

Extension of geographical distribution of three common species of diurnal butterflies (Lepidoptera: Papilionoidea) from the Colombian Caribbean

Ampliación del ámbito geográfico para tres especies comunes de mariposas diurnas (Lepidoptera: Papilionoidea) del Caribe colombiano

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Abstract

Palabras clave:
Bolívar; Colombia; distribution; records; Hesperiiidae; Pieridae

In this document we extend the geographical distribution for three common species of diurnal butterflies from the Colombian Caribbean region (*Aides dysoni*, *Calpodetes ethlius*, and *Anteos clorinde*). The specimens were captured with an insect net in samplings conducted in the Arjona jurisdiction (Bolívar Department) in 2015, between 8:00 and 16:00 hours. For each of them we provide important morphological characters for their recognition, and complement their distribution in the Neotropic.

Key words:
Bolívar; Colombia; distribución; registros; Hesperiiidae; Pieridae

Resumen

En este documento se registran tres especies comunes de mariposas diurnas de la región Caribe colombiana (*Aides dysoni*, *Calpodetes ethlius* y *Anteos clorinde*). Los especímenes fueron capturados con red entomológica en muestreos realizados en el municipio de Arjona (departamento de Bolívar) en el año de 2015 entre las 8:00 y 16:00 horas. Para cada una de ellas se proporcionan caracteres morfológicos útiles para su reconocimiento y se complementa su distribución en el Neotrópico.

Butterflies are one of the most studied groups of insects worldwide (e.g. Montero-A. *et al.*, 2009; Felízola *et al.*, 2010). Colombia is among the countries with the highest species richness, counting with a little more than 3274 species, of which 350 are endemic (Campos-Salazar *et al.*, 2011). Despite its high wealth, there are areas of the national territory such as the Atlantic Coast where information about the group is insufficient.

In the last two decades, efforts have been made to know the richness and ecology of the species that inhabit the departments of Atlántico and Cesar (e.g. Campos-Salazar y Andrade-C., 2009; Boom-Urueta *et al.*, 2013; Vargas-Zapata *et al.*, 2015), and recently Sucre and Bolívar (e.g. Mercado-Gómez *et al.*, 2018; Ahumada-C. *et al.*, 2019).

This study confirms the presence of three common species of diurnal butterflies for the Colombian

Caribbean located in the Bolívar Department: *Aides dysoni* Godman, 1900, *Calpodetes ethlius* (Stoll, 1782) (Hesperiiidae), and *Anteos clorinde* (Godart, [1824]) (Pieridae). Also, important morphological characters for their recognition are provided, and their distribution in the Neotropic is complemented.

The specimens were captured with an insect net in samplings conducted in the Arjona jurisdiction (Bolívar, Department) in 2015, between 8:00 and 16:00 hours, with a sampling effort of 7h/day.

The species were identified from their comparison with photographs of type specimens from the illustrated list of American butterflies (Warren *et al.*, 2017), and the works of Lewis *et al.* (1975), and Le Crom *et al.* (2004). Taxonomic identities were verified by examination of specimens stored in the reference collection of the Natural Sciences Institute (ICN) of the National University of Colombia.



The morphological description of the species follows the nomenclature proposed by Miller (1970), and the description of the colors of the wings follows the color chart of Rigdway (1912). The examined material is stored in the research laboratories of the Biology Program at the University of Cartagena (CUDC-INS).

Aides dysoni, *Calpododes ethlius* (Hesperiidae) and *Anteos chlorinde* (Pieridae) are registered for the Colombian Caribbean (figure 1). The lack of knowledge about these species in the region is probably due to the few explorations in their ecosystems and the shortage of specimens deposited in biological collections, which has made it difficult to update the lists of species, mainly in the departments of Bolívar and Sucre. The morphological characteristics for identification, and geographical distribution aspects of each species are presented below.

Family Pieridae
***Anteos chlorinde* (Godart, [1824])**

Examined material: 1♂1♀. Colombia Bolívar. Arjona, Hacienda Condominio, 125 m, 10° 17' N and 75° 22' W, entomological net, 19. viii. 2015, Segovia-Paccini, A. Leg. CUDC-INS-192 and CUDC-INS-193.

Recognition characters: dorsal thorax "White" and abdomen "Maize Yellow". Head "White", with filamentous antennae with elongate palpi "Marguerite Yellow". Front wing apex hooked. Dorsal anterior wing "Pale Olivane", with oval mark "Bale Brown" in the medial area, between origin of cells M2 and M3. Dorsal posterior wing "Pale Olivane", with circular mark "Primuline Yellow" in the medial area in the origin of cell M2. Ventral anterior wing "Pale Fluorite Green", with ovate mark "Pale Ochraceous-Salmon" in the medial area in the superior part of distal cell. Ventral posterior wing "Pale Fluorite Green", with two contiguous marks "White" with contour "Pale Ochraceous-Salmon" in the superior part of the distal cell. Distal margin tip-shaped between cells M2 and Cu1.

Distribution: Southwestern United States of America, Jamaica, Cuba, Hispaniola (Warren *et al.*, 2017), from Mexico to Paraguay (Valencia *et al.*, 2005) and Argentina. In Colombia it has been registered in the Pacific region in the Valle del Cauca Department (Millán-J. *et al.*, 2009), and for the Andean region in the departments of Tolima (Ospina-López *et al.*, 2010), Santander (Torres, 2010) and Caldas (Ríos-Málaver, 2007). It is recorded for the Arjona locality, Bolívar Department.

