



Scientific Note

First record of *Hexacladia hilaris* Burks (Hymenoptera: Encyrtidae) in Brazil and association with *Chinavia erythrocnemis* (Berg) (Heteroptera: Pentatomidae)

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Abstract. *Hexacladia hilaris* Burks (Hymenoptera: Encyrtidae) is a parasitoid associated to several stink bug species in Costa Rica, Porto Rico and United States. In April 2018, at the Passo Fundo (28°15'46" S / 52°24'24" O), Rio Grande do Sul state, Brazil, specimens of *H. hilaris* were collected from *Chinavia erythrocnemis* (Berg) (Heteroptera: Pentatomidae). This is the first record of this parasitoid in South America as well as its association with *C. erythrocnemis*.

Keywords: Biologic control; *Chinavia erythrocnemis*; parasitoid; Pentatomidae; Stink bugs.

Parasitoids of the genus *Hexacladia* Ashmead (Hymenoptera: Encyrtidae) are commonly found parasitizing Pentatomidae (Heteroptera) stink bugs. The most common species is *Hexacladia smithii* Ashmead, recorded in Brazil parasitizing adults of *Edessa meditabunda* (F.) (PANIZZI & CORRÊA-FERREIRA 1997), *Euschistus heros* (F.) (CORRÊA-FERREIRA *et al.* 1998), *Dichelops melacanthus* (Dallas) (CORRÊA-FERREIRA *et al.* 2005), *Arvelius albopunctatus* (De Geer), and *Dichelops furcatus* (F.) (PANIZZI & SILVA 2010).

Besides pentatomids, these encyrtids also parasitize adults of *Holhymenia clavigera* (Herbst), *Holhymenia histrio* (F.) and *Anisoscelis foliaceus* (F.) (Coreidae) (COSTA LIMA 1930; BALDIN *et al.* 2010), and *Pachycoris torridus* (Scop.) (Scutelleridae) (COSTA LIMA 1930). Another but less common species is *Hexacladia blanchardi* De Santis, recorded parasitizing *E. meditabunda* (Pentatomidae) (MEDEIROS *et al.* 1998). SILVA *et al.* (2017) observed natural parasitism of *Hexacladia impiros* Noyes in adults of *E. meditabunda* in a tomato plantation, at Dourados, Mato Grosso do Sul state, being the third known species of this genus in Brazil. Of a total of 27 species, all of them occurring in the New World, seven *Hexacladia* species are recorded in South America (NOYES 2010; TORRÈNS *et al.* 2017).

Hexacladia are gregarious endoparasitoids of adult stink bugs, which perform their embryonic and post-embryonic development in the abdominal cavity of their hosts, emerging through orifices made at the dorsal or ventral side (Figure 1A). The host, in that case, continues alive throughout the parasitoid development, an unusual fact among hymenopteran parasitoids (COSTA LIMA 1930; RASPLUS *et al.* 1990). COSTA LIMA (1930) reported that individuals of

parasitized *P. torridus* and *H. clavigera* had their internal organs of the abdominal cavity totally damaged, dying a while after the parasitoid's emergence. Contrasting, RASPLUS *et al.* (1990) reported that only adult gonads of *Lincus malevolus* Rolston were atrophied while the remaining organs were unharmed.

Hexacladia is recognized by the distinct petiole, the antennae inserted very high on head, scutellum dome-shaped, fore wings with characteristic infuscation and setae pattern and males having branched antennae (NOYES 2010).

During March 2018, in Passo Fundo (28°15'46" S / 52°24'24" O), Rio Grande do Sul state, Brazil, a total of 22 adults of *Chinavia erythrocnemis* (Berg) (Heteroptera: Pentatomidae) were collected on plants of *Pittosporum undulatum* Ventenat (Pittosporaceae). At the laboratory of the "Centro Nacional de Pesquisa de Trigo - Embrapa Trigo", the insects were kept under controlled conditions (25 ± 1 °C, 60 ± 10 % RU, photoperiod 14 hL:10 hD), in covered plastic boxes, fed twice a week with a natural diet of fresh bean pods (*Phaseolus vulgaris* L.), ripe soybean seeds [*Glycine max* (L.) Merrill] and ripe peanut grain (*Arachis hypogaea* L.).

A male stink bug died due to parasitism and from its body 20 females and four males of *H. hilaris* Burks emerged, through an orifice made at the ventral side of abdomen (Figure 1B). The identification of the parasitoid was made by one of the authors (VAC) and was based on the identification key of NOYES (2010).

