

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Entomology Papers from Other Sources

Entomology Collections, Miscellaneous

10-22-2010

Biological Control of Rubber Tree Lace Bug by Endophytic Parasitoid in Brazil

Rodrigo Souza Santos RSS
Embrapa Amapá, santos_rss@hotmail.com

Follow this and additional works at: <https://digitalcommons.unl.edu/entomologyother>



Part of the [Entomology Commons](#)

Santos, Rodrigo Souza RSS, "Biological Control of Rubber Tree Lace Bug by Endophytic Parasitoid in Brazil" (2010). *Entomology Papers from Other Sources*. 114.
<https://digitalcommons.unl.edu/entomologyother/114>

This Article is brought to you for free and open access by the Entomology Collections, Miscellaneous at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Entomology Papers from Other Sources by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

BIOLOGICAL CONTROL OF RUBBER TREE LACE BUG BY ENDOPHYTIC PARASITOID IN BRAZIL

Abstract - The rubber tree is a plant cultivated with the purpose of extraction of the natural rubber (latex), being an important segment of the Brazil economy. Among the main curses that attack the culture, he stands out the tingid, *Leptopharsa heveae* Drake & Poor (Hemiptera: Tingidae) and among their main natural enemies they stand out the lace wings, the mushroom *Sporothrix insectorum* and the egg parasitoid *Erythmelus tingitiphagus* (Soares) (Hymenoptera: Mymaridae). The objective of the work was to report the potential of this natural enemy use, as auxiliary in programs of integrated handling of this pest of rubber plantations. The study was developed in the farm of company "Plantações E. Michelin Ltda.", municipality of Itiquira, Mato Grosso, from October 2005 to February 2006 and from August 2006 to January 2007, being collected ripe folioles of five rubber tree clones (RRIM 600, PR 255, PB 235, PB 217 and GT 1), counted the number of eggs by foliole and the number of emerged parasitoid of the same ones. It was verified an average parasitism rate of 18.8% in the first period and 24.2% in the second.

Key words: Chalcidoidea, Euphorbiaceae, *Hevea brasiliensis*, Mymaridae.

Hevea brasiliensis Müell. Arg. is original from Brazil. It presents the largest reproductive capacity and the largest genetic variability (COSTA, 2001; FRANCISCO *et al.*, 2004). It is a tree with perennial cycle, of tropical origin, cultivated and utilized in an extractive way, with the purpose of natural rubber production (CAMPELO-JÚNIOR, 2000). From the retreat of its habitat, it started to be cultivated in big monocultures, mainly in Asian countries. In Brazil, its cultivation has obtained great success in South-East and West-Center regions, in Bahia and more recently in the west of Paraná (MARINHO, 2006).

The heveiculture has been expanding in a considerable way in planted areas in Brazil since 1970. This increase was related to two factors: high prices in the domestic market and ecological conditions favorable to the cultivation (BERNARDES, 1992). Nowadays there are more than 200 thousands hectares of lands filled with rubber tree plantations, distributed in several areas of the country (ABREU, 1996).

Amongst the main pathogens and key-pests of heveiculture, some organisms stand out: the fungus responsible for the disease known as “South American Leaf Blight”, *Microcyclus ulei* (P. Henn.) (SCOMPARIN, 2000), the mites of the families Eriophyidae (*Calacarus heveae* Feres, 1992, *Phyllocoptruta seringueirae* Feres, 1998, and *Shevtchenkella petiolula* Feres, 1998) and Tenuipalpidae (*Tenuipalpus heveae* Baker, 1945) (FERES, 1992; FERES, 2000; FERES *et al.* 2002), and the lace bug of the family Tingidae, *Leptopharsa hevae* Drake & Poor (Fig. 1) (VENDRAMIM, 1992).

This lace bug attacks the leaves of rubber tree grown in nursery, in young plantations and in productive plantations. The adult is characterized by the reticulated and honeycombed look of hemelytra and thorax, whitish color, presence of testaceous thorns, long legs, reticulated and tricarinated pronotum, hemelytra extended at the back of the abdomen (TANZINI, 1996). They have paurometabolic development and undergo by five ecdises until reach the adult stage (MOREIRA, 1986). The layings are endophytic, with isolated eggs on the lower page of rubber tree leaves, leaving the operculum exposed (TANZINI, 1996).



Figure 1. Adult *Leptopharsa heveae* (Hemiptera: Tingidae) at the abaxial face of rubber tree foliole (Credit of the picture: Fernando da Silva Fonseca – “Plantações E. Michelin Ltda.”).

According to MOREIRA (1986), both lace bug young stages and adults are located on the lower part of the leaves, sucking the sap and destroying the parenchyma, making the chlorophyllian function of the plant difficult, besides producing injuries which favor the appearing of microorganisms. The attack in high infestations causes a reduction of 28% in the growth in height and of 44.5% in the diameter of plants stem, in slips (MOREIRA, 1986) or even a fall in latex production in up to 30% (TANZINI & LARA, 1998).

