



**An annotated list of species of Genus *Encarsia* in Egypt with new records of species and hosts (Hymenoptera: Chalcidoidea: Aphelinidae: Coccophaginae)  
Shaaban, Abd-Rabou<sup>1</sup> and Gregory, A. Evans<sup>2</sup>**

<sup>1</sup>Plant Protection Research Institute, Agricultural Research Centre, Dokki, Giza, Egypt.

<sup>2</sup> USDA/APHIS/NIS, 10300 Baltimore Ave, BARC-West, Bldg. 0/05, Rm 09A Beltsville, MD 20705.

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**Abstract:**

Species of the genus *Encarsia* Förster (Hymenoptera: Chalcidoidea: Aphelinidae: Coccophaginae) are some of the most widely used and successful entomophagous biological control agents of whiteflies (Aleyrodidae) and armored scale insects (Diaspididae). This paper includes an annotated list of 22 species of the genus *Encarsia* as well as new hosts and distribution records for these species in Egypt.

**Introduction**

*Encarsia* Förster (Hymenoptera: Chalcidoidea: Aphelinidae: Coccophaginae) is the largest genus of the family Aphelinidae and currently contains 439 valid species known from all of the major zoogeographic regions of the world (Noyes, 2016). Most species of *Encarsia* are primary endoparasitoids of Aleyrodidae and Diaspididae and a few species are parasitoids of hormaphidine aphids or eggs of Lepidoptera (Polaszek, 1991). Diagnostic characters for the genus *Encarsia* include: all tarsi 5-segmented (tarsus of middle leg with 4 segments in certain species); antenna 8-segmented in females and 7-8 segmented in males, and usually is not spindle-shaped; submarginal vein with 1-3 setae (usually 2); scutellum with 2 pairs of setae; each axilla with 1 seta; hypopygium of female not prominent, usually not extending to the apex of the gaster; most species are parasitoids of whiteflies or armored scale insects, and a few species are parasitoids of

hormaphidine aphids, eggs or other hosts. Species of the genus *Encarsia* are some of the most widely used and successful entomophagous biological control agents. *Encarsia formosa* Gahan (Hymenoptera: Aphelinidae) has been used to control *Trialeurodes vaporariorum* Westwood (Hemiptera: Aleyrodidae), a serious pest of numerous horticultural plants in greenhouses. The aim of the present work is to report on a survey of the genus *Encarsia* in Egypt and provide an annotated list of the species and their hosts that are known to occur in Egypt.

**Materials and methods**

Specimens of this faunistic research were collected from different localities in Egypt by rearing the puparia of the whiteflies under optimum conditions (28±3 °C, 70±5 RH%, 16: 8 L: D). Specimens were dissected and mounted dorsally in Canada balsam on

slides following the method of Noyes (1982). All of the material examined is deposited in the PPRI (Plant Protection Research Institute), Dokki, Giza, Egypt.

**Results and discussion**

**An annotated list of the species of *Encarsia* known to occur in Egypt.**

**Genus *Encarsia* Förster**

Currently, there are 22 species of the genus *Encarsia* known to occur in Egypt including a new distributional record of *Encarsia cibcensis* Lopez Avila and *Encarsia gennaroi* Pedata and Giorgini in Egypt. The distribution of each species in Egypt as well as the hosts they have been recorded on are given below. One asterisk (\*) is used to indicate a new host record and 2 asterisks (\*\*) are used to indicate a new distribution record of the parasitoid species in Egypt.

**1. *Encarsia acaudaleyrodia* Hayat**

**Distribution:** New Valley Governorate .

**Hosts:** *Tetraleurodes leguminicola* (Hemiptera: Aleyrodidae).

**Remarks:** This species was reported for the first time in Egypt by Polaszek *et al.* (1999).

**2. *Encarsia aurantii* (Howard)**

**Distribution:** Beheira, Fayoum, Ismailia, Matruh, Northern Coast, Qalyubiya and Sharqiya Governorates.

**Hosts:** *Aonidiella aurantii*, *Aulacaspis tubercularis* \* (new host in Egypt and world), *Aonidiella orientalis*, *Hemiberlesia lataniae* and *Parlatoria oleae* (Hemiptera: Diaspididae).

