Available online at www.sciencedirect.com
ScienceDirect
Acta Tropica 101 (2007) 115–119
ACTA TROPICA
www.elsevier.com/locate/actatropica

Flight dispersal of the Chagas disease vectors *Triatoma brasiliensis* and *Triatoma pseudomaculata* in northeastern Brazil

Ana L. Carbajal de la Fuente [a,*,1], Sebastian A. Minoli [b,c,1], Catarina M. Lopes [a], François Noireau [d], Claudio R. Lazzari [c], Marcelo G. Lorenzo [e]

[a] *Depto. de Entomologia, Instituto Oswaldo Cruz, Fiocruz, Avenida Brasil 4365, CEP 21045-900 Rio de Janeiro, RJ, Brazil*
[b] *Laboratorio de Fisiología de Insectos, Departamento de Biodiversidad y Biología Experimental, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Argentina*
[c] *Institut de Recherche sur la Biologie de l'Insecte, Université François, Rabelais, UMR CNRS 6035, Tours, France*
[d] *Institut de Recherche pour le Developpement (IRD), UR016, Montpellier, France*
[e] *Laboratório de Triatomíneos e Epidemiologia da Doença de Chagas, Centro de Pesquisas René Rachou, Fiocruz, Belo Horizonte, MG, Brazil*

Received 30 May 2006; received in revised form 28 November 2006; accepted 28 December 2006
Available online 10 January 2007

Abstract

The present paper reports for the first time the capture of wild *Triatoma brasiliensis* and *Triatoma pseudomaculata* by means of light traps in Brazil. We tested commercially available lighting devices powered by batteries to attract the bugs to a white piece of cloth in the field. Two main findings showed to be significant: first, the results presented here show that light traps can be used for sampling these species in wild environments; second, they reveal that house colonization by triatomines may also happen as a consequence of the arrival of flying sylvatic bugs guided by artificial light sources. In addition, we discuss the effect of some environmental and biological factors on triatomine flight activity modulation.

Keywords: Triatominae; Light traps; Flight; Sampling; Northeastern Brazil

1. Introduction

Triatomine bugs are vectors of *Trypanosoma cruzi* Chagas, 1909, the etiological agent of Chagas disease. Currently, approximately 120 million people are exposed to infection in Latin America and 16–18 million are effectively infected with this parasite (TDR, 2002). There are more than 130 species of triatomine bugs described, and most of them feed on endothermic animals. Some of these species are closely related to human dwellings, and, therefore, they become epidemiologically important to man. On the other hand, most triatomines species are strictly sylvatic, almost with no contact with humans. Between these two opposite situations, there is a continuous gradient for other species sharing features of both groups (Schofield, 1994). This is the case of *Triatoma brasiliensis* Neiva, 1911 and *Triatoma pseudomaculata* Corrêa & Espínola, 1964, the two main vector species found in northeastern Brazil. *T. brasiliensis* is typically found in rock piles, in association with mammals and reptiles, and *T. pseudomaculata* is commonly found inhabiting hollow trees associated

* Corresponding author. Tel.: +55 21 25 98 43 20; fax: +55 21 25 73 44 68.
E-mail address: carbajal@ioc.fiocruz.br (A.L. Carbajal de la Fuente).
[1] These authors contributed equally to this work.

0001-706X/$ – see front matter © 2007 Elsevier B.V. All rights reserved.
doi:10.1016/j.actatropica.2006.12.007

with birds (Carcavallo et al., 1997; Dias-Lima et al., 2003).

The predominant landscape in our study area is the "caatinga", characterized by the presence of the catingueira tree (*Caesalpinia pyramidalis*) in the northeastern Brazilian region. This dominant vegetal species is distributed in rocky mountain ranges sparsely emerging from flat areas. Two different weather patterns can be described for this region: a remarkably hot and dry climate, that extends from May to the beginning of December; and intermittent rains throughout the rest of the year. As a consequence, there are many differences regarding foliage abundance and, therefore, host availability for the insects. As for the two Chagas disease vectors under study, *T. brasiliensis* is mostly found in the rocky mountain ranges, while *T. pseudomaculata* is more abundant in the flat areas of "caatinga".

Flight is one of the main mechanisms involved in long-distance movements in insects. The dispersal for either food or mate may be considered as the fundamental phenomena that induce them to fly. Nutritional (Lehane et al., 1992; McEwen and Lehane, 1993) and reproductive (McEwen and Lehane, 1994) status, as well as population density (McEwen et al., 1993) and environmental conditions, such as temperature (Lehane et al., 1992; Schofield et al., 1992), are factors known to modulate the flight activity in triatomines. Although triatomines are predominantly walking insects, colonization of new habitats seems to occur by flight and/or by passive dispersal (Forattini et al., 1979). Flight may be an important factor for the colonization of new houses not only by domiciliated species but also by wild species. Light may make human dwellings more attractive to these bugs, but few reports on light trap captures have supported this presumption (Tonn et al., 1978; Schweigmann et al., 1988; Wisnivesky-Colli et al., 1993; Noireau and Dujardin, 2001; Vazquez-Prokopec et al., 2004).

In this work, we analyzed whether *T. brasiliensis* and *T. pseudomaculata* can be captured in the field using light traps.

2. Materials and methods

The collecting area is located near Curaçá, Bahía State (S 8°57′ W 39°49′; 500 m a.s.l.), northeastern Brazil, in the caatinga region. In this area, natural colonies of both *T. brasiliensis* and *T. pseudomaculata* had been previously found by Dias-Lima et al. (2003). 15 light trap captures were done at two different sylvatic locations: a plain zone with arboreal vegetation (site a: 9 nights) and a pile of rocks on a foothill (site b: 6 nights). Only one light trap was operated during the 15 nights in three different periods (November 2001, November 2003 and May 2004, see Table 1).

Table 1
Triatomines captured by means of battery-powered light traps in Curaçá, Bahía State, Brazil

Date	Site	*Triatoma brasiliensis*		*T. pseudomaculata*		Wind	Moon
		Males	Females	Males	Females		
November 2001	b	2	1		1	Weak	No
	b	–	1	–	–	Weak	No
	b	–	–	–	–	Strong	No
	b	1	1	–	1	Weak	No
November 2003	a	–	–	–	–	None	No
	a	1	–	2	1	Weak	No
	a	–	–	1	1	Intermediate	No
	a	–	–	1	–	None	No
	a	–	–	1	1	Intermediate	No
	a	–	–	–	2	Weak	No
April 2004	a	–	–	–	1	Intermediate	No
	a	–	–	–	1	Intermediate	No
	b[a]	–	–	–	–	Strong	No
	a	1	–	2	–	Weak	Cloudy
	b	–	–	–	–	Weak	Yes
Total		5	3	7	9		

Insects were collected in wild environments during November 2001, November 2003 and April 2004. Capture sites corresponding to (a) "caatinga" plain; (b) rock piles on ridges of foothills.

[a] A male of *Panstrongylus lutzi* was captured.