

REVISTA NICARAGUENSE DE ENTOMOLOGIA

N° 314

Septiembre 2023

First observation of host plant use by *Heraclides pallas pallas* (Papilionidae) caterpillars in South-west Nicaragua, Department of Rivas.

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PUBLICACIÓN DEL MUSEO ENTOMOLÓGICO
LEÓN - - - NICARAGUA

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Foto de la portada: *Heraclides pallas pallas*, pupa, 28 June 2023.

First observation of host plant use by *Heraclides pallas pallas* (Papilionidae) caterpillars in South-west Nicaragua, Department of Rivas.

Eric OLSON*

RESUMEN

Se registra por primera vez, para Nicaragua, una planta hospedera de la mariposa *Heraclides pallas pallas* (GRAY, 1853).

Palabras claves: Lepidoptera, Papilionidae, *Citrus*

DOI: 10.5281/zenodo.8332630

ABSTRACT

A host plant of *Heraclides pallas pallas* (GRAY, 1853) is reported for first time in Nicaragua.

Key Words: Lepidoptera, Papilionidae, *Citrus*

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INTRODUCTION

For their size and beauty, the swallowtail butterflies (Papilionidae) have attracted the attention of generations of naturalists worldwide. Though relatively well-collected and studied, there continue to be new discoveries about the group, including a new cryptic species recently discovered in North America (Shiraiwa *et al.* 2014). A comprehensive global analysis of the genus *Papilio* (sensu lato) was published in 2023, in a report with eleven authors based in seven nations has refined taxonomic relationships among 235 species (Condamine *et al.* 2023). This species-rich clade has emerged as a model taxon for studies in evolution and natural history, and will continue to offer rich opportunities to students of organismal biology for many years to come.

To facilitate such studies, it is useful to review and clarify each species' local natural history wherever these butterflies occur, including phenology and host-plant relationships, and to report new occurrences. Here we report one of the first observations of breeding and host plant use in Nicaragua by the swallowtail species *Heraclides pallas pallas* (GRAY, 1853).



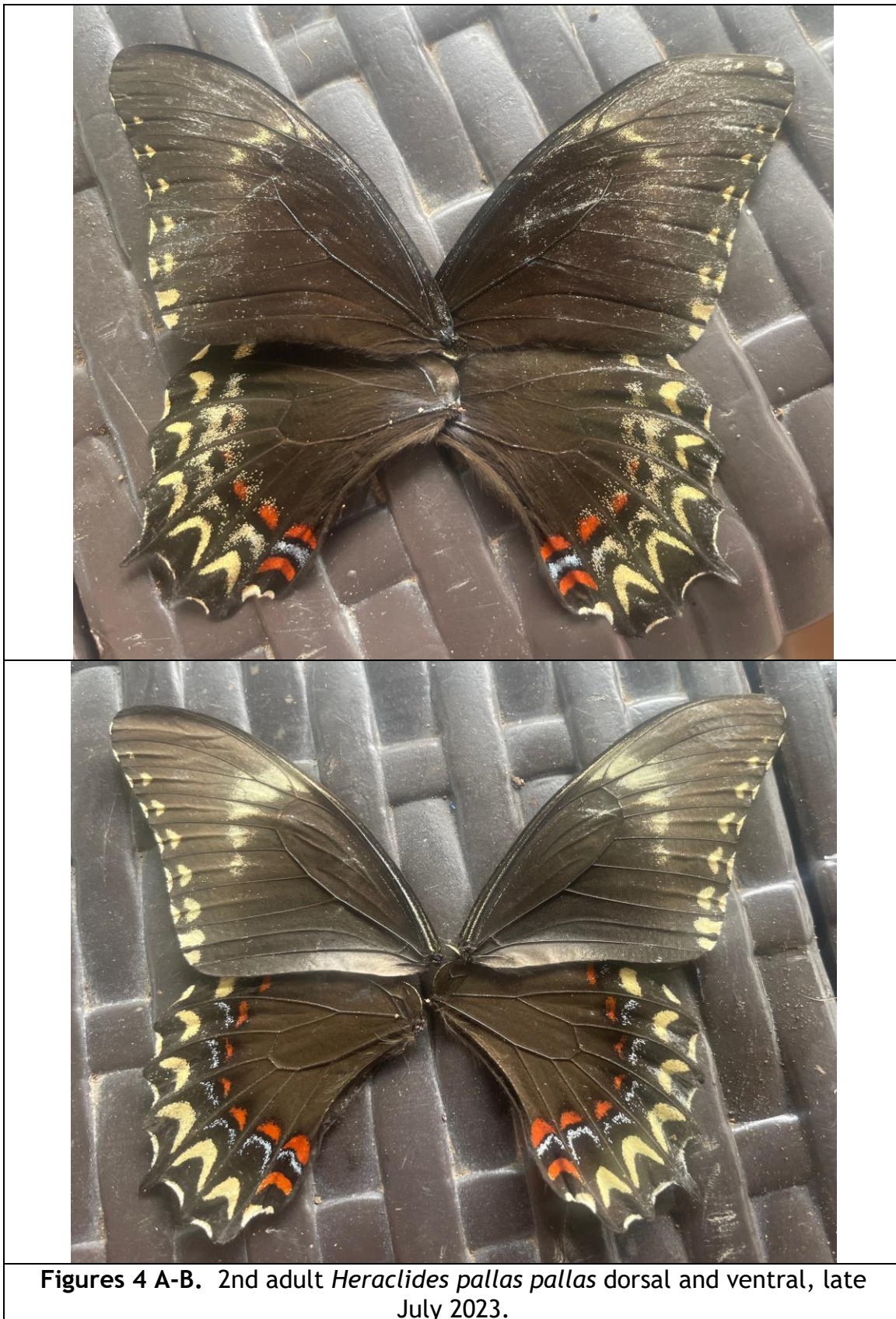
Figure 1. *Heraclides pallas pallas* final instar larva 26 June 2023 on citrus.



