



First record of dryinid and mymarid (Hymenoptera: Chrysididae: Chalcidoidea) parasitoids in Egypt

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Abstract

Three parasitoids were recorded for the first time in Egypt. The first one, *Dryinus canariensis* Ceballos (Hymenoptera: Chrysididae: Dryinidae) was collected from Saint Catherine (Sinai Peninsula) region. The others, *Dicopus* sp. and *Erythmelus (Parallelaptera) funiculi* Annecke and Doutt (Hymenoptera: Chalcidoidea: Mymaridae) were collected from Sakha (Nile Delta) region.

Introduction

Hymenopterous parasitoids are an important biological tool used widely in agriculture for the suppression of various pest species (Hagen *et al.*, 1971; DeBach, 1974 and Huffaker and Messenger, 1976). Parasitoids attack either by penetrating the body wall and laying eggs inside the host or attaching eggs to the outer body surface or attacking host eggs. The immature parasitoid develops on or within the host, consumes all or most of the host's body fluid, and pupates either within or external to the host (Hoy, 1994).

In the current study, two groups from Hymenoptera were surveyed, the first one is Dryinidae, which attacks nymph and adult species belonging to leaf and planthoppers. The second one is Mymaridae, which parasitizes the eggs of several hosts.

Dryinidae (Hymenoptera, Chrysididae) constitutes a family of solitary wasps with about 1,830

described species worldwide (Olm and Xu, 2015). In general, dryinids are ectoparasitoids of Auchenorrhyncha, with one nearctic/neotropical genus, *Crovettia* Olmi, being endoparasitoid of Membracidae (Olm, 1999). Females have a sting, used both as an ovipositor and for paralyzing the hosts for the time necessary for depositing the eggs. Immature larvae are ectophagous, their body is being contained in a sac or thylacium formed by the cast larval skins and protruding from the host body. They feed on the host haemolymph. Mature larvae emerge from the host body after consuming all haemolymph and internal tissues. Pupation takes place in a silk cocoon spinned on plants or in the soil (Mifsud and Olmi, 2016).

Species of the family Mymaridae, are parasitic in the eggs of other insects. Mymarids are cosmopolitan in distribution and can usually be collected in large numbers (Huber, 1986). The genus *Dicopus* is

weakly known (Schauff, 1984). It belongs to the *Alaptus* group (Noyes and Valentine, 1989 and Huber, 2009).

The genus *Erythmelus* is cosmopolitan in distribution that has 54 species. It is quite common, especially in warm, dry habitats. *Erythmelus* was recorded from eggs of Heteroptera mainly Miridae, Cicadillidae and Tingidae, some of which are well-known as agricultural pests (Triapitsyn, 2003). Therefore, members of *Erythmelus* are important for classical or augmentative biological control programs against some of these pests, although they may play a much larger role as native regulators of the population densities of their hosts.

Materials and methods

1. Locations:

This work was conducted at Sakha location which has a latitude of 31° 05'.12" N and a longitude 30° 56' 56.66"E. Saint Catherine has a latitude of 28°33'33.92"N and a longitude of 33°56'48.83"E.

2. Specimens:

2.1. Dryinid specimen was collected from Saint Catherine (Sinai Peninsula) region that was identified by sweep net.

2.2. Mymarid specimens were collected during 2021 from Sakha location in Delta, Northern Egypt. The specimens were collected using three methods, blue water pan trap, malaise trap and sweep net. Specimens are deposited in the personal collection of the author at Rice Research and Training Center (RRTC) Entomology lab, Sakha, Kafr El-Sheikh, Egypt.

3. Parasitoid identification:

3.1. Dryinid specimen, *Dryinus canariensis* Ceballos (Dryinidae: Chrysidoidea) was identified by Prof. Massimo Olmi.

3.2. Mymarid parasitoids were identified by the authors of the current study. The mymarid egg parasitoids, were identified according to all taxonomic papers mentioned in this manuscript and confirmed by Prof., Serguei V. Triapitsyn, John T. Huber and Emilian Pricop.

Results and discussion

1. Family: Dryinidae

Subfamily: Dryininae

Dryinus canariensis (Ceballos), 1927

Material: One female was collected by sweep net.

