



## New records of *Haplaxius* (Hemiptera: Cixiidae) in the Dominican Republic, with description of a new species

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The planthopper genus *Haplaxius* Fowler has a New World distribution. Kramer (1979) revised the New World *Myndus* Stål, consisting of 63 species. In that revision, Kramer synonymized *Haplaxius* and *Paramyndus* Fennah under *Myndus*, and *P. cocois* Fennah (1945), the type species of *Myndus*, as a junior synonym of *M. crudus*. Emeljanov (1989) reinstated the genus *Haplaxius* Fowler for the New World species formerly in *Myndus*. These consequent name changes have been accepted by all subsequent taxonomists (e.g., see Holzinger *et al.* 2002) but use of the name *Myndus*, when referring to New World species is still widely used, erroneously, in the applied literature.

One species, *H. crudus* (Van Duzee 1907) (Fig. 7), is a confirmed vector of Lethal Yellowing (LY) of coconut and other palms in Florida (Howard *et al.* 1983; Howard 1987), and perhaps elsewhere in its range where LY occurs (e.g., Dominican Republic, Jamaica, and Mexico) (Howard and Wilson 2001). Ferreira *et al.* (in review) documented the presence of *H. crudus* in the Dominican Republic; it is primarily a mainland species, but until now one of only three *Haplaxius* species recorded from the Antilles, occurring also in Cuba and Jamaica (Kramer 1979). The other insular species are *H. jamaicae* Kramer, which was thought until now to be endemic to Jamaica, and *H. hochae* O'Brien, from Dominica.

In this paper we record the presence of *H. jamaicae* in the Dominican Republic and describe a new species from that country. Both may be involved in the spread of LY.

The LY disease, caused by a phytoplasma, was first reported in the Dominican Republic from Puerto Plata (Carter, 1962), in the Northern Region of the country. This record has since been confirmed by specialists, such as Romney (1970) and Harries (1999). The LY has infested the coconut plantations in Cabarete, Sosua, Luperón (Provincia Puerto Plata) and Corral Grande and Villa González (Provincia Dajabón). Martinez *et al.* (2008) reported it from the locality of Boca Chica, Santo Domingo, indicating that the LY is spreading to the Southeast, and perhaps nationwide.

It merits mention that this phytoplasma is attacking coconut plantations along beach areas of the Dominican Republic, which draws tourism. The coconut palm is therefore part of the landscape context of the tourism. Because tourism constitutes one quarter of the GDP of the Dominican Republic (<http://www.godominicanrepublic.com/en/dr.htm>), the potential economic impact of uncontrolled LY, or its control through any massive destruction of the coconut plantations of the country is greatly increased.

Elsewhere in the tropical Americas, *Haplaxius crudus* has been confirmed as a vector of LY in coconut palms (Howard *et al.*, 1981, 1983; Purcell, 1985).

