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Abundance Episode of *Historis acheronta semele* (Lepidoptera: Nymphalidae) in Havana, Cuba

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ABSTRACT—The occurrence of an unprecedented abundance episode of *Historis acheronta semele* in July, 2021 in Havana, Cuba is reported. Ecological and ethological notes are made, and the possible causes and outcomes of the presence of large numbers of butterflies in the city are discussed. The absence of additional records makes it impossible to assess if the event is a migration or just a local abundance episode. The event developed during the rainy season of the Cuban climate, in coincidence with previously reported events for similar butterflies in Cuba. Nonetheless, the exact causes of this event remain unknown, as does the host plant of this butterfly in Cuba.

The genus *Historis* Hübner, 1819 belongs to the Nymphalidae family, and includes two species of butterflies distributed from northern Mexico to Argentina, including the Antilles (Riley 1975; Smith et al. 1994; Warren et al. 2021). These are *Historis acheronta* (Fabricius, 1775) and *Historis odius* (Fabricius, 1775), each with three accepted subspecies. The Greater Antilles are populated by *Historis odius odius* (Fabricius, 1775) on all the islands, *Historis acheronta cadmus* (Cramer, 1775) on Jamaica, and *Historis acheronta semele* (Bates, 1939) on Hispaniola and Cuba (Riley 1975). These butterflies are powerful and fast fliers of the humid forest canopy, although they sometimes fly in open areas such as scrublands, they feed on decomposing fruits, and their larvae consume shoots of various species of the genus *Cecropia* (Urticaceae) (Muysshondt and Muysshondt 1979; Smith et al. 1994).

Gundlach (1881) described *Historis acheronta semele* as common in Cuba, especially in the summer, when it visited villages and fed on “ripe fruit juice.” More than a century later, Alayo and Hernández (1987) described it as rare in Cuba, although with a wide distribution in forested areas, and being more common in the hills of the western province of Pinar del Río. More recently, Núñez et al. (2020) described it as uncommon though widely distributed throughout Cuba, with recent records from the Guanacahabibes Peninsula, Sierra del Rosario, Habana-Matanzas Hills, Ciénaga de Zapata, Sierra del Escambray, the mountains of Camagüey, Sierra Maestra, and the Nipe-Sagua-Baracoa mountain system. It has also been reported from Boca de Canasí, Mayabeque (Núñez and Barro 2003), but in the available literature there are no records of

the subspecies from Havana. In the present work, the presence of this butterfly is reported for the first time from Havana province.

From the second to the twentieth of July, 2021, 27 individuals of *Historis acheronta semele* (Fig. 1) were observed in ten of the 15 municipalities of Havana province. All of the observations consisted of isolated individuals flying swiftly over the city in forest patches, above the tree canopy level, and heading west. Several observations were registered within suburban areas, but other sightings were performed in the urban areas of 10 de Octubre and Playa municipalities. One of the individuals, spotted in the vicinity of La Veneciana River, Rincón de Guanabo, Habana del Este municipality, was feeding at flowers of *Coccoloba uvifera* (L.) L. (Polygonaceae) in a sea grape forest near the sea (Fig. 1A).

On July 21, 2021, in a visit to the aforementioned municipality, more than 200 individuals of *Historis acheronta semele* were observed. One of those specimens was collected and is deposited in the personal collection of Yosiel Álvarez (Fig. 2A–B). The butterfly was found flying in mangrove forests, coastal scrub, and ruderal vegetation near roads. The insects were moving westward, at high speed and above the tree canopy, often parallel to the road. On July 25, 2021, during another visit to the east coast in the Cojimar neighborhood, Habana del Este municipality, more than 50 individuals of the subspecies were observed, flying individually or in small groups in low coastal scrub near a road, heading west. One of those individuals was collected and is deposited in the personal collection of Yosiel Álvarez (Fig. 1D–E; Fig. 2C–D).



FIG. 1. Photographs of live individuals of *Historis acheronta semele* (Lepidoptera: Nymphalidae) observed in July, 2021 in Havana, Cuba. A. Adult observed on July 7, 2021 in Rincón de Guanabo, Habana del Este municipality, feeding on flowers of *Coccoloba uvifera* (Polygonaceae); B–C. Adult observed on July 20, 2021 in El Trigal, Boyeros municipality, perching in a tree of *Mangifera indica* (Anacardiaceae); D–E. Specimen collected on July 25, 2021 in Cojímar, Habana del Este municipality. Photographs by: A. Vladimir Mirabal; B–C. Carlos Hernández; D–E. Maybel María Rodríguez.



FIG. 2. Specimens of *Historis acheronta semele* (Lepidoptera: Nymphalidae) collected in July, 2021 in Havana, Cuba. A–B. Specimen collected on July 21, 2021 in Rincón de Guanabo, Habana del Este municipality (A. Dorsal view; B. Ventral view); C–D. Specimen collected on July 25, 2021 in Cojimar, Habana del Este municipality (C. Dorsal view; D. Ventral view). Photographs by Yosiel Álvarez.

