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Scientific Note

Confirmation of *Acutaspis albopicta* (Cockerell, 1898) (Hemiptera: Diaspididae) in Brazil: occurrence on baru (*Dipteryx alata* Vogel, Fabaceae), a native Cerrado plant species

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Abstract. Recent research has been shown that Cerrado hosts a high richness of scale insects (Hemiptera: Coccomorpha) associated with native and exotic plants from different families and botanical species. This work aimed to report for the first time an association of an armored scale insect (Diaspididae), *Acutaspis albopicta* (Cockerell, 1898), with baru (*Dipteryx alata* Vogel, Fabaceae), a native tree from Cerrado biome, in Federal District, Brazil. Additionally, this is the first occurrence of this species of Diaspididae in Central Brazil. *Acutaspis albopicta* was first mentioned in Brazil in Rio de Janeiro, associated with *Cocos nucifera* (L.) (Arecaceae), but, until now, there was no evidence of its occurrence in the country. In this work, there is a confirmation of *A. albopicta* in Brazil, and macroscopic and microscopic descriptions and illustrations are presented.

Keywords: Biodiversity, entomology, phytophagous insects, scale insects.

In Brazil, Cerrado biome is the second only to the Amazon in terms of size. It presents a great wealth of animal, plant and microorganism species, where many of them are considered native and endemic, occurring exclusively in this environment (Strassburg et al. 2017). Due to its fragility, unplanned occupation, and high fragmentation of habitats caused by agriculture, in addition to the occurrence of fires, Cerrado is considered a hotspot of biodiversity (Damasco et al. 2018). Therefore, protective and conservation measures must be carried out with the aim of ensuring the preservation of this biome. To be effectively, survey, cataloging and identification studies of floristic and fauna must be stimulated (Klink & Machado 2005).

Scale insects (Hemiptera: Coccomorpha) are phytophagous (sap-sucking) insects that occur in all regions of the world, with exception of Antarctica (Grazia et al. 2024). It is estimated that superfamily Coccoidea contains about 8500 catalogued species distributed across 35 families (Garcia-Morales et al. 2016). Diaspididae, Coccidae and Pseudococcidae are considered the richest in species and the most economically important families, causing signific crop losses around the world (Grazia et al. 2024).

Recent research has shown that Cerrado hosts a high richness of scale insects associated with native and exotic plants from different families and botanical species (Castro et al. 2020; 2022; 2024; 2025). It is estimated that many are exclusive to this biome and have not yet been described, with probable new species or even new genera to science. Studies aimed at expand the knowledge about the scale insect species associated with native plants of Cerrado and conserving insects diversity in this ecosystem are of fundamental importance, especially when analyzing the magnitude of this biome, its richness of species and habitat diversity (Strassburg et al. 2017).

In November 2024, scale insects were observed on "baru" (*Dipteryx alata* Vogel, Fabaceae) the leaves, a Cerrado native tree species that produces a nut extremely appreciated by local population (Sano et al. 2016). To date, few hemipteran insects have been observed in association with *D. alata* (Castro et al. 2019) and no scale insects have been reported (García-Morales et al. 2016). Therefore, this work aimed to report the first association of an armored scale insect (Hemiptera: Diaspididae) with *D. alata* in Brazil.

Armored scale insects associated with one *D. alata* tree were collected in November 2024 in Brasília, Federal District, Brazil (15°44'34.4"S; 47°53'48.9"W). The plant was identified using the key elaborated by Silva Júnior (2012) and the species description by Sano et al. (2016). Brasília is located at Cerrado biome that has two well-defined seasons, and the regional climate is classified as AW (i.e., a tropical climate with rain in summer and drought in winter), in which the rainy season runs from October to April and the drought from May to September (Köppen & Geiger 1928).

Leaves, branches, and stems were analyzed for the occurrence of scale insects. Plants samples containing armored scale insects were stored in a Falcon tube containing 70% alcohol until identification. Slides were mounted for subsequent analysis under an optical microscope, according to the methodology described by Wolff et al. (2014). Specimens were identified using the key to genus and species description (Ferris 1941; Claps & Wolff 2003). The macroscopic images were captured using a Sony® digital camera, and microscopic images were obtained using an Axiocam 208 color camera attached to an Axiolab 5 microscope with Zeiss Zen 3.10 software.

