

## Research Article

***Gryon vitripenne* Masner (Hymenoptera: Platygasteridae), new host-parasitoid association with *Leptoglossus zonatus* (Dallas) (Heteroptera: Coreidae) in corn crop and extension of geographic range**

*Gryon vitripenne* Masner (Hymenoptera: Platygasteridae), nueva asociación hospedero-parasitoide con *Leptoglossus zonatus* (Dallas) (Heteroptera: Coreidae) en cultivos de maíz y extensión del rango geográfico

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**Abstract.** The purpose of this publication is to report a new parasitoid association of *Gryon vitripenne* Masner, 1983 (Hymenoptera: Platygasteridae: Scelioninae) and the leaf-footed bug *Leptoglossus zonatus* (Dallas, 1852) (Heteroptera: Coreidae) in corn crop in Brazil as well as the extension of the geographic range of *G. vitripenne* to Sete Lagoas municipality, Minas Gerais State, Brazil, about 7,600 km SE from Brownsville and Harlingen, Texas, EUA, the types localities, and about 1,200 km SE from Campo Verde municipality, Mato Grosso State and 1,400 km NE from Porto Alegre municipality, Rio Grande do Sul State, the previously known records in Brazil.

**Key words:** Bionomy, Neotropical fauna, Scelioninae, *Zea mays*.

**Resumen.** El objetivo de esta publicación es informar una nueva asociación entre el parasitoide *Gryon vitripenne* Masner, 1983 (Hymenoptera: Platygasteridae: Scelioninae) y la chinche *Leptoglossus zonatus* (Dallas, 1852) (Heteroptera: Coreidae) en el cultivo de maíz en Brasil, ampliando la extensión de la distribución geográfica de *G. vitripenne* al municipio de Sete Lagoas, Minas Gerais, Brasil, aproximadamente 7600 km SE de Brownsville y Harlingen, Texas, EE. UU., las localidades típicas y aproximadamente a 1200 km SE del municipio de Campo Verde, estado de Mato Grosso y 1400 km NE del municipio de Porto Alegre, Estado de Rio Grande do Sul, registros previamente conocidos de Brasil.

**Palabras clave:** Bionomía, fauna neotropical, Scelioninae, *Zea mays*.

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## Introduction

*Gryon* Haliday, 1833 is a cosmopolitan and diverse genus of tiny solitary wasps of Platygasteridae (Hymenoptera: Scelioninae) and comprises circa of 330 species of parasitoids that generally attack eggs of Heteroptera belonging to Coreidae, Pentatomidae, Scutelleridae, Lygaeidae, Reduviidae and Phymatidae (Rajmohana *et al.* 2011; Peter and Rajmohana 2014; Bugguide 2019; Hymenoptera Online 2019).

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The taxonomy of *Gryon* is currently very poorly known (Polaszek and Kolberg 2008) and there has been no in-depth taxonomic studies on Neotropical *Gryon* despite the fact of Masner (1983) stated that species of this genus are important biological control agents of some Heteroptera pests by killing their hosts on egg stage.

*Gryon vitripenne* Masner (1983) belongs to the floridanum species group, whose species with known biology acts as solitary parasitoids of eggs of Coreidae and, rarely, of Pentatomidae; this group of species has mainly Neotropical distribution, with some species reaching southern parts of the North American continent (Masner 1983). Particularly, the biology of *G. vitripenne* Masner (1983) is scarcely known.

*Leptoglossus zonatus* (Dallas, 1852) (Heteroptera, Coreidae) has wide distribution, being found from the Southwest of the USA to Central and South America (Henne *et al.* 2003; Fernandes 2018); it has a very polyphagous habit and the species has status of secondary pest of cereals, vegetable crops and fruit trees. In the United States this leaf-footed bug is considered an emerging pest on corn, cotton, eggplant, peach, pecan, pomegranate, tomato and watermelon (Xiao and Fadamiro 2011). Panizzi (1989) and Gallo *et al.* (2002) gave to this bug the status of key pest in corn crops in Brazil because it is liable for direct losses to the culture as its attack takes place in the ear region, where they pierce and suck grains causing its wilting and rotting. It has been reported in Brazil that *L. zonatus* is one of the sting bugs responsible for the transmission of phytopathogenic trypanosomatids of the genus *Phytomonas* Donovan, 1909 (Trypanosomatida: Trypanosomatidae) that cause diseases in coffee, coconut, oil palm and cassava (Sbravate *et al.* 1989).

The objective of this paper is report a new host association of *G. vitripenne* and new data about its geographical range.

## Material and Methods

The studied specimens of *G. vitripenne* were obtained from eggs of *L. zonatus* collected in an experimental cornfield of the variety BRS VIVI cultivated in area of the Embrapa Milho and Sorgo (19°27'14" S, 44°09'25" W, circa of 730 m above sea level) in Sete Lagoas municipality, Minas Gerais State, Brazil (Fig. 1) in May 2016. The locality is classified as having an Aw climate (Köppen system), with an average temperature of 21.6 °C and 1,335 mm average annual rainfall (Alvares *et al.* 2013; Climate-Data.Org 2019).

