

First record of the African species *Leptodelphax maculigera* (Stål, 1859) (Hemiptera: Delphacidae) in Brazil

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Abstract

This study reports the first occurrence of *Leptodelphax maculigera* (Stål, 1859) in Brazil and the Americas. Until now, this species has not been reported outside of Africa. The notification occurred in the State of Goiás in species of agronomic importance, as corn, Brachiaria, elephant grass, cultivar BRS Capiaçú and beans. The identification of the species was carried out through the morphological analysis of the male terminalia. This species has been found in corn plants, were sharing the same space with another wellknown species great economic importance for the culture, the *Dalbulus maidis* (DeLong & Wolcott) and espite the morphological differences between the species, it's possible these two may be evaluated in the field only as "corn leaf-hoppers", without distinguishing the species because the presence of *L. maculigera* in Brazil was unknown. Furthermore, another worrying factor is the ability of the genus *Leptodelphax* to transmit phytoplasma as reported the literature, which may potentiate the damage to possible host plants in Brazil. Thus, the confirmed presence of *L. maculigera* in Brazil and the morphological distinction of the two species are key factors for establishing Integrated Pest Management (IPM) in the areas where it is found.

Fulltext

Leptodelphax maculigera (Stål, 1859) (Hemiptera: Delphacidae: Delphacinae: Delphacini) is an African species, with recorded occurrence in the Mascarene Islands, Ivory Coast, Madagascar, Kenya, and Cameroon (Attie et al. 2008; Asche 1988; Bonfils et al. 1994; Koji et al. 2012; Deguine and Ekukole 1997). This species has not previously been recorded in the Americas, and the Brazilian Ministry of Agriculture, Livestock, and Food Supply (MAPA) have not listed it as a quarantined pest.

L. maculigera is an oligophagous species that feeds on several economically important plants in the grass family (Poaceae) (Attie et al. 2008). The species has a straw color, a dark spot on the clypeus, hyaline wings, and black eyes (Stål 1864) (Figs. 1a-c). Female *L. maculigera* measure approximately 0.35 cm and males 0.30 cm. Their ovipositor is visible in the ventral view of the abdomen (Figs. 2a-d).

This work is the first report of the occurrence of *L. maculigera* in Brazil. Specimens of the insect were collected and observed in the months of July to November 2022, in the State of Goiás, in Goianira in corn (*Zea mays* L.) cultivation (Fig. 3a) and in the elephant grass (*Pennisetum purpureum* Schumach.) cultivar BRS Capiaçú (Estância Jerusalém, 16°25'25.3"S and 49°25'55.0"W); in the experimental areas of the Agronomy School of the Universidade Federal de Goiás, in Goiânia, present in corn, brachiaria grass (*Brachiaria* sp.), elephant grass (Fig. 3b), as well as in weeds in bean cultivation (16°35'54.2"S and 49°17'29.5"W / 16°35'46.8"S and 49°16'47.4"W); in Palminópolis in volunteer corn (Fazenda Saltador, 16°52'03. 2"S and 50°09'01.6"W); in Ipameri in a sticky trap in the area outside a eucalyptus plantation (Fazenda Piemonte, 17°08'59.2"S and 47°44'14.6"W).

Specimens were collected in the nymphal and adult stages and maintained under refrigeration in the laboratory. External (wing pattern and colors) and internal (male genital morphology) characteristics were

used for identification (viz. Asche 1988, Figs. 133–138) (Fig. 4). The genitalia studied were placed in heated potassium hydroxide solution (10%) for 5 min following standard techniques for preparation (e.g., Knight 1965, Barnett 1970) and mounted for observation of the pygofer, aedeagus, parameres, and anal tube, examining them in lateral and ventral view. Once the species was confirmed, all biological material used for identification was deposited as permanent laminas in the - collection at Universidade Federal de Goiás, Escola de Agronomia (Goiânia, Brasil), under the numbers LM 01 to 06.

This species found in corn plants were sharing the same space with another well-known species, *Dalbulus maidis* (DeLong & Wolcott) (Hemiptera: Cicadellidae). Despite the morphological differences between the species, these two leafhoppers may be evaluated in the field only as “corn leaf-hoppers” without distinguishing the species because the presence of *L. maculigera* in Brazil was unknown.

However, at 0.4 cm in length, *D. maidis* is larger than *L. maculigera* and has two black ocellar spots (Figs. 5a-b). Moreover, being from different families, *D. maidis* (Cicadellidae) has several spines on the tibiae of their hind legs, while *L. maculigera* (Delphacidae) has a spur on the apex of the tibiae of their hind legs.

Thus, the confirmed presence of *L. maculigera* in Brazil and the morphological distinction of the two species are key factors for establishing Integrated Pest Management (IPM) in the areas where it is found.

Several delphacids are agricultural pests that require a lot of attention, not only because they suck sap from the phloem, but they can transmit diseases, especially viruses; and leave lesions for other pathogens to enter. According to Wilson (2005), species of this family can transmit 25 types of plant viruses.

Another worrying factor is the apparent ability of the genus *Leptodelphax* to transmit phytoplasma as reported by Koji et al. (2012) the literature, which may exacerbate damage to plants in Brazil.

