrisia virgata</i> (Cockerell)</b>	<i>Acalypha indica</i>	Compositae	Giza	Ezzat, 1962
	<i>Chrysanthemum</i> sp.*	Rutaceae	Assuit	Present work
	<i>Citrus</i> sp.*	Rutaceae	Qena	Present work
	<i>Cupressus sempervirens</i>	Poaceae	Alexandria	Abou-Elkhair, 1999
	<i>Duranta ellisia</i>	Polypodiaceae	Qena	Present work

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Hibiscus</i> sp.	Cupressaceae	Alexandria	Abou-Elkhair, 1999
	<i>Lantana camara</i> *	Anacardiaceae	Cairo	Present work
	<i>Mangifera indica</i> L.	Musaceae	Giza	Present work
	<i>Mesembryanthemum</i> sp.	Malvaceae	Alexandria	Abou-Elkhair, 1999
	<i>Musa</i> sp.	Vitaceae	Ismailia	Present work
	<i>Solanum tuberosum</i> *	Verbenaceae	Port Said	Present work
	<i>Vitis vinifera</i> L.*	Solanaceae	Suez	Present work
<b>15. <i>Formicoccus lindingeri</i> (Bodenheimer)</b>	<i>Saccharum officinarum</i> L.	Rubiaceae	Qena	Abdulgawwad,1 983
<b>16. <i>Heliococcus obsormi</i> (Sanders)</b>	<i>Crucianella herbacea</i> Forssk.	Compositae	Marsa Matrouh	Ezzat, 1960a
	<i>Onopordon</i> sp.	Cyperaceae	Marsa Matrouh	Ezzat, 1960a
<b>17. <i>Heterococcus cyperi</i> (Hall)</b>	<i>Cyperus</i> sp.	Zygophyllaceae	New valley (Kharga Oasis)	Ezzat, 1962
<b>18. <i>Humococcus mackenziei</i> Ezzat</b>	<i>Zygophyllum album</i> L.	Chenopodiaceae.	Alexandria	Ezzat, 1959a
	<i>Salicornia fruticosa</i> L.	Poaceae	Alexandria	Ezzat, 1959a
<b>19. <i>Kiritshenkella sacchari</i> (Green)</b>	<i>Andropogon</i> sp.	Poaceae	Asslut	Ezzat, 1962b
	<i>Cyperus</i> sp.	Malvaceae	Tala	Ezzat, 1962b
	<i>Imperata cylindrical</i> L.	Poaceae	Aswan	Ezzat, 1962b
	<i>Imperata cylindrical</i> L.	Poaceae	Cairo	Ezzat, 1962b
	<i>Imperata cylindrical</i> L.	Poaceae	Giza	Ezzat, 1962b



Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Saccharum biflorum</i> Forsk	Poaceae	Giza	Ezzat, 1962b
	<i>Saccharum spontaneum aegyptiacum</i>	Poaceae	Giza	Ezzat, 1962b
<b>20. <i>Maconellicoccus hirsutus</i> (Green)</b>	<i>Acacia arabica</i> Willd	Leguminosae	Alexandria	Ezzat, 1962
	<i>Albizia lebbek</i> (L.)	Leguminosae	Giza	Ezzat, 1958
	<i>Annona</i> sp.	Annonaceae	Medani, Egypt	Ezzat, 1958
	<i>Annona</i> sp.	Malvaceae.	Pyramids, Egypt	Ezzat, 1958
	<i>Arachis hypogaea</i>	Liliaceae	Behira	Ezzat, 1958
	<i>Asparagus officinalis</i>	Chenopodiaceae	Beni-Suef	Ezzat, 1958
	<i>Chenopodium album</i>	Poaceae	Cairo	Present work
	<i>Cynodon dactylon</i> (L.)*	Moraceae	Sharqyia	Ezzat, 1958
	<i>Ficus</i> sp.	Moraceae	Daqahlyia	Ezzat, 1958
	<i>Ficus elastica</i>	Moraceae	Daqahlyia	Ezzat, 1958
	<i>Gossypium</i> sp.	Myrtaceae	Fayoum	Ezzat, 1962
	<i>Hibiscus schizopetalus</i> L.*	Malvaceae.	Alexandria	Present work
	<i>Hibiscus schizopetalus</i> L.	Malvaceae.	Giza	Present work
	<i>Hibiscus schizopetalus</i> L.	Malvaceae.	Cairo	Present work
	<i>Hibiscus schizopetalus</i> L.	Mimosaceae	Qalyubiya	Present work
	<i>Morus alba</i> L.	Cactaceae	Sohag	Ezzat, 1958