There are records of *H. hilaris* in Costa Rica, Porto Rico and

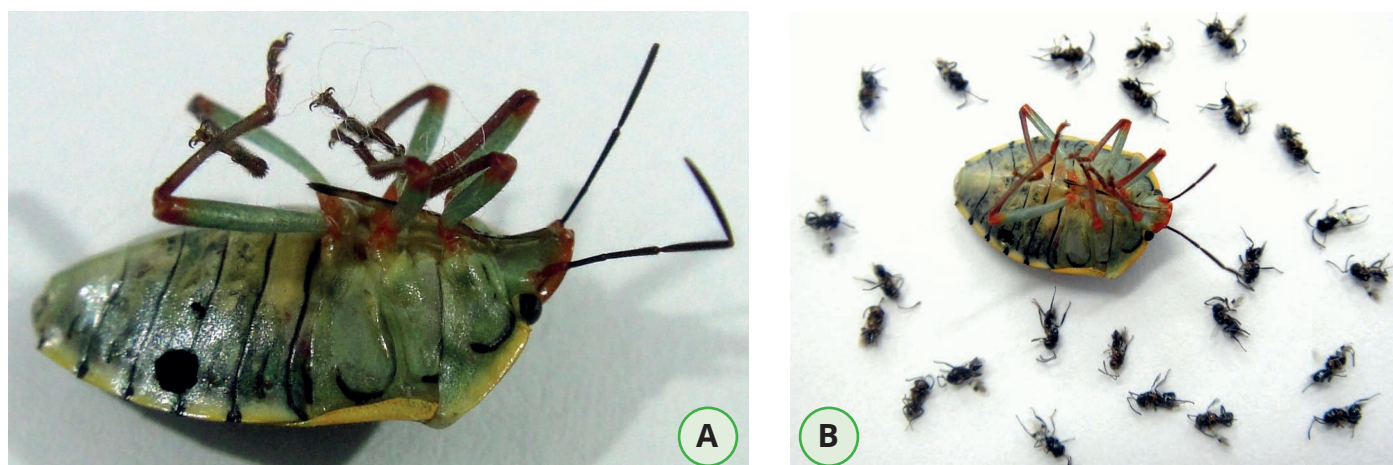


Figure 1. *Chinavia erythrocnemis*, male. A) Emergence orifice of *Hexacladia hilaris* at the abdomen; B) emerged individuals of *H. hilaris*. Author: A. L. Marsaro Júnior.

United States, all associated to phytophagous stink bugs, namely *Acrosternum hilaris* (Say), *Loxa virescens* Amyot & Serville, and *Nezara viridula* (L.) (Heteroptera: Pentatomidae) (NOYES 2019). This is the first record of this parasitoid in South America, as well as its association with *C. erythrocnemis*.

According to NOYES (2010), adults of *H. hilaris* are 2.1 - 3.0 mm long, have general coloration dark-brown and hyaline wings with infuscate areas; the males have branched antennae (Figure 2A), while females do not have such character (Figure 3).

Similar to what was observed in the present study, adults of *H. hilaris* emerged from a female of *A. hilaris*, at South Carolina (USA), through orifices made at the ventral face of the host's abdomen (JONES et al. 1996).

The following differences between the studied specimens and the *H. hilaris* description are reported: the proportion of length of the marginal vein/length of the stigmal vein is 0.87 (vs. 1 at the description) and costal cell with 17-22 ventral setae (vs. 11 setae at description). No other differences were observed in the remaining characters, including in the

male genitalia (Figure 2B). Thirteen voucher specimens were deposited at the "Coleção de Insetos Entomófagos Oscar Monte", at Campinas, São Paulo state, Brazil, at the "Unidade Laboratorial de Referência em Controle Biológico do Instituto Biológico", under the reference numbers from IBCBE 002943 to IBCBE 002955.

Chinavia erythrocnemis has little economic importance in Brazil and was previously observed feeding on white lily, *Lilium longiflorum*, in Rio Grande do Sul (PALMA et al. 2015), where it has been frequently collected on canola plants, *Brassica napus* L. var. *oleifera* (MARSARO JÚNIOR et al. 2017; BIANCHI et al. 2019). This stink bug is also observed feeding on bean, *Phaseolus vulgaris* L. pods (LUCINI et al. 2020).

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Figure 2. *Hexacladia hilaris*, male. A) Antenna (IBCBE 002954). B) Genitalia (IBCBE 002955). Author: V. A. Costa.



Figure 3. *Hexacladia hilaris*, female (IBCBE 002943). Author: V. A. Costa.

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