

# Association between *Zelus versicolor* (Herrich-Schäffer) (Hemiptera, Reduviidae, Harpactorinae) and *Bidens rubifolia* Kunth (Asterales, Asteraceae)

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**Abstract.** The association between the assassin bug *Zelus versicolor* (Herrich-Schäffer) (Hemiptera, Reduviidae, Harpactorinae) and the plant *Bidens rubifolia* Kunth (Asterales, Asteraceae) is related.

**Keywords:** Brazil; Harpactorini; Meliponini

## Associação entre *Zelus versicolor* (Herrich-Schäffer) (Hemiptera, Reduviidae, Harpactorinae) e *Bidens rubifolia* Kunth (Asterales, Asteraceae)

Resumo. Relata-se a associação entre o percevejo predador *Zelus versicolor* (Herrich-Schäffer) (Hemiptera, Reduviidae, Harpactorinae) e a planta *Bidens rubifolia* Kunth (Asterales, Asteraceae).

**Palavras-chave:** Brasil; Harpactorini; Meliponini

Reduviidae is the second largest family of true bugs (Hemiptera, Heteroptera) and all its members are predators; the Triatominae are distinctive for their blood-sucking habits (SCHUH & SLATER 1995). Despite the lack of consensus about the suprageneric classification of Reduviidae, more than 20 subfamilies are recognized (SCHUH & SLATER 1995). Harpactorinae is the largest subfamily and is represented by the tribes Apiomerini and Harpactorini in the New World. Members of Harpactorinae are commonly associated with plants crops and some have been studied as biological control agents of crop pests (FORERO *et al.* 2008). Harpactorini is the most diversified Reduviidae Group, with 50 genera recognized in the Neotropical Region (GIL-SANTANA & FORERO 2009). There is a need for a revision of the species of the speciose genus *Zelus* Fabricius Worldwide. CAPRILES (1990) recognized 59 species in this genus. HART (1986, 1987) treated the species found in North America and West Indies, but most of the species in Central and South America remain unrevised.

For a long time, the female of the species *Zelus versicolor* (Herrich-Schäffer) assassin bug had been considered as another taxon, *Zelus nigrispinus* (Herrich-Schäffer). Only recently, the synonymy between them was formally established by GIL-SANTANA (2008). *Z. versicolor* has a marked sexual dimorphism (Figs. 1-4, 5), and females show considerable color variation (e. g., Figures 1, 3-4), as do some other species of *Zelus* (GIL-SANTANA 2008). Several observations have shown that certain Harpactorinae are associated with particular plants. These polyphagous predators often live on a single plant, not only as adults but also sometime as immature instars and eggs. While seeking prey, some Harpactorinae apparently found certain plants to have other advantages, and became adapted to visiting these plants species exclusively. In addition to the prey itself, these plants provide other sources of food, rich in sugars, produced by extrafloral nectaries or other structures (BÉRENGER & PLUOT-SIGWALT 1997).

MILLER (1956) believed that a close study the plant-insect relationships of *Cosmoclopius* spp. (Harpactorinae) would be of value in order to deduce the speciation processes in this interesting genus of predatory bugs.

BÉRENGER & PLUOT-SIGWALT (1997) recorded that *Zelus araneiformis* Haviland can achieve complete postembryonic development on glandular formations of *Cecropia obtusa* Tréc. (Cecropiaceae) and furnished a synopsis of the literature on observations about Harpactorinae associated to plants.

The association of *Z. versicolor* and *Bidens rubifolia* Kunth is presented here for the first time.

The field observations were made in the city of Nova Friburgo (22° 17' S; 42° 29' W, ca. 1000 m a. s. l.), Rio de Janeiro State, Brazil, between the months of October to May of the years of 1999-2000, 2002-2003 and 2004-2005, in a total area sampled of about 5.000 m. The area studied presents fragments of secondary forest with native and exotic herbaceous and arboreal species such as *Eucalyptus* sp. (Myrtaceae). Five transects were established in the area and they were walked, slowly, in the morning and/or afternoon, three times per week in the period mentioned above. The insects were observed alive and the observations registered.

In the study area were observed from *B. rubifolia* flowers between March and April.

The insect species was identified following HERRICH-SCHÄFFER (1848), HART (1972) and GIL-SANTANA (2008). The host plant was identified by comparison with material at the herbarium R and the assistance of the specialist Jimi Naoki Nakajima from the Universidade Federal de Uberlândia. Voucher specimens are deposited at Museu Nacional, Universidade Federal do Rio de Janeiro, Brazil, respectively in the entomological collection (MNRJ) and herbarium (R).

A total of 47 females, 27 males and 15 nymphs of *Z. versicolor* were observed alive in the area studied. All but one

female were on individuals of *B. rubifolia*. It's important to notice that the individuals of this plant were found adjacent other species of plants and in places completely exposed to sun as well in moderate shade. On the same plant it was common to see both adults and nymphs of *Z. versicolor*, from November to May. In March and April, along with the flowering of *B. rubifolia*, it was common to see adults of *Z. versicolor* on the flowers (Figures 1-3, 5), where they preyed upon insects attracted to them. Prey observed were small flies, beetles and more frequently Meliponini bees (Figures 1-2, 4). As an additional record, a female with a Tachinid egg attached on its scutellum was observed (Figure 3). Few records of Tachinidae parasitizing Reduviidae are known (GIL-SANTANA & FORERO 2010). Unfortunately, as no adult fly could be obtained, it was not possible to identify the tachinid species, but it is likely a Phasiinae.

The data obtained in the field showed that *Z. versicolor* is associated with *B. rubifolia*. Although a clear advantage of the association observed to *Z. versicolor* is the source of prey in the flowers, the species was also persistently found in other months with no flowering, always only on *B. rubifolia* and not on surrounding vegetation.

Insects require sterols for their growth and development but they are not able to synthesize them (CLARK & BLOCH 1959). The Asteraceae are a large plant family known to synthesize an impressive variety of compounds, and at least some are a known source of sterols (NIÑO *et al.* 2006), diversely metabolized by different insects (JANSON *et al.* 2009). Sterols are synthesized by at least one species of *Bidens* (KHAN *et al.* 2001). Only more extensive future fieldwork would clarify if the significance of the

association observed between *Z. versicolor* and *B. rubifolia* is restricted to prey on its flowers or includes other advantages, such as sterols, to the reduviid.

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Figures 1-3. *Zelus versicolor* (Herrich-Schäffer), females on flowers of *Bidens rubifolia* Kunth: (1) preying a Meliponini bee; (2) preying a Meliponini bee, which is being attacked also by a small spider under the flower; (3) with a tachinid egg attached in its scutellum.



Figure 4-5. *Zelus versicolor*: (4) female preying a Meliponini bee; (5) male on flowers of *Bidens rubifolia* Kunth.

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