

SCIENTIFIC NOTE

Insects Associated with Seeds of *Lonchocarpus muehlbergianus* Hassl. (Fabaceae) in Três Barras, Parana, Brazil¹L.T. SARI^{2,3}, C.S. RIBEIRO-COSTA^{2,3} AND A.C.S. MEDEIROS⁴¹Contribuição nº1315 do Depto. Zoologia, Universidade Federal do Paraná²Depto. Zoologia, Universidade Federal do Paraná, C. postal 19020, 81531-990, Curitiba, PR³Bolsistas do CNPq⁴Embrapa Florestas, Estrada da Ribeira, km 111, 83411-000, Colombo, PRInsetos Associados às Sementes de *Lonchocarpus muehlbergianus* Hassl. (Fabaceae) em Três Barras, Paraná

RESUMO - Com o objetivo de conhecer os insetos associados às sementes de uma espécie de leguminosa nativa do Brasil, *Lonchocarpus muehlbergianus* Hassl., frutos foram coletados de árvores isoladas no Município de Três Barras, Paraná, Brasil. Uma amostra de 500 g de frutos com 2353 sementes foi avaliada em laboratório. Foram registradas 77,4% de sementes não danificadas por insetos, 12,4% de sementes danificadas e 10,2% de sementes chochas. A espécie de Bruchidae *Ctenocolum crotonae* (Fähræus) foi detectada pela primeira vez nessa planta. Esta espécie já havia sido registrada no estado do Mato Grosso, Brasil, e neste trabalho, sua distribuição geográfica é ampliada para o estado do Paraná. *Horismenus missouriensis* Ashmead (Hymenoptera: Eulophidae) também foi observada na amostra e provavelmente é um parasitóide da larva ou pupa do bruquídeo. Do total de 2353 sementes, 4,9% foram danificadas por *C. crotonae* e 4,6% apresentavam orifícios de emergência de *H. missouriensis*. Larvas de Tenebrionidae e Curculionidae foram detectadas predando as sementes e representaram um dano de 2,8% do número total de sementes.

PALAVRAS-CHAVE: Bruchidae, Coleoptera, Hymenoptera, sementes danificadas.

ABSTRACT - To find the insects associated with seeds of a Brazilian native leguminous plant, *Lonchocarpus muehlbergianus* Hassl., fruits were collected from isolated trees in Três Barras, Parana, Brazil. A sample of 500 g of fruits with 2353 seeds was evaluated in the laboratory. It was found that 77.4% of the seeds were not damaged by insects, 12.4% of the seeds were damaged and 10.2% of the seeds were empty. The bruchid species *Ctenocolum crotonae* (Fähræus) was detected for the first time in this plant. This species was recorded in Mato Grosso, Brazil and, in this paper, the geographical distribution is amplified to include Parana State. *Horismenus missouriensis* Ashmead (Hymenoptera: Eulophidae) was also observed in the sample and it is probably a parasitoid of the bruchid larva or pupa. Of the 2353 seeds, 4.9% were damaged by *C. crotonae* and 4.6% had emergence holes of *H. missouriensis*. Larvae of Tenebrionidae and Curculionidae were also detected feeding on the seeds, representing 2.8% of the total number of the seeds.

KEY WORDS: Bruchidae, Coleoptera, Hymenoptera, damaged seeds.

Lonchocarpus muehlbergianus Hassl. (Fabaceae), commonly known as "rabo-de-bugio" (monkey tail), is a native tree of Brazil which occurs in the states of Minas Gerais, Mato Grosso do Sul, Paraná, Santa Catarina, and Rio Grande do Sul. It can be used in general landscaping due to the beauty of its flowers. Its wood is used for general board making, light carpentry, box making, and other purposes (Lorenzi 1992). The same author emphasized that this is a pioneer and rustic species, which cannot be missing in mixed plantings aiming to recover degraded areas. Nowadays this plant has received special attention because it has been

selected to be stored in the Germplasm Collection recently implemented by Embrapa – Centro Nacional de Pesquisa de Florestas, located in Colombo County, State of Parana, South Brazil. The viability of the seeds stored in a germplasm collection has to be guaranteed for possible uses of a given species in future reforestations. Thus, the identification of the insects associated with these seeds, the level of damage caused by them as well as the accomplishment of germination tests are essential.

Studies on damage caused by insects on seeds of forest species are scarce in Brazil. Although it is known that the

seeds of the majority of the economically important species are damaged significantly by insects, which are the main biotic agents accountable for seed deterioration, principally by affecting germination capacity (Santos *et al.* 1994b). Among the insects that damage seeds of forest species, the Coleoptera of the families Bruchidae, Curculionidae, Anthribidae and Cerambycidae, the Lepidoptera of the family Pyralidae and the Diptera of the family Tephritidae are the most important ones (Santos *et al.* 1994a, 1997).

The species of the family Bruchidae, despite damaging seeds of forest species, are important mainly due to the losses caused to economically important grain seeds such as bean, pea and lentil (Southgate 1979). The majority of bruchids complete one or a few generations within a year. However, in stored seeds of economically important grains they may achieve several generations (Johnson 1989, 1994). The females lay one or more eggs, individually or in clusters, on the surface of a fruit or seed of a host plant (Southgate 1979, Janzen 1971), which is generally a Fabaceae (Johnson 1999). Some species complete their life cycle in a single seed, leaving a circular orifice, which is associated with the emergence of the adult, while others need several seeds to complete their development (Johnson 1989, 1994; Ribeiro-Costa 1998).

