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Scientific Note

Damage caused by the mite *Brevipalpus yothersi* Baker, 1949 (Acari: Tenuipalpidae) on 'Cortibel' guava fruits (*Psidium guajava*) in northeastern São Paulo State

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Abstract. This study reports damages caused by *Brevipalpus yothersi* Baker, 1949 (Acari: Tenuipalpidae) mites in guava fruits in northeastern São Paulo State, Brazil. High population densities of *B. yothersi* were observed, primarily infesting green peduncles and young fruits of guava (cv. Cortibel RG). The mites caused dark spots on the fruit skin, rendering them unsuitable for *in natura* market sale.

Keywords: Cortibel cultivar, flat mites, Tropical fruit production.

The guava tree (*Psidium guajava* L., Myrtaceae) is native to the American tropics and is currently cultivated in various regions worldwide (Pommer & Murakami 2009; Oviedo et al. 2024). Guava fruits are rich in nutrients, especially calcium and phosphorus, and contain high levels of vitamins A and C, fiber, and antioxidants (Barazarte et al. 2015; Arévalo-Marín et al. 2021). In addition to being consumed *in natura*, guava is used to produce various products, including sweets, juices, jellies, preserves, and syrups (Barazarte et al. 2015; Oviedo et al. 2024).

Brazil is among the world's largest guava producers, along with India, China, Thailand, Pakistan, and Mexico (Rajan & Hudedamani 2019). São Paulo is Brazil's second-highest producing state, behind only Pernambuco (IBGE 2024). The Paluma cultivar is the most widely grown in Brazil, primarily because it serves both the fresh fruit market and the processing industry (Vitii et al. 2020). However, the Cortibel cultivar has gained ground in some regions of Brazil due to its vigor, large fruit size, and sweet flavor which are desirable traits for *in natura* market commercialization (Costa & Pacova 2003; Coser et al. 2014).

Pests such as fruit flies, *Ceratitis capitata* (Wiedemann, 1824) and *Anastrepha fraterculus* (Wiedemann, 1830) (Diptera: Tephritidae), as well as the guava psyllid *Triozoida limbata* (Enderlein, 1918) (Hemiptera: Triozidae), can compromise both the productivity and quality of guava fruits (Barbosa et al. 2001; Sampaio et al. 2011). Some mite species, such as *Polyphagotarsonemus latus* (Banks, 1904) (Acari: Tarsonemidae) and the two-spotted spider mite *Tetranychus urticae* Koch, 1836 (Acari: Tetranychidae), are reported as guava pests (Barbosa et al. 2001).

In March 2024, a high incidence of guava fruits damaged by *Brevipalpus* Donnadieu, 1875 (Acari: Tenuipalpidae) mites was observed in production areas in northeastern São Paulo, the state's primary guava-producing region (IBGE 2024). Therefore, this study reports the occurrence of *Brevipalpus yothersi* Baker, 1949 (Acari: Tenuipalpidae) causing damage to guava fruits in that region.

Guava fruits of the Cortibel cultivar damaged by mites were found in two areas in northeastern São Paulo: one in the municipality of Monte Alto (21°11'42.02''S, 48°35'28.04''W), and the other in Taiaçu (21°09'07.63''S, 48°32'57.92''W). In both areas, the three-year-old plants (planted in 2021) were drip-irrigated. At each site, a minimum of 50 fruits were examined *in situ* for external symptoms and the presence of mites, using a 10× magnifying lens prior to sample collection. Twenty-five infested fruits with peduncles were collected per site, placed in paper bags, and sent to the Acarology Laboratory for mite identification. Approximately 15 adult female mites from each area were mounted on microscope slides using Hoyer's medium, with the aid of a stereomicroscope. The slides were kept in an oven at 50 °C for seven days, then sealed with colorless nail polish, following the method described by Krantz & Walter (2009). Species identification was conducted using a Zeiss Axioplan 2 imaging phase-contrast microscope equipped with an Axiocam MRc5 camera, supported by taxonomic keys provided by Beard et al. (2015).

To confirm the mite species, the following morphological characteristics were examined: leg II with two solenidia on the tarsus; spermathecal apparatus with an oval vesicle and a distinct distal stipe; prodorsum with a central cuticle bearing prominent areolae, weakly reticulate sublateral anterior region up to setae v_2, and posterior region with reticulation forming large cells; opisthosoma with the cuticle typically exhibiting strong chevron-shaped (V-shaped) folds from setae e_1–e_1 to h_1–h_1 that gradually weaken posteriorly h_1, and with six pairs of lateral setae, i.e. setae f_2 absent; palp femur bearing a barbed, setiform dorsal seta; ventral plate uniformly verrucose with small rounded warts; and genital plate verrucose-reticulate with large cells. Based on these features, the species was identified as *B. yothersi* (Fig. 1).

Infestations of *Brevipalpus* spp. on *Psidium* spp. have been reported by several authors (Ochoa et al. 1994; Guerere & González 2000; Rivero-Maldonado et al. 2007; 2009; Costa et al. 2022). For instance, Guerere & González (2000) reported significant damage caused by *Brevipalpus phoenicis* (Geijskes, 1939) (Acari: Tenuipalpidae) to *P. guajava* fruits in Venezuela. Similarly, Costa et al. (2022) identified *Brevipalpus* spp. as a pest of guava crops in the state of Alagoas, Brazil, highlighting the need for control measures.

