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IDENTITY AND FIRST RECORD OF THE SPITTLEBUG *MAHANARVA BIPARS* (HEMIPTERA: AUCHENORRHYNCHA: CERCOPIDAE) ON SUGARCANE IN COLOMBIA

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Spittlebugs (Hemiptera: Auchenorrhyncha: Cercopidae) are widespread pests of sugarcane in the Neotropics (Fewkes 1969). Adult injury is expressed as a chlorosis known as froghopper burn that leads to losses in sugar content, juice purity and overall stalk and sugar yields (Dinardo-Miranda 2002). Sugarcane fields in Colombia have been notably free from serious spittlebug attacks and a damaging outbreak has not been documented until now.

In 2002, growers in the coffee zone of the Andean region reported severe infestations of spittlebugs in sugarcane fields used for gur ("panela") production. The problem was first detected in the locality of San José (vereda Santa Ana, municipio Guática, department Risaralda) in 2000, but the incipient damage was not cause for concern until now. This region was visited in September 2002 to document the incident and determine the identity of the spittlebug species involved.

Two infested fields were visited on 24 September 2002 on a farm at Guática (5°18'N, 75°49'W) where the owner first noted the infestation 8 months earlier. In this production system, sugarcane stands are of mixed ages due to selective harvesting, and stems in all age classes were attacked; some stems as young as 1-2 months old were infested with nymphs. A high proportion of stems were infested in each field; the chlorotic streaks attributed to adult feeding, however, were not evident. The infested area in the first field (1624 m elevation) was approximately 2 ha with 76.2% of stems infested (n = 21, var Puerto Rico 61632). Mean infestation was 4.7 nymphs and 1.1 adults per stem. The infested area in the second field (1663 m elevation, mixed sugarcane varieties) was approximately 0.5 ha, with 43.1% of stems infested (n = 43, mixed varieties) with an average of 1.8 nymphs and 0.3 adults per stem. Agronomists from other areas around Guática also reported problems with persistent spittlebug populations in sugarcane under the same production system. To date, however, spittlebugs have not been detected in the nearest fields of sugarcane under industrial sugar production (24 km north). This will be an important frontier to monitor in the next few years as Colombia moves to prohibit preharvest burning by 2005 (Cenicaña 1998); a shift to green production may open opportunities for emergent spittlebug pests in extensive sugarcane production systems.

The spittlebug was identified as *Mahanarva bipars* (Walker). Voucher specimens were deposited in the Cornell University Insect Collection under Lot #1227. This is the first definitive report of this species from Colombia and from sugarcane. The original species description was based on an unknown number of adults collected in South America. Walker (1858) placed *bipars* in the genus *Sphenorhina* Amyot & Serville, and this was later moved to *Tomaspis* Amyot & Serville by Lallemand (1912) and then to *Mahanarva* Distant by Fennah (1968). No specific locality data or other information were recorded for the type specimens. To our knowledge, there are no other accounts of *M. bipars* in the literature, meaning no available information on distribution, biology, host plants, size, or color pattern variation.

The genus *Mahanarva* is known from Costa Rica, Panama and throughout South America. There are 32 described species (pers. comm. M. Webb), of which several are known as forage grass or sugarcane pests. The most important pest species are reported from Brazil, Colombia and Ecuador. *Mahanarva posticata* (Stal) and *M. fimbriolata* (Stal) are found on sugarcane (Guagliumi 1973; Dinardo-Miranda et al. 2001; García 2002), and *M. spectabilis* on forage grasses (DCP, pers. observ.) in Brazil. *Mahanarva trifissa* (Jacobi) feeds on forage grasses in southeastern Colombia (Peck 2001; CIAT 2002). *Mahanarva andigena* (Jacobi) occurs on sugarcane in northwestern Ecuador (Mendoza 1999; Fors 2000, DCP personal observation). The other known grass-feeding species include *M. indicata* Distant, *M. mura* (China & Myers), *M. phantastica* (Breddin), *M. quadripunctata* (Walker), and *M. tristis* (F.). *Mahanarva costaricensis* (Distant) is the only known species to specialize on non-grasses, reported from *Calathea* (Marantaceae) and *Heliconia* (Heliconiaceae) (V. Thompson, Dept. Biology, Roosevelt University, unpublished).

