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Notas / *Notes*

First report of immatures of *Cryptocephalus* Geoffroy, 1762 (Coleoptera: Chrysomelidae) from Brazil with notes of its bioecology on *Wedelia goyazensis* Gardner (Asteraceae) and synthesis of the genus occurrence records in Brazilian territory

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ABSTRACT

Cryptocephalus Geoffroy, 1762 is recognized for its cosmopolitan distribution and great richness, with at least 1700 described species. However, information is lacking for Brazil: (1) no record of immatures; and (2) almost nothing about the biology of this genus. Here, immature stages of *Cryptocephalus* from Brazil are reported for the first time, as well as some notes of its bioecology on the host plant. Records in Brazilian territory are also compiled from the literature.

Keywords: Anthocoridae; Cryptocephalinae; host plant; larva; Neotropical *Cryptocephalus*.

RESUMEN

Primer reporte de inmaduros de *Cryptocephalus* Geoffroy, 1762 (Coleoptera: Chrysomelidae) de Brasil con notas de su bioecología sobre *Wedelia goyazensis* Gardner (Asteraceae) y síntesis de los registros de presencia del género en territorio brasileño

Cryptocephalus Geoffroy, 1762 es reconocido por su distribución cosmopolita y gran riqueza, con al menos 1700 especies descritas. Sin embargo, falta información para Brasil: (1) no hay registro de inmaduros; y (2) no se conoce casi nada sobre la biología de este género. En este trabajo se documentan por primera vez las etapas inmaduras de *Cryptocephalus* de Brasil y se presentan algunas notas sobre su bioecología en la planta huésped. Además, se recopilan sus registros en territorio brasileño a partir de la bibliografía.

Palabras clave: Anthocoridae; Cryptocephalinae; *Cryptocephalus* Neotropical; larva; planta huésped.

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Cryptocephalinae and Lamprosomatinae form the Camptosomata clade within Chrysomelidae and are defined by the behavior of building fecal shelters for and by their offspring (Erber, 1988). The female holds the naked egg with the posterior legs and rotates while covering it with fecal plates to form, after up to half an hour, a capsule; the immature hatches, breaks the maternal seal and expands that first protection with its own feces while developing until reaching the adult stage (Brown & Funk, 2005).

Chryptocephalini has the smallest representatives and concentrates 3500 of the 5300 species of the subfamily; only in the genus *Cryptocephalus* Geoffroy, 1762 (Chrysomelidae: Cryptocephalinae) there are at least 1700 species described (Chamorro, 2014).

Cryptocephalus species can be found feeding on flowers, such as Asteraceae (Baselga & Novoa, 2000; Lencina Gutiérrez *et al.*, 2007). However, even though it is a cosmopolitan genus and there is knowledge of immatures of at least 106 species, there is not a single record of immature stages of this genus in Brazil (Chaboo *et al*., 2016).

Here we present the first report of immature stages of *Cryptocephalus* from Brazil with some notes of its bioecology on the host plant. We also compile *Cryptocephalus* occurrence records in Brazil from the recent literature.

Adult beetles were collected on Asteraceae inflorescences at A.C. Simões Campus, Federal University of Alagoas (-9.557309, -35.775158), in September 2018. Adults were taken to the laboratory together with the inflorescences of Asteraceae to document bioecological aspects. Sexing was performed by observing copulation. Rearing was carried out to obtain juveniles, with inflorescences being replaced daily (24,7-26,8 ºC and 51-72 % RH; photoperiod 12:12 h). To avoid predation, the rearing proceeded with the removal of any other insect from the collected fresh inflorescences, which were immersed in water, with one drop of detergent to break its tension, for 12 hours before being used for food replacement. Digital photographs of the plant and the beetle were taken; and morphometric measurements were performed. Beetles and host plant have been identified by

Figs. 1-6.– *Cryptocephalus* Geoffroy, 1762 sp. (Coleoptera: Chrysomelidae) on *Wedelia goyazensis* Gardner (Asteraceae). 1: Male (left) and female (right). 2: *Wedelia goyazensis* in an urban area in Maceió, Alagoas. 3: Adult beetles copulating (white circle) on inflorescence. 4: Adult feeding on tubular flower petal. 5: Female ovipositing (white circle) on ligulate flower axil. 6: Immature feeding (white circle) on tubular flower pollen. Scale bar = 1 mm.

Figs. 1-6.– *Cryptocephalus* Geoffroy, 1762 sp. (Coleoptera: Chrysomelidae) en *Wedelia goyazensis* Gardner (Asteraceae). 1: Macho (izquierda) y hembra (derecha). 2: *Wedelia goyazensis* en un área urbana de Maceió, Alagoas. 3: Escarabajos adultos copulando (círculo blanco) en la inflorescencia. 4: Adulto alimentándose del pétalo de flor tubular. 5: Hembra ovopositando (círculo blanco) sobre la axila de la flor ligulada. 6: Inmaduro alimentándose (círculo blanco) del polen de flores tubulares. Barra de escala = 1 mm.

specialists, respectively, Dr. Davide Sassi (Università degli Studi di Milano) and Dr. Mara Angelina Galvão Magenta (Universidade Santa Cecília). Beetle voucher specimens will be deposited in the Padre Jesus Santiago Moure Entomological Collection, Federal University of Paraná; plant exsiccates was deposited at the Herbarium-MAC, Environmental Institute of Alagoas, under registration 65501.

