Virla, Eduardo G.; Olmi, Massimo
Dryinidae (hymenoptera: chrysidoidea) parasitoids of the corn leafhopper, dalbulus maidis (delong & wolcott) (hemiptera: cicadellidae), in Argentina, with description of the male of Gonatopus moyaraygozai OLMI
Interciencia, vol. 32, núm. 12, december, 2007, pp. 847-849
Asociación Interciencia
Caracas, Venezuela

Available in: http://www.redalyc.org/articulo.oa?id=33913508
DRYINIDAE (HYMENOPTERA: CHRYSIDOIDEA) PARASITOIDS OF THE CORN LEAFHOPPER, Dalbulus maidis (DELONG & WOLCOTT) (HEMIPTERA: CICADELLIDAE), IN ARGENTINA, WITH DESCRIPTION OF THE MALE OF Gonatopus moyaraygozai OLMI

Eduardo G. Virla and Massimo Olmi

SUMMARY

The parasitoids of the Corn Leafhopper, Dalbulus maidis (DeLong & Wolcott) (Hemiptera: Auchenorrhyncha) were studied in Tucumán Province, Argentina. Leafhoppers parasitized by Dryinidae (Hymenoptera: Chrysidoidea) were collected in cornfields from Dec 2003 to Apr 2005. Dryinid adults belonging to three species, Gonatopus caraibicus (Olmi), Gonatopus contortus Olmi, and G. moyaraygozai Olmi, were obtained. G. moyaraygozai is quoted for the first time in Argentina, and the male is described for the first time. This contribution presents the first field host-association record for G. caraibicus and D. maidis; in addition, G. contortus, and G. moyaraygozai are cited for the first time attacking Corn Leafhopper populations. Data on the parasitization rate by G. moyaraygozai are given.

DRYINIDAE (HYMENOPTERA: CHRYSIDOIDEA) PARASITOIDES DE LA CHICHARRITA DEL MAÍZ, Dalbulus maidis (DELONG & WOLCOTT) (HEMIPTERA: CICADELLIDAE), EN ARGENTINA, Y DESCRIPCIÓN DEL MACHO DE Gonatopus moyaraygozai OLMI

Eduardo G. Virla y Massimo Olmi

RESUMEN

Se estudiaron los parasitoides de la chicharrita del maíz, Dalbulus maidis (DeLong & Wolcott) (Hemiptera: Auchenorrhyncha) en la provincia de Tucumán, Argentina. Las chicharritas atacadas por Dryinidae (Hymenoptera: Chrysidoidea) fueron colectadas en campos de maíz entre dic 2003 y abr 2005. Se obtuvieron dríínidos de tres especies diferentes: Gonatopus caraibicus (Olmi), Gonatopus contortus Olmi, y G. moyaraygozai Olmi. Se cita por primera vez a G. moyaraygozai en Argentina, y se describe al macho de dicha especie. Se registra por primera vez en campo la asociación parasitoido-hospedador de G. caraibicus y D. maidis; además, se mencionan por primera vez a G. contortus y G. moyaraygozai como parasitoides de la chicharrita del maíz. Se calculó la tasa de parasitoidización de G. moyaraygozai en campo.

Introduction

The Corn Leafhopper, Dalbulus maidis (DeLong & Wolcott) (Hemiptera: Auchenorrhyncha) is the most common leafhopper feeding on corn in northern Argentina (Paradell et al., 2001). It causes great losses to corn crops in most parts of the tropical and subtropical Americas because it is able to transmit the following pathogens (Nault and Amato, 1984; Quezada, 1979); Corn stunt spiroplasm (CSS), Maize bushy stunt spiroplasm (MBSP), and Maize rayado fino virus (MRFV). The diseases caused by these pathogens seriously affect corn crops in Argentina (Giménez Pecci et al., 2002; Virla et al., 2004).

