



First Record of *Horiola picta* (Coquebert, 1801) (Hemiptera: Membracidae) on *Filicium decipiens* (Wight & Arn.) Thwaites. (Sapindaceae) in Minas Gerais, Brazil

Primeiro registro de *Horiola picta* (Coquebert, 1801) (Hemiptera: Membracidae) em *Filicium decipiens* (Wight & Arn.) Thwaites. (Sapindaceae) em Minas Gerais, Brasil

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Abstract. *Horiola picta* (Coquebert, 1801) (Hemiptera: Membracidae) is a secondary pest of *Theobroma cacao* L. (Malvaceae), a species of cocoa, in several regions of Brazil. It is found in young branches and cocoa fruits, where it lays its eggs in plant tissue, causing damage to plantations. Here, we report the first occurrence of *H. picta* for the state of Minas Gerais and its first record on *Filicium decipiens* (Wight & Arn.) Thwaites. Egg masses, nymphs, and adults of *H. picta* were observed from 2021 to 2024, with increasing colonization over the years. This finding highlights the potential risk of ornamental plants becoming hosts for agricultural pests.

Keywords: Pest of cocoa; Insect-plant interaction; Treehoppers.

Resumo. *Horiola picta* (Coquebert, 1801) (Hemiptera: Membracidae) é uma praga secundária de *Theobroma cacao* L. (Malvaceae), uma espécie de cacaueteiro, em diversas regiões do Brasil. É encontrada em ramos jovens e frutos de cacau, onde deposita seus ovos no tecido vegetal, causando danos às plantações. Relatamos aqui a primeira ocorrência de *H. picta* para o estado de Minas Gerais e seu primeiro registro em *Filicium decipiens* (Wight & Arn.) Thwaites. Massas de ovos, ninfas e adultos de *H. picta* foram observados de 2021 a 2024, com aumento da colonização ao longo dos anos. Essa descoberta destaca o risco potencial de plantas ornamentais se tornarem hospedeiras de pragas agrícolas.

Palavras-chave: Praga do cacau; Interação inseto-planta; Soldadinhos.

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Filicium decipiens (Wight & Arn.) Thwaites is an ornamental plant of the Sapindaceae family, which comprises 144 genera and approximately 1,900 species worldwide (Acevedo-Rodríguez *et al.* 2017). In Brazil, there are 32 genera and 436 species of this family registered (Flora e Funga do Brasil 2025). Sapindaceae species have a cosmopolitan distribution, found in tropical and subtropical zones, with rare representatives in temperate countries (Acevedo-Rodríguez *et al.* 2011; Acevedo-Rodríguez *et al.* 2017). In Brazil, this family encompasses trees, shrubs, and vines, and is represented in the phytophysiognomies of the Amazon Rainforest, the Atlantic Rainforest and the Cerrado (Souza & Lorenzi 2019). *Filicium decipiens* is a medium to large tree and is used in the Asian region for ornamentation and gardening (Eka & Adji 2012). It has a phytotoxic potential and is considered a natural herbicide (Bari & Kato-Noguchi 2017).

The species *Horiola picta* (Coquebert, 1801) (Hemiptera: Membracidae) is considered a secondary pest of cocoa, *Theobroma cacao* L. (Malvaceae), in some regions of Brazil (Sánchez 2011; Silva *et al.* 2020). They are found in young cocoa shoots and fruits, where they lay their eggs in plant tissues, causing damage to plantations. They are approximately 3 to 4 mm long, and adults are distinguished by brown to dark brown markings on the pronotum, accompanied by white "x"-shaped designs. Their nymphs are milky white or dark in color (Sánchez 2011). *Horiola picta* lays its eggs endophytically, that is, within the internal tissue of the plant, thus avoiding predation and desiccation (Benassi *et al.* 2016). This species is gregarious and attacks floral buds and fruits, where females lay their eggs. This oviposition behavior disrupts sap circulation and may potentially cause tissue death (Benassi *et al.* 2016). It is common to find ants associated with sap-sucking insects (Wood 1993), in which the latter benefit from feeding on a sugary compound eliminated by the membracids, and in exchange, receive protection against predators.

This study aimed to expand the known geographic distribution of *H. picta* and to report *F. decipiens* as a new host plant for this insect. Between 2021 and 2024 (Table 1), both adult and immature stages of *H. picta* were observed colonizing *F. decipiens* on the campus of the Universidade Federal de Viçosa (UFV) (20°45'12" S, 42°52'15" W, 688 m), located in Viçosa, Minas Gerais, Brazil.