Ripe fruits of *L. muehlbergianus* were collected from isolated trees in June, 1999, in Tres Barras County, State of Parana and sent to Embrapa – Centro Nacional de Pesquisa de Florestas. A sample of 500 g of pods containing 2353 seeds was processed. These seeds were classified as empty, damaged or not damaged by insects. The presence of insects and/or holes of adult emergence and/or partial destruction of cotyledons and tegument characterized damaged seeds.

Ctenocolum crotonae (Fåhraeus) (Coleoptera: Bruchidae), was detected for the first time in seeds of *L. muehlbergianus* (Fig. 1). This bruchid species was first recorded in Mato Grosso, Brazil (Kingsolver & Whitehead 1974) and, in this paper, the geographical distribution is amplified to include Parana State. Besides this insect, *Horismenus missouriensis* (Ashmead) (Hymenoptera: Eulophidae) (Fig. 2), one species of Tenebrionidae and one

species of Curculionidae were also found. The identification at the specific level of the two last groups was not possible because the specimens collected were still in the larval stage.

The genus *Ctenocolum* Kingsolver & Whitehead comprises about eight species in South and Central America, and is the only genus of Bruchidae associated with species of *Lonchocarpus* Kunth. (Kingsolver & Whitehead 1974). The known genera of host plants for *Ctenocolum* in Mexico and Central America are *Lonchocarpus* and *Piscidia* L., but in South America they may also occur on *Berberonia* M. Micheli (Kingsolver & Whitehead 1974). Besides *L. muehlbergianus*, the following host plant species for *C. crotonae* have been already reported: *L. hondurensis* Benth., *L. margaritensis* Pittier., *L. nitidus* (Vog.) Benth., *L. pentaphyllus* (Poir.), *L. rugosus* Benth., *Piscidia carthagenensis* Jacq., all reported by Udayagiri & Wadhi (1989), and *L. costaricensis* D. Smith, *L. minimiflorus* D. Smith, *L. parviflorus* Benth. (Janzen 1977, 1978, 1980).

Species of *Horismenus* Walker have been reported as probable parasitoids of immature Bruchidae such as *Amblycerus submaculatus* (Pic), *A. hoffmanseggi* (Gyll.) (Ribeiro-Costa 1992, 1998) and *Gibbobruchus speculifer* (Gyll.) (Ribeiro-Costa, personal communication), besides species of *Sennius* Bridwell (Luca 1980, Ribeiro-Costa 1998). Thus, it is probable that *H. missouriensis* is a parasitoid of *C. crotonae* larvae or pupae. The genus comprises species parasitoids of Lepidoptera (Bautista-Martinez *et al.* 1998), besides others are considered as hyperparasitoids (Penteado-Dias *et al.* 1990, Coffelt & Schultz 1993).

From a total of 2353 seeds, 77.4% were recorded as not damaged by insects, 12.4% as damaged by insects and 10.3% as empty. The differentiation of the emergence holes of the Bruchidae and Hymenoptera was made by the size which, in the case of bruchids is bigger than the hole made by the microhymenoptera (1.85 ± 0.16 mm and 1.04 ± 0.11 mm, respectively) (Figs. 3 and 4). The damage caused by Tenebrionidae and Curculionidae were undistinguishable from each other although perfectly distinguished from the Bruchidae and Hymenoptera by which the seeds were totally



Figure 1. *C. crotonae* adult. Size = 3 mm.



Figure 2. *H. missouriensis* adult. Size = 2.5 mm.

or partially destroyed without presenting circular holes (Fig. 5). From the total number of seeds, 4.9% were damaged by *C. crotonae*, 4.6% by *H. missouriensis*, and 2.8% by species of Tenebrionidae and/or Curculionidae. If we assume that *H. missouriensis* is a parasitoid of *C. crotonae*, the seed damage of *C. crotonae* is 9.5%.



Figure 3. Damage caused by *C. crotonae* on seeds of *L. muehlbergianus*. Scale = average length of seeds.



Figure 4. Emergence holes of *H. missouriensis* adults on seeds of *L. muehlbergianus*. Scale = average length of seeds.



Figure 5. Damage caused by species of Tenebrionidae and Curculionidae on seeds of *L. muehlbergianus*.

These values of seed damage are relatively small although other papers have reported that predation on seeds of native plant species by Bruchidae reached higher levels. Santos *et al.* (1985) reported that 70% of *Albizia lebbek* Benth seeds were damaged by *Merobruchus paquetae* Kingsolver (Coleoptera: Bruchidae). In 1991, Santos *et al.* observed that the damage caused by species of *Sennius* Bridwell on seeds of *Melanoxylon braunea* Schott. reached 63.8% and 51.6% in the years of 1983 and 1986, respectively.

The bruchid species was identified by the second author and the microhymenoptera by Professor Vinalto Graf. The material is deposited in the Coleção de Entomologia Pe. J. S. Moure, of the Departamento de Zoologia, Universidade Federal do Paraná, Brasil.

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