

Cornops frenatum frenatum (Marschall) (Orthoptera: Acrididae, Leptysminae) in crops of tropical flowers of *Heliconia* spp. in the State of Pará, Brazil.

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Abstract

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Crops of *Heliconia* spp. were followed in three Municipalities of the State of Pará, Brazil to evaluate the associated pests. The grasshopper *Cornops frenatum frenatum* (Marschall) (Acrididae, Leptysminae) was found among the identified species damaging these ornamental plants, causing significant defoliation.

Additional key words: Amazon, defoliators of *Heliconia*, floriculture, grasshopper.

Resumo

PAULO LEMOS W DE, COELHO RIBEIRO R, GONÇALVES LHANO M, SANTOS DA SILVA JP, COLA ZANUNCIO J. 2010. *Cornops frenatum frenatum* (Marschall) (Orthoptera: Acrididae, Leptysminae) in crops of tropical flowers of *Heliconia* spp. in the State of Pará, Brazil. ENTOMOTROPICA 25(1): 43-47.

Foram realizados monitoramentos para avaliar associação de insetos-praga com plantações de *Heliconia* spp. em três municípios do Estado do Pará, Brasil. O gafanhoto *Cornops frenatum frenatum* (Marschall) (Acrididae, Leptysminae) provoca desfolhamento significativo dessas plantas ornamentais e foi encontrado entre as espécies-praga identificadas danificando as flores tropicais no campo.

Palavras-chave adicionais: Amazônia, desfolhadores de *Heliconia*, floricultura, gafanhoto.

Introduction

Many species of tropical flowers belonging to the families Araceae, Heliconiaceae, Musaceae and Zingiberaceae occur naturally or are cultivated commercially in tropical regions of South America, Asia and West Pacific. Species from these families are characterized by colored flowers with different shapes, longer postharvest

life, great beauty and use in ornamentation (Assis et al. 2002).

The ideal temperature to cultivate *Heliconia* spp. ranges between 21 and 33°C (Castro 2003) with the state of Pará, Brazil, showing proper conditions for the development of these plants.

However, the climate of this region is also favorable for development and establishment of various insect pests of these flowers (Watanabe 2007, Reitz 2009). The Brazilian literature does not have an acceptable classification for the different pest species of cultivated tropical flowers. Some researchers classify them according to the plant part that is damaged, as pests of shoots (for example, grasshoppers and defoliator caterpillars) and pests of roots (for example, Lepidoptera borers and scale species) (Upmooor 2003). On the other hand, other classifications are based on the feeding habit of pests as sap sucking (for example, greenflies, whiteflies, trips) and chewing insects (for example, caterpillars, beetles, and ants) (Imenes and Alexandre 2001).

Species of the genus *Cornops* (Orthoptera: Acrididae, Leptysminae) can be found in different habitats, particularly aquatic. *Cornops aquaticum* (Bruner) is reported as a beneficial insect with potential to be used in the biological control of plants, such as *Eichhornia crassipes* (Mart.), *E. azurea* (Swartz) Kunth and other Pontederiaceae that are noxious weeds in aquatic environments (natural or artificial) (Junk 1997, Hill and Cilliers 1999, Oberholzer and Hill 2001). The subfamily Leptysminae is distributed from the southern Nearctic Region (with the genus *Leptysma* Stål) down to central Argentina and Uruguay (Neotropical region), and *Cornops* spp. from southern Mexico to central Argentina and Uruguay (Adis et al. 2007) and are usually associated to macrophytes.

Information about the occurrence of insect pests in tropical flowers crops, particularly *Heliconia* spp., is scarce in spite of the potential and the diversity of species of this group for the floriculture in the State of Pará, Brazil. This is the first report of an Orthoptera defoliator in plantations of tropical flowers in the Northeast region of the state of Pará, Brazil.

