SCIENTIFIC NOTE

Natural Enemies of the Chinch Bug, *Blissus antillus* Leonard (Hemiptera: Lygaeidae: Blissinae), Pasture Pest in Rio de Janeiro State, Brazil

DÉBORAH L.A. CORACINI AND RICHARD I. SAMUELS

Lab. Proteção de Plantas, Universidade Estadual do Norte Fluminense, Av. Alberto Lamego 2000, 28015-620, Campos, RJ, e-mail: richard@uenf.br

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Inimigos Naturais do Percevejo das Gramíneas, *Blissus antillus* Leonard (Hemiptera: Lygaeidae: Blissinae), Praga de Pastagens no Estado do Rio de Janeiro

RESUMO – Esse estudo teve o objetivo de identificar inimigos naturais do percevejo das gramíneas, *Blissus antillus* Leonard, que ataca "Tanner grass" (*Brachiaria arrecta*) e capim Tangola (híbrido de *B. arrecta* e *B. angola*) em pastagens mal drenadas da região Norte e Noroeste Fluminense-RJ. Ninfas de um ácaro parasita, identificado como *Leptus* sp. (Parasitengona: Erythraeidae) foram encontradas regulamente atacando ninfas e adultos do *B. antillus* em todas as regiões onde o percevejo foi amostrado no estado de Rio de Janeiro. O parasitóide de ovos, *Eumicrosoma* sp. (Hymenoptera: Scelionidae), foi observado somente duas vezes atacando ovos de *B. antillus* que têm sido encontrados nas plantas trazidas do campo. Esses inimigos naturais poderiam ser candidatos para utilização em programas de controle biológico. Apesar de uma procura extensa, *B. antillus* nunca foi encontrado infectado com fungos entomopatogênicos.

PALAVRAS-CHAVE: Insecta, controle biológico, *Brachiaria*, parasita, parasitóide.

ABSTRACT – This study aimed to identify natural enemies of the chinch bug, *Blissus antillus* Leonard, which attacks Tanner grass (*Brachiaria arrecta*) and Tangola (hybrid of *B. arrecta* and *B. angola*), in poorly drained pastureland in the northern region of Rio de Janeiro State. Immature stages of a parasitic mite, identified as *Leptus* sp. (Parasitengona: Erythraeidae), were commonly found attacking nymphs and adult chinch bugs in all sampled areas of Rio de Janeiro State. An egg parasitoid, *Eumicrosoma* sp. (Hymenoptera: Scelionidae), was observed on only two occasions attacking eggs which had been collected on plant stems in the field. These natural enemies are possible candidates for biological control programs. Despite extensive sampling, *B. antillus* was not observed to be infected by entomopathogenic fungi.

KEY WORDS: Insecta, biological control, *Brachiaria*, parasite, parasitoid.

Chinch bugs were first observed attacking pasturelands in Minas Gerais State (MG) in 1975, in Rio de Janeiro State (RJ) in the 1980's (Pereira & Silva 1988) and most recently in Mato Grosso do Sul State in 1996 (Valério *et al.* 1999). These chinch bugs were initially identified as *Blissus leucopterus* Say (Hemiptera: Lygaeidae), which is a very serious pest of sorgum in the USA (Spike *et al.* 1994). However, as the chinch bugs in MG and RJ were only found attacking Tanner grass (*Brachiaria arrecta*) and Tangola (hybrid of *B. arrecta* and *B. angola*), it was suspected that the insect had been wrongly identified. Therefore samples from Mato Grosso do Sul State and RJ were sent to Dr. Thomas Henry (USDA), for identification. The chinch bugs were subsequently identified as *Blissus antillus* Leonard, which had been originally described from Puerto Rico (Leonard 1968). The correct identification of this pest species is important in the development of integrated pest management or biological control programs. Here we describe for the first time the occurrence of two natural enemies of the chinch bug in Brazil, which may have potential for control purposes.

Insects were collected in pastures of Tanner grass and Tangola in the State of Rio de Janeiro (Municipals of Campos dos Goytacazes, Macaé, Rio das Ostras, São Francisco de Itabapuana), during the period 1997-2001 at regular intervals. Collection was carried out by placing a large plastic tray at the base of the plant and subsequently beating the plant, in order that the insects fell into the tray. The population density in the field was determined by collecting insects from one square meter areas by extensive beating until no more insects

were found. Three samples were taken from each pasture. It should be noted that this technique underestimates the actual population. The rate of parasitism by *Leptus* sp. was determined by counts from randomly collected samples in the field at three different sites. Numbers of mites attacking individual insects were determined by observations of the same random samples used for rate of parasitism determinations collected from Ibitioca.