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Opuntia</i> sp.	Punicaceae	Sharqyia	Ezzat, 1958
	<i>Psidium guajava</i> L.	Annonaceae	Kantarah, Egypt	Ezzat, 1958
	<i>Punica granatum</i>	Vitaceae	Alaxandria	Ezzat, 1962
	<i>Vitis vinifera</i> L.	Vitaceae	Giza	Ezzat, 1962
	<i>Vitis vinifera</i> L.	Poaceae	Minya	Present work
	<i>Zea mays</i> L.	Rhamnaceae	Qena	Ezzat, 1958
	<i>Ziziphus</i> sp.	Convolvulaceae	Assuit	Ezzat, 1958
<b>21. <i>Mirococcus inermis</i> (Hall)</b>	<i>Cressa cretica</i> L.	Frankeniaceae	Helwan	Ezzat, 1962
	<i>Cleome Arabica</i> L.	Poaceae	Helwan	Ezzat, 1962
	<i>Frankenia pulverulenta</i> (L.)	Zygophyllaceae	Helwan	Ezzat, 1962
	<i>Hordeum maritimum</i> With.	Caryophyllaceae	Cairo	Ezzat, 1962
	<i>Polycarpeae repens</i> (Forsk)	Poaceae	Giza	Ezzat, 1962
	<i>Zygophyllum</i> sp.	Capparaceae	Helwan	Ezzat, 1962
<b>22. <i>Misericoccus imperatae</i> (Hall)</b>	<i>Imperata cylindrica</i> L.	Bignoniaceae	Cairo	Ezzat, 1961
<b>23. <i>Nipaecoccus nipae</i> (Maskell)</b>	<i>Acacia arabica</i> Willd	Rutaceae	Sohag	Ezzat, 1962
	<i>Albizzia lebbekhi</i> *	Leguminosae	Assuit	Present work
	<i>Albizzia lebbekhi</i>	Tamaricaceae	Qena	Present work
	<i>Citrus medica</i>	Rutaceae	Minufiya	Ezzat, 1962
	<i>Citrus nobilis</i>	Verbenaceae	Minufiya	Ezzat, 1962
	<i>Citrus sinensis</i> L.	Rutaceae	Minufiya	Ezzat, 1962
	<i>Clerodendron</i> sp.	Rhamnaceae	Garbiya	Ezzat, 1962
	<i>Kentia</i> sp.	Rosaceae	Alxandria	Ezzat, 1962
	<i>Pyrus malus</i>	Leguminosae	Daqhliya	Ezzat, 1962
	<i>Tamarix</i> sp.	Leguminosae	Suez	Ezzat, 1962
	<i>Ziziphus</i> sp.	Tamaricaceae	Daqhliya	Ezzat, 1962
<b>24. <i>Nipaecoccus viridis</i> (Newstead)</b>	<i>Tamarix</i> sp.	Chenopodiaceae	Qena	Ezzat, 1962



Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
<b>25. <i>Octococcus salsolisa</i> (Priesner &amp; Hosny)</b>	<i>Salsola foetida</i> Delle	Poaceae	Sinal	Ezzat, 1962
<b>26. <i>Peliococcopsis priesneri</i> (Laing)</b>	<i>Cynodon dactylon</i> (L.)	Asteraceae	Behira	Present work
	<i>Cynodon dactylon</i> (L.)	Poaceae	Giza	Ezzat, 1962
<b>27. <i>Peliococcus zillae</i> (Hall)</b>	<i>Zilla spinosa spinosa</i> (L.)	Brassicaceae	Giza	Ezzat, 1960c
	<i>Zilla spinosa spinosa</i> (L.)	Brassicaceae	Helwan	Ezzat, 1960c
	<i>Zilla spinosa spinosa</i> (L.)	Brassicaceae	Helwan	Ezzat, 1960c
	<i>Zilla spinosa spinosa</i> (L.)	Brassicaceae	Ismailia	Ezzat, 1960c
	<i>Zilla spinosa spinosa</i> (L.)	Brassicaceae	Suez	Ezzat, 1960c
<b>28. <i>Phenacoccus gypsophila</i> Hall</b>	<i>Gypsophila rokejeka</i> Delle	Caryophyllaceae	Qalyubiya	Abdulgawwad, 1983
<b>29. <i>Phenacoccus halli</i> Ezzat</b>	<i>Anthemis</i> sp.	Asteraceae	Giza	Abdulgawwad, 1983
<b>30. <i>Phenacoccus pyramidensis</i> Ezzat</b>	<i>Ananas sativus</i> Schult.	Bromeliaceae	Giza	Ezzat, 1960
<b>31. <i>Planococcus citri</i> (Risso)</b>	<i>Acacia</i> sp.	Leguminosae	Giza	Ezzat, 1962
	<i>Albizia lebbekh</i>	Leguminosae	Garbiya	Ezzat, 1962
	<i>Ambrosia</i> sp.	Cyperaceae	Cairo	Ezzat, 1962
	<i>Annona squamosa</i> L.	Annonaceae	Marsa Matruh	Ezzat, 1962
	<i>Aralia</i> sp.	Araliaceae	Cairo	Ezzat, 1962
	<i>Asparagus</i> sp.*	Brassicaceae	Giza	Present work