Additional locality records for *M. bipars* were obtained from specimens housed in the Natural His-

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Fig. 1. Known global distribution of *Mahanarva bipars*.

tory Museum (UK, 3 specimens), Universidad del Valle (Colombia, 2 specimens) and the Universidad Nacional sede Palmira (Colombia, 6 specimens). Together with our field collections, all known reports of *M. bipars* are listed below and mapped (Fig. 1). This species has only been collected from the Colombian departments of Cauca, Chocó, Risaralda and Valle del Cauca, representing the Pacific coast east to the central cordillera of the Andes.

COLOMBIA: *Cauca*, El Trueno, río Naya, XI-1984, coll. Camilo Hurtado. *Chocó*, Quibdó, "on weeds", XI-1983, coll. Velez; Tutunendó, "on weeds", XI-1983, coll. Velez; Proparicio Urriabo, 20-V-1987. *Risaralda*, Guática, Santa Ana, 24-IX-2002, 1624-1663 m elevation, coll. J. Rodríguez. *Valle del Cauca*, Cali, X-1989, coll. Ramírez H.; Calima, 20-VII-1981, coll. Chaves; Palmira, 3-X-1978, coll. Acevedo; Valle, IV-1978.

Mahanarva bipars is distinguished from other *Mahanarva* and other Colombian grass-feeding spittlebugs by characteristic genitalia and color pattern. Males of the genus have a pair of simple horn- or scimitar-shaped aedeagal processes between one third and one half the length of the aedeagal shaft. These are usually positioned perpendicular to and approximately half-way up the shaft; if downturned they do not reach the base of the aedeagus. In *M. bipars*, these processes emerge from the widest point of the aedeagus and reach their greatest width (in lateral aspect) half-way along their length and then taper evenly to the tip; the tip of the aedeagal shaft is rounded, without an apical tooth or projection. The gonopore is apical.

Like other neotropical grass-feeding species of spittlebugs (Rodríguez et al. 2002), adult *M. bipars* are sexually dimorphic. Compared to females, males are smaller with respect to certain body size measurements (Table 1). There is significant variation in the color patterns of the wings based on partial to complete reduction in the orange markings over the brown to dull black dorsum (Fig. 2). Compared to females, males exhibited less reduction in the orange patch making their coloration more conspicuous.

Similar to *M. andigena* and *M. posticata*, spittle masses are aerial. Younger nymphs tend to be found within young rolled leaves while older nymphs occur on the older lower leaves where the leaf sheath begins to separate from the stem. Adults were most commonly observed in the rolled up leaves that form the apical shoots, or under the leaf sheaths. Oviposition sites were not determined. This insect is being managed locally by removing old leaves from the stem (reducing protective sites for nymphs to establish spittle masses) and use of the insecticide chlorpyrifos.

Although *M. bipars* is the first documented sugarcane spittlebug pest of economic importance in Colombia, three other species are at least present in sugarcane and do represent species that should be monitored. The Central American pasture and sugarcane pest *Prosapia simulans* (Walker) was reported for the first time in Colombia in 1999 (Peck et al. 2001). Given persistent populations in *Brachiaria* pastures of the Cauca Valley, this species is being locally monitored for its presence in sugarcane. There is a particular concern that sugarcane will become a more susceptible habitat to this species when preharvest burning is prohibited. Another spittlebug species of known concern to sugarcane producers in Colombia is *M. andi-*

TABLE 1. SIZE (MM) OF ADULT *MAHANARVA BIPARS* COLLECTED FROM SUGARCANE (COLOMBIA: RISARALDA, GUÁTICA) (MEAN ±SE, RANGE, N = 13 FEMALES AND 9 MALES).