Figure 2. *Heraclides pallas pallas* pupa 28 June 2023.



Figure 3. Reared *Heraclides pallas pallas* female 21 July, 2023.



Figures 4 A-B. 2nd adult *Heraclides pallas pallas* dorsal and ventral, late July 2023.

OBSERVATIONS

On June 26, 2023, I found a large swallowtail caterpillar (Figure 1) resting on a small citrus tree (*Citrus* sp.) in the San Rafael del Valle neighborhood, municipality of San Juan del Sur, in south-west Nicaragua. I reared the insect in captivity and noted the caterpillar in pre-pupal form on the 28th, and in pupa June 29th. An adult female eclosed on 21 July, 2023 and was preserved for later study.

I placed photos of the caterpillar, pupa, and adult butterfly on iNaturalist, and a consensus emerged among several observers that I had reared *Heraclides pallas pallas* (GRAY, 1853) (Papilionidae). This is one of the first rearing records for this butterfly in Nicaragua.

Soon after collecting that larva I collected a second larva from the same small tree, and again reared it to adulthood. I created another observation for this individual on iNaturalist, and it was again identified as a female of *Heraclides pallas pallas*.

DISCUSSION

This is a relatively rare butterfly in Nicaragua and there are to date no published host plant records (Jean Michel Maes pers. comm. 2023). In contrast, in the caterpillar-host plant database assembled for the Guanacaste Conservation Area (ACG) there are 358 larval collection records from sixteen host plant species representing seven plant genera, all in the Rutaceae (Janzen & Hallwachs 2009). Drawing on that multi-decade dynamic database, an ACG parataxonomist contributed a webpage summary for *H. pallas*, including information parasitism by tachinid flies (Perez, 2020).

Collections from the Santa Rosa Sector of the ACG are especially well-represented in this dynamic database, and like the area of this report, that Sector is dominated by highly-seasonal tropical dry forest. The 16 ACG host records include four species of *Citrus*, an introduced genus, while the other 12 plants listed are native to Central America (Table 1). It will now be useful to examine native Nicaraguan Rutaceae (e.g., *Zanthoxylum* sp.), in appropriate habitats and times of year, for occurrences of *Heraclides pallas pallas* caterpillars.

Table 1. Host plants known for *H. pallas* in the Guanacaste Conservation Area, NW Costa Rica. All are in the Rutaceae. Status N = native species, I = introduced to Central America. Records = number of times the species has been found feeding on a plant. Source: Janzen and Hallwachs (2009).

Host plant species	Status	Records
<i>Amyris balsamifera</i>	N	30
<i>Amyris pinnata</i>	N	28
<i>Angostura granulosa</i>	N	25
<i>Casimiroa dura</i>	N	9
<i>Citrus aurantium</i>	I	1
<i>Citrus limetta</i>	I	41
<i>Citrus reticulata</i>	I	20
<i>Citrus sinensis</i>	I	38
<i>Esenbeckia berlandieri</i>	N	1
<i>Esenbeckia pentaphylla</i>	N	1
<i>Pilocarpus racemosus</i>	N	69
<i>Zanthoxylum caribaeum</i>	N	14
<i>Zanthoxylum fagara</i>	N	17
<i>Zanthoxylum monophyllum</i>	N	26
<i>Zanthoxylum riedelianum</i>	N	3
<i>Zanthoxylum setulosum</i>	N	35

Acknowledgments.

I thank Jean-Michel Maes for help with clarifying the species name, and for alerting me to the fact that *H. pallas* is a relatively little-studied butterfly in Nicaragua. He also connected me via iNaturalist with three people who helped verify the species identity: David Hoag, Dariel Sanabria and Nick Block.

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