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Begonia</i> sp.	Begoniaceae	Cairo	Ezzat, 1962
	<i>Bougainvillea</i> sp. *	Nyctagineae	Alexandria	Present work
	<i>Brassica oleracea</i>	Cruciferaeae	Daqhiya	Ezzat, 1962
	<i>Cactus</i> sp.	Rutaceae	Qena	Ezzat, 1962
	<i>Canna</i> sp.	Cannaceae	Sinai	Ezzat, 1962
	<i>Cassia</i> sp.	Leguminoseae	Suez	Ezzat, 1962
	<i>Casuarina equisetifolia</i>	Casuarinaceae	Helwan	Ezzat, 1962
	<i>Chenopodium album</i>	Chenopodiaceae	Assut	Ezzat, 1962
	<i>Citrullus vilqaris</i>	Rutaceae	Sohag	Present work
	<i>Citrus decumanus</i>	Rutaceae	Minufiya	Present work
	<i>Citrus medica</i>	Rutaceae	Minyia	Present work
	<i>Citrus nobilis</i>	Rutaceae	Port Said	Present work
	<i>Citrus sinensis</i> *	Rutaceae	Behira	Present work
	<i>Cocos nucifera</i> L.	Arecaceae	Ismailia	Ezzat, 1961
	<i>Coleus</i> sp.	Lamiaceae	Qena	Ezzat, 1962
	<i>Convolvulus</i> sp.	Convolvulaceae	Daqhiya	Ezzat, 1962
	<i>Croton</i> sp. *	Euphorbiaceae	New Valley	Present work
	<i>Cucumis melo</i> L.	Cucurbitaceae	Marsa Matruh	Ezzat, 1962
	<i>Cucurbita</i> sp.	Cucurbitaceae	Qena	Ezzat, 1962
	<i>Cycas</i> sp. *	Cycadeceae	Qalyubiya	Present work
	<i>Cyperus</i> sp.	Cyperaceae	Minufiya	Ezzat, 1961
	<i>Cyperus alternifolius</i>	Cyperaceae	Daqhiya	Ezzat, 1962
	<i>Dianthus caryophyllus</i> L.	Caryophyllaceae	Qalyubiya	Ezzat, 1962
	<i>Dioscorea</i> sp.	Dioscoreaceae	Qalyubiya	Present work
	<i>Duranta</i> sp.	Verbenaceae	Qalyubiya	Ezzat, 1962

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Euphorbia</i> sp.*	Euphorbiaceae	Qena	Present work
	<i>Ficus sycamorus</i>	Moraceae	Qalyubiya	Ezzat, 1962
	<i>Gardenia</i> sp.	Rubiaceae	New Valley	Ezzat, 1962
	<i>Geranium</i> sp.	Geraniaceae	Daqhliya	Ezzat, 1962
	<i>Impatiens</i> sp.	Balsaminaceae	Minufiya	Present work
	<i>Imperata cylindrical</i> *	Graminae	Minufiya	Present work
	<i>Ipomoea batatas</i> L.	Convolvulaceae	Marsa Matruoh	Present work
	<i>Latania</i> sp.	Palmaceae	Behira	Ezzat, 1962
	<i>Lippia</i> sp.	Verbenaceae	Daqhliya	Ezzat, 1962
	<i>Mangifera Indica</i> L.	Anacardiaceae	Qalyubiya	Ezzat, 1961
	<i>Mentha silvestris</i> L.	Labiatae	Minufiya	Ezzat, 1962
	<i>Musa</i> sp.	Musaceae	Daqahilya	Ezzat, 1962
	<i>Musa sapientum</i>	Musaceae	Gharbyia	Present work
	<i>Myoporum pictum</i>		Alexandria	Ezzat, 1962
	<i>Nerium oleander</i>	Apocynaceae	Alexandria	Abou-Elkhair, 1999
	<i>Nicotiana</i> sp.	Solanaceae	Qena	Ezzat, 1962
	<i>Oryza latifolia</i> Desv.	Poaceae	Aswan	Ezzat, 1962

