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THE SPECIES OF *ANAGYRUS* HOWARD (HYMENOPTERA: ENCYRTIDAE) RECORDED FROM EGYPT

SHAABAN ABD-RABOU

Plant Protection Research Institute, Agricultural Research Centre, Dokki, Giza, Egypt

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Abstract

Six species of the encyrtid genus *Anagyrus* Howard were recorded. Each species is briefly diagnosed and the known informations on hosts and distribution are given. An identification key for distinguishing each of these six species is provided.

INTRODUCTION

The species of the encyrtid genus *Anagyrus* Howard (Hymenoptera : Encyrtidae) are primary endoparasitoids on mealybugs (Homoptera: Pseudococcidae) (Noyes and Hayat, 1984). This genus is the most successfully used in pest control. The world funa comprise mostly about 200 species (Noyes and Hayat, 1994).

The taxonomy of the genus *Anagyrus* was studied by Compere (1939), Tachikawa (1963), De Santis (1964), Beardsely (1969), Shafee *et al.*, (1975), Hayat (1979), Noyes and Hayat (1984, 1994).

The present work deals with a preliminary contribution to the taxonomy of these Egyptian species of *Anagyrus*.

MATERIALS AND METHODS

Mealybug species were collected from different plants from different localities in Egypt. They were kept in the laboratory in well–ventilated emergence boxes and the emerged of *Anagyrus* species were sorted out and identified according to Noyes (1982). Specimens of *Anagyrus* species were identified and confirmed by the present author and Prof. Dr. Mohammad Hayat, Aligarh Muslim University, India.

RESULTS AND DISCUSSION

Genus *Anagyrus* Howard

Anagyrus Howard in Howard and Ashmed, 1896, Proc; U.S. natn. Mus, 18: 638.
Heterathrellus Howard, 1898, Proc. U.S. natn. Mus., 21:239.

Epidinocarsis Girault, 1913, Arch Naturgesch (A), 79 (6): 83.
Protanagyrus Blanchard, 1940, An. Soc. Cient. argent.,130:115.
Xiphomastix De Santis, 1972, Resvista Peru. Entomo. Agri., 15:45.
Cremesina Noyes & Hayat, 1984, Br. Mus. nat. Hist. (Ent.), 48 (3): 260-261.
Tongyus Noyes & Hayat, 1984, Br. Mus . nat. Hist. (Ent.), 48 (3): 343-344.

Diagnosis: Female: Scape not more than three times as long as broad; funicle 6-segmented, all funicle segment longer than broad; clava three-segmented; fore wing more or less generally suffused pale fuscous or with only longitudinal infuscate streaks adjacent to venation or with a patter of dark and pale setae, postmarginal vein not longer than stigmal vein; gaster varying from shorten than thorax to clearly much longer than head and thorax together; ovipositor hidden to strongly exserted, varying from about half length of mid tibia to two or three times as long.

KEY TO EGYPTAIN SPECIES OF *ANAGYRUS* FEMALES

1. Frontovertex about half head width ..... *Anagyrus shahidi* Hayat.
   Frontovertex less than half head width ..... 2.
2(1). First funicle segment dark brown, remainder of flagellum brown.....
   .....*Anagyrus kamali* Moursi.
   First funicle segment brown or dark brown, remainder of flagellum white ..... 3.
3(2). Stigmal vein about as long as marginal vein.....*Anagyrus saccharicola* Timberlake.
   Stigmal vein longer than morginal vein.....4.
4(3). Gaster longer than thorax.....*Anagyrus greeni* (Howard).
   Gaster about as longer as thorax.....5.
5(4). Second funicle segment dark brown.....*Anagyrus aegyptiacus* Moursi.
   Second funicle segment white .....Anagyrus pseudococci (Girault).

1. *Anagyrus aegyptiacus* Moursi, Fig. 1.

Anagyrus aegyptiacus Moursi, 1948, Bull. Soc. Fouad Entom. 32 (1): 3-7.

