

SCIENTIFIC NOTE

First Record of *Eudorylas schreiteri* (Shannon) (Diptera: Pipunculidae) as a Parasitoid of the Corn Leafhopper (Hemiptera: Cicadellidae) in Argentina, with a Table of Pipunculid-Host Associations in the Neotropical Region

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Primeiro Registro de *Eudorylas schreiteri* (Shannon) (Diptera: Pipunculidae) como Parasitóide da Cigarrinha do Milho (Hemiptera: Cicadellidae) na Argentina, e uma Tabela dos Hospedeiros de Pipunculídeos na Região Neotropical

RESUMO - *Eudorylas schreiteri* (Shannon) é registrada pela primeira vez como endoparasitóide da cigarrinha do milho *Dalbulus maidis* (DeLong & Wolcott) no norte da Argentina. Uma tabela das espécies neotropicais de pipunculídeos com hospedeiros conhecidos é apresentada.

PALAVRAS-CHAVE: Inimigo natural, vetor, *Dalbulus maidis*

ABSTRACT - The big-headed fly *Eudorylas schreiteri* (Shannon) is recorded for the first time as an endoparasitoid of the corn leafhopper *Dalbulus maidis* (DeLong & Wolcott) in Northern Argentina. A table of known Neotropical pipunculid-host associations is presented.

KEY WORDS: Natural enemy, disease vector, *Dalbulus maidis*

The corn leafhopper *Dalbulus maidis* (DeLong & Wolcott) is the most common leafhopper pest on maize in the tropics (Nault 1990). *D. maidis* is important because efficiently vectors three plant pathogens; the corn stunt Spiroplasma, *Spiroplasma kunkelii*, the maize bushy stunt phytoplasma and the maize rayado fino virus (Nault 1980, Oliveira *et al* 1998, Virla *et al* 2004).

Eggs of the corn leafhopper are parasitized by wasps (Trichogrammatidae and Mymaridae) (Gladstone *et al* 1994, Luft Albarracin *et al* 2006), whereas nymphs and adults are parasitized by strepsipterans (Halictophagidae), wasps (Dryinidae) and flies (Pipunculidae) (Vega *et al* 1991, Kathirithamby & Moya-Raygoza 2000, Virla & Olmi 2007). Most of the corn leafhopper parasitoids have been collected in Mesoamerica and little is known about their natural enemies in South America.

The Pipunculidae (big-headed flies) have always been considered exclusively as endoparasitoids of Auchenorrhyncha (Hemiptera), including Cicadellidae, Delphacidae, Cercopidae, Cixiidae, Flatidae, Fulgoridae and Membracidae. They attack host nymphs and adults in all

groups except Cercopidae, in which they attack only the adults (Waloff & Jervis 1987). This specialized behavior has been consistently recorded for species throughout the subfamilies Chalarinae and Pipunculinae (Skevington 2005). However a recent discovery by Koenig & Young (2007) showed that *Nephrocerus* Zetterstedt (Nephrocerae) was reared from large adults of crane flies (Tipulidae). An overview of pipunculid-host associations was published by Skevington & Marshall (1997), but very little information is available concerning the hosts of tropical species.

In northern Argentina nymphs and adults were sampled by sweeping with a standard entomological net. Samples were collected from December 2005 to February 2007 on corn fields from the sites "El Manantial" (26°49'50.2"S, 65°16'59.4"W, elevation 495 m), San Miguel de Tucumán (26°48'35.7"S, 65°16'25.3"O, 470 m) and Los Nogales (26°42'27.5"S, 65°13'3.9"O, 585 m), all in Tucumán Province.

The above method allowed sampling individuals of the corn leafhopper parasitized by Pipunculidae larva, as evidenced by the voluminous abdomen. These specimens were isolated in glass tubes (10 x 2 cm), with a piece of

fresh corn leaf, which was daily replaced, and tapped with a water-wetted cotton pad.

Emerged adults were identified as *Eudorylas schreiteri* (Shannon). Therefore, we report for the first time the pipunculid *E. schreiteri* attacking *D. maidis* in Argentina. Data on host range (Table 1) are available for six species of Pipunculidae that occurs in the tropics.

The species changed the genus several times as below.

Eudorylas schreiteri (Shannon)

Pipunculus schreiteri Shannon 1927: 37.