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Panicum colonum</i> L.	Poaceae	Aswan	Ezzat, 1962
	<i>Pelargonium</i> sp.	Poaceae	Alexandria	Abou-Elkhair, 1999
	<i>Persea americana</i> Mill.	Lauraceae	Assuit	Ezzat, 1962
	<i>Phaseolus lilmensis</i> Macfad	Leguminosae	Sohag	Ezzat, 1962
	<i>Phoenix</i> sp.	Arecaceae	Minufiya	Ezzat, 1961
	<i>Phoenix dactylifera</i> L.	Arecaceae	Behira	Ezzat, 1962
	<i>Psidium guajava</i> L.	Myrtaceae	Port Said	Ezzat, 1962
	<i>Punica granatum</i> L.	Punicaceae	Behira	Present work
	<i>Pyrus communis</i> L.	Rosaceae	Minufiya	Ezzat, 1962
	<i>Pyrus malus</i> L.*	Rosaceae	Daq'hliya	Present work
	<i>Pyrus malus</i> L.	Rosaceae	Marsa Matruoh	Ezzat, 1962
	<i>Solanum melongena</i> L.	Solanaceae	Behira	Ezzat, 1962
	<i>Solanum melongena</i>	Solanaceae	Giza	Present work
	<i>Solanum tuberosum</i> *	Solanaceae	Qena	Ezzat, 1962
	<i>Tacoma capensis</i>	Begoniaceae	Marsa Matruoh	Ezzat, 1962
	<i>Tacoma smithi</i>	Begoniaceae	Ismailia	Ezzat, 1962
	<i>Theobroma cacao</i> L.	Sterculiaceae	Minufiya	Ezzat, 1961
	<i>Trifolium alexandrinum</i> L.	Leguminosae	Behira	Ezzat, 1962
	<i>Zygophyllum album</i> L.	Zygophyllaceae	Minyia	Ezzat, 1962

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
<b>32. <i>Planococcus ficus</i> (Signoret)</b>	<i>Ambrossia</i> sp.	Cyperaceae	Sohag	Ezzat, 1962
	<i>Andropogon</i> sp.	Graminae	Daqhliya	Ezzat, 1962
	<i>Carpobrotus edulis</i> (L)	Mesembryanthemaceae	Giza	Ezzat, 1962
	<i>Carpobrotus edulis</i> (L)	Mesembryanthemaceae	Cairo	Ezzat, 1962
	<i>Chenopodium</i> sp.	Chenopodiaceae	Suez	Ezzat, 1962
	<i>Cladium mariscus</i> (L.)	Cyperaceae	Assuit	Ezzat, 1962
	<i>Cyperus papyrus</i> L.	Cyperaceae	Cairo	Ezzat, 1962
	<i>Ficus carica</i> L.*	Moraceae	Behira	Present work
	<i>Ficus carica</i> L.	Moraceae	Gharbyia	Ezzat, 1962
	<i>Ficus carica</i> L.	Moraceae	Qalubiya	Ezzat, 1962
	<i>Ficus padifolia</i> L.	Moraceae	Giza	Present work
	<i>Mangifera indica</i> L.	Anacardiaceae	Gharbyia	Ezzat, 1962
	<i>Nerium oleander</i>	Apocynaceae	Minya	Ezzat, 1961
	<i>Hibiscus esculentum</i>	Malvaceae	Minya	Ezzat, 1962
	<i>Hibiscus esculentum</i>	Malvaceae	Minufiya	Ezzat, 1962
	<i>Imperata cylindrical</i>	Graminae	Minufiya	Ezzat, 1962
	<i>Mentha</i> sp.	Labiatae	Minya	Ezzat, 1962
	<i>Nitraria retusa</i>	Zygophyllaceae	Garbiya	Ezzat, 1962