Diagnosis: Female: First and second funicle segments completely dark brown, remainder of flagellum white; ventral surface of costal cell with at least two complete lines of setae; propodeum with at least one or two setae inside each spiracle; eye margins distinctly diverging anterior to posterior ocelli; mesoscutum entirely orange or orange mixed with brown; marginal and postmarginal veins combined a little longer than stigmal, postmarginal quite long and distinct; gaster about as long as thorax; oviposi-

tor very slightly exserted.

Hosts: *Nipaecoccus viridis* (Newstaed).

Distribution: Beni-Suef, Giza.

Comments: This species was first recorded in Egypt by Moursi (1948).

2. *Anagyrus greeni* (Howard), Fig. 2.

Anagyrus greeni in Howard and Ashmead, 1896, Proc. U.S. nant. Mus, 18: 639.

Diagnosis: Female: First funicle segment brown, remainder of flagellum white; ventral surface of costal cell with at least two complete lines of setae; hypopygium not unusually elongate; marginal and postmarginal veins combined at least as long as stigmal vein; gaster slightly shorter than head and thorax together; ovipositor slightly exserted; frontovertex nearly two-fifth head width.

Hosts: *Antonina* and *Pseudococcus* sp.

Distribution: Cairo, Giza, Qalyubiya.

Comments: This species was recorded for the first time in Egypt by Mercet (1925).

3. *Anagyrus kamali* Moursi, Fig. 3.

Anagyrus kamali Moursi, 1948, Bull. Soc. Fouad Entom., 32 (1): 1-3.
Anagyrus flavus Agarwal, 1965, Acta Hymenopt., 2: 49-50.
Anagyrus comperei Subba Rao and Rai, 1970, Beitr. Ent. 20: 91-94.
Anagyrus nigroradiclatus Subba Rao and Rai, 1970, Beitr. Ent., 20: 94-96.
Anagyrus kamali Noyes and Hayat, 1994, GAB International, Nat. Hist. Mus., 151.

Diagnosis: Female: First funicle segement dark brown, remainder of flagellum brown; ventral surface of costal cell with several lines of setae; marginal and postmarginal veins shorter than to about as long as stigmal; gaster about as long as thorax, ovipositor not exserted; apex of forewing devoid of marginal setae; frontovertex slightly wider to much wider than one-third head width.

Hosts: *Maconellicocus hirsuts* (Green).

Distribution: Cairo, Giza, Qalyubiya.

Comments: This species was recorded for the first time in Egypt by Moursi (1948).

4. *Anagyrus pseudococci* (Girault), Fig. 4.

Epidinocarsis pseudococci Girault, 1915, Entomologist, 4: 185.
Anagyrus pseudococci (Girault); Noyes and Hayat, 1994, CAB International, Nat. Hist. Mum., 184.

Diagnosis: Female: First funicle segment dark brown, remainder of flagellum white; ventral surface of costal cell with at least two complete lines setae; stigmal vein longer than combined lenghts of marginal and postmarginal veins; gaster about as long as thorax; ovipositor very slightly exserted; frontovertex less than one-third head width; genae, mouth margin, interantennal prominence almost dark brown.

Hosts: *Maconellicocus hirsuts* (Green), *Planococcus citri* (Risso).

Distribution: Alexandria, Giza.

Comments: This species was recorded for the first time in Egypt by Priesner and Hosny (1940).

5. *Anagyrus saccharicola* Timberlake, Fig. 5.

Anagyrus saccharicola Timberlake, 1932, Proc. Hawaii. Ent. Soc. 8: 159-162.

Diagnosis: Female: First funicle segment dark brown, remainder of flagellum white; stigmal vein about as long as marginal vein; gaster about as long as head and thorax together; ovipositor hardly exserted; frontovertex two-fifth head width; head in side view about twice as long as deep.

Hosts: *Saccharicoccus sacchari* (Cockerell).

Distribution: Beni-Suef.

Comments: This species is recorded here for the first time in Egypt.

6. *Anagyrus shahidi* Hayat, Fig. 6.

Anagyrus shahidi Hayat , 1979, Oriental Insects, 13 (1-2): 177-178.

Diagnosis: Female: Flagellum varying from yellow brown to dark brown almost always with F2 and F3 white to yellow; frontovertex about half head width; ovipositor hardly exserted; forewings characteristically infuscate below submarginal vein and apex of venation.