All of these observations indicate that *Historis acheronta semele* is developing an episode of abundance increase in Havana province, Cuba. These phenomena are not uncommon in Cuban butterflies: sudden increases in abundance of *Ascia monuste eubotea* (Godart, 1819) (Pieridae) have been observed during the rainy season, in which hundreds of individuals were recorded in small patches of vegetation, as well as migrations between different parts of the island (Alayo and Hernández 1987; Lauranzón et al. 2010; Lauranzón and Saladrigas 2011). The same has been reported for *Eunica tatila tatilista* Kaye, 1926 (Nymphalidae), *E. monima* (Stoll, 1792) (Nymphalidae) and the endemic species *Libytheana motya* (Hübner, 1826)

(Nymphalidae) (Alayo and Hernández 1987). However, the mentioned episodes correspond to common and abundant species that are found throughout the island. The large increases in abundance in uncommon butterflies such as *Historis acheronta semele* appear to be extremely rare given the lack of reports of them. However, in May 25, 2017, a flock of 20 individuals of this subspecies was spotted in Soplillar, Ciénaga de Zapata, Matanzas province, flying in circles and feeding on an unidentified plant, which was also visited by *Dryas iulia nudeola* (Bates, 1934) (Nymphalidae) and *Pyrisitia lisa euterpe* (Ménétriés, 1832) (Pieridae) (A. Barro, pers. comm.). Similar events have been previously recorded for some nymphalids with similar hab-

its and characteristics to those of this subspecies, such as *Hypna clytemnestra iphigenia* (Herrich-Schäffer, 1862) in Santiago de Cuba city, between August and October 1930 and in January 1942, and *Anaea cubana* (Druce, 1905) repeatedly in the Yumuri Valley, Matanzas (Alayo and Hernández 1987).

The causes of this unusual episode of abundance in Havana are unknown. The synchronized movement of all the individuals towards the west suggests the occurrence of a migratory event in the subspecies heading to the westernmost provinces. Without additional observations from other locations in the island, denied by the current Covid-19 pandemic restrictions, it is not possible to verify this assumption. In agreement with the aforementioned episodes documented for other butterflies, this one takes place in the months of the rainy season of the Cuban climate (Borhidi 1996). During this period, heavy rainfall stimulates a vigorous plant growth, which leads to an increase in the availability of resources for adults and juveniles, and an augmented butterfly abundance (Grøtan et al. 2012; Valtonen et al. 2013; Checa et al. 2014). It is possible that rainfall favors the development of new shoots of the host plant of this subspecies. In El Salvador, larvae of *Historis acherona acheronta* have been collected feeding on *Cecropia mexicana* Hemsl. (Urticaceae) (Muysshondt and Muysshondt 1979), while larvae of *Historis acheronta cadmus* have been observed in Jamaica feeding on *Cecropia peltata* L. (Smith et al. 1994).

Although the host plant of *Historis acheronta semele* in Cuba remains unknown, Alayo and Hernández (1987) and Hernández (2004) suggested *Syzygium jambos* (L.) Alston (Myrtaceae) as a candidate, because the insects tend to frequent areas where this tree is found. However, given the aromatic and sweet nature of this plant's fruit, the butterfly is more likely to visit it looking for food, and not to oviposit. Thus, the host plant is probably of the genus *Cecropia*, as suggested by Riley (1975) and Smith et al. (1994), although this has yet to be verified. *Cecropia peltata* is very common in all Cuban habitats, including urban areas (Borhidi 1996), so it could be a potential host plant, thereby allowing the development of this abundance episode. However, both the availability of this presumed host plant, as well as the annual rainfall cycles that prompt a greater abundance of butterflies, are constant patterns in Cuba. Therefore, these factors

alone cannot explain this unprecedented abundance of this subspecies in Havana. It is also unknown if the event will lead to the subspecies establishing itself in the province as a common and abundant member of the butterfly communities, or if as in previous cases, this will be only temporary.

The observations in Soplillar and Rincón de Guanabo also suggest that the butterfly also consumes the nectar of flowers. This is in contrast with what is stated in the available literature, where it is mentioned that *Historis acheronta semele* exclusively feeds on rotten fruits (Gundlach 1881; Muysshondt and Muysshondt 1979; Hernandez 2004). However, this is not the only example, since this same discovery was recently made in another butterfly with similar habits: *Memphis verticordia echemus* (Doubleday, 1849) (Nymphalidae) (Norris 2021). Perhaps it is a behavior that frugivorous butterflies develop in coastal areas, where there is little fruit availability, but more evidence is needed to verify it.

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