This research was carried out between August 2004 and October 2005 in three municipalities

(Castanhal, Benevides and Belém) of the Northeast region of the State of Pará that corresponds to the main producing areas of tropical flowers in Pará. Different *Heliconia* species cultivated in these municipalities showed leaves with injuries, losses of foliage, and decreased productivity. For this reason, evaluations were made every fifteen days to capture and identify the biotic agent of this damage. The field evaluations revealed a grasshopper as the main defoliator of *Heliconia* spp. plants.

Insects collected in the field were sent to the Entomology Laboratory from Embrapa Eastern Amazonia, where they were reared to obtain adults. Adults of grasshopper obtained in the laboratory were killed, mounted and identified by one of the authors (M.G. Lhano). The adult specimens and photographs allowed the identification of the *Heliconia* spp. plants grasshopper defoliator as *Cornops frenatum frenatum* (Acrididae, Leptysminae).

The species of Leptysminae Amedegnato (1974) (Orthoptera: Acrididae) are grasshoppers with body usually prolonged or bacilliform and differ from other Acrididae because they have the 2/3 of the distal part of tibia semi-cylindric, usually, with lateral expansions, and male cercus curved upward. Nymphs of *C. f. frenatum* show orange antennae and green body with blue and orange markings (Figure 1A). This species is gregarious and always found in groups on the leaf surface (Figure 1B) or inside the "cigars" (coiled unopened leaves). This place seems to be important for the development of *C. f. frenatum* by supplying humidity and shelter against natural enemies. These characteristics were also observed for *C. aquaticum* that feeds on aquatic macrophytes (Carbonell 1981) where it finds food, humidity and protection against natural enemies (Zolessi 1956). *C. f. frenatum* has a semi aquatic habit with sporadic association with *Heliconia* spp. (Adis et al. 2007, Braga et al. 2007) in the Brazilian Amazonia. Immature and

