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Short Communication

Silviculture

First Report of *Parasaissetia nigra* in *Khaya ivorensis* Seedlings in Brazil

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ABSTRACT

The objective of this research is to report the occurrence of the nigra scale *Parasaissetia nigra* (Nietner, 1861) (Hemiptera: Coccidae) in mahogany (*Khaya ivorensis*) seedlings in a forest nursery in Mato Grosso state. In September 2017, the infestation was detected on the leaves and branches of the plants, causing injury and the death of the apical meristem and leaf curling symptoms. It was verified the symbiosis of *P. nigra* with ants, due to the sugary exudate. The chemical control was performed with insecticidal syrup and the proposed method was effective. This was the first reported occurrence of *P. nigra* on African mahogany in Brazil.

Keywords: african mahogany, nigra scale, forestry entomology.

The species *Khaya ivorensis*, belonging to the Meliaceae botanical family comes from regions of West Africa, where it occurs naturally in Côte d'Ivoire, Ghana, Angola, Togo, Benin, Nigeria and Cameroon (Lemmens, 2008). This tree species is commonly called African mahogany, presents great economic importance, having its plantation explored commercially in the countries of natural occurrence and in Asian and South American countries (Moura et al., 2017).

It is a large tree, with average height ranging from 40 to 50 meters and diameter at 1.30 meters from the ground level can reach up to 200 cm. The stem is rectilinear, free of branches up to 30 m in height, with thick reddish-brown rhytidome and bitter taste (Nikles et al., 2008). The leaves are pinnate, with four to seven pairs of leaflets, their flowers are small and white, and the fruits are of capsules dehiscent type (Dipelet et al., 2017).

In Brazil, the introduction of African mahogany occurred in the decade of 1970, in the Pará state, through seeds from Côte d'Ivoire (Ribeiro et al., 2017). Currently, the distribution of plantations occurs in all over the country (Sartoretto & Rossi, 2014).

K. ivorensis present great resistance to *Hypsiphyla grandella* (Zeller, 1848) (Lepidoptera: Pyralidae), knonw as Mahogany woodborer (Verzignassi et al., 2009). This insect, in larval phase, injures and kills the terminal bud, breaking the apical dominance, damaging the stem growth (Brunck & Mallet, 1993). It guaranteed to this species a competitive advantage against *Swietenia macrophylla*, the Brazilian mahogany. However, according to Zanetti et al. (2017), *H. grandella* was attack a commercial plantation in Brazil, indicating that African mahogany is not free from the injury of this pest. Other insect attacks have also been reported (Ofori et al., 2007; Ong et al., 2014).

The scales are insects that feed on a wide variety of plant species, being abundant in forest stands and causing damages to attacked crops (Culik et al., 2013; Abdelkader, 2016). The nigra scale *Parasaissetia nigra* (Nietner, 1861) (Hemiptera: Coccidae) is a polyphagous species that attack different plant species of agricultural importance, highlighting citrus, coffee and cotton (Myartseva et al., 2014). There are no records of this species attack on *Khaya ivorensis* plants, or records of chemical control techniques for scale insects to African mahogany in the Brazilian Ministry of Agriculture, Livestock and Food Supply (Brasil, 2018).

In this context, this work aimed to report the first occurrence of *Parasaissetia nigra* (Nietner, 1861) (Hemiptera: Coccidae) on seedlings of *Khaya ivorensis*, describe the injuries caused and propose an experimental chemical control for this insect.

In September 2017 the infestation by scale was detected in *Khaya ivorensis* individuals in the forest nursery of the Instituto Federal de Educação, Ciência e Tecnologia de Mato Grosso (IFMT), *Campus* Cáceres, in the municipality of Cáceres (57°40'51"W, 16°11'42"S and altitude of 117 m), Mato Grosso state, Brazil. The injuries caused on the mahogany seedlings were characterized and photographed. Scale specimens were collected in the plants and preserved in 70% alcohol. Subsequently, they were sent to the Laboratório de Fitossanidade of the IFMT *Campus* Cáceres, Mato Grosso state, Brazil, separated in samples and sent to specialist for identification. After identification, voucher specimens were deposited in the Forest Protection Collection of the Laboratório de Fitossanidade of the IFMT - Campus Cáceres.

