

Heliconia Bug *Leptoscelis tricolor* Westwood¹

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Introduction

The heliconia bug, *Leptoscelis tricolor* Westwood, lives in Central America on many species of tropical heliconia plants (Zingiberales: Heliconiaceae). This insect has primarily been used to examine insect behavior, sexual selection, plant-insect interactions, and color variation.



Figure 1. Adult heliconia bug, *Leptoscelis tricolor* Westwood, feeding on *Heliconia platystachys* on Barro Colorado Island, Panama.

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Distribution

Leptoscelis tricolor has been recorded in many areas of Panama, Costa Rica, and Nicaragua, wherever Heliconia plants grow. This insect and its host plants are mostly found in low-lying areas in tropical forests. It is not found in Florida.

Description

The original description (Westwood 1942) is as follows:

“Fulvo-rufescens, capitis thoracisque disco, antennis pedibus et hemelytris nigris, his fascia obliqua ad apicem corii, albida, antice bi-emarginata; tarsi pallidis; abdomine supra fulvo-rufescenti maculis sex parvis nigris, per paria dispositis; thoracis angulis posticis prominulis; corpore subtus toto fulvo-rufescenti.” (Latin)

Adults: The adults are elongate-ovoid shaped with 4-segmented antennae. They are primarily black in color, with red lining the dorsal posterior edges of the pronotum and the sides of the abdomen. A yellowish-white color lines the juncture between the tegmina and membranous part of the forewings. The distal antennae segment is white. The hind femurs of males are enlarged with several pairs of spines on the proximal-ventral side. Female femurs are much more slender, though small spines are still visible under close inspection.

Nymphs: Young nymphs are red and black. Fourth and fifth instar nymphs vary in color, from yellow to orange, red, or black. The variation in color appears to be a form

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Figure 2. Adult heliconia bug, *Leptoscelis tricolor* Westwood, feeding on the inflorescence of a *Heliconia* sp. in Costa Rica.
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of background matching; nymphs raised on lighter species of heliconia, such as *H. latispatha*, are more likely to be lighter in color than nymphs raised on darker species, such as *H. mariae*. Color variation in nymphs does not translate into variation in adult color, i.e., yellow nymphs and black nymphs will both molt into similar-looking adults (Miller & Hollander 2010). There is no evidence of these insects forming aggregations, though other members of this family do aggregate.



Figure 3. Two fifth instar nymphs of the heliconia bug, *Leptoscelis tricolor* Westwood, showing variation in color.
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Life Cycle and Biology

Females lay eggs singly and may spread their eggs among several different heliconia plants. Nymphs complete five instars on a single host plant. Both nymphs and adults feed on developing fruits, nectar from flowers, and the phloem of inflorescences.

The generation time of *L. tricolor* is approximately 30 days. Eggs hatch after approximately 14 days. The first instar nymphs do not feed, but require access to water. This first instar is approximately two days, with the remaining nymphal instars from five to ten days long. The cuticle of new adults remains soft for at least two days after eclosion, and reproductive maturity can occur within ten days. Adults can live for up to 80 days or more.



Figure 4. An almost newly emerged adult heliconia bug, *Leptoscelis tricolor* Westwood.
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The species of heliconia where nymphs grow and develop and the time of year can have significant effects on adult size; the size of adult male hind femurs, used as weapons in contests with other males (Miller & Emlen 2010b); and adult mating behaviors (Miller 2008). Females lay more eggs on *Heliconia platystachys*, the host plant where offspring are most likely to succeed in the middle of the wet season (Miller 2007).



Figure 5. Adult (upper right) and nymph (red insect, lower left) heliconia bugs, *Leptoscelis tricolor* Westwood, on *Heliconia platystachys*.

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Hosts

Leptoscelis tricolor relies upon the inflorescences of heliconia plants for all life stages. It has been recorded on *Heliconia hirsuta*, *H. imbricata*, *H. irrasa*, *H. latispatha*, *H. mariae*, *H. platystachys*, *H. pogonantha*, and *H. vaginalis*, though it probably uses many other species of heliconia as well (Miller & Emlen 2010a). Mark-recapture studies have revealed insect movement between the different species of heliconia (Miller 2007).

Predation and Parasitism

Leptoscelis tricolor is parasitized by a member of the family Encyritidae (Hymenoptera). This wasp parasitoid is very close to *Hexacladia townsendi* (Crawford), described as a parasitoid of *Stenomacra* (Hemiptera: Largidae) in Peru (John Noyes, personal communication). Parasitism by this encyritid species appears to be rare. Occasionally, red mites have also been found feeding externally on *L. tricolor*.

The predators of juvenile *L. tricolor* are primarily invertebrates, including many species of spiders and ants. Adult predators include spiders and insectivorous birds (Miller & Hollander 2010).

Sexual Selection

Male *L. tricolor* defend territories on heliconia inflorescences. When two males encounter one another, one male usually begins twitching his front legs up and down. If the competition continues to escalate, the second male will also begin twitching his front legs up and down. The two males turn around, end-to-end, and wrap their hind legs around one another. Short squeezing bursts may then be observed, with the spines of one or both of the male's legs pressing into the abdomen of the opponent. Squeezing may continue for some time, and males will even continue to wrestle if they fall off the host plant.

Female pairs have been observed competing in a similar fashion, though only rarely.

In addition to male-male competition, as described above, mate choice also occurs. Either a male or a female will approach a member of the opposite sex. Next, the male will begin twitching his front legs up and down, similar to the initiation of a male-male competition. The male will touch a female with his front legs. At this point, females may remain motionless, kick the male away, or leave the area. If a female remains motionless, the male will climb upon the female and initiate copulation (Miller 2007).



Figure 6. Adult heliconia bugs, *Leptoscelis tricolor* Westwood, copulating. The female is in the foreground. Note that females nearly always feed while mating.

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Females nearly always feed while mating. Copulatory courtship is common in this species, where males stroke females and rock while mating (Miller 2008). Both females and males mate multiple times over their lifetimes.

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