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Oxalis</i> sp.	Oxalidae	Ismailia	Ezzat, 1962
	<i>Panicum</i> sp.	Poaceae	Giza	Ezzat, 1962
	<i>Panicum</i> sp.	Poaceae	Qena	Ezzat, 1962
	<i>Punica granatum</i> L.	Punicaceae	Assuit	Present work
	<i>Punica granatum</i> L.	Punicaceae	Qena	Ezzat, 1962
	<i>Panicum viride</i>	Poaceae	Daqhliya	Ezzat, 1962
	<i>Phoenix dactylifera</i> L.	Arecaceae	Qena	Ezzat, 1962
	<i>Saccharum officinarum</i> L.	Poaceae	Assuit	Ezzat, 1962
	<i>Solanum melongena</i>	Solanaceae Ae	Daqhliya	Ezzat, 1962
	<i>Sonchus</i> sp.	Compositae	Minufiya	Ezzat, 1962
	<i>Sporobolus spicatus</i>	Poaceae	Suez	Ezzat, 1962
	<i>Vitis vinifera</i> L.	Vitaceae	Alxandria	Present work
	<i>Vitis vinifera</i> L.	Vitaceae	Minufiya	Present work
	<i>Vitis vinifera</i> L.	Vitaceae	Giza	Present work
	<i>Zea mays</i> L.	Poaceae	Qena	Ezzat, 1962
	<i>Zygophyllum album</i> L.	Zygophyllaceae	Gharbyia	Ezzat, 1962
<b>33. <i>Pseudococcus comstocki</i> (Kuwana)</b>	<i>Catalpa bungei</i> C. A. Mey.	<u>Bignoniaceae</u>	Sharqyia	Ezzat and Rashad, 1962
	<i>Croton</i> sp.	Euphorbiaceae	Alexandria	Ezzat and Rashad, 1962
	<i>Musa sapientum</i>	Musaceae	Giza	Ezzat and Rashad, 1962



Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Pinus radiata</i> L.	Pinaceae	Minufiya	Ezzat and Rashad, 1962
<b>34. <i>Pseudococcus longispinus</i> (Targioni Tozzetti)</b>	<i>Agave</i> sp.	Amaryllidaceae	Alexandria	Ezzat and Rashad, 1962
	<i>Aralia</i> sp.	Araliaceae	Suze	Ezzat and Rashad, 1962
	<i>Camellia</i> sp.	Theaceae	Behira	Ezzat and Rashad, 1962
	<i>Camellia</i> sp.	Theaceae	Qalyubia	Ezzat and Rashad, 1962
	<i>Cycas</i> sp.	Cycadaceae	Alexandria	Ezzat and Rashad, 1962
	<i>Cycas</i> sp.	Cycadaceae	Daqahlya	Ezzat and Rashad, 1962
	<i>Cycas revoluta</i> Thunb.	Cycadaceae	Minufiya	Ezzat and Rashad, 1962
	<i>Cycas revoluta</i> Thunb.	Cycadaceae	Alexandria	Ezzat and Rashad, 1962
	<i>Dianthus Caryophyllus</i> L.	Caryophyllaceae	Daqahlya	Ezzat and Rashad, 1962
	<i>Dahlia</i> sp.	Compositae	Giza	Ezzat and Rashad, 1962
	<i>Dracaena</i> sp.	Dracaenaceae	Giza	Ezzat and Rashad, 1962
	<i>Dracaena</i> sp.	Dracaenaceae	Cairo	Ezzat and Rashad, 1962
	<i>Jasminum</i> sp.	Oleaceae	Alexandria	Ezzat and Rashad, 1962
	<i>Mangifera indica</i> L.	Anacardiaceae	Eastern Desert	Ezzat and Rashad, 1962
	<i>Melia azedarach</i> L.	Meliaceae	Suze	Ezzat and Rashad, 1962
	<i>Musa sapientum</i>	Musaceae	Suze	Ezzat and Rashad, 1962
	<i>Nerium oleander</i>	Apocynaceae	Alexandria	Abou-Elkhair, 1999
	<i>Olea</i> sp.	Oleaceae	Sinai	Ezzat and Rashad, 1962