We found *B. yothersi* mites primarily on green peduncles and young guava fruits. Specifically, significant numbers of mites were observed only on fruits approximately four weeks old, with diameters smaller than 3.0 cm. Rivero-Maldonado et al. (2007) reported that *B. phoenicis* on guava trees prefers the sepals and peduncles, infesting the fruits only when population densities are very high. Additionally, the authors observed that in the Criolla Roja cultivar, although sepals and peduncles differ morphologically and functionally, they share anatomical similarities such as a uniseriate epidermis, cuticle of similar thickness, isodiametric parenchyma cells, and extensive intercellular spaces. These features may contribute to the *B. phoenicis* preference for these regions.

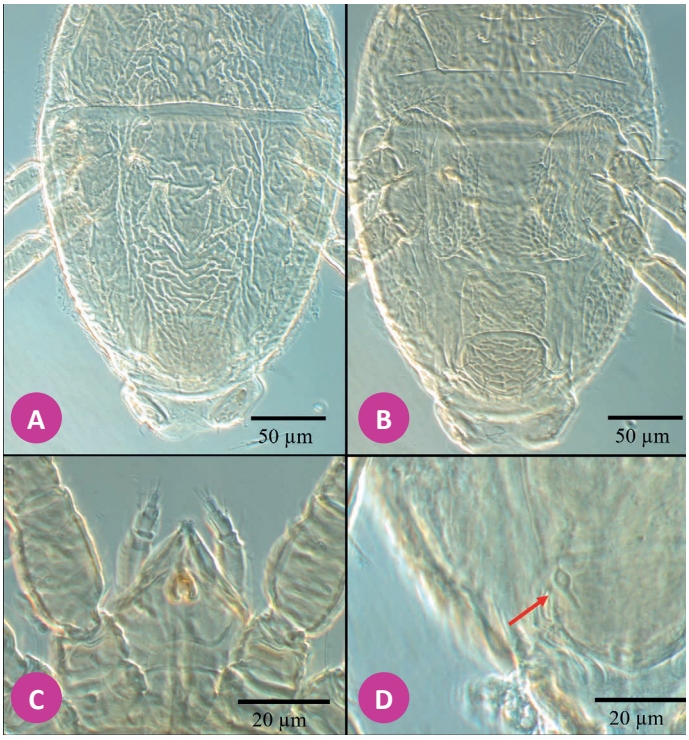

Figure 1. Morphological details of adult females of *Brevipalpus yothersi* Baker, 1949 (Acari: Tenuipalpidae) collected from Cortibel RG guava fruits: (A) Dorsal region with central cuticle showing strong areolae, posterior region with reticulation forming large cells, and cuticle usually marked by strong chevrons; (B) Ventral plate uniformly verrucose with small rounded warts, genital plate verrucose-reticulate with large cells; (C) Palp femur barbed with a setiform dorsal seta; (D) Spermathecal apparatus with an oval vesicle and a strong distal stipe.

Fruit symptoms included dark patches on the skin, occasionally covering a large portion of the surface (Fig. 2). These symptoms compromised the fruit's appearance, rendering them unsuitable for sale in the *in natura* market and limiting their use to industrial processing, where prices are typically lower. Thus, the observed damage was primarily qualitative, directly affecting the commercial value of the fruit. In this study, it was not possible to assess the actual quantitative damage, as guava fruits are harvested according to their ripeness stage, and there was insufficient time to measure total production.

Interestingly, guava orchards of the Paluma cultivar were also present in the same areas, where *B. yothersi* mites were found apparently in lower densities, but no symptoms were observed on Paluma fruits. No published information was found regarding the susceptibility of the Cortibel cultivar to pest infestation. The guava orchards were bordered by citrus groves, primarily sweet orange (*Citrus sinensis* L.) and 'Tahiti' lime (*Citrus latifolia* Yu. Tanaka ex Q. Jiménez), both known hosts of *B. yothersi* (Castro et al. 2025). In sweet orange, this mite vectors the virus responsible for citrus leprosis (*Citrus leprosis* virus – CiLV-C), one of the most severe diseases affecting citrus production (Kapp et al. 2024). *B. yothersi* mites likely migrated from the citrus groves to the guava orchards.

Following *B. yothersi* detection in Cortibel RG guava orchards, multiple acaricide applications were conducted throughout 2024. As a result, symptoms disappeared in both areas, and mite populations were no longer found at high densities. In conclusion, given the associated economic losses, further research is needed to clarify the apparent greater susceptibility of the Cortibel RG cultivar to *B. yothersi* compared to other cultivars, and to determine whether additional agents contribute to symptom development.

Figure 2. Symptoms caused by *Brevipalpus yothersi* Baker, 1949 (Acari: Tenuipalpidae) on Cortibel RG guava fruits in northeastern São Paulo State, Brazil.

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Authors' Contributions

DJA: Supervision, Conceptualization, Validation, Resources, Investigation, Methodology, Writing – original draft and Writing – review & editing; VD: Investigation, Methodology, Writing – original draft.

Conflict of Interest Statement

The authors declare no conflicts of interest regarding the ownership of the data presented in this manuscript.

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