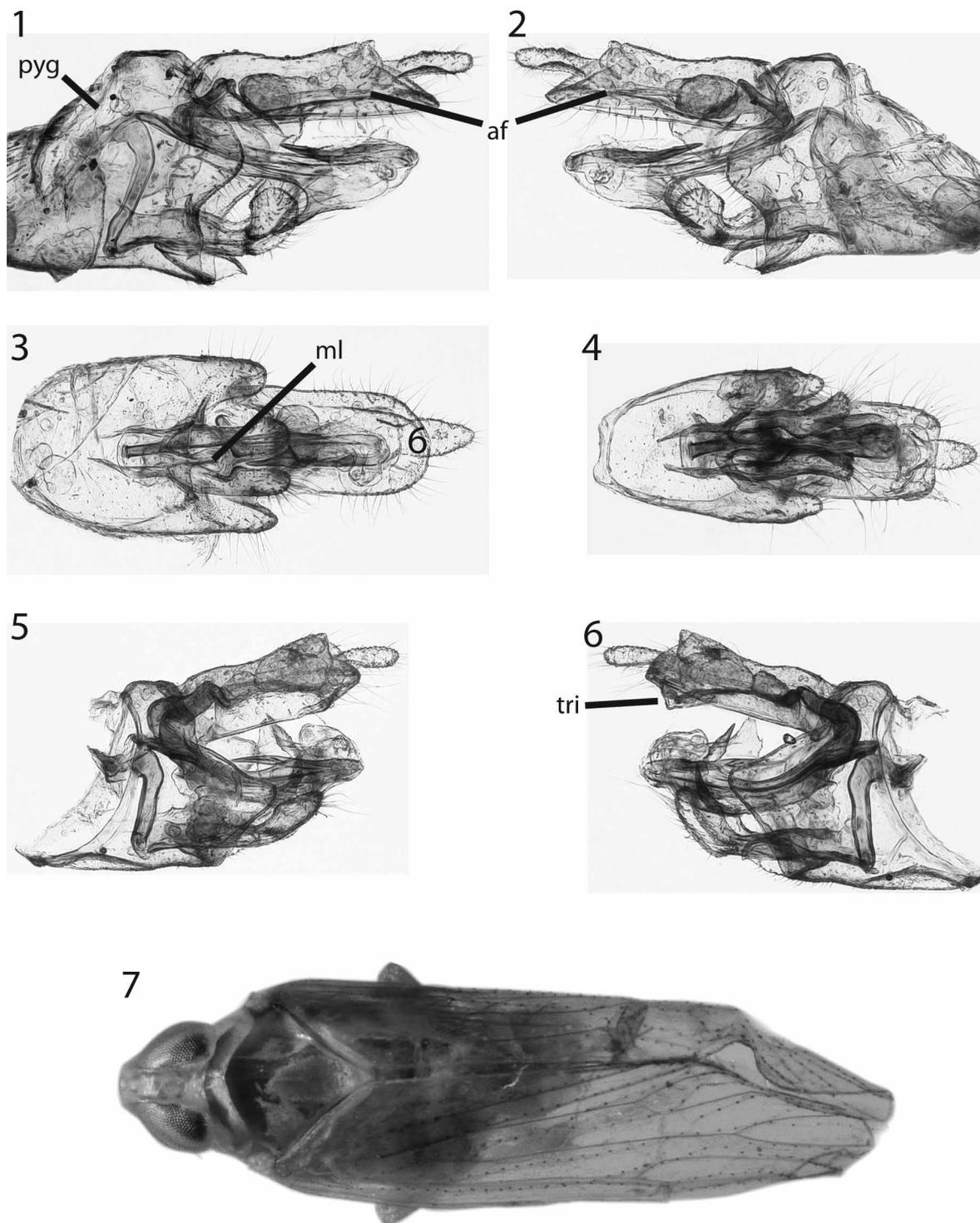
Kramer's (1979) diagnosis of this important genus (as *Myndus*) merits repeating: "The genus [*Haplaxius*] can be separated from other American cixiid genera by the following combinations of positive and negative characters: vertex not narrowed for entire length, lateral coronal margins not strongly elevated, frons no wider than long, antennae not in earlike cavities, mesonotum tricarinate, no spines on hind tibia before apex, and forewings not tectiform."

The genus *Haplaxius* was reported in the Dominican Republic by Howard *et al.* (1981), as "*Myndus* sp. (próximo a [= near to] *M. crudus*)," but an undescribed species with unspecified genitalic differences. The two males on which this report was based, presumably were examined by J. P. Kramer (a junior author of the paper) and deposited in the United States National Museum of Natural History [USNM], could not be located for comparison. They, perhaps, were other specimens of the new species described here.

*Haplaxius cabrerensis* Ferreira, McKamey, & Sanchez, n. sp.

Figs. 1–3

**Diagnosis.** Aedeagus with a narrow dorsal process directed anteriorly and a broad falcate ventral process directed ventroanteriorly.