Hosts: Unknown

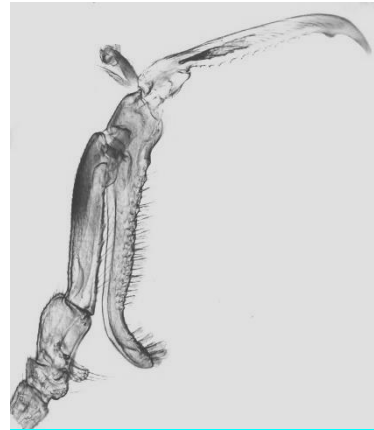
Distribution: Palaearctic region: Canary Islands and St. Catherine, Sinai, Egypt.

Ceballos (1927) recorded *Dryinus canariensis* as a *Paradryinus canariensis*, Olmi (1984) put genus a new comb (*Dryinus*).

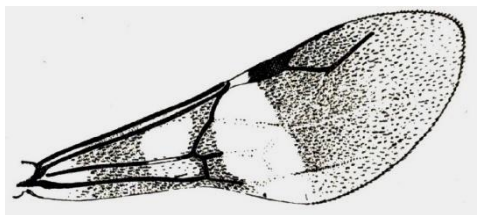
D. canariensis female: fully winged; length 4,25- 4,50 mm; head, antennae, prothorax, legs reddish; mesothorax, metathorax, propodeum and petiole black; abdomen brown, with segment 1 reddish as Olmi (1984) mentioned (Figure 1). Fore tarsal segments in following proportions: 15: 4: 7: 15: 24; enlarged claw with a subapical tooth and with 12 lamellae; segment 5 of front tarsus with 2 rows of nearly 27 lamellae same length; apex with a group of 12 lamellae as Olmi (1984) mentioned (Figure 1).



Female of *Dryinus canariensis*



Chela



Wing after Ceballos (1927)



Chela after Olmi (1984)

Figure (1): *Dryinus canariensis* (Ceballos), 1927

2. Family: Mymaridae

2.1. Genus: *Dicopus* Enock

Material: One female

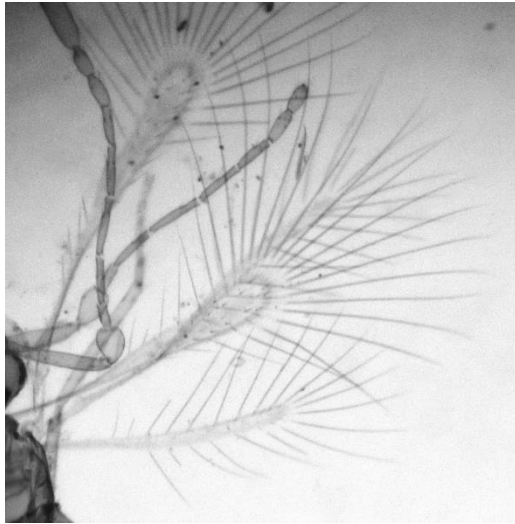
Hosts: Unknown

Distribution: worldwide.

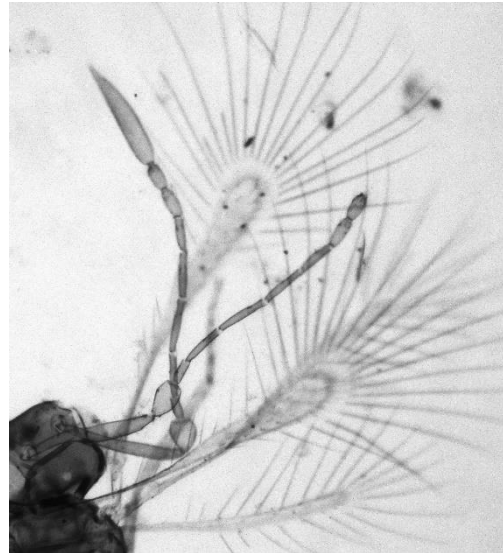
Twelve species have been described worldwide: *Dicopus minutissimus* Enock and *D. cervus* Morley from the United Kingdom; *D. citri* Mercet from Spain; *D. halitus* Girault from Canada (Quebec); *D. enocki* Doutt and *D. pygmaeus* Doutt from the USA (California); *D. longipes* (Subba Rao) and *D. noyesi* Manickavasagam from India; *D. bidentiscapus* Girault from Australia (Victoria); *D. psyche* Girault from Fiji

and *D. lilliput* Mathot from The Democratic Republic of Congo (Zaire); *D. moscovit* Triapitsyn from Russia all species are listed in Noyes (2014).

