EFFICACY OF MOLASSES AND Beauveria bassiana (Balsamo) Vuill ON THE CONTROL OF Cosmopolites sorditus Germar, 1824

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ABSTRACT

This research sought to study the compatibility between the molasses and the entomopathogenic fungi *Beauveria bassiana* (Balsamo) Vuill on the control of *Cosmopolites sorditus* Germar, 1824. The study was conducted on the Site Pitiá in a banana plantation of approximately 250 m^2, located in the municipality of Areia, state of Paraiba, Brazil. The results showed that the constancy of *C. sorditus* was significantly higher in traps consisting of molasses+fungi (P <0.01). And significantly lower in traps without yeast and molasses. The frequency of *C. sorditus* was classified as accidental in traps with only *B. bassiana* (23.44%) and in traps without the addition of *B. bassiana* and molasses (10.71%), and being accessory in traps consisting of molasses (28.43%) and in traps with molasses+fungi (37.27%). Therefore the food bait molasses along with the fungi *B. bassiana*, may be used in an integrated control of *C. sorditus* in banana plantations.

Keywords: Capture; Efficiency; Weevil.

EFICIÊNCIA DE MELAÇO E *Beauveria bassiana* (Balsamo) NO CONTROLE DE *Cosmopolites sorditus* Germar, 1824

RESUMO

Esta pesquisa procurou estudar a compatibilidade entre o melaço e o fungo entomopatogênico *Beauveria bassiana* (Balsamo) Vuill no controle de *Cosmopolites sorditus* Germar, 1824. O estudo foi conduzido no Sítio Pitiá no Município de Areia, brejo paraibano. Os resultados evidenciaram que a constância de *C. sorditus* foi significativamente superior em armadilhas constituídas de melaço+fungo (P< 0,01) e significativamente inferior em armadilhas sem fungo e melaço. A frequência de *C. sorditus* foi classificada em acidental em armadilhas com somente *B. bassiana* (23,44%) e em armadilhas sem adição de *B. bassiana* e melaço (10,71%), e sendo acessória em armadilhas constituídas de melaço (28,43%) e em armadilhas com melaço+fungo (37,27%). Portanto, o atrativo alimentar melaço juntamente com o fungo *B. bassiana*, poderão ser utilizados de forma integrada no controle de *C. sorditus* na cultura da bananeira.

Palavras-chave: Captura; Eficiência; Broca.

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1. INTRODUÇÃO

Cosmopolites sorditus Germar, 1824, is frequent in the banana plantations, with a wide distribution in the Americas, from the United States to Brazil (ZORZENO et al., 2000; GALLO et al., 2002; PRESTES et al., 2006). Several control measures can be taken to reduce the incidence of drill bits in banana plantations, such as the production of bait, you can type and type cheese tile, cultural control through the application of vegetation and microbial control, using entomopathogenic fungi.

The microbial control of pests is a branch of biological control is the rational use of entomopathogenic maintaining populations of target organisms below the economic threshold (MOINO Jr, 2005). A viable alternative is the biological control of insects, this control can be done in several ways, involving different species, including other controller insects of agricultural pests. Entomopathogenic fungi are known and used worldwide as biocontroller agents of many agricultural pests, they have potential to control several insect orders (BRIDGE et al., 1990; ALVES, 1992; PEREIRA et al., 1993). The use of entomopathogenic microorganisms for pest control has grown in proportion to the interest in a pesticide-free farming chemicals, coupled with environmental preservation (ALMEIDA & BATISTA FILHO, 2006). To control of banana drill the fungi *Beauveria bassiana* has been shown to be feasible, reducing the insect population of the economic injury level (BURG & MAYER, 2006).

The entomopathogenic fungi *B. bassiana* is one of the most studied and used biological control agents of *C. sorditus* in Brazil (FANCELLI et al., 2004), this species of fungi occurs frequently on insects and soil samples, which can persist for a long time saprogenesis colonizing in the form field epizootic and enzootic (ALVES, 1998; 2004) oral infection can occur in some insects, and can penetrate the respiratory system via the spiracle (ROBINSON, 1966).

As a result of harmful effects to humans and the environment, caused by chemicals, alternatives that reduce those problems and are compatible with other control tactics must be studied (PEREIRA et al., 2004; 2006), so there is a growing demand other methods of control. The use of bait in the presence of attractive food and entomopathogenic fungi may serve as a tool of paramount importance in monitoring programs and control bits in bananas, although the knowledge on the integrated use of these elements is considered undeveloped. Therefore this study aimed to assess the field

compatibility between the food bait molasses with the entomopathogenic fungi in the control of *C. sorditus*.