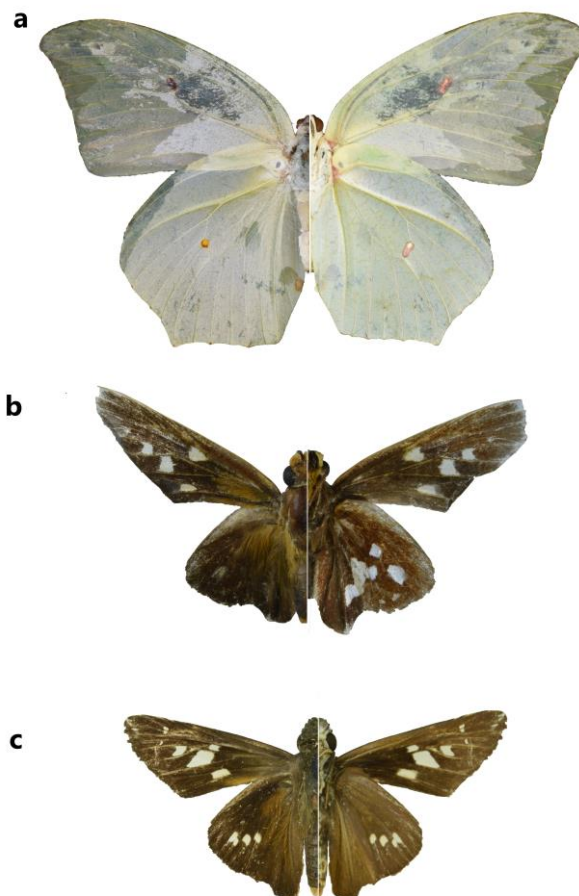


Figure 1. New records of daytime butterflies for the Colombian Caribbean. a. *Anteos chlorinde* (CUDC-INS 192), b. *Aides dysoni* (CUDC-INS 446), c. *Calpododes ethlius* (CUDC-INS 412).

Family Hesperiidae
***Aides dysoni* Godman, 1900**

Examined material: 1♀. Colombia Bolívar. Arjona, Hacienda Condominio, 125 m, 10° 17' N and 75° 22' W, entomological net, 4.x. 2015, Segovia-Paccini, A. Leg. CUDC-INS-446.

Recognition characters: dorsal thorax and abdomen "Sepia". Head "Sepia" with stout and curved antennae and palpi "Bone Brown". Dorsal anterior wing "Sepia" with four semi-hyaline marks "White": one semi-circular medial in the superior part of the distal cell; post medial semi-square mark near origin of cells M3 and Cu1; another one in the center of cell Cu1; and one ovate mark in the post medial area, near the toro, located in cell Cu2. Dorsal posterior wing "Sepia", "Mustard Yellow" in the center of basal and post-basal area.

Ventral anterior wing similar to dorsal anterior wing. Ventral posterior wing: "Isabella Color", with two circular marks "White", one in the sub medial area and other that covers the medial and post medial area; irregular mark "White" that covers the sub medial and medial areas; and two little ovate marks near the margin.

Distribution: from Mexico to Colombia (Warren *et al.*, 2017). This study confirms the presence of this species in the Colombian Caribbean.

***Calpododes ethlius* (Stoll, 1782)**

Examined material: 1♂. Colombia Bolívar. Arjona, Hacienda Condominio, 125 m, 10° 17' N and 75° 22' W, entomological net, 31.x. 2015, Segovia-Paccini, A. Leg. CUDC-INS-412.

Recognition characters: Dorsal thorax and abdomen "Deep Olive". Head "Deep Olive" with hooked antennae and palpi "Deep Olive". Dorsal anterior wing "Sepia", with seven semi-hyaline and semi-ovate marks "White" color: one in the center of distal cell; two contiguous small marks between cells R4 and R5, near their origin; one middle size in the center of cell M2; one big mark in the center of cell M3; and one median mark in the center of cell Cu2. Center of cells 1A+2A "Mustard Yellow" color. Dorsal posterior wing "Sepia", with the basal and part of the post basal areas with "Mustard Yellow" fine setae; with four semi-hyaline and semi-ovate marks "White", two contiguous in the center of cell Rs, one in the center of cell M1 and another in the center of cell M2. Ventral dorsal wing similar to dorsal anterior wing. Ventral posterior wing similar to dorsal posterior wing.

Distribution: Southeast of the United States of America, West Indies, from Mexico to Argentina, and Galapagos Island (Warren *et al.*, 2017). González y Andrade-C. (2008) record this species for the Colombian Andean region, without data on its collection location. We confirm the presence of this species in the Colombian Caribbean.

Tropical butterflies are one of the most spectacular and visually appealing organisms in the world. In the tropics evolved most of the butterfly diversity, and they play many vital roles in tropical ecosystems, with complex species interactions (*e.g.* mimicry, parasitism, predation), so they can have significantly influences on ecological and evolutionary processes in the tropics (Bonebrake *et al.*, 2010). Also, many species have potential in environmental monitoring as indicators of habitat quality (Montero *et al.*, 2009). This invaluable

biological resource is threatened in the Colombia Caribbean region by the progressive intervention and destruction of natural habitats, transformation in agricultural and livestock areas, fragmentation, and climate change (Orozco *et al.*, 2009).

The three species recorded here are common and with a broad geographical distribution in agro-ecosystems and conserved areas in Colombia. Strangely, that they had not been reported previously in the Caribbean region. This confirm that Bolívar Department remain as one of the geographical areas of the Colombian Caribbean Region in which is necessary concentrate efforts to estimate populations sizes and species richness. Fundamental information to determine the health of the ecosystems, and to formulate plans for their conservation, management and sustainable use, in this case for butterflies and other tropical insects, and the services that they can provide (*e.g.* pollination).

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