Dryinid wasps (Hymenoptera: Dryinidae) are highly specialized parasitoids of Hemiptera Auchenorrhyncha (treehoppers, leafhoppers, and planthoppers) nymphs and adults (Guglielmino and Olmi, 1997, 2006). Representatives of the family have been successfully utilized in several instances for the biological control of crop pests (Swezey, 1928; Olmi, 2000). The Dryinidae species known in the Americas as parasitoids of D. maidis are Gonatopus bartletti Olmi 1984, Gonatopus caraibicus (Olmi, 1986) and Gonatopus desantisii Olmi and Virla 1993 (for references see Guglielmino and Olmi, 1997). Gonatopus bicolor (Haliday), quoted by Maes and Godoy (1993), cannot be a parasitoid of D. maidis because it is a European species not present in other continents and attacking only Delphacidae (Olmi, 1999). Agonatopus sp., quoted by Quezada (1979), is a mysterious species that has never been identified, but probably...
DRYINIDAE (HYMENOPTERA: CHRYSIDOIDEA) PARASITOIDES DA CIGARRINHA DO MILHO, Dalbulus maidis (DELONG & WOLCOTT) (HEMIPTERA: CICADELLIDAE), EM ARGENTINA, E DESCRIÇÃO DO MACHO DE Gonatopus moyaraygozai OLMI

Eduardo G. Virla e Massimo Olmi

RESUMO


corresponds to Gonatopus bartletti Olmi.

Thirty five species of the genus Gonatopus Ljung occur in Argentina (Virla and Olmi, 1998, 2007) and only two of them, G. caraibicus and G. desantisii, were mentioned as affecting D. maidis populations. The development of a research project on the natural enemies of Corn Leafhopper in northern Argentina resulted in the discovery of new parasitoids of D. maidis and permitted to obtain the new biological data reported below.

Material and Methods

Nymphs and adults of D. maidis were sampled by sweeping with a standard entomological net. Samples were collected in both subsistence and commercial cornfields in Tucumán province from Dec 2003 to Apr 2005.

Several individuals of the Corn Leafhopper parasitized by Dryinidae were obtained, as evidenced by the possession of the typical larval sac. Most of the specimens died as prepupa or pupa in the laboratory, probably due to sensory experimental conditions (temperature and humidity). However, some Dryinid adults emerged, allowing the specific identification.

In order to estimate the rate of parasitism affecting the Corn Leafhopper population inhabiting a cornfield in Horco Molle, Tucumán, Argentina, sites (26°47’29.3”S and 65°19’39.7”W; 636masl), a trial of three replicates of 10 sweep beating over the corn plants was done on Jan 28th, 2004. All collected individuals were isolated in glass tubes containing corn leaves. Leaves were changed as needed, and leafhoppers were checked daily, looking for parasitization evidences. After 12 days, individuals without parasitization symptoms were considered as healthy.

Dried voucher, host as well as parasitoid specimens studied were deposited in the collection of Fundación e Instituto Miguel Lillo in San Miguel de Tucumán, Argentina.

Results

The following three species of Dryinidae parasitizing D. maidis were obtained: Gonatopus caraibicus (Olmi 1986), G. contortus Olmi 1984, and G. moyaraygozai Olmi 1991.

Gonatopus caraibicus Olmi

Reared specimens: Female specimens of G. caraibicus were obtained from a female adult of D. maidis on 14/VI/2004 in San Miguel de Tucumán (26°48’35.8”S, 65°14’24.8”W; 464masl).

Remarks: G. caraibicus is a broadly distributed species cited in Puerto Rico and Argentina (Olmi, 1984; Virla and Olmi, 1998; Virla, 2008). This species is known to parasitize the following leafhoppers (Cicadellidae): Exitianus obscurinervis Stål (De Santis et al., 1988); Amplicephalus simpliciusculus Linnavuori, Haldorus sexpunctatus Berg (Virla, 1992); Chlorotettix sp. (Virla and Olmi, 1998); Planicephalus flavicosta (Stål), Amplicepalus (Mendozellus) dubius (Linnavuori) and Graminella stelliger viridescens Linnavuori (Virla, 2000). Virla (1992) verified that G. caraibicus parasitized D. maidis in the laboratory, but the dryinid was not able to complete the development. Thus, this is the first field record confirming this host-species relationship.