Following monthly observations, *H. picta* was confirmed to be associated with *F. decipiens* (Figure 1). Several individuals were collected (the sampling collection was done according to the National System of Biodiversity Information (SISBIO), authorization number 89341-3), pinned, labeled, and deposited in the Entomological Collection of the Department of Systematics and Ecology at Universidade Federal

Table 1. Data collection period for observed plants at the Federal University of Viçosa.

Season	Year	Colonized plants	Number of Females*	Number of Males*	Nymphs	Postures
Autumn	2021	3	4	1	Absent	0
Winter		1	2	0	Absent	0
Spring		7	6	3	Present	2
Summer		7	9	3	Present	2
Autumn	2022	2	3	1	Absent	0
Winter		0	0	0	Absent	0
Spring		6	5	1	Present	1
Summer		6	6	1	Present	2
Autumn	2023	3	4	0	Absent	0
Winter		0	1	0	Absent	0
Spring		5	4	2	Present	1
Summer		5	5	2	Present	3
Autumn	2024	3	3	1	Absent	0
Winter		0	0	0	Absent	0
Spring		5	7	3	Present	3
Summer		4	8	4	Present	3

*Average quantity per colony

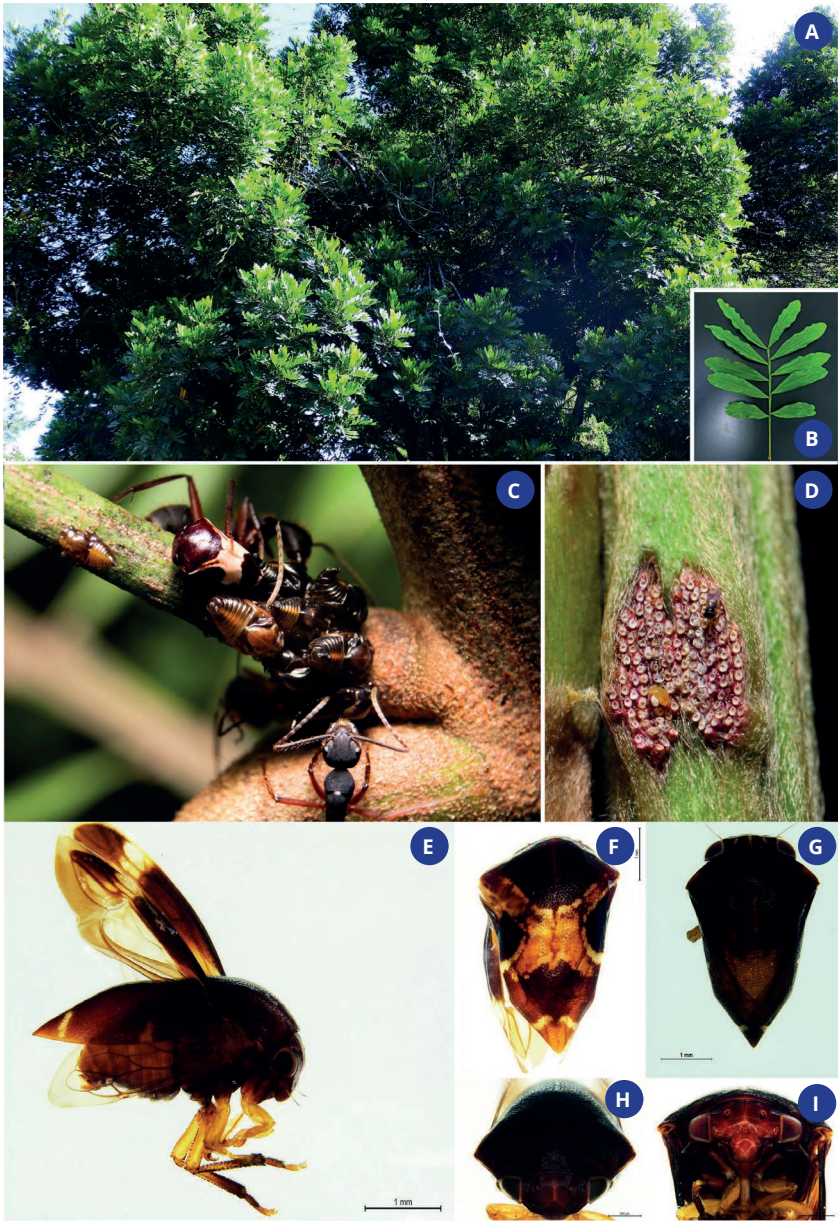


Figure 1. A – *Filicium decipiens* (Wight & Arn.) Thwaites. tree. B – Detail of *F. decipiens* branch. C – *Horiola picta* (Coquebert, 1801) (Hemiptera: Membracidae) on *F. decipiens*. D – Posture. E – Male *H. picta*, lateral view. F – Female, dorsal view. G – Male, dorsal view. H – Male, frontal view of the head. I – Male, ventral view of the head. (Photographs – Costa, DA).

da Paraíba, Paraíba, Brazil. The ants associated with *H. picta* aggregations were identified as *Camponotus* (*Myrmothrix*) *ruficeps* (Fabricius, 1775) (Hymenoptera: Formicidae) by Dr. Júlio Cezar Mário Chaul and registered under code ANTWEB1062765 (Figure 2). *H. picta* adults and the ants were sexed and preserved in 70% ethanol. The insects were placed on a 6 cm x 8 cm glass Kline plate with 70% alcohol gel and photographed in both dorsal and ventral views using a Leica M205C stereomicroscope equipped with a Leica MC170HD digital camera.