**Remarks:** This species was recorded for the first time in Egypt by Hafez (1988).

**3. *Encarsia berlesei* (Howard)**

**Distribution:** Alexandria Governorate .

**Hosts:** *Pseudaulacaspis pentagona* (Hemiptera : Diaspididae).

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

**4. *Encarsia citrina* (Craw)**

**Distribution:** Cairo, North Sinai (El-Arish), Giza and Qalyubiya Governorates.

**Hosts:** *Aonidiella aurantii*, *Aulacaspis tubercularis*\* (new host in Egypt and world), *Aspidiotus hedraeae*, *Chrysomphalus aonidum*, *C. dictyospermi*, *Lepidosaphes gloveri*, *L. beckii*, *Lindingaspis floridana* and *Parlatoria ziziphi* (Hemiptera : Diaspididae).

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

**5. *Encarsia cibcensis*\*\* Lopez Avila**

**Distribution:** Qalyubiya Governorate.

**Hosts:** *Aleuroclava psidii*\* (new host in Egypt and world) (Hemiptera: Aleyrodidae)

**Remarks:** This is the first record of *E. cibcensis* parasitizing this host species.

**6. *Encarsia davidi* Viggiani and Mazzon**

**Distribution:** Aswan, Giza, Qalyubiya, North and South Sinai Governorates.

**Hosts:** *Acaudaleyrodes rachipora*, *Aleurolobus marlatti*, *Aleyrodes prolella*, *Bemisia tabaci* and *Siphoninus phillyreae* (Hemiptera: Aleyrodidae).

**Remarks:** This species was first recorded in Egypt by Polaszek *et al.* (1999).

**7. *Encarsia elegans* Masi**

**Distribution:** Assiut, Aswan, El-Minya, Cairo\*\*, Giza\*\*, Sharqiya and North Sinai Governorates.

**Hosts:** *Aleurolobus marlatti*, *A. olivinus* and *Bemisia tabaci* (Hemiptera: Aleyrodidae).

**Remarks:** This species was first recorded in Egypt by Priesner and Hosny (1940).

**8. *Encarsia formosa* Gahan**

**Distribution:** Beni-Suef, El-Minya\*\*, Qalyubiya and Gharbiya Governorates.

**Hosts:** *Bemisia tabaci* and *Trialeurodes ricini* (Hemiptera: Aleyrodidae.)

**Remarks:** This species was recorded for the first time in Egypt by Abd-Rabou (1998).

**9. *Encarsia galilea* Rivnay and Gerling**

**Distribution:** North Sinai (El-Arish) and South Sinai \*\* Governorates.

**Hosts:** *Siphoninus phillyreae* (Hemiptera: Aleyrodidae).

**Remarks:** This species was recorded for the first time in Egypt by Abd-Rabou (1998).

**10. *Encarsia gennaroi*** Pedata and Giorgini

**Distribution:** Demmyate\*\* and Behira\*\* Governorates.

**Hosts:** *Bemisia tabaci*, *Trialeurodes vaporariorum*. (Hemiptera: Aleyrodidae).

**Remarks:** This species was recorded for the first time in Egypt by Simmons *et al.* (2002) as *Encarsia pergandiella*; however in a revision of the *Encarsia pergandiella* species complex by **Gebiola *et al.* (2017)**, they described *E. gennaroi*, which was introduced from California to Europe (Italy and Israel) in 1979 to control *Trialeurodes vaporariorum*; it is the only known species in this group known from the Western Palearctic region and is likely to be the species occurring in Egypt, especially since **Gebiola *et al.* (2017)** cited **Abd-Rabou's (2006)**, paper on the introduction of *Encarsia pergandiella* into Egypt in the discussion of *E. gennaroi*.

**11. *Encarsia inaron* (Walker)**

**Distribution:** Assiut, Behira\*\*, Beni-Suef, Cairo, Kafr El-Sheikh, North Sinai and Qena Governorates.

**Hosts:** *Acaudaleyrodes rachipora*, *Siphoninus phillyreae*, *Aleyrodes proletella*, *Bemisia tabaci* and *Trialeurodes ricini* (Hemiptera: Aleyrodidae).