Eggs were transported to Laboratório de Criação de Insetos (LACRI) of Embrapa Milho e Sorgo (Embrapa/CNPMS) and kept at room temperature 25 °C in Petri dishes until the emergence of the immatures or their parasitoids. About 80 specimens of Platygasteridae were obtained and no other parasitoids emerged from the collected eggs. Three males and 13 females were sent to the Laboratório de Sistemática e Bioecologia de Parasitoides e Predadores of the Instituto Biológico, Ribeirão Preto, São Paulo State, Brazil, for specific identification.

The identification was made using the key proposed by Masner (1983) and images of the studied material were sent to Dr. Lubomir Masner (Biosystematics Research Institute, Agriculture Canada, Ottawa, Canada) for confirmation of the specific identification.

The color images were obtained with a Leica DFC 295 digital camera attached to a Leica M205C APO stereomicroscope. Serial images from different layers were combined with Helicon Focus software (version 5.3) and figures were prepared using Adobe Photoshop software (version 11.0).

Abbreviations are as follows:  $T_n$ , metasomal tergum ( $n$  = number of the metasomal tergum).

The specimens examined in this study have been deposited in the Coleção Entomológica do Laboratório de Sistemática e Bioecologia de Parasitoides e Predadores (LRRP) (LRRP #814-829), of the Instituto Biológico (Ribeirão Preto, SP, Brazil), N.W. Perioto, curator, and

17 males and 47 females in the Coleção Entomológica do Laboratório de Criação de Inseto (LACRI) Emprapa/CNPMS) (Sete Lagoas, MG, Brazil), Ivan Cruz, curator.

## Results and Discussion

From eggs of *L. zonatus* emerged males (Fig. 2) and females of *G. vitripenne*, species easily recognized for presenting T6 in male with long spikes posterolaterally (Fig. 3). *L. zonatus* is, for the first time, cited as host of *G. vitripenne*, which gives to this species the status of potential controller of that agricultural pest.

Almost nothing is known about the biology and habits of *G. vitripenne*: when Masner (1983) described the species he stated that part of the type series was obtained from eggs of an unidentified coreid. Polaszek and Kolberg (2008) reported the primary parasitism of *G. vitripenne* in *Holhymenia rubiginosa* Breddin, 1904 and *Anisoscelis foliaceus* (Fabricius, 1803) (Heteroptera: Coreidae) eggs, Margaría (2008) and Margaría *et al.* (2009) reported that exemplars of *G. vitripenne* were reared from eggs of unidentified bugs on *Oryza sativa* (Poaceae).

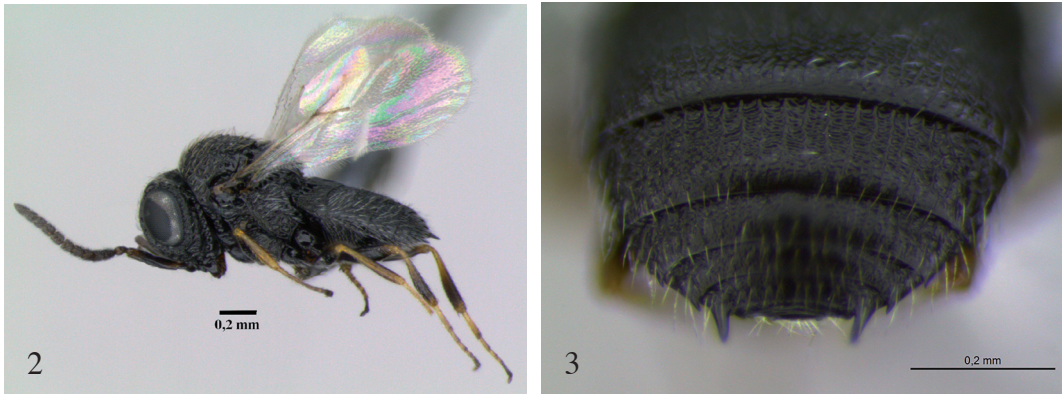
The present paper extends the geographic range of *G. vitripenne* to Sete Lagoas municipality, Minas Gerais State, Brazil, about 7,600 km SE from Brownsville and Harlingen, Texas, EUA, the types localities (Masner 1983), and about 1,200 km SE from Campo Verde, Mato Grosso State and 1,400 km NE from Porto Alegre, Rio Grande do Sul State, the previously known records in Brazil (Polaszek and Kolberg 2008; Margaría 2008; Margaría *et al.* 2009).



**Figure 1.** Distribution range map of *Gryon vitripenne* Masner; the black dots indicate the known distribution and the red one Sete Lagoas, Minas Gerais State, the new record of distribution (in detail).

Based on the results of this study we have increased the knowledge about the associations and distribution of *G. vitripenne*, a potential agent of biological control of *L. zonatus*. It is not too much to recall the words of Masner (1983) who stated that further studies on host-parasite relations, host specificity, and fecundity of *Gryon* species are needed to allow their practical application in pest management.

*Gryon vitripenne* is a new potential biological control agent of *L. zonatus*; those parasitoids may be acting “silently” and in a yet unquantified way in the reduction of populations of that leaf-footed bug in corn crops.



Figures 2-3. *Gryon vitripenne* Masner. 2. male habitus. 3. apex of male metasoma, dorsal.

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