The population fluctuated throughout the observation period. In the fall and spring seasons, denser populations were found, and the number of eggs and nymphs increased; however, in the summer and winter seasons, the population rate decreased. According to Brown-Jr (1997), this type of relationship is associated with the degree of specificity of the insect with the host plant, so that females oviposited in seasons that favored an abundance of resources needed by the nymphs or changed branches where there was more accessible food (Wood 1993), consequently increasing the population rate during these seasons.

Filicium decipiens is a tropical plant, with development favored by climatic conditions typical of equatorial and tropical regions (Acevedo-Rodríguez *et al.* 2017). Like other species of the Sapindaceae family, it has nectariferous discs that act as attractants for sap-sucking insects. The frequent presence of *H. picta* in *F. decipiens* may be related to the preference of treehoppers for well-lit plants, with inflorescences and infructescences rich in sap, as observed by Lopes (1995).

A mutualistic relationship is commonly observed between some species of Hymenoptera and treehoppers (Del-Claro & Oliveira 2000; Delabie 2001). When the latter feed on the phloem, part of the carbohydrates ingested is eliminated as honeydew, which serves as food for several hymenopteran species (Lin 2006). Insects that feed on this honeydew provide defense for both adults and offspring of the membracids, thus maintaining the mutualistic relationship. We also observed the association of *H. picta* with *C. (M.) ruficeps*, being the first record of this association. This cooperation helps to clarify the intimate relationships between these species, particularly the ants' dependence on nutritional resources in exchange for defense