Eudorylas schreiteri (Shannon) in Aczél (1948): 25.

Pipunculus (Eudorylas) schreiteri (Shannon) in Hardy (1963a): 223.

Metadorylas schreiteri (Shannon) in Rafael (1987): 37.

Eudorylas schreiteri (Shannon) in Skevington & Yeates (2001): 439.

Eudorylas schreiteri was described from Raco (Tucumán province, Argentina), but it is known to Argentina (Entre Ríos, Salta, Tucumán, and Santiago del Estero provinces) and Brazil (Rio de Janeiro, São Paulo and Paraná states) (Rafael 1990). Until this contribution, the hosts for this

species were unknown.

Material examined. S.M. de (Tucumán), xii/2005, Virla leg. One ♂; El Manantial (Tucumán), 13/xii/2006, Virla leg., one ♂ one ♀; El Manantial (Tucumán), 2-5/i/2007, Virla leg., one ♂; Los Nogales (Tucumán), 15/i/2007, Virla leg., two ♂♂ two ♀♀; Los Nogales (Tucumán), 10/ii/2007, Virla leg. one ♂ one ♀.

Dried voucher specimens of *E. schreiteri* resulting from this study were deposited in the collection of the Instituto Nacional de Pesquisas da Amazônia (INPA) at Manaus, Brazil and Fundación e Instituto Miguel Lillo (IMLA) at San Miguel de Tucumán, Argentina.

It is for the first time that the corn leafhopper pest *Dalbulus maidis* is recorded here as a natural host for *E. schreiteri*, and the third pipunculid parasitizing it. *E. subopacus* (Loew) and *E. spinosus* (Hardy) were previously recorded attacking the corn leafhopper in central Mexico (Vega *et al* 1991, Moya-Raygoza *et al* 2004, Moya-Raygoza 2007).

Taking into account the importance of the diseases the corn leafhopper vectors in the Americas, we point out to the need for a proper evaluation of *E. schreiteri* as a potential biocontrol agent against this leafhopper pest, as the highest parasitism of *Dalbulus elimatus* (Ball) by *E. subopacus* was 57% in central Mexico, whereas on *D. maidis* was 20% (Moya-Raygoza 2007).

Table 1 Neotropical pipunculids and their associated hosts.

Pipunculid parasitoid	Distribution	Auchenorrhyncha host	Country recorded	References and notes
<i>Cephalops penepauculus</i> (Hardy)	Argentina	Delphacidae: <i>Toya propinqua</i> (Fieber) <i>Dicranotropis fuscoterminata</i> Berg	Argentina	Virla & Rafael (1996)
<i>Eudorylas schreiteri</i> (Shannon)	South-eastern, South of Brazil and North of Argentina	Cicadellidae: <i>Dalbulus maidis</i> (DeLong & Wolcott)	Argentina	New record
<i>Eudorylas spinosus</i> (Hardy)	Mexico to Argentina	<i>D. maidis</i>	Mexico	Moya-Raygoza <i>et al</i> (2004)
<i>Eudorylas subopacus</i> (Loew)	Canada to Peru	Cicadellidae: <i>Cicadulina pastusae</i> Ruppel & DeLong	Colombia, Ecuador	Hardy (1963b) treated the species as <i>E. absconditus</i> (Hardy) ¹
		<i>Scaphytopius acutus</i> (Say)	USA	Hardy (1964)
		<i>D. maidis</i>	Mexico	Vega <i>et al</i> (1991) as <i>Eudorylas</i> sp. probably <i>absconditus</i> (Hardy) *
		<i>Dalbulus elimatus</i> (Ball)	Mexico	Moya-Raygoza <i>et al</i> (2007)
<i>Tomosvaryella appendipes</i> (Cresson)	USA and Mexico	Cicadellidae: <i>Scaphytopius nitridus</i> (DeLong)	USA	Pierce 1972
<i>Tomosvaryella subvirescens</i> (Loew)	Cosmopolitan	Cicadellidae: <i>Circulifer tenellus</i> Baker	Canada, USA	Thompson (1951) in Skevington & Marshall (1997)

¹*E. absconditus* was described from Rio de Janeiro (Brazil) and it is known only from the female holotype (Rafael 1990) and the record should be considered a misidentification.

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