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

**12. *Encarsia lahorensis* (Howard)**

**Distribution:** Qalyubiya Governorate .

**Hosts:** *Dialeurodes citri* (Homoptera: Aleyrodidae).

**Remarks:** This species was recorded for the first time in Egypt by Abd-Rabou (1997).

**13. *Encarsia lounsburyi* (Berlese and Paoli)**

**Distribution:** Assiut, Aswan, Beni-Suef, El-Minya, Fayoum, Giza and Sohag Governorates.

**Hosts:** *Aonidiella aurantii*, *Aspidiotus nerii*, *Duplachionaspis natalensis*, *Chrysomphalus aonidum*, *C. dictyospermi*, *Diaspis echinocacti*, *Fiorinia fioriniae*, *Hemiberlesia cyanophylli*, *H. lataniae*, *Lepidosaphes beckii*, *L. pallidula*, *Lineaspis striata* and *Mycetaspis personata* (Hemiptera: Diaspididae).

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

**14. *Encarsia lutea* Masi**

**Distribution:** Aswan, Alexandria, Behira, Cairo, Daqahilya, Giza and Qalyubiya Governorates.

**Hosts:** *Aleurolobus marlatti*, *Bemisia tabaci*, *Parabemisia myricae*, *Siphoninus phillyreae* and *Trialeurodes ricini* (Hemiptera: Aleyrodidae).

**Remarks:** This species was recorded for the first time in Egypt by Abd-Rabou (1998).

**15. *Encarsia mineoi* Viggiani**

**Distribution:** Cairo, Giza, Qalyubiya and Sharqiya Governorates.

**Hosts:** *Acaudaleyrodes rachipora*, *Bemisia tabaci* and *Trialeurodes ricini* (Hemiptera: Aleyrodidae).

**Remarks:** This species was recorded for the first time in Egypt by Polaszek *et al.* (1992).

**16. *Encarsia olivina* (Masi)**

**Distribution:** North Sinai (El-Arish) and Fayoum\*\* Governorates.

**Hosts:** *Aleurolobus olivinus* (Hemiptera: Aleyrodidae).

**Remarks:** This species was recorded for the first time in Egypt by Abd-Rabou (2000).

**17. *Encarsia perconfusa* Evans and Abd-Rabou**

**Distribution:** Aswan, Qena and New Valley Governorates.

**Hosts:** *Tetraleurodes leguminicola* (Hemiptera:Aleyrodidae).

**Remarks:** This species was recorded for the first time in Egypt by Evans and Abd-Rabou (2005).

**18. *Encarsia perniciosi* (Tower)**

**Distribution:** Sharqia Governorate .

**Hosts:** *Lepidosaphes pallidula* (Hemiptera: Diaspididae).

**Remarks:** This was recorded for the first time in Egypt by Evans and Abd-Rabou (2005).

**19. *Encarsia protransvena* Viggiani**

**Distribution:** Qalyubiya Governorate .

**Hosts:** *Dialeurodes citri* (Hemiptera : Aleyrodidae)

**Remarks:** This species was recorded for the first time in Egypt by Abd-Rabou (1997).

**20. *Encarsia ramsesi* Polaszek**

**Distribution:** New Valley Governorate.

**Hosts:** *Ramsesseus follioti* (Hemiptera: Aleyrodidae).

**Remarks:** This species was recorded for the first time in Egypt by Polaszek *et al.* (1999).

**21. *Encarsia sophia* (Girault and Dodd)**

**Distribution:** Demyaate, Kafr El-Sheikh, Qalyubiya and Sharqia Governorates.

**Hosts:** *Bemisia tabaci* and *Pealius mori* (Hemiptera : Aleyrodidae)

**Remarks:** This species was recorded for the first time in Egypt by Abd-Rabou (1998) as a *Encarsia transvena*.

**22. *Encarsia strenua* (Silvestri)**

**Distribution:** Qalyubiya and Behira \*\* Governorates .

**Hosts:** *Dialeurodes citri* (Hemiptera: Aleyrodidae)

**Remarks:** This species was first recorded in Egypt by Abd-Rabou (1998).

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