SCIENTIFIC NOTE

Natural Efficiency of Parasitism by *Billaea rhynchophorae* (Blanchard) (Diptera: Tachinidae) for the Control of *Rhynchophorus palmarum* (L.) (Coleoptera: Curculionidae)

José Inacio L. Moura[1], Ronaldo Toma[2], Ricardo B. Sgrillo[3] and Jacques H.C. Delabie[4]

[1]*Estação Experimental Lemos Maia / CEPLAC, 45690-000 Una, BA, jinacio@bitsnet.com.br*
[2]*Museu de Zoologia, USP, Avenida Ipiranga, 481, C. postal 42694, 04299-970 São Paulo, SP*
[3]*Seção de Métodos Quantitativos;* [4]*Unidade de Pesquisa Associada Laboratório de Mirmecologia, Convênio UESC-CEPEC, delabie@cepec.gov.br. CEPEC/CEPLAC, C. postal 7, 45600-000 Itabuna, BA*

Neotropical Entomology 35(2):273-274 (2006)

Eficiência do Parasitismo Natural por *Billaea rhynchophorae* (Blanchard) (Diptera: Tachinidae) para o Controle de *Rhynchophorus palmarum* (L.) (Coleoptera: Curculionidae)

RESUMO - Foi avaliada a ocorrência do parasitóide *Billaea rhynchophorae* (Blanchard) em larvas de *Rhynchophorus palmarum* (L.) em plantações das palmeiras piaçava (*Attalea funifera* Mart.) e dendê (*Elaeis guineensis* Jacquin) no Sudeste da Bahia. As porcentagens mensais de parasitismo foram determinadas durante 13 meses, entre novembro de 2000 e novembro de 2001, comparando-se o número de casulos de *R. palmarum* parasitados e não-parasitados. O índice médio de parasitismo foi 40%, variando de 57% em novembro de 2000 a 18% em julho de 2001. Enquanto não existe método de criação massal do parasitóide, recomenda-se uma prática simples de manejo que visa a preservar seu efeito benéfico nas plantações de palmeiras.

PALAVRAS-CHAVE: *Attalea funifera*, *Elaeis guineensis*, palmeira, *Bursaphelenchus cocophilus*, doença do anel vermelho

ABSTRACT - The occurrence of the tachinid parasitoid *Billaea rhynchophorae* (Blanchard) on larvae of the palm weevil *Rhynchophorus palmarum* (L.) was evaluated in plantations of piassava palm (*Attalea funifera* Mart.) and African oil palm (*Elaeis guineensis* Jacquin), in southeastern Bahia, Brazil. The monthly percentages of parasitism were evaluated during 13 months, from November 2000 to November 2001, based on the comparison between the number of parasitized and non-parasitized cocoons of *R. palmarum*. Mean parasitism was 40% and ranged from 50% in November 2000 to 18% in July 2001. While there is no method of mass reproduction of the parasitoid, a simple management practice is recommended, in order to preserve its beneficial effects in palm plantations.

KEY WORDS: *Attalea funifera*, *Elaeis guineensis*, palm tree, *Bursaphelenchus cocophilus*, red ring disease

The palm weevil *Rhynchophorus palmarum* (L.) is one of the most important pests of coconut and African oil palm in Tropical America causing relevant economic damages (Bondar 1940; Franco 1964; Ferreira *et al.* 1998, 2002). This insect is the main vector of the red ring disease caused by the nematode *Bursaphelenchus cocophilus* (Cobb). Many researches have been carried out (Bondar 1940, Franco 1964, Morin *et al.* 1986) in order to find more efficient ways of controlling *R. palmarum*. Among the reports on the use of natural enemies aiming at the biological control of the beetle, there are references in the literature on the fungus *Beauveria bassiana* (Balsamo) Vuillemin and the parasitoid tachinid *Billaea menezesi* (Guimarães) (formerly *Paratheresia menezesi*) (Diptera: Tachinidae) (Moura *et al.* 1993, Ferreira *et al.* 2002). The other tachinid *Billaea rhynchophorae* (Blanchard) was reported by Guimarães (1977a, 1977b) as a parasitoid of *R. palmarum*, but, according to Murphy & Briscoe (1999), no recent study has been reported on this fly.

Observations on piassava, *Attalea funifera* Mart, and African oil palms, *Elaeis guineensis* Jacquin, were carried out in palm plantations at Una and Canavieiras, Bahia State, Brazil. Twenty cocoons of *R. palmarum* were collected monthly in *A. funifera* and another 20 in *E. guineensis*, all on plants infected with the red ring disease in advanced stage

