

Scientific Note

First Parasitism Record of the Eggs of *Thlastocoris laetus* Mayr, 1866 (Hemiptera: Coreidae) and New Host and Distribution Records for *Hadronotus vitripennis* (Masner, 1983) (Hymenoptera: Scelionidae)

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Abstract. *Thlastocoris laetus* Mayr, 1866 (Hemiptera: Coreidae) is one of the main pineapple pests in the Amazon region. A survey of the natural enemies of *T. laetus* in pineapples of the BRS Turiaçu variety was conducted in Manaus and Itacoatiara, Amazonas state, Brazil, revealing a parasitism rate of 28.85% of *T. laetus* eggs by *Hadronotus vitripennis* (Masner, 1983) (Hymenoptera: Scelionidae). This is the first record of parasitism in *T. laetus* and of the occurrence of *H. vitripennis* in this host in Amazonas. This natural parasitism indicates that *H. vitripennis* is a potential biological control agent of the pineapple bug.

Keywords: Biological control, Amazonas, Pineapple bug, Egg parasitoid.

In the Amazon region, *Thlastocoris laetus* Mayr, 1866 (Hemiptera: Coreidae) (Fig. 1), the orange pineapple mealybug, is a major pest of pineapples (*Ananas comosus* L., Poales, Bromeliaceae). While feeding, the mealybug injects toxins that cause stoning of the pulp and malformation of the fruit, harming plants from development to reproduction and causing negative impacts on fruit productivity, quality, and marketability (Fazolin et al. 2001; Noronha et al. 2016). Despite the economic importance of pineapple cultivation in the region, there are no studies on possible natural enemies of this pest, and the parasitoids that may attack its eggs are still unknown.

In Brazil, *T. laetus* occurs in the states of Acre (AC), Amazonas (AM), and Mato Grosso (MT), with pineapple as its only host plant (Couturier et al. 1993; Fazolin et al. 2012).



Figure 1. Couple of *Thlastocoris laetus* Mayr, 1866. Detail of the sexual dimorphism in the femur of the metathoracic legs, which are robust in the male and slim in the female.

Hadronotus Förster, 1856 (Hymenoptera: Scelionidae) is a cosmopolitan and diversified genus of wasps that comprises about 217

species that parasitize Heteroptera (Hemiptera) eggs of the families Coreidae, Pentatomidae, Scutelleridae, Lygaeidae, and Reduviidae (Masner 1983; Perioto et al. 2019; Talamas et al. 2021). Adults of *Hadronotus vitripennis* (Masner, 1983) (Hymenoptera: Scelionidae) are black, measure approximately 1.85 mm in length, and have wings with reduced venation. Since the species is a scelionid, it is characterized as an idiobiont solitary endoparasitoid of insect eggs (Masner 1995). *Hadronotus vitripennis* has a wide geographical distribution in North America; in Brazil, it has only been recorded in the states of Rio Grande do Sul (RS), Mato Grosso (MT), and Minas Gerais (MG) (Margaría et al. 2009; Perioto et al. 2019).

The present study aimed to survey possible parasitoids of the eggs of *T. laetus*, as well as to record the parasitism rate, sex ratio, and geographic distribution in Brazil.

Collections were carried out in plantations of pineapple belonging to the BRS Turiaçu variety in the 2017-2018 and 2020 growing seasons in the community of Vila do Engenho (03°09'41.77" S; 59°09'59.30" W) and the Experimental Farm of the Federal University of Amazonas - FAEXP (2°38'44" S; 60°02'27" W), located in the municipalities of Itacoatiara and Manaus, AM, Brazil, respectively.

Egg masses of *T. laetus* were collected in the fruits and leaves of pineapple and transported to the Laboratory of Entomology and Agricultural Acarology of the Federal University of Amazonas (LEA/UFAM), where they were kept in Petri dishes at a room temperature of $29 \pm 1^\circ\text{C}$ and relative humidity of $60 \pm 10\%$ for the emergence of parasitoids and/or nymphs. The parasitoids were identified by one of the authors (VAC) based on Masner (1983). Voucher specimens were deposited at the "Oscar Monte" Entomophagous Insect Collection of the Biological Institute (IB-CBE, Campinas, SP, Brazil) and at the Laboratory of Entomology and Agricultural Acarology of the Faculty of Agricultural Sciences of the Federal University of Amazonas.

