

# FIRST RECORD OF THE SOLITARY WASP *GONATOPUS CAMELINUS* KIEFFER (HYMENOPTERA: DRYINIDAE) FROM JORDAN

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## ABSTRACT

A new species of *Gonatopus camelinus* Kieffer (Hymenoptera: Dryinidae), is described from Jordan for the first time in Mafraq Governorate north of the country. The larvae of dryinidae are parasitoids of the nymphs and adults of Auchenorrhyncha. This Hemipteran suborder contains, leafhoppers, treehoppers, planthoppers, and spittlebugs. Planthoppers (Hemiptera: Delphacidae) (Leach, 1815) with parasitized Delphacid nymphs and dryinidae females were collected from bermuda grass, *Cynodon dactylon* (L.) and preserved. Digital images were taken to illustrate important morphological characters for the female of the parasitoid.

## KEYWORDS:

Delphacidae, Dryinidae, Parasitoids, Jordan

## INTRODUCTION

Leafhoppers and planthoppers are important pests of bermudagrass, *Cynodon dactylon* (L.) [1], that needs warm climate to grow simply as in Jordan. However, Delphacidae are economically significant family of planthoppers. Fifty-five species are known pests on 25 crops [2]. Delphacids cause injury both through direct feeding, injection of saliva and as vectors of plant pathogens [3, 4].

Pincer wasps (Hymenoptera, Dryinidae) are parasitoids and often also predators of Auchenorrhyncha (Hemiptera) [5-7]. The family includes 50 genera and 16 subfamilies, there are ca. 1,410 described species found worldwide [8, 9]. Dryinidae are rare species [10] and most males and females are morphologically distinct [11, 12]. Some females are wingless and resemble ants. The antennae have ten segments, and the front tarsi of the female are usually pincer like. The peculiar -front tarsi of some females in this family are deployed for holding the host during oviposition. Most dryinids are parasitoids of nymphs (Figure 1) and adults of Homoptera. Their larvae feed internally on the host, although during most of their development a part of the body of the larva protrudes from the host in a

sac-like structure. The parasitoid, when full grown, leaves the host and spins a silken cocoon nearby [13].

Dryinids are all solitary wasps whose larvae are parasitoids on other insects. The only known hosts are hemiptera. Adults are usually small, to a maximum length of 11mm. Males are mostly fully winged but females are often completely wingless and therefore resemble ant workers.

Eggs are oviposited in the host with a sharp ovipositor and the larvae spend the early stages feeding internally on the host but when larger they start to protrude from the abdomen of the host and develop a hardened sac-like "case" for protection. They continue feed on the host, which is finally killed [7].

*Gonatopus* is a genus of solitary wasps of the family dryinidae, sometimes called hump-backed pincer wasps. The wingless females have large scissor-like appendages at the tips of the front legs which are used to catch the leafhopper grubs which act as hosts to the larvae of these wasps. The larva consumes the leafhopper grub from the inside. An indication that a leafhopper is hosting a grub is a cyst (Figure 1) of accumulated shed integuments which surround and protect the growing wasp larva [14]. However, our study led to discovery of a gonatopodinae species for the first time in Jordan.

## MATERIALS AND METHODS

Field trips were conducted on weekly basis to the north of Jordan, Mafraq, Balama from August to middle of October 2020. The geographical coordinates for latitude and longitude were recorded by GPS: 32°21'80"N 36°3'41"E.

Samples were collected using a sweep net at different times of the day. Thereafter, samples were examined under a stereomicroscope (Leica EZ4). Final identification of specimens was done by M. Olmi of Tropical Entomology Research Center, in Italy. The terminology is after Olmi [7, 11, 12, 15]. In the descriptions POL= distance between inner edges of two lateral ocelli; OL= distance between inner edges of a lateral and median ocellus; OOL= distance from outer edge of a lateral ocellus to

compound eye; OPL= distance from posterior edge of a lateral ocellus to occipital carina; TL= distance from posterior edge of an eye to occipital carina



**FIGURE 1**  
Delphacid nymph parasitized by  
*Gonatopus camelinus*

## RESULTS

This is the first time that a dryinid species is recorded in Jordan. However, *G. camelinus* is new for Jordan, but it is known in Egypt, Iran and United Arab Emirates, in addition to several European countries [8].