The slides containing the diaspidids are deposited on the "Coleção Entomológica do Museu Ramiro Gomes Costa (MRGC)". Material was collected under the Brazilian government official authorization conceded to M. T. de Castro by Chico Mendes Institute for Biodiversity Conservation (ICMBio), Ministry of Environment (MMA) (collection permit No. 96628-1).

The scale insect observed on the *D. alata* leaves was identified as *Acutaspis albopicta* (Cockerell, 1898) (Hemiptera: Diaspididae) (Figs. 1 and 2). Individuals were observed mainly on the old leaves, at the upper surface and next to the foliar nervures (Figs. 1A and 1B). No apparent symptoms were observed on the infested leaves.

Female and male adults were observed on the surface of the *D. alata* leaves. Female shields (scales) were circular to subcircular, brownish to black in color, about 1.5 mm of diameter (Fig. 2A). Male

Figure 1. *Acutaspis albopicta* on *Dipteryx alata* leaves. A) Leaves with scale insects. B) Detail of the armored scales.

Figure 2. *Acutaspis albopicta* on *Dipteryx alata* leaf. A) Females shields; B) Male shields.

shields were oblong in format, and some were similar to rackets, white to black in color (Fig. 2B). Therefore, it is not possible to identify the genus and species of the scale insect based only on the macroscopic characteristics. To determine the species, it is necessary to examine the microscopic characteristics of the adult female's body.

Adult females observed on microscopic slides have a subcircular body shape in the cephalothorax and part of the abdomen with an acute pygidial end (Fig. 3A). On the pygidial margin, the median lobes (LM) are small, rounded, separated by a small plate, the second pair of lobes (L2) slightly larger and notched along the outer margin, the third (L3) still wider and with the outer margin notched, the fourth (L4) being merely a small prominence. Between the lobes of the pygidium are the paraphyses: median lobes with a very small paraphysis on the inner margin and a much longer one on the outer margin; L2 with similar paraphyses and the second interlobular space with a paraphysis that is longer than any other, followed by a short process from the mesal angle of the third lobe and a longer one from the external angle of this lobe (Fig. 3B). Margin beyond the fourth lobe with a series of small and indistinct paraphyses. Perivulval pores present in four small groups.

Diaspididae is a large family of infraorder Coccomorpha, with 419 genus and 2,715 species described in the world attacking more than 1,800 plant genera, where many species are considered pests in agricultural crops (García-Morales et al. 2016). In Brazilian Cerrado, this family was reported in association with exotic and native plants, causing heavy damage or no apparent symptoms (Castro et al. 2020; 2022; 2024; 2025).

The genus *Acutaspis* Ferris, 1941, has 20 species described around the world (García-Morales et al. 2016). In Brazil, eight species are reported associated with 24 botanical families, where the most common are *Acutaspis paulista* (Hempel, 1900), *Acutaspis perseae* (Comstock, 1881), and *Acutaspis scutiformis* (Cockerell, 1893), with the major number of hosts and regions of occurrence (Peronti et al. 2025). *Acutaspis oliveirai* (Lepage & Giannotti, 1942) was recently described in association with *Myrsine guianensis* (Aubl.) Kuntze (Primulaceae) by Castro et al. (2024), characterizing the first report of the occurrence of the *Acutaspis* genus in the Brazilian Midwest. Additionally, the authors list the hosts and the distribution of the *Acutaspis* species that occur in Brazil.

Acutaspis albopicta occurs primarily in the Americas in association with 16 families and 21 genera of host plants (García-Morales et al. 2016). It was first mentioned in Brazil by Rosen & DeBach (1979) in Rio de Janeiro, associated with *Cocos nucifera* (L.) (Arecaceae). In a revision of *Acutaspis* species that occur in Brazil, Castro et al. (2024) related that this scale was only mentioned as a host of the parasitoid *Aphytis acutaspidis* Rosen & DeBach, 1979, and, until now, *A. albopicta* has not effectively found in Brazil. Therefore, with this work, there is a confirmation of the occurrence of this armored scale in Brazil, associated for the first time with a Brazilian native species, and,