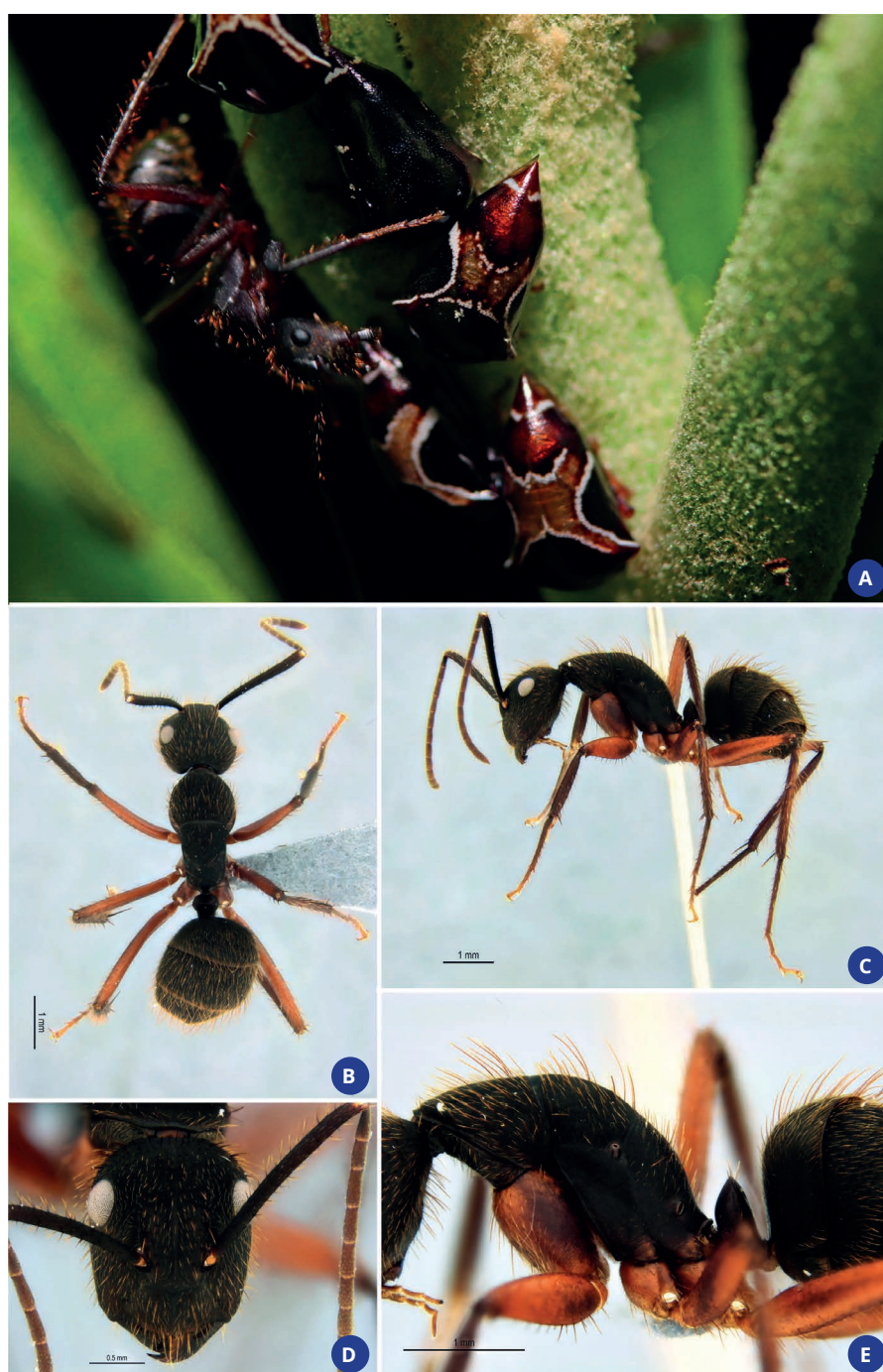


Figure 2. A – *Camponotus* (*Myrmothrix*) *ruficeps* (Fabricius, 1775) (Hymenoptera: Formicidae) in mutualistic association with *Horiola picta* (Coquebert, 1801) (Hemiptera: Membracidae). B – Dorsal view. C – Lateral view. D – Head. E – Thorax.

for the membracids, generating a complex and well-structured mutualistic network (Fagundes et al. 2016; Fornoff et al. 2019).

H. picta has been reported utilizing several host plants, including cocoa *Theobroma cacao* (Malvaceae) (Benassi et al. 2016), sugar apple *Annona* sp. (Annonaceae) (Santos et al. 2021), and cashew *Anacardium occidentale* L. (Bleicher & Melo 1996), which are agricultural plants, and this is the first record in ornamental plants. The most significant damage is related to laying eggs, which, when carried out on thin plant structures, such as flower and fruit peduncles, can cause cankers and tissue death. Consequently, affected fruits become deformed, smaller, cracked, and commercially unviable (Benassi et al. 2016).

Until now, *H. picta* had a known geographic distribution in some Brazilian states, such as Ceará, Bahia, Espírito Santo (Bleicher & Melo 1996), Acre (Santos et al. 2021) and Paraíba (Cabral et al. 2020), and here we report for the first time its occurrence in the state of Minas Gerais.

Our observations confirm *F. decipiens* as a new host for *H. picta* and suggest potential risks to ornamental plants. Further studies are needed to assess the pest's adaptability to other hosts and its impact on urban vegetation.

Author Contributions

DAC: Writing - original draft preparation, conceptualization, Writing, review, and editing, Methodology, Analysis and investigation. PHR: Analysis and investigation, Writing, review, and editing. MSP: Analysis and investigation, Writing, review, and editing. FWSN: Analysis and investigation, Writing, review, and editing. AL: Analysis and investigation, Writing, review, and editing. GD: Analysis and investigation, Supervision. JLN: Analysis and investigation, Supervision.

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Conflict of Interest Statement

The authors declare no competing interests.

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