Therefore, correctly identifying the occurring species is important, since the knowledge gained from monitoring the area helps effectively establish appropriate control tactics for each species before the population reaches levels of economic damage as we are already seeing with the species *D. maidis* in Brazilian corn crops.

Declarations

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Conflict of Interest The authors declare no competing interests.

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Figures



Figure 1

Adult male *Leptodelphax maculigera* in dorsal view (a), ventral view (b), and lateral view (c). (Goiânia, GO, November 2022)



Figure 2

Leptodelphax maculigera adults: male (a) and female (b) in lateral view; comparison of the size of the male and female together in lateral (c) and ventral (d) views. (Goiânia, GO, September 2022)



Figure 3

L. maculigera adults on corn in Goianira, GO (a) and elephant grass in Goiânia, GO (b)

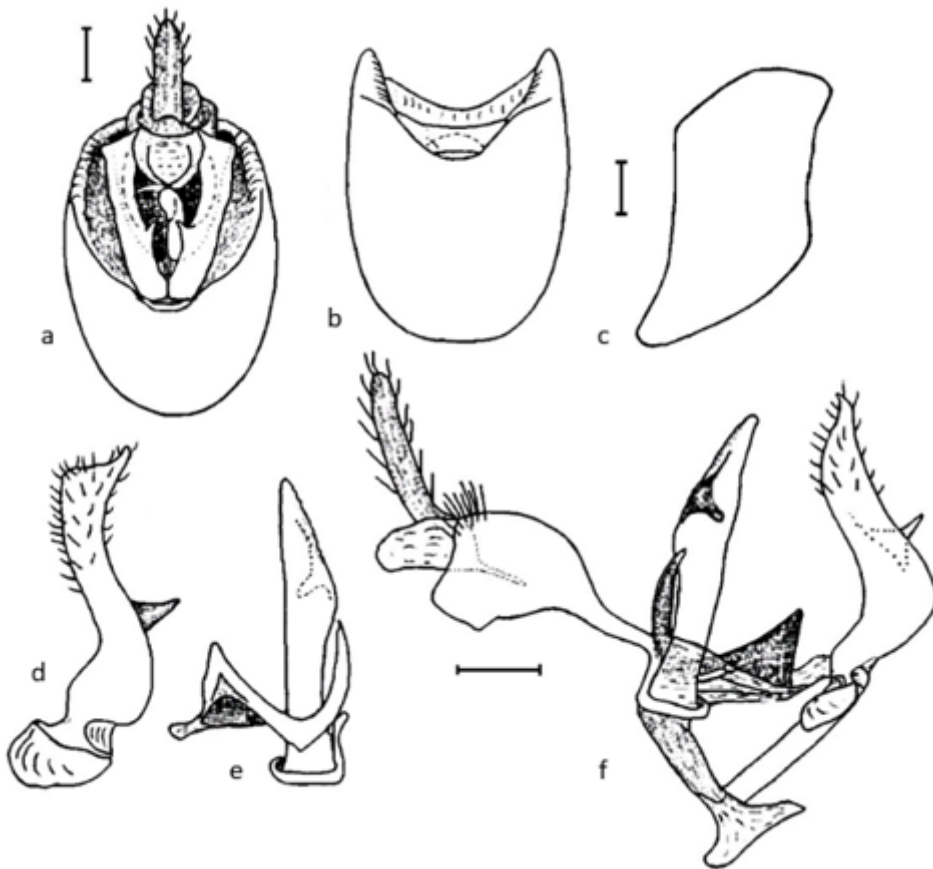


Figure 4

Male terminalia of *Leptodelphax maculigera*, reproduced from Asche 1988. (a) terminalia, ventrocaudal view, (b) pygofer, ventral view, (c) pygofer, left lateral view, (d) left gonostylus, left lateral view, (e) aedeagus, right lateral view, (f) aedeagal complex (anal tube, aedeagus, connective, left gonostylus), left lateral view

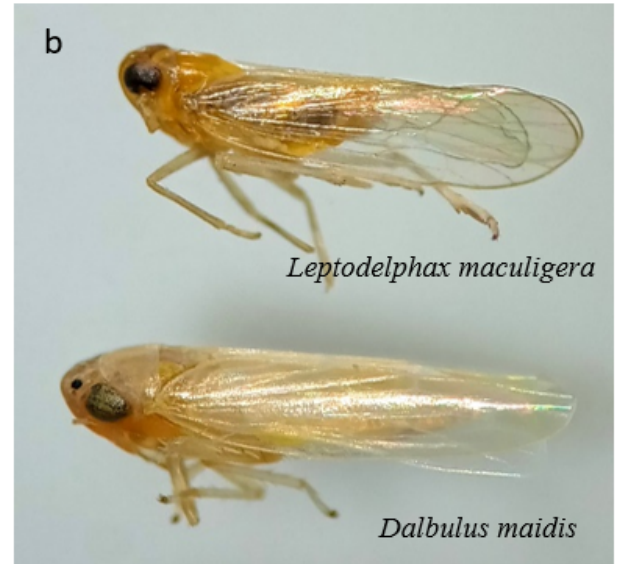


Figure 5

Comparison of adult *Dalbulus maidis* with *Leptodelphax maculigera* (Goiânia, GO, November 2022)