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Phaseolus vulgaris</i> L.	Fabaceae	Sharqya	Ezzat and Rashad, 1962
	<i>Pincenectia</i> sp.	Liliaceae	Assuit	Ezzat and Rashad, 1962
	<i>Pittosporum</i> sp.	Pittosporaceae	Alexandria	Ezzat and Rashad, 1962
	<i>Pittosporum</i> sp.	Pittosporaceae	Sinai	Ezzat and Rashad, 1962
	<i>Vitis vinifera</i> L.	Vitaceae	Alexandria	Ezzat and Rashad, 1962
<b>35. <i>Saccharicoccus sacchari</i> (Cockerell)</b>	<i>Imperata cylindrical</i> *	Graminae	Qena	Present work
	<i>Panicum</i> sp.	Poaceae	Sohag	Present work
	<i>Phragmites communis</i> <i>Isaica</i>	Poaceae	El-Minya	Ezzat, 1962
	<i>Saccharum biflorum</i>	Poaceae	Qena	Present work
	<i>Saccharum officinarum</i> L.	Poaceae	Cairo	Present work
	<i>Saccharum officinarum</i> L.	Poaceae	Qena	Present work
<b>36. <i>Spilococcus alhagii</i> (Hall)</b>	<i>Alhagi maurorum</i> Medik.	Fabaceae.	Cairo	Ezzat, 1962
	<i>Alhagi maurorum</i> Medik.	Fabaceae.	Giza	Ezzat, 1962
	<i>Artemisia</i> sp.	Asteraceae	Cairo	Ezzat, 1962
	<i>Echinops spinosus</i> L.	Asteraceae	Cairo	Ezzat, 1962
	<i>Zygophyllum</i> sp.	Zygophyllaceae	Wadi el Teeh	Ezzat, 1962
	<i>Zygophyllum coccineum</i> L.	Zygophyllaceae	Wadi el Teeh	Ezzat, 1962
<b>37. <i>Spilococcus halli</i> Makenzie &amp; Williams</b>	<i>Andropogon</i> sp.	Poaceae	Giza	Ezzat, 1962
	<i>Anthemis</i> sp.	Compositae	Giza	Ezzat, 1962

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Cynodon dactylon</i> (L.)	Poaceae	Cairo	Ezzat, 1962
	<i>Hordeum</i> sp.	Poaceae	Behira	Ezzat, 1962
	<i>Imperata cylindrical</i>	Graminae	Behira	Ezzat, 1962
	<i>Imperata cylindrical</i> L.	Poaceae	Gharbyia	Ezzat, 1962
<b>38. <i>Spinococcus convolvuli</i> Ezzat</b>	<i>Convolvulus</i> sp.	Convolvulaceae	Daqahlyia	Ezzat, 1960
	<i>Convolvulus</i> sp.	Convolvulaceae	Qalyubiyia	Ezzat, 1960
	<i>Euphorbia</i> sp.	Euphorbiaceae	Daqahlyia	Ezzat, 1960
	<i>Mentha</i> sp.	Lamiaceae	Sharqyia	Ezzat, 1960
<b>39. <i>Trabutina manipara</i> (Hemprich &amp; hremberg)</b>	<i>Tamarix</i> sp.	Tamaricaceae	South Sinai	Abdulgawwad, 1983
<b>40. <i>Trabutina serpentina</i> Green</b>	<i>Tamarix</i> sp.	Tamaricaceae	South Sinai	Abdulgawwad, 1983
<b>41. <i>Trionymus angustifrons</i> Hall</b>	<i>Ambrosia</i> sp.	Asteraceae	Cairo	Ezzat, 1962a
	<i>Ambrosia maritime</i> L.	Asteraceae	Qalyubiya	Ezzat, 1962a
	<i>Sonchus oleraceus</i> L.	Asteraceae	Qalyubiya	Ezzat, 1962a
	<i>Sonchus oleraceus</i> L.	Asteraceae	Giza	Ezzat, 1962a
	<i>Urtica</i> sp.	Urticaceae	Cairo	Ezzat, 1962a
<b>42. <i>Trionymus cressae</i> (Hall)</b>	<i>Andropogon</i> sp.	Poaceae	Assiut	Ezzat, 1962a
	<i>Arundo donax</i> L.	Poaceae	Behira	Ezzat, 1962a
	<i>Cladium mariscus</i> (L.)	Cyperaceae	Qalyubiya	Ezzat, 1962a
	<i>Cressa cretica</i> L.	Convolvulaceae	Cairo	Ezzat, 1962a