The beetle was identified as belonging to the genus *Cryptocephalus*; the female (≈ 2 mm) being larger than the male (≈ 1.6 mm) (Fig. 1). The plant is *Wedelia goyazensis* Gardner (Synonyms: *Aspilia ramagii* Ridl.; *Seruneum goyazense* (Gardner) Kuntze; *Wedelia alagoensis* Baker; *Wedelia hookeriana* Gardner; *Wedelia ramagii* (Ridl.) J.U. Santos; *Wedelia villosa* Gardner) (Asteraceae) (Fig. 2).

In the field, adults were observed copulating on tubular flowers (Fig. 3) or hidden on the ligulate flower axils or sepal axils. During rearing, adult *Cryptocephalus* fed on petals of tubular flowers of *W. goyazensis* (Fig. 4), never on ligulate ones, causing damage to the floral tube. Females oviposit on sepal axils and on ligulate flower axils (Fig. 5). At the end of covering the egg with fecal plates, the female gives a slight kick to the fecal capsule, throwing it back. Eggs do not have a chorionic stem and can be found on ligulate flower axils or sepal axils. No eggs were seen on tubular flowers. After hatching, the larvae look for tubular flowers to feed on pollen, often entering almost entirely into the floral tube (Fig. 6), and may go unnoticed in a superficial search.

Laboratory observations showed that adults and nymphs of pirate bug (Hemiptera: Anthocoridae) forage quickly on inflorescences of *W. goyazensis*, finding *Cryptocephalus* egg capsules and newly hatched larvae which they handled with their front legs. Eggs resist this attack, but the newly hatched larvae are preyed upon.

Wedelia goyazensis is a shrub endemic from Brazil, with prevalent occurrence in the phytogeographic domain of the Caatinga, northeast region (Alves & Bringel Jr., 2020). Immatures of *Cryptocephalus* were registered only once feeding on an Asteraceae (Paulian, 1953), but there are no other reports of Asteraceae flowers as food.

There are 18 published records of *Cryptocephalus* in Brazil (Table 1), four of them in the northeast (Bryant, 1954; Harley *et al*., 1995; Guedes *et al*.,

Table 1.– *Cryptocephalus* Geoffroy, 1762 occurrences in Brazilian territory according to the literature.

Tabla 1.– Citas bibliográficas de *Cryptocephalus* Geoffroy, 1762 en territorio brasileño.

Cryptocephalus	**Locality**	**Identification**	**Extra information**	**References**
binotatus	Brasília, Distrito Federal	Author		Dejean, 1837
chalybeus	Brasília, Distrito Federal	Author		Dejean, 1837
confinis	Brasília, Distrito Federal	Author		Dejean, 1837
cruentatus	Brasília, Distrito Federal	Author		Dejean, 1837
geniculatus	Brasília, Distrito Federal	Author		Dejean, 1837
batesi	Tapajós, Amazonas	Author		Bryant, 1954
brasiliensis	Alto da Serra, São Paulo	Author		Bryant, 1954
flavovittatus	Pernambuco	Author		Bryant, 1954
herbaceus	Amazonas	Author		Bryant, 1954
roberti	Chapada dos Guimarães, Mato Grosso	Author		Bryant, 1954
servicus	Tapajós, Amazonas	Author		Bryant, 1954
nr. *miserabilis*	Espírito Santo; Rio de Janeiro; Paraná	Specialists		Harley *et al*., 1995
nr. *viridaeneus*	Goiás; Minas Gerais; Rio de Janeiro; São Paulo	Specialists		Harley *et al*., 1995
spp.	Bahia; Espírito Santo; Goiás; Minas Gerais; Paraná; São Paulo	Specialists		Harley *et al*., 1995
sp.	Montes Claros, Minas Gerais	Specialists		Leite *et al*., 2007
androgyne	Not informed	Not informed	Phylogenetic tree of biofilm using *Cryptocephalus* as an external group.	Silva, 2012
sp.	Santa Terezinha, Paraíba	Specialists	Two specimens in Caatinga: one in xerophilous vegetation and one in riparian forest.	Guedes *et al*., 2019
sp.	Fernando de Noronha, Pernambuco	Specialists/Authors (it is unclear)		Rafael *et al*., 2020

2019; Rafael *et al*., 2020). However, they only offer superficial information. Only one (Guedes *et al*., 2019) presents habitat data, but no information regarding host plants or bioecology. It is worth noting that we did not compile data from museum collections, which should be consulted for a more complete overview of the distribution of the genus in Brazil.

Cryptocephalus is one of the most species-rich genera within the animal kingdom (Sassi, 2006). However, many descriptions need to be revised since there is a numerous history of taxonomic errors (Schöller, 2002). Very little is known about the biology of this genus in Brazil and this new information can help improve species recognition.

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