Gonatopus contortus Olmi

Reared specimens: Female specimens of G. contortus Olmi were obtained from adults of D. maidis on 19/XII/2003 (1 ♀) and 23/II/2004 (2 ♀♀) in Ranchoitos, Tucumán, Argentina (26°57’37.7”S, 65°03’03.1”W; 387masl). With these specimens, a small laboratory colony was established. The reproduction of this species was parthenogenetically teltokous.

Remarks: This species is known from Puerto Rico, Bolivia, Paraguay, and Argentina (Olmi, 1984; Virla and Olmi, 1998; Olmi et al., 2000; Garcezte Barrett, 2001). It was previously mentioned as a parasitoid of Cicadellidae Dellocephalinae (Virla, 2001).

Gonatopus moyaraygozai Olmi 1991

Reared specimens: Two females and a male of G. moyaraygozai Olmi were obtained from parasitized corn leafhoppers collected on 28/1/2004 in Horco Molle, Tucumán, Argentina site. Later, two females were further bred from the same place on 13/II and 24/II/2004.

Remarks: This species was known only from México (Olmi, 1990) and it is now mentioned for the first time in Argentina. Cicadellidae was the previously known host of this parasitoid (Guillemino and Olmi, 1997) and in México it was found attacking Dalbulus quincunciatatus De Long and Nault (Olmi, 1990), so that this is the first quotation of this species affecting D. maidis populations.

Only female specimens of G. moyaraygozai were known. The male reared during this study is the first known male of this species. It may be described as follows:

MALE: fully winged; length 1.62mm. Head brown,
Key to the males of Gonatopus species attacking Dalbulus maidis in America

1. Antennal segment 3 less than three times as long as broad .......................... 2
   Antennal segment 3 three times or more than three times as long as broad .......................... 3

2. Propodeum granulated ................................. caraibicus (Olmi)
   Propodeum reticulate rugose .......................... moyaraygozai Olmi

3. Head punctate, without sculpture among punctures; frontal line absent .......................... desantisi Olmi and Virla
   Head slightly granulated; frontal line complete .......................... bartletti Olmi

The male of G. contortus is still unknown

REFERENCES


Figure 1. Male genitalia of Gonatopus moyaraygozai Olmi from Horco Molle, Tucumán, Argentina. Right half removed. Bar: 0.1mm

with mandibles testaceous; antennae brown; mesosoma black; gaster brown; legs brown. Antennae filiform; antennal segment 3 approximately twice as long as broad (6.3); antennal segments in the following proportions: 5.5:6.6:6.5:5.5:5:5.8. Head shiny, smooth, without sculpture; frontal line absent; occipital carina absent; POL = 5; OL = 1; OOL = 2.5; greatest diameter of posterior ocelli = 2. Scutum, scutellum and metanotum shiny, finely punctate, without sculpture among the punctures. Notauli complete, posteriorly separated; minimum distance between notauli much shorter than greatest diameter of posterior ocelli (1.2). Propodeum dull, completely reticulate rugose. Forewing hyaline, without dark transverse bands; marginal cell open; stigmal vein regularly curved. Dorsal process of the parameres (Figure 1) short, with proximal part slender and distal apex broadened. Palpal formula 5/2. Tibial spurs 1, 1, 2.

Parasitization rate

At a cornfield in Horco Molle site (Jan 28th, 2004), a total of 217 corn leafhoppers were captured (68 nymphs, 101 females and 48 males). Mean of D. maidis individuals/10 sweep beating was 72.3 (SD= 9.3). Eleven individuals were parasitized by dryinid wasps (6 nymphs, 4 females and only one male), but only 3 adults of G. moyaraygozai Olmi emerged (2 females and 1 male). So, the parasitization rate measured on that day was 5.1%.