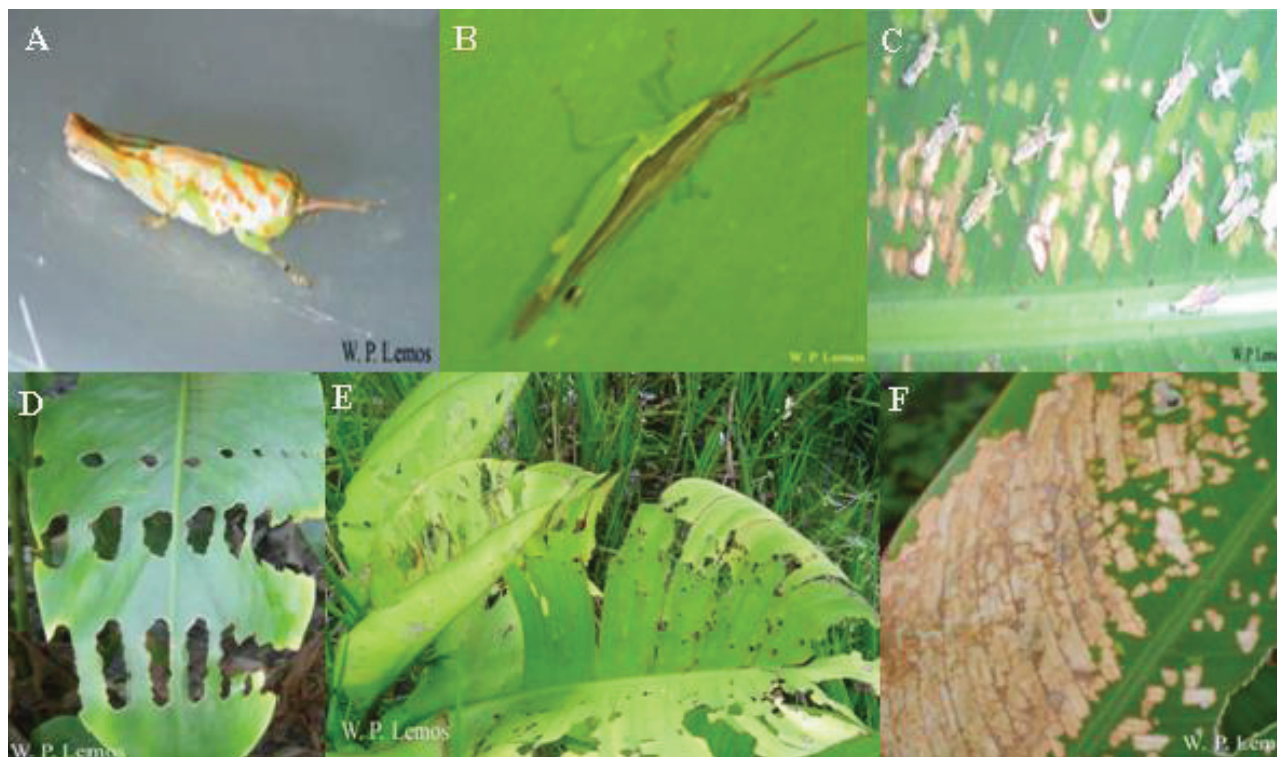


Figure 1. Morphological aspects of nymphs (A), adult (B) and gregarious habit (C) of *C. frenatum* (Orthoptera: Acrididae). *Heliconia* spp leaves with symmetrical damages (D), severe damage (E) and darkened due to attack of immature of grasshopper (F).

adults of *C. f. frenatum* are extremely agile, and would readily flee when approached by humans.

Adults of *C. f. frenatum* are green and with the upper body part and the antenna brown (Figure 1B). They are also characterized by black stripes in the middle part of the thorax and head and wings longer than the abdomen (Figure 1B). Females differ from males by larger and wider body. This characteristic facilitates sex identification, which can also be done based on the external genitalia of these insects.

Fresh damage by *C. f. frenatum* on plants during its first instars (Figure 1A) (from first to the third instars) is characterized by scratching the leaf tegument (Figure 1C) and darkening of the consumed area (Figure 1F). These attacks may occur when the leaves of *Heliconia* spp. are in the “cigar” form before they are fully opened (Figure 1D).

The gregarious habit of immature *C. f. frenatum* (Figure 1C) and its presence in coiled leaves (“cigar”) are also important for their protection (shelter) because this insect shows similar color to that of *Heliconia* spp. plants. The severe attack to coiled leaves causes the appearance of damaged areas in symmetrical positions of the leaves once they are opened (Figure 1D). The potential of damage increases with the growth of this insect and considerable losses of leaf area specially occurs when a large number of individuals of this grasshopper is present (Figure 1F). This may reduce production and flower quality (marketable product) of *Heliconia* spp. crops. However, Braga et al. (2007) reveal that although *C. f. frenatum* presents feeding (herbivore) and oviposition (endofitic) habits that in great populations can reduce the development of *Heliconia*, this grasshopper is not as yet considered a pest of those plants.

Efficient control methods of *C. f. frenatum* do not exist in the Brazilian Amazon region, particularly in the Pará State, because entomological studies in this region (Braga et al., 2007) are relatively recent. Besides the control of Orthoptera pest species in tropical flower crops will depend on the characteristics of the affected area, the plant attacked and the kind of insect in the area. The following measures can be recommended to control grasshoppers in tropical flowers crops: a) manual collection and destruction of immature and adult grasshoppers; b) physical and chemical barriers (for migratory grasshoppers); c) spraying and/or dusting with synthetic insecticides of contact and ingestion and; d) the use of biological insecticides such as entomopathogenic fungi and vegetable extracts (Imenes and Ide 2001).

The possible use of synthetic insecticides in cultivations of *Heliconia* spp. should be done, only, in extreme cases. The care in the selection of these products should minimize environmental damage through faster product degradation, greater efficiency and minimal impact on man, environment and non-targeted organisms.

Cornops frenatum frenatum is nowadays the major defoliator in commercial crops of *Heliconia* spp. in the Northeast region of the Pará State, in the Brazilian Amazonia.

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