

First Report of *Heterotermes longiceps* (Blattodea: Rhinotermitidae) Termite in Teak Plantations

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ABSTRACT

Heterotermes longiceps termites was observed causing injuries in *Tectona grandis* plants in a forest plantation in Cáceres, Mato Grosso, Brazil. *H. longiceps* caused galleries below the bark, at the heartwood-sapwood interface, from the beginning of the root until approximately 1 m height tall and very infested plants has died. This is the first report of *H. longiceps* damage in teak in Brazil.

Keywords: forest entomology, forest protection, *Tectona grandis*.

Teak, *Tectona grandis*, is a forest species native to southwestern Asia, between parallels 20° and 10° N (Hansen et al., 2014; Deb et al., 2017), which has been gaining each more space in the world forest scene due to the high quality and resistant wood, used for the manufacture of fine furniture, shipbuilding and civil construction (Miranda et al., 2011; Moya et al., 2014). Currently, countries with the largest teak areas in the world are India and Indonesia, but countries in South and Central America such as Brazil, Ecuador, and Panama, and African countries such as Ghana and Nigeria, are in full expansion of their planting areas (Kollert & Cherubini, 2012).

The first teak plantations in Brazil occurred in the Mato Grosso state, in the decade of 1970 (Assis & Resende, 2011). According to IBÁ (2017), in 2016 there was a planted area of 87,502 hectares in the country.

Cultivated forests become an abundant resource for insects feeding, causing some species to rise to pest level (Kulkarni et al., 2009; Nascimento et al., 2016). The termites attack on seedlings or live trees can destroy the root system and cause the death of plants (Junqueira et al., 2008; Leitão-Lima et al., 2014), support the development of pathogens (Kirton & Cheng, 2007), or reduce the wood production (Hadi et al., 2010). However, most of the termite fauna present in the plantations are represented by beneficial species with a key role in the forest ecosystem (Jouquet et al., 2011).

Among the species of economic importance are heartwood termites, which attack the trees in cultivated forests, such as *Coptotermes testaceus* (Linnaeus, 1758), *Cylindrotermes* sp. and *Heterotermes* spp. (Constantino, 2002). Although, these species have reduced importance when compared to termites of seedlings of the genera

Syntermes and *Cornitermes* (Wilcken et al., 2002; Santos et al., 2015).

In a study of termites associated with the degradation of *Tectona grandis* wood in Sinop, Mato Grosso state, Brazil, were observed two different species of *Anoplotermes* genus, *Coptotermes testaceus*, *Cyrlillotermes angulariceps* and *Embiratermes neotenicus* (Corassa et al., 2014). Teak wood showed a natural resistance to *Coptotermes formosanus* termites in bioassays in New Orleans, LA (Cornelius & Osbrink, 2015).

Heterotermes tenuis and *H. longiceps* termites are the most abundant in South America, with wide geographical distribution and reported as agricultural pests (Constantino, 2002). In this context, the objective of this work was to report the first occurrence of *Heterotermes longiceps* (Snyder, 1924) termite and describe the injuries promotes in clonal commercial teak plantations.

Trees in a commercial plantation were found with 20% of termite infestation in the trunk and below the bark, in 100 hectares of teak plantation in Cáceres municipality (16°04'14"S, 57°40'44"W and altitude of 117 m), Mato Grosso state, Brazil, in September 2015.

The injuries promoted by these organisms to the plants were photographed. The termites of the caste of the soldiers were collected in the plants and preserved in 80% alcohol. They were sent to the Laboratório de Fitossanidade (FitLab) of the Instituto Federal de Mato Grosso (IFMT) - Campus Cáceres, Mato Grosso state, Brazil, where it was screened with a stereoscopic microscope (40x), photographed and identified.

The specimens were identified as *Heterotermes longiceps* (Blattodea: Rhinotermitidae) (Figure 1A and B). The injuries observed were the formation of galleries up the bark and below the bark, in the interface



Figure 1. Soldier of *Heterotermes longiceps*. (A) Lateral region; (B) Dorsal region.

bark-sapwood (Figures 2A and B), from the beginning of the root to approximately 1 m tall. A larger number of galleries were observed in the stem (Figure 2A), decreasing as they ascended the trunk (Figure 2B). There were also galleries in the center of the heartwood in one individual (Figure 3A) and was observed the death of two trees (Figure 3B).

The cellulose among other chemical constituents present in the wood is attractive for this group of insects and as more abundant, the greater the susceptibility of termite attack (Shanbhag & Sundararaj, 2013), which can reach 78 mg of dry wood per live termite in a day (Melo & Bandeira, 2007). In this way, these termites can cause severe damages to the plants and



Figure 2. Injuries caused by *Heterotermes longiceps*. (A) Termite galleries on the bark; (B) Termite galleries below the bark.

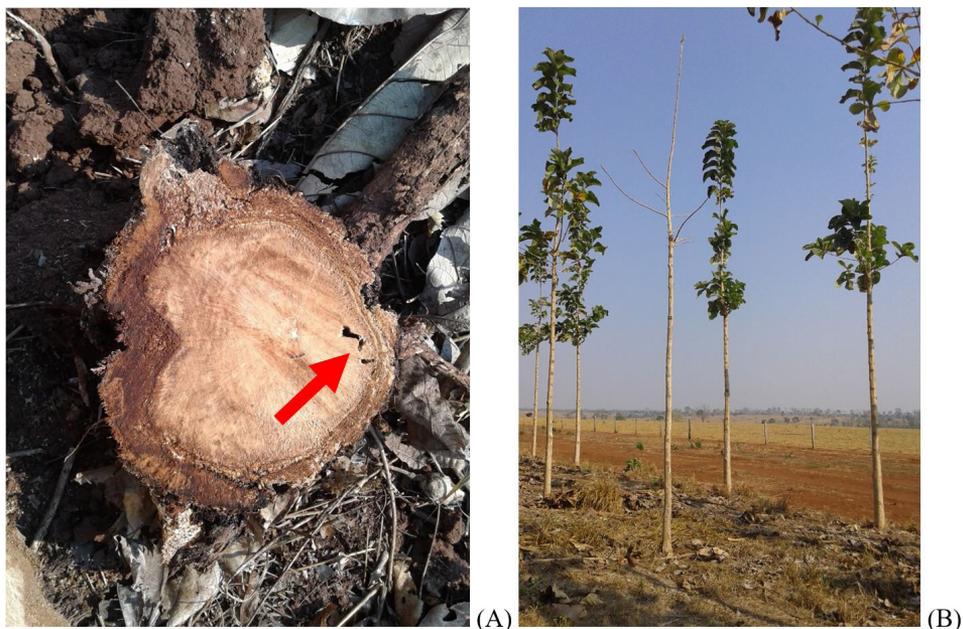


Figure 3. (A) Damage caused by *Heterotermes longiceps* in the sapwood of the plant; (B) Dead plant by termite attack in the field.

great losses to the forest production, making the commercialization of the wood impossible or even causing the death of the trees, besides being associated with the occurrence of canker caused by *Cryphonectria cubensis* (Raetano et al., 1997).

Species of the genus *Heterotermes* have a wide world distribution, occurring in all tropical and subtropical regions and areas. Teak plantations are increasingly expanding in tropical regions (Kollert & Cherubini, 2012), which may promote an increase in the occurrence of encounters between these two species.

The present study reports the occurrence and characterizes the injuries of the termite *Heterotermes longiceps* (Blattodea: Rhinotermitidae) on commercial teak plantations (*Tectona grandis*) in Brazil.

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