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First Record of *Ectomyelois muriscis* (Dyar, 1914) (Lepidoptera: Pyralidae) on Jatoba *Hymenaea stigonocarpa* (Fabaceae) Fruits in Brazil

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Abstract

The jatoba, *Hymenaea stigonocarpa* Mart. Ex Hayne (Fabaceae), is a tree species native to the Brazilian Cerrado and is recommended for recovering degraded areas. The fruit of this species is used for food and traditional medicine purposes, and its propagation occurs occurs through seeds. This study aimed to record, for the first time in Brazil, the occurrence of an insect pest on jatoba fruits. We sampled 58 *H. stigonocarpa* fruits from September to October 2017, on a typical Brazilian Savanna area in the municipality of Monte Carmelo, Minas Gerais (18°50′26″ S and 47°19′04″ W). The emergence of nine adults belonging to the *Ectomyelois muriscis* (Dyar, 1914) (Lepidoptera: Pyralidae) species was recorded on four jatoba fruits (6.9%). The insect only occurred on injuried fruits. The larva was fed from the pulp of the fruit until reaching the pupa stage, but not consuming the seeds. This is the first record of *E. muriscis* on jatoba fruits in Brazil.

Keywords: Brazilian Cerrado, forest entomology, injury, microlepidoptera

1. Introduction

The jatoba *Hymenaea stigonocarpa* Mart. ex Hayne is a leguminous tree species belonging to the Fabaceae family, native to the Cerrado Biome, occurring naturally in Brazil, in the states of Bahia, Ceará, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pernambuco, Piauí, Rio Grande do Norte, São Paulo and the Federal District. Its propagation occurs through seeds, and the dispersion of fruits and seeds is essentially zoocorical, by avifauna. The species is recommended for recovering degraded areas, and its fruit is used for food and traditional medicines (Carvalho, 2007).

In this sense, studies were developed to evaluate the dormancy of *H. stigonocarpa*, as a strategy for forest restoration of tropical pastures (Pereira, Laura, & Souza, 2013), to test the survival of seedlings in the recovery of former mining areas (Silva & Corrêa, 2008), as well as in the restoration of disturbed area in an urban environment (Oliveira, 2006).

A flour with a high content of total dietary fiber is obtained from the fruit of the jatobá used as a replacement for wheat flour, in the manufacturing of biscuits, breads and porridge (D. B. Silva, J. A. Silva, Junqueira, & Andrade, 2001). The jatobá plant has medicinal qualities and is often used as a depurative, anti inflammatory, appetite stimulant and iron rich fortifier (Souza & Felfili, 2006).

Surveys carried out in different Brazilian biomes with leguminous tree species highlight the predation of seeds and fruits by bean weevils/seed beetles (Coleoptera: Chrysomelidae) (Santos, J. A. S. Costa, C. B. N. Costa, & Calado, 2015; Mojena & Barreto, 2016) *Cryptophlebia carpophagoides* Clarke, 1951 (Lepidoptera: Olethreutidae) (Wink, Guedes, Murari, & Pelentir, 2007), microlepidoptera (Lepidoptera: Tortricidae, Olethreutinae) (Boscardin, Costa, Garlet, & Oliveira, 2012), *Agathodes designalis* (Guenée, 1854), *Liopasia ochracealis* (Walker, 1865) and *Terastia meticulosalis* (Guenée, 1854) (Lepidoptera: Crambidae) (Pereira & Silva, 2013; Pedron et al., 2015).

In this sense, planting legumes such as *H. stigonocarpa* can be compromised by insect attacks on its fruits and seeds, which compromises its propagation. Thus, the present work aimed to record, for the first time in Brazil, the occurrence of an insect pest on jatoba fruits in an area of the Cerrado Biome.

2. Method

For this purpose, *H. stigonocarpa* fruits were harvested on a typical Cerrado biome vegetation, located in the Gonçalves community in the municipality of Monte Carmelo (18°50′26″ S and 47°19′04″ W). The municipality belongs to the mesoregion of the Alto Paranaíba, Minas Gerais, and is at about 890 m altitude.

The area is located on the Paranaíba River Basin, with a predominance of Red Latosol. The region is characterized by a seasonal Aw climate type according to Köppen classification, with two well-defined seasons; one hot and rainy summer, and the other with cold and dry winter. The average temperature is 20.7 °C and annual average rainfall of 1569.1 mm (Prado Júnior et al., 2012).

The fruits were randomly sampled from four matrix trees. The fruits were collected in the four cardinal directions of the canopy tree (north, south, east and west). Pruning was employed for the fruit sampling when necessary. A total o 58 fruit were collected on Septempber and October 15th, 2017.

After sampling, the fruits were properly packed in plastic bags, identified and taken to the laboratory where the diameter and length variables of the fruits were measured. These fruits were then stored into plastic containers insulated with "voile" type fabric, and kept in natural environment. The daily emergence of adult insects was verified.

