

***Trigona fuscipennis* and *Trigona fulviventris* (Hymenoptera: Apidae) Damage *Garcinia mangostana* L. in Southern Chiapas, Mexico¹**

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While monitoring phytophagous insects associated with the commercial production of mangosteen, *Garcinia mangostana* L. (Clusiaceae), in Chiapas, Mexico from 2015 to 2019, we observed damage to the vegetative and reproductive parts of the plants caused by stingless bees, *Trigona* spp. Specimens were collected, preserved in 75% alcohol, and later mounted. Using the taxonomic keys of Ayala (1999, Fol. Entomol. Mex. 106: 1–123), *Trigona fuscipennis* Friese and *T. fulviventris* Guérin-Meneville (Hymenoptera: Apidae: Apinae: Meliponini) were subsequently identified. Voucher specimens are deposited in the Insect Collection at El Colegio de la Frontera Sur, Unidad Tapachula (registration number SEMARNAT CHIS-INV-133-09-02, acronym ECO-TAP-E). The mangosteen orchards from which these specimens were collected were located in the municipality of Tuxtla Chico (N 14°58'35'', W 92°9'18'', 314 m), Huehuetán (N 15°00'35'', W 92°26'20'', 20 m), and Tapachula (N 52°52'33'', W 92°21'25'', 47 m) in Chiapas, Mexico.

The *Trigona* genus is morphologically characterized by a longitudinal elevation on the inner surface of the posterior tibia, which is covered by keirotrichia, while the inner surface of the posterior barsitarsus has a more or less circular silky basal area. In addition, mandibles have three or four teeth. *Trigona fuscipennis* is distinguished by black mandibles with five teeth of reddish-brown distal margin, a

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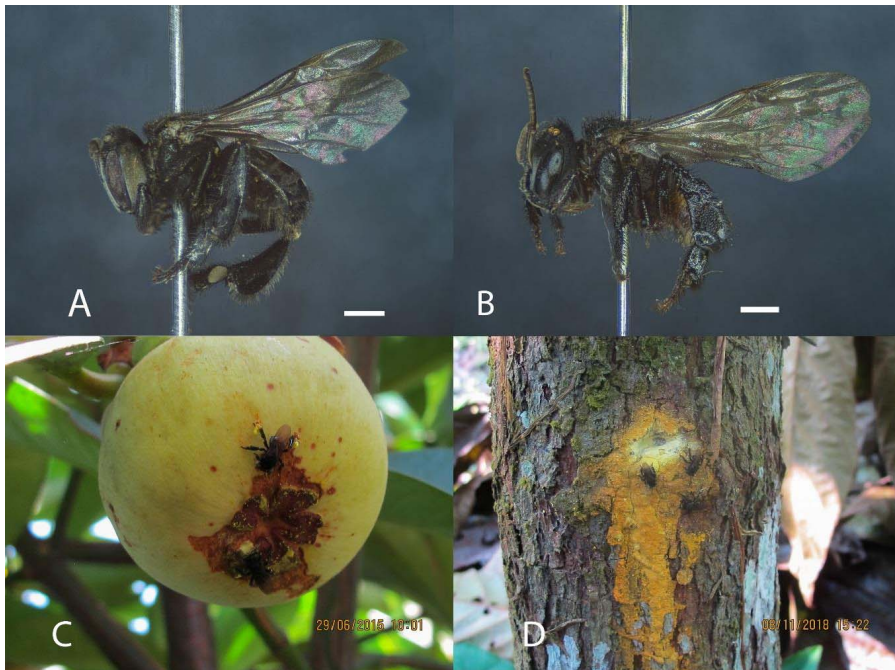


Fig. 1. Stingless bees from *T. fuscipennis* (A) and *T. fulviventris* (B). *Trigona* sp. chewing fruit (C); stem of *G. mangostana* (D).

clypeus with setae shorter than the diameter of the scapus, and black metasoma (Fig. 1A). *Trigona fulviventris* mandibles presented four reddish-brown teeth, a clypeus with longer setae, and reddish-orange metasoma (Fig. 1B).

Trigona fuscipennis and *T. fulviventris* damaged *G. mangostana* plants by chewing or boring the bark of stems, branches, and the fruit pericarp (Fig. 1C). No inflorescence or leaf damage was observed. *Trigona fuscipennis* created holes of 7-mm diameter on the stems. Lesions on fruit pericarp usually occurred on the lower pole and caused a secretion of yellow resin, giving the fruits a scarred appearance (Fig. 1D). Damage to the fruit caused by the two species was aesthetic; damage rarely affected the fruit pulp. In our observations, we found single bees or as many as five bees of the two species feeding on the same tree.

Members of the genus *Trigona* are widely distributed (Michener 2000, Bees of the World, Johns Hopkins Univ. Press, Baltimore, MD, USA), and a number of species are important pollinators and producers of honey and wax (Ayala 1999; Slaa et al. 2006, Apidologie 37: 293–315). However, some species damage crops of economic importance in tropical and subtropical regions (Nunes dos Santos et al. 2012, Sci. Agric. 69: 281–283; Peruquetti et al. 2010, Neotrop. Entomol. 39: 1051–1052). These species feed on soft and woody vegetative tissues, feed on the surfaces, or bore into fruits to obtain resins and fibers which they mix with mud and wax to form cerumen, a material used to build their nests (Nogueira-Neto 1997, Vida e Criação de Abelhas sem Ferrão, Edição Nogueirapis; Sacramento et al.

2007, Rev. Bras. Frutic., Jaboticabal-SP 29: 195–203). Some species damage flowers of *Luffa* sp., *Passiflora ligularis* Juss (Gutiérrez-Chacón et al. 2018, J. Pollinat. Ecol. 22: 75–81; Leite et al. 2011, Rev. Ciênc. Agron. 42: 986–992) while others damage leaves of *Macadamia integrifolia* Maiden & Betcher and *M. tetraphylla* Johnson (Wille 1965, Rev. Biol. Trop. 13: 271–291) and fruits of *Psidium guajava* L. (Peruquetti et al. 2010).

Ours is the first report of *T. fuscipennis* and *T. fulviventris* damaging mangosteen, *G. mangostana*, in Mexico and the world. Previously, Sacramento et al. (2007) reported *T. spinipes* (F.) damaging flowers and fruits of *G. mangostana* orchards in Brazil. According to Affandi and Emilda (2009, J. Fruit Ornam. Plant Res. 17: 219–233), the mangosteen international standard for export requires fruit be free from scar and aesthetic damage. Thus, it is now necessary to develop tactics for the management of *Trigona* spp. in the commercial production of mangosteen in southern Chiapas. *Garcinia mangostana* is grown mainly in tropical regions of Asia, India, Australia, and some Central and South American countries (Araújo et al. 2012, Rev. Bras. Frutic. 34: 1074–1083). In Mexico, it is cultivated in the states of Chiapas and Veracruz, with more than 700 ha planted in Chiapas (Díaz-Fuentes et al. 2011, El Mangostán *Garcinia mangostana* L. INIFAP-CIRPAS) and 50 ha of that for fruit production only (SIAP 2019, El cultivo de mangostán. Secretaría de Agricultura y Desarrollo Rural. <http://www.siap.gob.mx/>).