The taxonomy of chinch bugs in the Neotropics is in serious need of revision (Dr. Thomas J. Henry, USDA, pers. com.). However, despite the seriousness of this pest species in Brazil, very little is known about its biology or natural enemies. Populations of this insect can reach alarming levels, causing death of the host plant, probably due to the losses of nutrients. During collection of insects in the field, heavy infestations were classified to have population densities of approximately 2000 insects m^{-2}. Other studies described serious infestations to be as high as 20,000 insects m^{-2} (Reis 1976, Reis *et al.* 1976).

Insects (2^{nd}- and 5^{th}-instar nymphs and adults) were regularly found in the field with parasitic mites attached to the integument. The incidence of parasitism determined during collections at three different sites is shown in Table 1. The highest levels of parasitism were observed in São Francisco de Itabapuana (4.3%). Insects were observed with up to four mites per individual, however this number of mites were only seen attacking 5^{th}-instar nymphs and adults. The relationship between developmental stage and number of parasites is shown in Table 2. The mites were identified by Dr. R. Ochoa (USDA) as larvae of a *Leptus* sp. (Parasitengona: Erythraeidae), a generalist parasite (R. Ochoa, pers. com.). These mites could be considered as part of a future integrated pest management program. Another interesting observation made during these studies was the occurrence of an egg parasitoid, *Eumicrosoma* sp. (Hymenoptera: Scelionidae). *Blissus* eggs were parasitized by this micro-hymenoptera, which following emergence was identified by Dr. John Huber (ECORC, Canada). However, it was not possible to quantify the rate of parasitism in the field as the eggs found to be parasitized by this hymenopteran were observed as a result of introduction of infested plant material into laboratory populations. A total of 23 eggs were parasitized on two different occasions. The egg parasite *Eumicrosoma benefica* Gahan has been reported as a natural enemy of *Blissus leucopterus* (McColloch & Yuasa 1915) and *Blissus insularis* Barber (Reinert 1978) in the USA, and may be an important factor in the natural control of chinch bug populations.

Although the entomopathogenic fungus *Beauveria bassiana* (Bals.) Vuill. has been found to cause natural epizootics in populations of *Blissus leucopterus* in the USA (Kruger *et al.* 1992), chinch bugs naturally infected by entomopathogenic fungi have yet to be found in Rio de Janeiro State following six years of intensive sampling and collection of insects in the field. During this period all moribund insects collected in the field or subsequently from laboratory maintained populations, were separated and maintained in a humidity chamber to induce fungal development. The only microorganisms observed were found to be saprophytic. The absence of natural infections of the southern chinch bug, *Blissus insularis* Barber, has also been noted, despite the humid habitat frequented by this insect (Wilson 1929, D. Boucais, pers. com.). However, Reinert (1978) stated that *B. bassiana* is an important pathogen of all life stages of *B. insularis*. In studies of pathogenicity of *B. bassiana* and *Metarhizium anisopliae* (Metsch.) Sorok against adult females and 4^{th}-instar nymphs of *B. antillus*, we considered this insect either to have a low susceptibility to infections, requiring high levels of inoculum (5×10^8 conidia ml^{-1}) to cause mortality greater than 50%, or that the isolates so far

Table 1. Rate of parasitism of *Blissus antillus* by *Leptus* sp. Rio de Janeiro, 1997-2001.

Collection site	Date	Total number of insects	% parasitized
Ibitioca (Campos)	09/01	582	2.4
São Francisco de Itabapuana	04/98	353	4.3
Macaé	05/99	298	2.8

Table 2. Relationship between host developmental stage and number of parasites observed. Rio de Janeiro, 1997-2001.

Developmental stage	Number of *Leptus* sp. per insect host			
	1	2	3	4
2^{nd} instar	9	2	0	0
3^{rd} instar	23	4	1	0
4^{th} instar	11	2	1	0
5^{th} instar	30	8	1	1
Adult	48	11	4	2

tested were of low virulence to this insect (Coracini 2000). The production of anti-fungal compounds by Hemipterans may be related to the low susceptibility of these insects. Sosa-Gomez *et al.* (1997) detected the aldehyde E-2-decenal in the cuticle of *Nezara viridula* (L.), which inhibited germination of *M. anisopliae* conidia. It is interesting to note that the egg phase of *B. antillus* was found to be highly susceptible to infection by certain isolates of *M. anisopliae*, whilst isolates of *B. bassiana* were generally non-pathogenic (Samuels *et al.* 2002).

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