The main natural enemies of lace bug recorded in literature are the green lacewings, the entomopathogenic fungus *Sporothrix insectorum* Hoog & Evans, and the parasitoid of the family Mymaridae, *Erythmelus tingitiphagus* (Soares). COSTA *et al.* (2003) observed *L. heveae* eggs parasitized by this microhymenopteran (Fig. 2) in leaves of clone PB 235 in the municipality of Pindorama, São Paulo state, Brazil, observing a parasitism rate of 7%.

This study was carried out from October 2005 to February 2006 and from August 2006 to January 2007 in the farm of the company "Plantações E. Michelin Ltda." (latitude 17°22'S and longitude 54°44'W), located in the municipality of Itiquira, Mato Grosso state, Brazil. The folioles were collected weekly, washed in sodium hypochlorite 1.5% solution, let to dry and disposed in plastic bags. The areas containing the postures of *L. heveae* were demarcated using a projector pen. Later the sacks were inflated using an air compressor and then sealed and transferred to acclimatized room ($25 \pm 1^\circ\text{C}$). Five days after, the material was examined under stereomicroscope and the number of adult parasitoids was annotated.



Figure 2. *Leptopharsa heveae*'s egg parasitized by *Erythmelus tingitiphagus* (Hymenoptera: Mymaridae).

It was observed an average parasitism rate of 18.8% in *L. heveae* eggs, collected in leaves of rubber tree clones in the first period of the study, and an average parasitism rate of 24.2% for the same clones in the second period.

This natural enemy shows to be a promising biological control agent of this serious pest of *Hevea* plantations in Brazil. However, more researches are necessary in order to implement a mass creation system and liberation of this natural enemy in the field.

Acknowledgments

To the company "Plantações E. Michelin Ltda." for financial support of the first author's research project, and to the employees Braz da Silva and Silmar Dias Ferreira for their help in the accomplished experiments.

References

ABREU JM. 1996. **Aspectos bioecológicos e controle das principais pragas da seringueira no Brasil**. Ilhéus, CEPLAC/CEPEC, 21 p.

- BERNARDES MS. 1992. Cultura da seringueira no Estado de São Paulo e perspectivas para a produção de mudas. *In*: MJS MEDRADO, MS BERNARDES, JD COSTA & AN MARTINS, (eds.) . **Formação de mudas e plantio de seringueira**. Piracicaba: ESALQ, Departamento de Agricultura, 158 p.
- CAMPELO-JÚNIOR JH. 2000. Estimativa da transpiração em seringueira. **Revista de Agrometeorologia** 8(1): 35-42.
- COSTA VA, CF PEREIRA & A BATISTA FILHO. 2003. Observações preliminares sobre o parasitismo de ovos de *Leptopharsa heveae* (Hemiptera: Tingidae) em seringueira em Pindorama, SP. **Arquivos do Instituto Biológico** 70: 205-206.
- FERES RJF. 1992. A new species of *Calacarus* Keifer (Acari, Eriophyidae, Phyllocoptinae) from *Hevea brasiliensis* Müell. Arg. (Euphorbiaceae) from Brazil. **International Journal of Acarology** 18(1): 61-65.
- FERES RJF. 2000. Levantamento e observações naturalísticas da acarofauna (Acari: Arachnida) de seringueiras cultivadas (*Hevea* spp., Euphorbiaceae) no Brasil. **Revista Brasileira de Zoologia** 17(1): 157-173.
- FERES RJF, DC ROSSA-FERES, RD, DAUD & RS SANTOS. 2002. Diversidade de ácaros (Acari, Arachnida) em seringueiras (*Hevea brasiliensis* Müell. Arg., Euphorbiaceae) na região noroeste do Estado de São Paulo, Brazil. **Revista Brasileira de Zoologia** 19(1): 137-144.
- MARINHO JTS. 2006. **Seringueira: opções de cultivo e geração de renda na Amazônia**. 2006. Available in: <<http://www.cpaFac.embrapa.br/chefias/cna/artigos/seringa>> Acess in 21 may of 2009.
- MOREIRA IPS. 1986. Biologia da *Leptopharsa heveae* (Drake & Poor, 1935) e seus danos nas mudas de *Hevea brasiliensis* (Müell, 1932). **Silvicultura** 11(41): 47.

- SCOMPARIN ALX. 2000. **Biologia de percevejo-de-renda (*Leptopharsa heveae* Drake & Poor, 1935) (Hemiptera: Heteroptera, Tingidae) e a avaliação do fungo entomopatogênico *Sporothrix insectorum* (Hoog & Evans).** UNESP. Botucatu. MSc. diss.
- TANZINI MR. 1996. **Resistência de clones de seringueira (*Hevea brasiliensis* Müell. Arg.) a *Leptopharsa heveae* Drake & Poor, 1935 (Hemiptera, Tingidae) e sua biologia.** UNESP. Jaboticabal. MSc. diss.
- TANZINI MR & FM LARA. 1998. Biologia do percevejo-de-renda-da-seringueira *Leptopharsa heveae* Drake & Poor (Heteroptera: Tingidae). **Ecosistema** 23: 65-67.
- VENDRAMIM JD. 1992. Praga de viveiros e jardins clonais de seringueira e seu controle. *In*: MJS MEDRADO, MS BERNARDES, JD COSTA & AN MARTINS. (eds.). **Formação de mudas e plantio de seringueira.** Piracicaba: FEALQ, 158 p.