The specimens were identified as *Parasaissetia nigra* (Nietner, 1861) (Hemiptera: Coccidae), as shown in Figure 1.

This species of scale presents as biological aspects dark brown color in the young phase and bright black color in the adult phase, oval-elongated shape, with slightly convex back and ventral region (Abd al-Rasul & Al-Mallu, 2014). Adult females can measure about 3-5 mm, depending on the host species, and their reproduction is parthenogenic (Ben-Dov, 1978).

The attack on *Khaya ivorensis* occurred in the vegetative organs twigs, leaves, and branches. The injuries denoted were the death of the apical bud and leaf corrugation (Figure 2).

P. nigra feeds on the plant by suction on the phloem, reducing the nutrients and consequently affecting its development (Mau & Kessing, 2007). It was verified that this species presents symbiosis with unidentified ants species, these being observed together with the scale insects in all the infested plants (Figure 3). This interaction occurs because *P. nigra* releases an exudate, which reduces the photosynthetic area of the host and facilitates the development of saprophytic fungi,

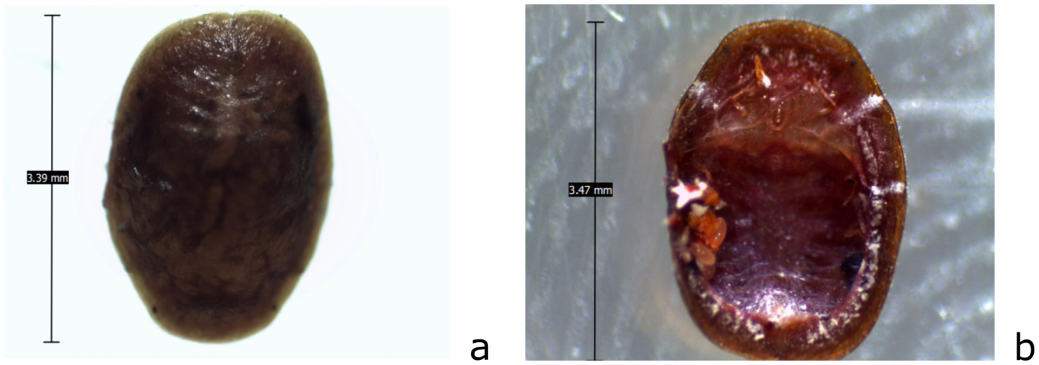

Figure 1. Nigra scale *Parasaissetia nigra* (Nietner, 1861) (Hemiptera: Coccidae); (a) dorsal region; (b) ventral region.

Figure 2. (a) Injury caused by *Parasaissetia nigra* to the apical bud of *K. ivorensis*, causing death; (b) *K. ivorensis* leaf corrugation, caused by the attack of *P. nigra*.

Figure 3. Symbiosis presented by *P. nigra* with unidentified ants.

causing fumagine (EPPO, 2002), not observed in the present work.

There is no registered product for the control of *P. nigra* in African mahogany (*Khaya ivorensis*) plants, however, an experimental chemical control was performed with an insecticidal syrup spray consisting of 0.8 mL/L of agricultural mineral oil (Paraffin and aromatic hydrocarbons mixture from petroleum distillation and polysorbate 80 emulsifier at 0.005%) and 6 ml/L of deltamethrin at 2.5% (Pyrethroid chemical group) in distillated water. The plants were sprayed with this syrup to the point of drainage and monitored for a period of seven days in order, to evaluate the mortality of *P. nigra*. The proposed method was widely effective,

showing 100% of efficiency in the mortality of this pest in the time analyzed. Chemical control using agricultural mineral oil and deltamethrin is commonly used for several scales species (Garcia & Cim, 1997; Felippe et al., 2005; Brito et al., 2008).

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