**FIGURES 1–7.** terminalia of male *Haplaxius* species from the Dominican Republic. 1–3, *H. cabrerensis*, n. sp., holotype. Male terminalia in left lateral, right lateral, and ventral views, respectively. 4–6, *H. jamaicae* (Kramer). Male terminalia in left lateral, right lateral, and ventral views, respectively. 7, *H. crudus* (Van Duzee). Habitus, dorsal view; *af*, “anal flap” of Kramer (abdominal segment X); *ml*, median lobe of pygofer (*pyg*); *tri*, diagnostic subtriangular projection. All images are of specimens from the Dominican Republic.

**Description.** Length of male with forewings in repose 4.2 mm. Color stramineous to light brown throughout, including forewing veins and stigma. Pygofer in lateral view (Figs. 1, 2) with posterior margin sinuous, in ventral view (Fig. 3) with median lobe subtriangular, distally rounded. Abdominal segment X (the “anal flap” of Kramer 1979) simple, symmetrical, without ventral processes, in lateral view (Figs. 1, 2) ventroposteriorly acute with ventral length 3 × maximum height. Aedeagus asymmetrical with two processes: a narrow acuminate process dorsally, directed anteriorly along aedeagal shaft (Figs. 1, 2), a broadly based falcate process slightly left of center (Fig. 3), directed ventroanteriorly. Subgenital plates (Figs. 1–3) capitate, distally rounded.

**Material examined.** Holotype ♂ (USNM): DOMINICAN REPUBLIC, Prov. Maria Trinidad Sanchez, Cabrera, Payita, Baoba del Pinar, N19° 30.709, W69° 55.638. 8-V-2008. coll. Mileida Ferreira, Teresa Martinez y Andrea Feliz.

**Etymology.** The specific epithet is based on the type locality, Cabrera.

**Notes.** The collection was taken in a coconut plantation, sweeping grass (Poaceae) and weedy herbs. In Kramer’s (1979) key to Neotropical species, *H. cabrerensis* keys out to couplet 27, which includes *H. tekton* (Kramer) from Peru (aedeagus with three long processes) and *H. frontalis* (Fowler) from Mexico (aedeagus lacking long dorsal process). *Haplaxius cabrerensis* is easily distinguished from other insular species of the Caribbean by the broad falcate ventral process of the aedeagus, and its abdominal segment X is simple, lacking ventral processes. In contrast, *H. crudus* has a narrow digitate ventral process on the aedeagus and an abdominal segment X with a pair of small triangular processes at its base; *H. hochae* O’Brien (2006), from Dominica, has an abdominal segment X with a large convex projection at the base and a sinuous ventral margin. Three *Haplaxius* females were collected with the holotype, but their species identity cannot be determined because the collection lot also included a male of *H. jamaicae* (Kramer), the only other Antillean species.

### *Haplaxius jamaicae* (Kramer)

Figs. 4–6

**Diagnosis.** Pygofer in lateral view (Figs. 5, 6) with posterior margin subtriangular, abdominal segment X with singular, triangular process distoventrally. Aedeagus with a small, serrate, apical process directed dorsally, and a long narrow process directed anteriorly. Subgenital plates (Fig. 4) distally capitate but elongate. Color uniformly pale brown without distinct color pattern; forewings hyaline with veins pale brown.

**New material examined.** 1 ♂ (USNM): DOMINICAN REPUBLIC, Prov. Maria Trinidad Sanchez, Cabrera, Payita, Baoba del Pinar, N19° 30.709, W69° 55.638. 8-V-2008. coll. Mileida Ferreira, Teresa Martinez y Andrea Feliz.

**Notes.** Both this specimen and the holotype (USNM) agree with Kramer’s (1979) original description and illustration. The single male was collected in the same collection event as *H. cabrerensis* n. sp. and three unidentified *Haplaxius* females.

When Kramer’s (1979) revised the genus *Haplaxius*, he remarked that because 24 of the 29 Mexican and Neotropical species were new, that “there seems to be little reason that these represent more than a fraction of the total fauna south of the United States.” Based on the discoveries by O’Brien (2006), Ferreira *et al.* (in review), and the current paper, it appears the same can be said about the Antillean fauna. It is a lesson to remember, especially for those studying LY, that if *Haplaxius* is implicated as a vector, it does not automatically imply that the species involved is *H. crudus*.

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