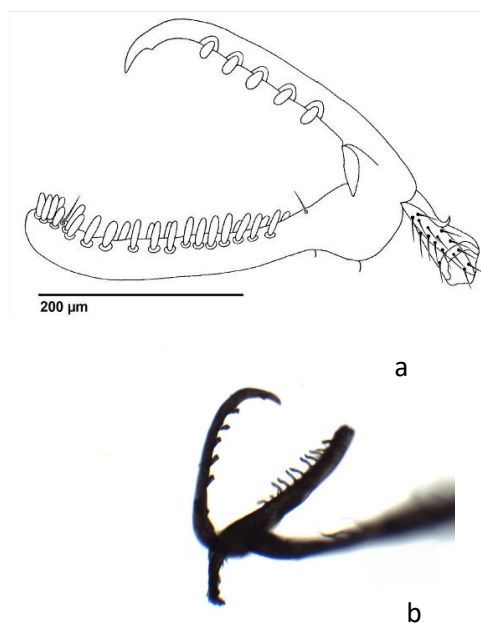
*G. camelinus* Kieffer female is Apterous (Fig 2), with enlarged claw with lamellae, without peg-like setae (Figures 3a and b, and 4). Using Olmi keys [16] for identification, the following are the key characters for the present studied dryinid:

**Description (♀) for *Gonatopus camelinus* Kieffer, 1904 (♀).** Apterous (Figures 2,3,4,5,6 and 7), body length 2.7–4.4 mm. Color. Body testaceous-reddish, except black petiole and part of



**FIGURE 2**  
*Gonatopus camelinus* Kieffer female from  
Jordan; Mafraq, Balama.

metasoma; antenna brown, except yellow scape and pedicel; occasionally vertex, pronotum, metanotum and metapectal-propodeal complex reddish-dark or brown or partly black; occasionally mesoscutum totally black or brown; occasionally (in ortholabis form) pronotum; mesoscutellum and metapectal-propodeal complex black, with mesoscutum partly or totally yellow or brown-reddish; metasoma brown-reddish. Head (Figures 4,5,6 and 7). Antenna is clavate, with scape slightly larger than last flagellomere; head excavated, shiny, unsetose, weakly granulate and rugose; POL = 2.5, OL = 3.0, OOL = 6; occipital carina incomplete; palpal formula 3/2 or 4/2. Mesosoma (Figure 5). Pronotum crossed by strong and wide transverse furrow, shiny, unsetose, slightly granulate; mesoscutum dull, granulate; metanotum very short, granulate, with rounded sides, not hollow behind mesoscutellum; mesopleuron transversely striated; metapectal-propodeal complex shiny, unsculptured, except for transversal striate on first abdominal tergum and metapleuron; disc metapectal-propodeal complex with or without track median longitudinal furrow; meso-metapleural suture obsolete, occasionally slightly distinct; occasionally clearly distinct, if metanotum and mesopleuron are smooth; protarsomeres in following proportions: 14:2:4:11:17; enlarged claw with one large subapical tooth and one row of 3–6 lamellae; protarsomere 5 with two rows of 14–29 lamellae; distal apex with approximately 5–9 lamellae; tibial spurs 1/0/1. Metasoma (Figure 8). Shiny, smooth and with sparse setae, with coriaceous surface except tergite I; ovipositor short, with moderately dense apical setae (Figure 9).



**FIGURE 3**  
Chela of *Gonatopus camelinus* female : Drawing  
(a) and photographing (b).



**FIGURE 4**  
*Gonatopus camelinus* female: Head, dorsal view;  
Chela, antennae.



**FIGURE 5**  
*Gonatopus camelinus* female: Head, frontal view.



**FIGURE 6**  
*Gonatopus camelinus* female Mesosoma,  
dorsal view.



**FIGURE 7**  
*Gonatopus camelinus* female: Head, ventral view



**FIGURE 8**  
*Gonatopus camelinus* female: Metasoma, dorsal  
view.



**FIGURE 9**  
*Gonatopus camelinus* female: Metasoma and  
ovipositor , lateral view.

Jordan populations of Dryinidae must be considered for further investigations. It is important to decrease the use of insecticides as much as possible. The negative effects of the pesticides necessitate the use of alternative methods as those of using biological control [17]. Furthermore, Delphacidae (Figure 1) are economically important family [18,19,20] that need to be studied further in Jordan.

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