2. MATERIAL AND METHODS

The study was conducted on the Site Pitiá in a banana plantation of approximately 250 m^2, located in the municipality of Areia, latitude -6.973270 and longitude: -35.691770 state of Paraiba, Brazil. The fungi used was *B. bassiana* obtained by Boveril® product manufactured by ITAFORTE BioProdutos Company. The attraction was used molasses sugar, diluted with water (10%). In this study, we used the traps: cheese and tile. The fungal solution was prepared by diluting 30g product Boveril® in 2 liters of water, as proposed by Burg & Mayer (2006), the product was mixed and applied with or without the attractive molasses traps.

The experimental design was randomized blocks, distributed in a 2x4, and 2 types of traps: type cheese and tile. As each trap consists of the following treatments: only attractive, only fungus traps with fungus+attractive traps and only traps (control). Each treatment consisted of 3 blocks, each block consisting of 3 traps. To fulfill the requirements of ANOVA, data were transformed into $(x+0.5)^{1/2}$. The results were analyzed by SNK test.

The data were subjected to analysis of constancy of each pest specie, the constancy was determined with the formula: C= P x 100/ T, where C= constancy index; P= total number of collections with a specific trap and pest species; N= total number of collections. Pest species and traps were classified in the following categories based on constancy indexes (BODENHEIMER, 1955; SILVEIRA NETO et al., 1976, GALLO et al., 2002): "constant"= present in more than 50% of collections; "accessory"= present in 25% to 50% of collections and "accidental"= present in less than 25% of collections.

3. RESULTS AND DISCUSSION

The results showed that the constancy of *C. sorditus* was significantly higher in traps consisting of molasses+fungi ($P < 0.01$). And significantly lower in traps without fungi and molasses. In other hands, it was found that the frequency of *C. sorditus* was classified as accidental in traps with only *B. bassiana* (23.44%) and in traps without the addition of *B. bassiana* and molasses (10.71%), and being accessory in traps consisting of molasses (28.43%) and in traps with molasses+fungi (37.27%) (Table 1).

Traps consisted of molasses and *B. bassiana*, were more promising for the control of *C. sorditus*. Results obtained by Fancelli et al. (2004) confirm the practical possibility of using entomopathogenic fungi to control drills banana. Allied to this tactic to control the bait with food baits in the case of molasses cane sugar, because they are inexpensive and easy to obtain (PEREIRA et al., 2004; 2006) can increase the efficiency of control of these insects in the field.

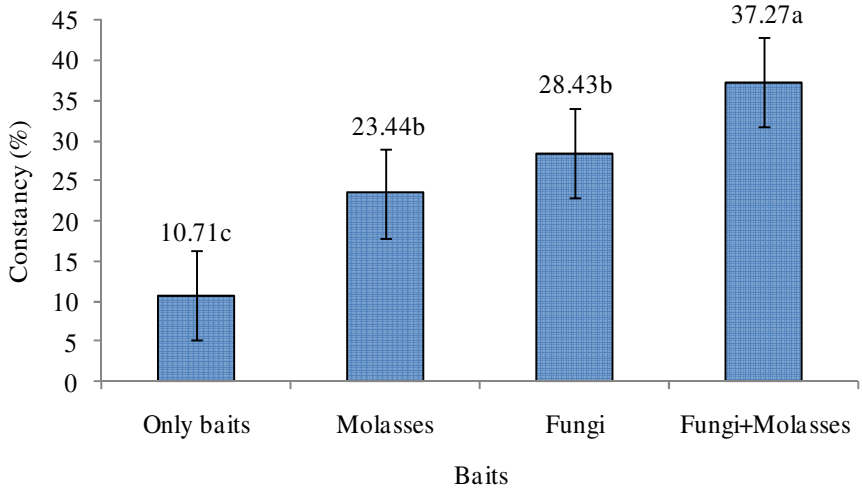

Figure 1. Effects of different forms of attractive baits clothing in constancy (Mean±SE) of *Cosmopolites sorditus.* Mean in original values; analysis of variance conducted with data transformed into $(x+0.5)^{1/2}$. Means followed by the same letter did not differ significantly by SNK test (P = 0.05).

The compatibility between these two products is of great importance, since the use of molasses along with *B. bassiana* did not affect the frequency of *C. sorditus* in the traps. Moreover, the addition of *B. bassiana* is considered prolonged (BURG & MAYER, 2006), is unnecessary in most cases to repeat the application in the same year. As Fancelli et al. (2004) fter the adult to be infected with the conidia, remains alive, helping to disperse the entomopathogen, even to areas not treated. Therefore, the results of this research confirmed the possibility of integration between fungi and attractive food molasses bait, since the fungi former is considered viable, and the latter product can be readily obtained.

4. CONCLUSION

The results of this research show that the food bait molasses along with the fungi *B. bassiana* are compatible and may be used in an integrated control of insects-pest *C. sorditus* in banana plantations.

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