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First record of the genus *Heterostylum* Macquart, 1848, in the Lesser Antilles (Diptera, Bombyliidae)

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Abstract. – The genus *Heterostylum* Macquart, 1848, is reported for the first time from Lesser Antilles with the discovery of the Neotropical species *Heterostylum ferrugineum* in Martinique, Guadeloupe and Saint Barthelemy islands. One specimen was collected for the first time in Martinique by Father Pinchon (1913-1980) in 1953 and four others during entomological surveys conducted in natural areas of ecological, faunistic and floristic interest (ZNIEFF). This bee fly is revealed to have limited distribution in xeric biotope woodland of Caravelle Peninsula. Its presence on other islands is also attested by naturalist observations.

Résumé. – **Premier signalement du genre *Heterostylum* Macquart, 1848, dans les Petites Antilles (Diptera, Bombyliidae)**. Le genre *Heterostylum* Macquart, 1848, est signalé pour la première fois des Petites Antilles suite à la découverte d'*Heterostylum ferrugineum* dans les îles de Martinique, Guadeloupe et Saint-Barthélemy. Un unique spécimen fut collecté pour la première fois en Martinique en 1953 par le Père Pinchon (1913-1980), puis quatre autres au cours d'une récente campagne d'inventaire entomologique des Zones Naturelles d'Intérêt Écologique, Faunistique et Floristique (ZNIEFF). Il s'avère que l'espèce est inféodée aux habitats forestiers xérophiles de la presqu'île de la Caravelle. Sa présence dans les autres îles est attestée par des observations de naturalistes sans qu'aucun spécimen n'ait été conservé.

Keywords. – West Indies, faunistics, ZNIEFF, bee flies.

The genus *Heterostylum* Macquart, 1848, contains nine described species in the Neotropics. Five of them occur in Greater Antilles islands of Caribbean region (Cunha *et al*., 2007; Lamas *et al.*, 2014): *H. ferrugineum* (Fabricius, 1805), *H. haemorrhoicum* (Loew, 1863), *H. hirsutum* (Thunberg, 1827), *H. pallipes* Bigot, 1892, and *H. rufum* (Olivier, 1789).

During an entomological survey developed in the Nature Reserve of Caravelle Peninsula, located on the east coast of Martinique, bee flies' specimens of the genus *Heterostylum* have been collected (Touroult *et al*., 2015). Some of them were observed on the ground (fig. 1) or foraging on the Wild Marigot flowers (*Wedelia calycina* Rich., 1807, Asteraceae), a common shrubby plant of the dry wood of the Reserve (fig. 2). The species was also observed and photographed by naturalists in Guadeloupe (www.tiracoon.fr) and Saint-Barthelemy (Questel, 2015). One earlier specimen was identified in the insect collection of Father Pinchon (1913-1980). Our preliminary determination led us to consider that these bee flies belonged to an undescribed species of *Heterostylum* because of their external features as orange hairs of body contrasting with the other species keyed in Cunha *et al*. (2007) (Touroult *et al*., 2015). After dissections and the examination of male genitalia structures, we concluded that all specimens collected in the Reserve are *Heterostylum ferrugineum*.

As stated by Lamas *et al*. (2014), the genus *Heterostylum* is divided into two major groups, represented by one Neotropical clade, which includes the Neotropical species and is sister of a second Nearctic clade. *Heterostylum ferrugineum* is positioned within the Neotropical group,

distributed through the Caribbean and in the semi-arid diagonal of South America. There is a large distributional gap for the species in the Amazon biome, which is expected for bee flies, except for a single known record from Boa Vista (State of Roraima), locality covered by typical vegetation of Cerrado (Brazilian Savannah) (Lamas *et al*., 2014).

In this note, we report for the first time the occurrence of the genus *Heterostylum* in the Lesser Antilles. The recorded species, *H. ferrugineum*, was recently reported to Argentina, which represents the austral-most record of the genus in South America (Torretta *et al*., 2021).

Family **Bombyliidae** Latreille, 1802

Genus ***Heterostylum*** Macquart, 1848

Heterostylum ferrugineum (Fabricius, 1805)

Material examined from Martinique. – 1 ♀, 24.V.1953, Pointe Ferret (Caravelle Peninsula), Trinité, *R. Pinchon leg*. (collection R. Pinchon, Fort-de-France); 1 ♂, 1 ♀, 26.VIII.2014, Réserve Naturelle de la Caravelle, Trinité, *E. Dumbardon-Martial* (Museum of Zoology of the University of São Paulo); 1 ♀, 1.V.2017, Réserve Naturelle de la Caravelle, Trinité, *E. Dumbardon-Martial leg*. (collection

Fig. 1-3. – *Heterostylum ferrugineum* (Fabricius). – **1**, Specimen photographed for the first time in 2013 in a part of ecological bare-ground unit of the Caravelle Natural Reserve. – **2**, A flower head of *Wedelia calycina* visited by *Heterostylum ferrugineum* in the Caravelle Natural Reserve. – **3**, Specimen photographed in Guadeloupe in 2021.