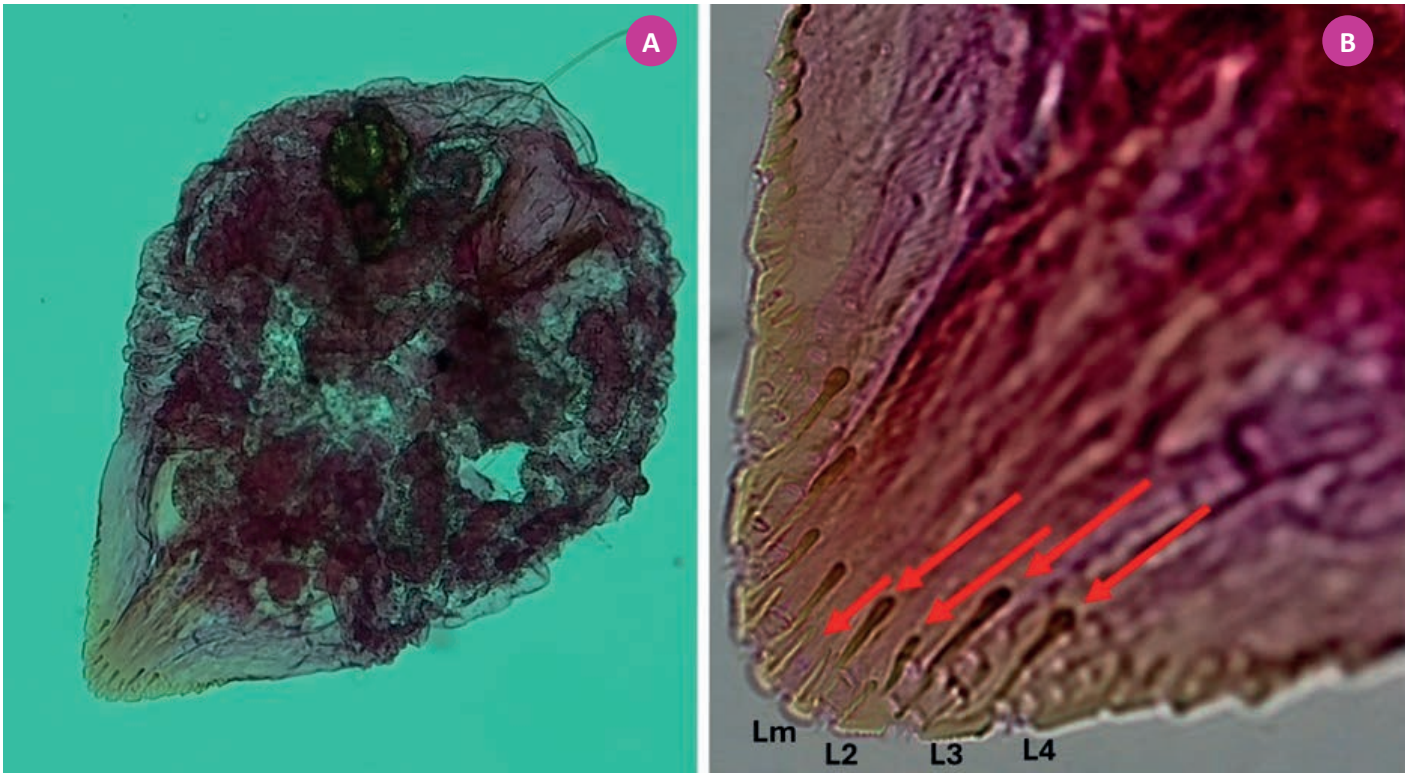

Figure 3. Microscopic characteristics of *Acutaspis albopicta* adult females observed on *Dipteryx alata*. A) Subcircular body shape in the cephalothorax and part of the abdomen with an acute pygidial end; B) Pygidial margin with four pairs of lobes (LM, L2, L3, L4) and paraphyses between the lobes indicated by arrows.

additionally, the first report of *A. albopicta* in the Brazilian Midwest.

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Authors' Contributions

MTC: Conceptualization, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing; SCLM: Formal analysis, Investigation; VRSW: Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

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