Adult insects were identified by Dr. Vitor Osmar Becker, from the Uiraçu Institute, Camacan, Bahia, Brazil. Voucher specimens were deposited in the Vitor O. Becker Colection. The jatobá species was identified by Forest engineer, Msc. Kelen Pureza Soares.

3. Results

The insect species found on the jatoba was identified as a microlepidoptera species, *Ectomyelois muriscis* (Dyar, 1914) (Lepidoptera, Pyralidae, Phycitinae) (Figure 1). The presence of this insect was observed from orifices with the presence of pupae. Endocarp consumption was also observed, but only on the fruits that presented some type of previous injury (Figure 2).

Figure 1. *Ectomyelois muriscis* adult

Nine adult insects emerged from the 58 sampled fruits, from September to October, 2017. The pupae were verified on 6.9% of the fruits. Non-occurrence of the insects attacking the jatoba seeds is noteworthy, as well as the absence of associated insects. The sampled jatoba fruits had an average length of 12.91 ± σ = 1.81 cm, largest diameter thickness of 4.48 ± σ = 0.57 cm, while the diameter of the lowest thickness was 3.24 ± σ = 0.51 cm.

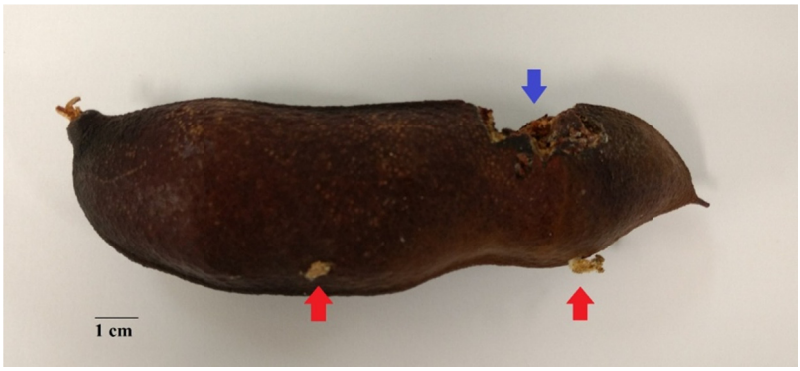

Figure 2. Injury of jatoba *Hymenaea stigonocarpa* (arrow in blue), and presence of pupae (arrow in red) of *Ectomyelois muriscis*

4. Discussion

A study performed by Ribeiro, Sales, Miranda, Soares, and Oliveira (2007) indicates that insect predation negatively influences the vigor of healthy seeds of the Cerrado legume tree species such as *Dalbergia miscolobium* Benth., *Enterolobium gummiferum* (Mart.) J. F. Macbr., *Plathymenia reticulata* Benth. and *Stryphnodendron adstringens* (Mart.) Coville.

The microlepidoptera *E. muriscis* is widely distributed in the Neotropical region (Neunzig, 2003). In this sense, the species is reported to feed on fruits, using host plants *Mammea americana* L. (Calophyllaceae) and *Theobroma cacao* L. (Malvaceae) in Latin American countries (Heinrich, 1956), and occurring in Costa Rica in 80% of the fruits of *Hymenaea courbaril* L. (Fabaceae) (Janzen, 1983) and *Theobroma simiarum* Donn. Sm. (Malvaceae) (Young, 1986). Also, a natural infestation by *E. muriscis* larvae on fruits and branches of *Jatropha curcas* L. (Euphorbiaceae) was reported in Chiapas, México (Gómez-Ruiz, López-Guillén, Barrera, Solis, & Zamarripa-Colmenero, 2015).

In Costa Rica, the oviposition of 20 *E. muriscis* eggs of was verified in the epicarp of *H. courbaril*. After hatching, the cream-to-yellow-colored month larvae enter the fruit and spend about a month feeding on the flesh of the fruit. There were 7 to 20 larvae per fruit of *H. courbaril*, and these did not consume the seeds. About two weeks after pupation the adult emerges. The newly emerged adults disperse in the habitat and do not oviposit in *H. courbaril* fruits until the next harvest, approximately 10 months later (Janzen, 1983).

In a field study of *E. muriscis* attacking *J. curcas* it was verified that the first instar larvae penetrate the fruit through its petiole, developing into a seed. The larvae leave the infested fruit after 18-20 days, then the emerged larva perforates the stem of the plant where it remains for approximately 10 months before pupation. After 15 days in the pupae stage, adults emerge from the stem. The total life cycle from oviposition to adult emergence in *J. curcas* is 11 months. Overlapping generation were not observed (Gómez-Ruiz, López-Guillén, Barrera, Solis, & Zamarripa-Colmenero, 2015).

This is the first report of *E. muriscis* attacking *H. stigonocarpa* fruits in Brazil, constituting a potential pest since they may compromise the propagation of this Fabaceae species, which is economically and ecologically important for the Brazilian Cerrado region.

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