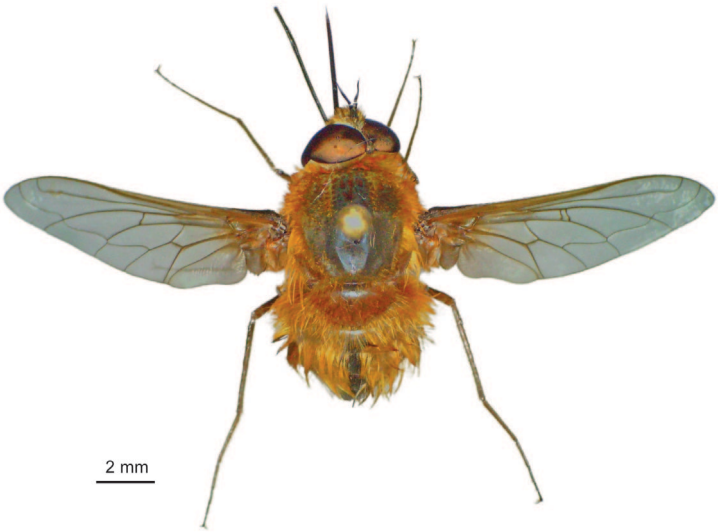

Fig. 4. – *Heterostylum ferrugineum*, habitus of male captured in the Caravelle Natural Reserve (1.XI.2018).

E. Dumbardon-Martial); 1♂, 1. XI.2018, Réserve Naturelle de la Caravelle, Trinité, *E. Dumbardon-Martial leg*. (collection E. Dumbardon-Martial).

Field observations from Martinique. – Caravelle Nature Reserve: 1 ♀, 22.V.2013, photographed by C. Pierre (fig. 1); 1 ♀, 24.VIII.2014, photographed by R. Delannoye; 1 ♀, 1.V.2018, foraging on *Wedelia calycina*, photographed by C. Pierre (fig. 2).

Field observations from Guadeloupe. – 1 ♀, 5.V.2012, Morne Cadet, Gourbeyre (Basse-Terre), photographed by P. & C. Guezennec (www.tiracoon.fr); 1♂, 28.IV.2021, Saragotte, Sainte-Anne (16.268567, -61.391786, alt. 39m), photographed by L. Malglaive (fig. 3).

Field observations from Saint Barthelemy. – 1 ♀, 29. XI. 2008, Le Gouverneur (17.882832, -62.838516, alt. 92m), photographed by K. Questel (Questel, 2015).

All data will be integrated into the CardObs database of the INPN (French National Inventory of Natural Heritage, https://cardobs.mnhn.fr).

Diagnosis. – *Heterostylum ferrugineum* can be easily distinguished from the other species of the genus by the color pattern of the body (Cunha *et al*., 2007): abdomen with golden hairs and stripe of dark brown hairs on center of tergites; palpus yellow; scutellum light brown.

Comments. – The studied specimens present some discrete variations in the body color, as the setae are not golden as described by Cunha *et al*. (2007), but orange (fig. 4). There is no other evident morphological variation concerning male or female body parts or structures that may suggest that these specimens belong to a different species.

Distribution. – South America: Argentina; Bolivia; Brazil; Paraguay; Greater Antilles: Porto-Rico, British Virgin Island, U.S. Virgin Islands (type locality) (Lamas *et al*., 2014; Evenhuis & Greathead, 2015; Torreta *et al*., 2021); Lesser Antilles (first record): Saint-Barthelémy, Guadeloupe, Martinique.

Observations. – *Heterostylum ferrugineum* is an uncommon bee fly species in Martinique having a highly-limited distribution restricted to the Caravelle Peninsula. The earliest known specimen was collected by Father Pinchon (1913-1980) in “Pointe Ferré”, a rocky point at this locality. Despite the different naturalist and scientific survey programs developed in

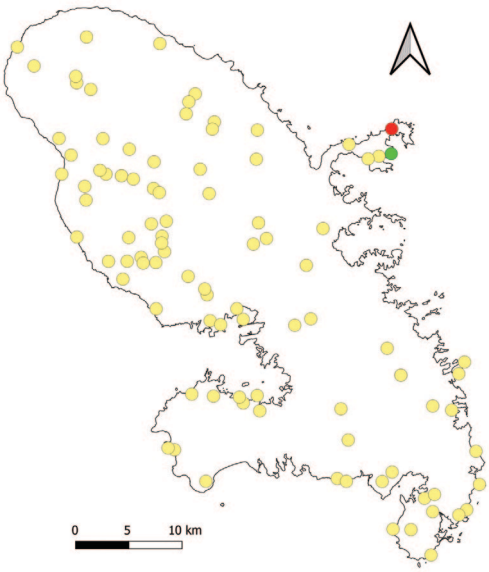

Fig. 5. – Distribution map of *Heterostylum ferrugineum* in Martinique. Red dot indicates the Caravelle Natural Reserve where *Heterostylum ferrugineum* was captured and observed foraging on flower plants between 2013 and 2018. Green dot represents the location (pointe Ferré) where one female was captured by Robert Pinchon in 1953. Yellow dots indicate 96 locations of "pollinators-plant" database (www.betafle) where *Heterostylum ferrugineum* has not been recorded.

Martinique, there was a long period without records for *Heterostylum* (Touroult *et al*., 2015, 2016, 2017, 2018, 2019, 2020, 2021). Furthermore, the local database recording more than 2,000 "pollinator-plant" interactions in 96 locations does not provide occurrences for the species outside of the Caravelle Peninsula area (Pierre & Dumbardon-Martial, 2017) (fig. 5).

The biology of *H. ferrugineum* has not been described. Species of the genus are known to be natural enemies of fossorial solitary bees parasitizing their nests. Females oviposit while in flight at the entrance of their host nests (Roubik, 1989). The potential hosts of *H. ferrugineum* in Lesser Antilles are probably solitary bees nesting in soil, as species of the genera *Centris* Fabricius, 1804, and *Melissodes* Latreille, 1829, common in xeric areas (Meurgey & Dumbardon-Martial, 2015; Pierre & Dumbardon-Martial, 2017).

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