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Cyperus</i> sp.	Cyperaceae	Minufiya	Ezzat, 1962a
	<i>Panicum colonum</i> L.	Poaceae	Qayubiya	Ezzat, 1962a
	<i>Saccharum officinarum</i> L.	Poaceae	Cairo	Ezzat, 1962a
	<i>Saccharum officinarum</i> L.	Poaceae	Minia	Ezzat, 1962a
<b>43. <i>Trionymus internodii</i> (Hall)</b>	<i>Euphorbia</i> sp.	Euphorbiaceae	Alxandira	Ezzat, 1962a
	<i>Zea mays</i> L.	Poaceae	Behira	Ezzat, 1962a
<b>44. <i>Trionymus masrensis</i> (Hall)</b>	<i>Imperata cylindrica</i> L.	Poaceae	New Valley	Ezzat, 1962a
<b>45. <i>Trionymus phragmitis</i> (Hall)</b>	<i>Arundo donax</i> L.	Poaceae	Qalyubiya	Ezzat, 1962a
	<i>Rhizoma Phragmitis</i> L.	Polygonaceae	Cairo	Ezzat, 1962a
<b>46. <i>Trionymus polyporus</i> (Hall)</b>	<i>Andropogon halepensis</i> (L.)	Poaceae	Giza	Ezzat, 1962a
	<i>Arundo donax</i> L.	Poaceae	Qalyubiya	Ezzat, 1962a
	<i>Cynodon dactylon</i> (L.)	Poaceae	Ghrbiya	Ezzat, 1962a
	<i>Cynodon dactylon</i> (L.)	Poaceae	Qalyubiya	Ezzat, 1962a
	<i>Cynodon dactylon</i> (L.)	Poaceae	Qalyubiya	Ezzat, 1962a
	<i>Cyperus</i> sp.	Cyperaceae	Sharqya	Ezzat, 1962a
	<i>Gossibim barbadece</i>		Giza	Ezzat, 1962a
	<i>Panicum colonum</i> L.	Poaceae	Cairo	Ezzat, 1962a
	<i>Panicum miliaceum</i> L.	Poaceae	Cairo	Ezzat, 1962a
<b>47. <i>Trionymus williamsi</i> Ezzat</b>	<i>Imperata cylindrica</i> L.	Poaceae	Cairo	Ezzat, 1959

Table 1. Continued

Species	Host plants		Location	References
	Species	Family		
	<i>Imperata cylindrica</i> L.	Poaceae	Qalyubiya	Ezzat, 1959
48. <i>Vryburgia amaryllidis</i> (Bouche)	<i>Carma</i> sp.	Cannaceae	Alexndria	Ezzat, 1962a
	<i>Crinum assalicum</i>	Amaryllidaceae	Behira	Ezzat, 1962a
	<i>Crinum marie</i>	Amaryllidaceae	Port Said	Ezzat, 1962a
	<i>Cyperus</i> sp.	Cyperaceae	Ismailia	Ezzat, 1962a
	<i>Glaucololus communis</i> L.	Iridaceae	Cairo	Ezzat, 1962a
	<i>Kniphofia</i> sp.	Liliaceae	Fayoum	Ezzat, 1962a

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## حصار العوائل النباتية للبق الدقيقى فى مصر مع تسجيل عوائل نباتية جديدة

شعبان عبدربه<sup>١</sup> ، تيبو مالوزا<sup>٢</sup>

١. معهد بحوث وقاية النباتات- مركز البحوث الزراعية- الدقى جيزة

٢. مركز الأبحاث الزراعية - نيس- فرنسا

البق الدقيقى من الآفات التى تصيب العديد من المحاصيل الأقتصادية الهامة. و بسبب خسائر فادحة لهذه المحاصيل. تم فى هذا البحث عمل حصار للعوائل النباتية المتخصصة عليها البق الدقيقى فى مصر. و أنتضح من النتائج أن البق الدقيقى يصيب ١٨١ عائل نباتى تنبع ١٣٣ جنس فى ٧٩ فصيلة وأن أهم الأنواع هى بق العنب الدقيقى و بق الموالح الدقيقى وبق الهمسكس الدقيقى وبق الفرزيا الدقيقى و التى تصيب ٢٦ و ١٨ و ١٣ و ١٢ عائل نباتى على الترتيب و أن باقى أنواع البق الدقيقى تصيب ما بين ١-١٠ عائل نباتى. و أنتضح من النتائج أيضا تجميع ٣٢ عائل نباتى منهم ١٨ تسجيل لأول مرة فى مصر.