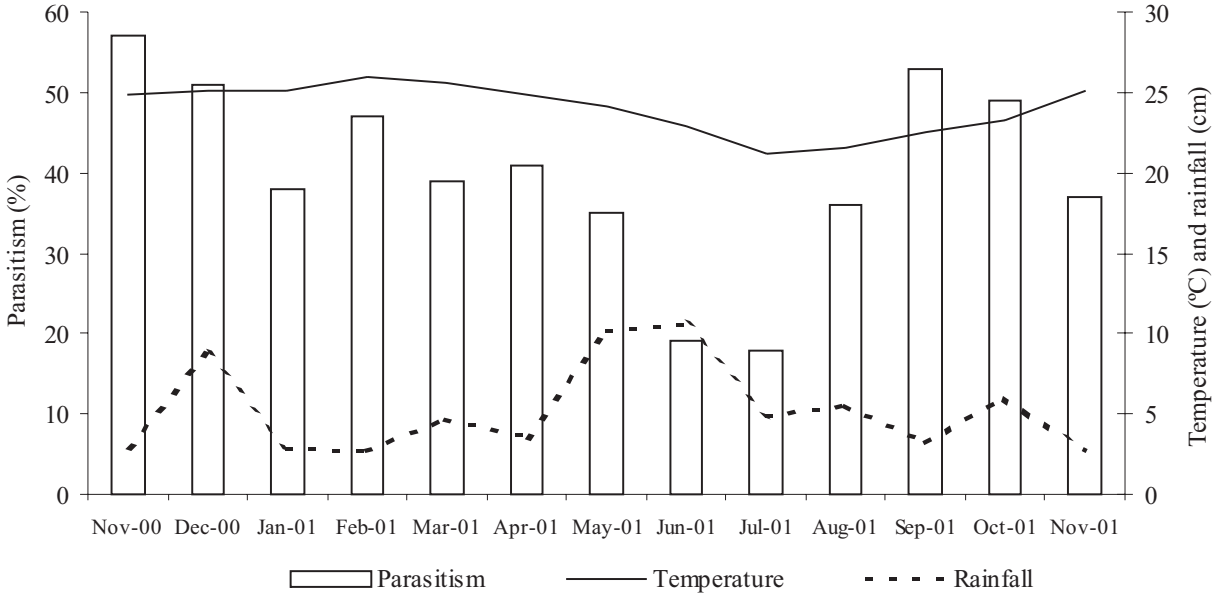

Fig. 1. Monthly percentage of parasitism by *B. rhynchophorae* on pupae of *R. palmarum*, rain precipitation and temperature, Una, Bahia, Brazil, November 2000 to November 2001.

of decomposition. Percent parasitism was calculated as the ratio between the number of parasitized and non-parasitized cocoons of *R. palmarum*s. We considered as non-parasitized cocoons those that presented inside living imago, larvae or pupae of *R. palmarum*, and as parasitized those with larva, exsuviae, puparia or rests of puparium of *B. rhynchophorae*.

Mean parasitism of *B. rhynchophorae* on *R. palmarum* was 40% (Fig. 1). The results showed a reduction in the percentage of parasitism during winter probably linked to the increase of precipitation in May and June as well as a reduction of temperature.

Mass rearing and release of *B. rhyncophorae* for the control of *R. palmarum* is not possible yet because the biological cycle of the former species is unknown. However, in order to protect this parasitoid we suggest that large amounts of cocoons of *R. palmarum* should be collected and placed in screening cages in which the mesh size would allow the tachinid flies to escape while the non-parasitized hosts are retained.

References

Bondar, G. 1940. Insetos nocivos e moléstias do coqueiro (*Cocos nucifera* L.) no Brasil. Salvador, Tipografia Naval, 156p.

Ferreira, J.M.S., M.F. Lima, D.L.Q. de Santana, J.I.L. Moura & L.A. de Souza. 1998. Pragas do coqueiro, p.189-267. In J.M.S.Ferreira, D.R.N. Warwick & L.A. Siqueira (eds.), A cultura do coqueiro no Brasil, 2ª. ed., Brasília, Embrapa-SPI/ EMBRAPA-CPATC, 292p.

Ferreira, J.M.S.; M.M. Filho & P.M.P. Lins. 2002. Pragas do coqueiro: características, amostragem, nível de ação e principais métodos de controle. p.37-57. In J.M.S Ferreira & M. Michereff Filho (eds.), Produção integrada de coco: Práticas fitossanitárias. Aracaju, Sergipe, Embrapa / Tabuleiros Costeiros, 107p.

Franco, E. 1964. Estudo sobre o anel-vermelho do coqueiro. Inspetoria de Defesa Sanitária Vegetal, Rio de Janeiro, 233p.

Guimarães, J.H. 1977a. Host-Parasite and Parasite-Host catalogue of South American Tachinidae (Diptera). Arquivos Zool. 28: 1-131.

Guimarães, J.H. 1977b. A revision of the genus *Paratheresia* Townsend (Diptera: Tachinidae, Theresiini). Papéis Avulsos Zool. 30: 267-288.

Morin, J.P., F. Lucchini, J.M de Ferreira & L.S. Fraga. 1986. Le controle de *Rhynchophorus palmarum* par piégeage à l'aide de morceaux de palmier. Oléagineux 41: 57-62.

Moura J.I.L., D. Mariau & J.H.C. Delabie. 1993. Eficiência de *Paratheresia menezesi* Townsend (Diptera: Tachinidae) no controle biológico natural de *Rhynchophorus palmarum* (L.) (Coleoptera: Curculionidae). Oléagineux 48: 219-223.

Moura, J.I.L., J.M.S. Bento., J. de Souza & E.F. Vilela. 1997. Captura de *Rhynchophorus palmarum* pelo uso de feromônio de agregação associado à árvore-armadilha e inseticida. An. Soc. Entomol. Brasil 26: 69-73.

Murphy S.T. & B.R. Briscoe. 1999. The red palm weevil as an invasive: Biology and the prospects for biological control as a component of IPM. Biocontrol News Inf. 20: 35-46.

Received 23/I/04. Accepted 18/VI/05.