Specimen was collected during 2021 from Sakha location in Delta, Northern Egypt using blue water pan trap. *Dicopus* is characterized by the following combination of characters (Figure 2): according to many authors; Doutt, 1974; Schauff, 1984; Yoshimoto, 1990; Huber, 1997; Viggiani, 2003; Huber 2009; Manickavasagam and Rameshkumar, 2011; Pricop and Ndriescu, 2011 and Triapitsyn, 2015.



Front and hind wings



Antenna



Genitalia



Dicopus sp.

Figure (2): *Dicopus* sp.

2.2. Genus: *Erythmelus* Enock

Subgenus: *Parallelaptera*

Erythmelus (Parallelaptera) funiculi Annecke and Doutt, 1961

Material examined: 2 females, the first specimen was collected by malaise trap on 16th of July, 2021, and the second one was collected by sweep net on 7th of September, 2021, both females were collected from graminaceous weeds infested by many kinds of cicadellids at Sakha Agricultural Research Station.

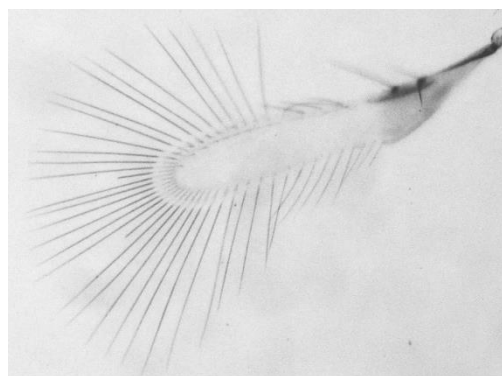
Diagnosis: *E. funiculi* is a very distinctive species due to the proportions of funicle segments of the female antenna: F3, which bears two

longitudinal sensilla, is much longer than F2 or F4 and almost as long as F5 (Figure 3) (Annecke and Doutt, 1961 and Triapitsyn, 2003). This species is known from the female only (Triapitsyn, 2003).

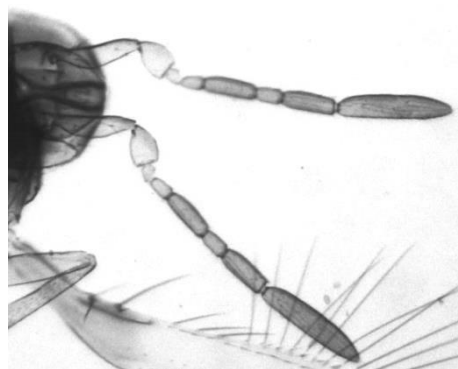
Distribution: South Africa (Annecke and Doutt, 1961), Uganda (Triapitsyn, 1993), USA (Hawaiian Islands) (Beardsley and Huber, 2000) and Egypt.

Host: Unknown.

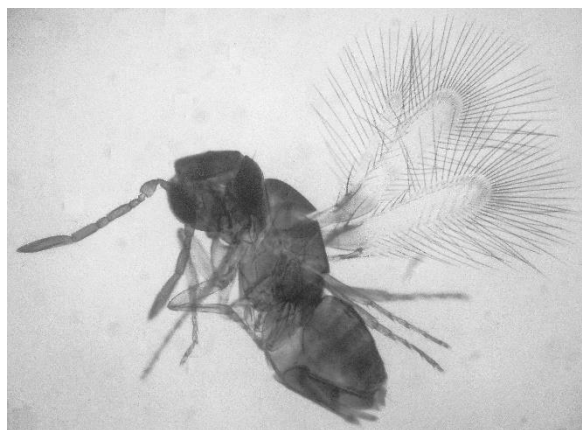
E. (Parallelaptera) funiculi is a very rare species from mymarids, and Sakha region is the only location where it was found in Egypt till now.



Front wing



Antenna



Females

Figure (3): *Erythmelus (Paralleleptera) funiculi* Annecke and Doutt

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