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Scientific Note/Comunicação Científica

Floral association of adult *Cyclocephala tucumana* Brethes and *Cyclocephala melanocephala* (Fabricius) with passion flowers (*Passiflora edulis* Sims)

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Abstract. Adults of *Cyclocephala tucumana* Brethes and *Cyclocephala melanocephala* (Fabricius) were sampled in yellow passionflower flowers, being the first record of *C. tucumana* associated with flowers of this plant.

Keywords: Cyclocephalini; Dynastinae; Food resource; Passifloraceae; Scarabaeidae.

Associação floral de adultos de *Cyclocephala tucumana* Brethes e *Cyclocephala melanocephala* (Fabricius) com flores de maracujá (*Passiflora edulis* Sims)

Resumo. Adultos de *Cyclocephala tucumana* Brethes e *Cyclocephala melanocephala* (Fabricius) foram amostrados em flores de maracujá amarelo, sendo o primeiro registro de *C. tucumana* associada com flores dessa planta.

Palavras-chave: Cyclocephalini; Dynastinae; Recurso alimentar; Passifloraceae; Scarabaeidae.

In the family Scarabaeidae and subfamily Dynastinae is the genus *Cyclocephala*, which has several species (RATCLIFFE & CAVE 2002). Some adult *Cyclocephala* beetles are found feeding on pollen and nectar of flowers, which may have an important pollinating function. In Brazil, there is great diversity of *Cyclocephala* with, according to MORÓN (2004), 83 species distributed in several regions. Usually adults of this genus appear associated with flowers of several plant species (MOORE & JAMESON 2013), and in Brazil some of these floral associations can be observed (MAIA *et al.* 2013; COSTA *et al.* 2017).

According to PRANCE & ARIAS (1975), adult *Cyclocephala hardyi* Endrödi beetles were observed within *Victoria amazonica* (Poepp.) J.C. Sowerby (Nymphaeaceae) flowers, where they can be found feeding and pollenizing. CAVALCANTE *et al.* (2009) reported that floral visitors for araticum (*Annona crassiflora* Mart.) (Annonaceae) are *Cyclocephala atricapilla* Mannerheim, *Cyclocephala latericia* Höhne and *Cyclocephala octopunctata* Burmeister, considered important pollinators. As stated by COSTA *et al.* (2017), adult *C. atricapilla*, *C. latericia*, *C. octopunctata* and *C. ohausiana* Hoehne were observed carrying out the pollination of *Annona coriaceae* Mart. (Annonaceae) flowers.

MAIA & SCHLINDWEIN (2006) described adult *C. celata* Dechambre feeding and mating within flowers of *Caladium bicolor* (Aiton) Vent. (Araceae), a species considered an important pollinating agent for this plant. According to MAIA *et al.* (2013), *Taccarum*

ulei Engl. & K. Krause (Araceae) flowers are pollinated exclusively by *Cyclocephala celata* and *C. cearae* Höhne beetles. OLIVEIRA & ÁVILA (2011) reported adult *C. forsteri* Endrödi were observed feeding on inflorescences of *Acrocomia aculeata* (Jacq.) Lodd. ex Mart. (Arecaceae). For *Opuntia monacantha* (Willd.) Haw. (Cactaceae), LENZI & ORTH (2011) described floral visitations of *Cyclocephala* sp feeding on stamens and mating within the flowers. MUNIN *et al.* (2008) verified that adult *C. paraguayensis* Arrow use flowers of *Bauhinia curvula* Benth. (Leguminosae) as a source of food and also as a mating place.

Despite the diversity of *Cyclocephala* observed in Brazil, there is little information on floral associations of adults with cultivated or native plants. In view of that, in a technical visit on 8-10 February 2017, adult *Cyclocephala* beetles were observed in several flowers in a yellow passion fruit (*Passiflora edulis* Sims) commercial crop (Figures 1 and 2), with 1 hectare of cultivated area, located in the municipality of Chapadão do Sul, state of Mato Grosso do Sul, Brazil.

The collected adult beetle specimens were taken to the entomology laboratory of the Universidade Estadual de Mato Grosso do Sul (UEMS) in the municipality of Cassilândia, state of Mato Grosso do Sul, Brazil, and were compared to the adults preserved in the entomological collection. The analysis identified species of *Cyclocephala tucumana* Brethes and *Cyclocephala melanocephala* (Fabricius) (Figure 3). The specimens kept in

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the university entomological collection had been previously identified by Dr. Miguel Angel Morón (Institute of Ecology, Xalapa, Veracruz, Mexico) and Dr. Fernando Zaguri Vaz-de-Mello (Universidade Federal de Mato Grosso, Cuiabá, MT, Brazil).

Adults were found both in withered flowers ($n = 20$) and in open flowers ($n = 15$). Since passion flowers produce nectar and pollen, adult *C. tucumana* and *C. melanocephala* beetles are attracted to feeding on its flowers.

Four to ten adult *C. tucumana* beetles were found within each passion flower. Withered flowers seemed to provide a better protected environment for adults, where the beetles were observed in larger amounts (six to 10 adults per flower); while in smaller amounts in open flowers (four to five adults per flower). For this particular species, this is the first record of adults feeding on passion flowers. Considering that males and females were found in a same flower, probably the adults of this species also mate in the flowers. Although adult *C. tucumana* beetles are found within the flowers, and since they just feed on pollen and nectar, it is very unlikely that any damage would be caused to the flowers.

Adults of *C. melanocephala* were also found in amounts of two to four adults per flower ($n = 8$). In some flowers from where adult *C. melanocephala* beetles were collected, it was observed that

they remained in the floral nectaries, in the anthers, feeding on pollen, and between sepals and fimbriae, or between petals and fimbriae. In the petals and sepals where the adults were found, it was verified that basal portions of the stems had been consumed (Figures 3 and 4), indicating that adult *C. melanocephala* beetles feed on these parts of the flowers. However, the eating habit observed for adults would not cause the flowers to fall, but rather damage them.

Several passion flowers had a withered appearance and many of them fell, indicating that adult *C. tucumana* and *C. melanocephala* were damaging the flowers, leading to flower drop and reduced fruiting. However, *P. edulis* fruiting depends on cross-pollination, thus a decrease in fruiting may be explained by the lack of pollinators (FREITAS & OLIVEIRA JUNIOR 2003).

Despite the above observations, there are reports in the literature describing adult *C. melanocephala* scarab beetles as pests for this culture (GALLO *et al.* 2002; LEONEL & SAMPAIO 2007; OLIVEIRA & FRIZZAS 2014; TAIRA *et al.* 2014). Other than feeding on passion flowers, adult *C. melanocephala* are known for feeding on sunflowers (CAMARGO & AMABILE 2001), *Cereus peruvianus* L. Mill. (Cactaceae) flowers (SILVA & SAZIMA 1995) and *Datura wrightii* Regel flowers (RAGUSO *et al.* 2003).

Finally, this study describes, for the first time, floral associations of adult *C. tucumana* beetles with *P. edulis* flowers.



Figures 1-4. 1 and 3) Adult *Cyclocephala melanocephala* within *Passiflora edulis* flower. 2) Adult *Cyclocephala tucumana* within passion flower. 4) Damage caused to the passionflower sepal by adult *C. melanocephala*. Photos. B.M.R. Dias.

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