Hosts: *Antonina graminis* (Maskell).

Distribution: Alexandria.

Comments: This species was recorded for the first time in Egypt by Karam and Abou-ElKhair (1996).

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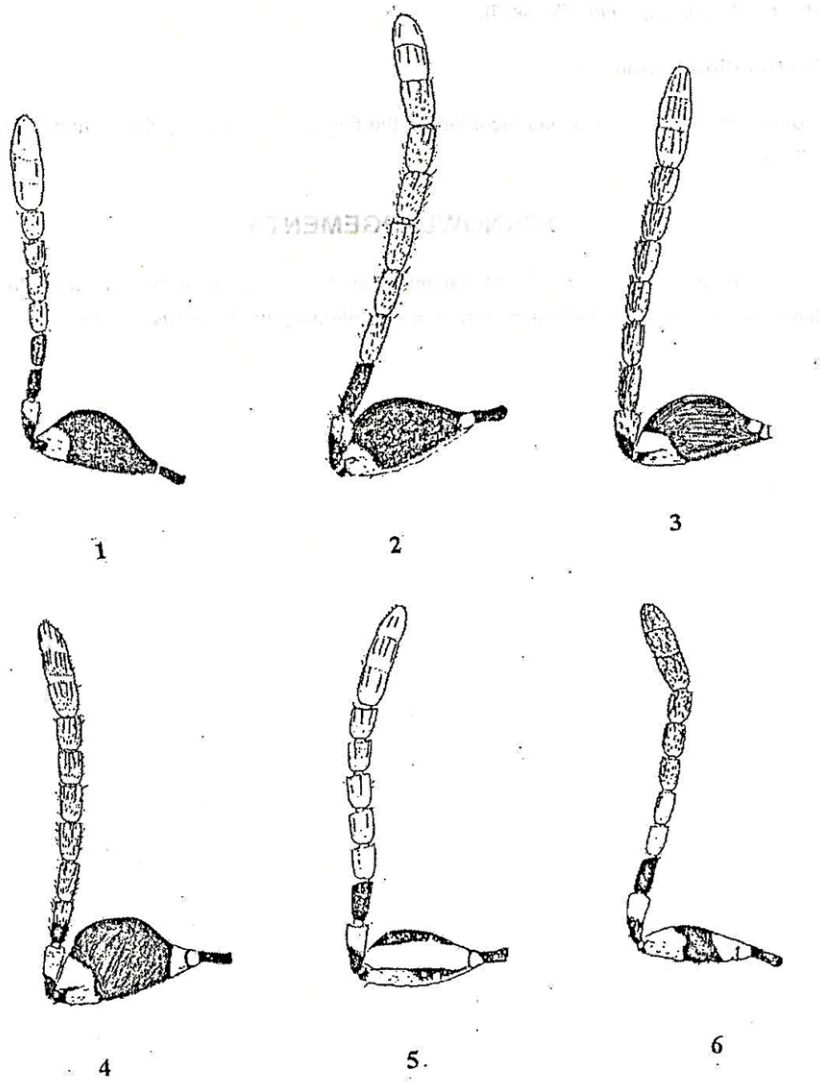

Figs. 1-6. Antenna of *Anagyrus* species (females). Fig. (1): *Anagyrus aegyptiacus*, Fig. (2): *A. greeni*, Fig. (3): *A. kamali*, Fig. (4): *A. pseudococci*, Fig. (5): *A. saccharicola* and Fig. (6): *A. shahidi*.

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أنواع جنس *ANAGYRUS* HOWARD المسجلة فى مصر

شعبان عبد ربه

معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقى – جيزة – مصر

تم حصر عدد ستة أنواع من جنس *ANAGYRUS* HOWARD فى مصر. ومن خلال هذا العمل تم تسجيل نوع جديد على الفونه المصرية إلى جانب شرح للصفات التصنيفية للأنواع الستة مع ذكر العوائل الحشرية والتوزيع الجغرافى لهم وبالإضافة إلى ذلك تم عمل مفتاح تصنيفى لهذه الأنواع.