A total of 1,053 eggs of *T. laetus* were collected from which 275 adults of *H. vitripennis* emerged (Fig. 2), resulting in a parasitism rate of 28.85%. This result indicates that *H. vitripennis* is a potential biological control agent of the pineapple bug.

This is the first record of parasitism of the eggs of *T. laetus* and the occurrence of *H. vitripennis* in the state of Amazonas, Brazil.

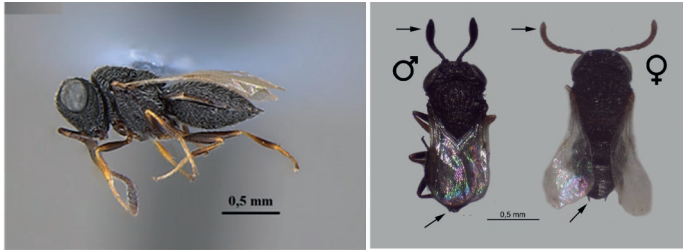


Figure 2. Adult of *Hadronotus vitripennis* (Masner, 1983). Detail of the sexual dimorphism in the antennae (cleaved in the female, filiform in the male) and the cerci at the apex of the metasoma (short and close in the female, long and distant in the male).

The wasp species has been recorded parasitizing eggs of *Holhymenia rubiginosa* Breddin, 1904 (Hemiptera: Coreidae) in passionfruit crops (Paloszeck & Kolberg 2008), eggs of *Leptoglossus zonatus* Dallas, 1852 (Hemiptera: Coreidae) (Perioto et al. 2019) and an undetermined species of mealybugs in rice crops (Margaría et al. 2009).

This new record of *H. vitripennis* in the present study, the first recorded occurrence in the AM state, broadens its distribution in Brazil; it is now known to occur in the states of RS, MG, MT (Margaría et al. 2009; Perioto et al. 2019), and now for AM (Fig. 3).

Males and females of *H. vitripennis* emerged from the eggs of *T. laetus*, with a sex ratio (0.60 ± 0.07) that showed a trend toward a greater number of females; this finding further supports the species potential as a biological control agent because only adult females locate and parasitize the pest hosts.



Figure 3. Geographical distribution of *H. vitripennis* (Hymenoptera: Scelionidae) in Brazil. Dots = previous records in Brazil; star = new record.

Complementary studies (focusing on taxonomy, bioecology, biological efficiency, intra- and interspecific interaction, mass production technology, and economic viability) aiming at the future use of *H. vitripennis* in the biological control of *T. laetus* should be conducted to establish new integrated management strategies for controlling the pest.

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Authors' Contributions

Conceptualization: Oliveira, S.P.; Silva, W.M.; Silva, N.M. Data curation: Oliveira, S.P.; Silva, W.M.; Silva, N.M.; Acioli, A.N.S.; Costa, V.A. Formal analysis: Oliveira, S.P.; Silva, W.M.; Silva, N.M.; Acioli, A.N.S.; Costa, V.A. Funding acquisition: Pinheiro, F.S. Investigation: Oliveira, S.P.; Silva, W.M.; Pinheiro, F.S. Methodology: Oliveira, S.P.; Silva, W.M.; Silva, N.M. Project administration: Oliveira, S.P.; Silva, W.M. Supervision: Silva, N.M. Validation: Oliveira, S.P.; Silva, W.M.; Silva, N.M.; Acioli, A.N.S.; Costa, V.A. Writing - review & editing: Oliveira, S.P.; Silva, W.M.; Silva, N.M.; Acioli, A.N.S.; Costa, V.A.; Pinheiro, F.S.

Conflict of Interest Statement

All authors declare that they have no conflict of interest.

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