Sex	Head capsule Width	Body length without wing	Body length with wing	Body width	Stylet length	Anterior wing length
Male	2.41 ± 0.08 a (2.25 - 2.52)	10.22 ± 0.73 a (8.57 - 11.07)	10.99 ± 0.40 a (10.50 - 11.71)	5.23 ± 0.26 a (4.86 - 5.57)	1.19 ± 0.05 a (1.14 - 1.29)	8.97 ± 0.43 a (8.36 - 9.79)
Female	2.68 ± 0.10 b (2.52 - 2.84)	11.98 ± 0.63 b (10.79 - 12.86)	12.14 ± 0.45 b (11.36 - 12.86)	5.82 ± 0.33 b (5.36 - 6.36)	1.42 ± 0.13 b (1.21 - 1.79)	9.63 ± 0.36 b (8.93 - 10.07)

For each column, means followed by different letters are significantly different at $P < 0.05$ (t-test).

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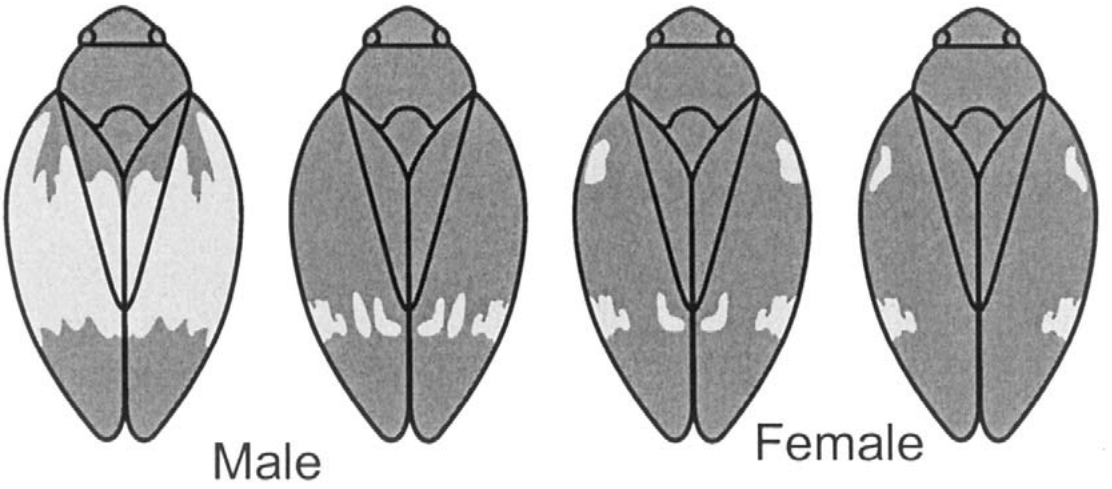


Fig. 2. Most common color pattern variation exhibited dorsally in adult *Mahanarva bipars*.

gena. This species was first documented in Colombia in 1999 and is reported from Johnson grass (*Sorghum halepense*) and sugarcane on the south Pacific coast (JRC & DCP, personal observation). Over the last 5 years this species emerged as a highly injurious pest for sugarcane production on the Pacific coast of Ecuador (Mendoza 1999; Fors 2000). Finally, according to reports received by CENICAÑA, *Aeneolamia* sp. has been reported on sugarcane near Cucutá in the department of Norte de Santander (LAG, pers. observ.).

Summary

Mahanarva bipars (Walker) is identified as the species causing the first spittlebug outbreak in Colombian sugarcane. Information on the biology, host plants and geographic range are absent from the literature. Therefore, we summarize field observations on infestation levels and location of feeding sites, laboratory observations on size and adult color pattern variation, and known locality information that indicates distribution is restricted to western Colombia.

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