

## SCIENTIFIC NOTE: *PAPILIO DEMOLEUS* (THE LIME SWALLOWTAIL) (LEPIDOPTERA: PAPILIONIDAE), A POTENTIAL PEST OF CITRUS, EXPANDING ITS RANGE IN THE CARIBBEAN

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**ABSTRACT-** This is the third (see Homziak & Homziak 2006) record of *Papilio demoleus* L. from Americas. The species is a well known pest of citrus from the Far East and was first recorded from the Dominican Republic in 2004. *P. demoleus* is now well established in most Jamaican parishes and is a minor pest in citrus nurseries.

**KEY WORDS:** Jamaica, *Heraclides andraemon*, introduced species.

Four specimens of a butterfly reared from larvae collected on a citrus farm in the parish of St Catherine, Jamaica, were taken to the University of the West Indies, Mona, in October, 2006, for identification. The material was identified as *Papilio demoleus* L.

A visit to the farm was conducted in late October. All stages of the life cycle of *P. demoleus* were collected from a nursery. The nursery had seedling of several citrus varieties, including Goutout, Smooth Flat Seville, Valencia and Cleopatra Mandarin.

Two neighboring mature citrus fields were examined. One field had a wide range of species/varieties of citrus, while the second had Valencia, Parson Brown and Pineapple. Both fields yielded several larvae of *P. demoleus* on the flush of various trees. Also present here were larvae of the Cuban Swallowtail *Heraclides andraemon*. *H. andraemon* was introduced into Jamaica in the 1940's (Lewis 1946) and is well established throughout the island (Garraway and Bailey 2006); it is a minor pest in citrus nurseries.

A survey in January 2008 showed that *P. demoleus* was well established in most parishes across the island. It is presently being controlled in citrus nurseries by hand-picking the larvae or by insecticides.

This is the third record of a population of *Papilio demoleus* in the Americas. The first record of a population in the Americas by Guerrero et al. (2004) in Santo Domingo. *P. demoleus*, commonly known as the lime swallowtail, citrus swallowtail, or chequered swallowtail, is found throughout southern Asia, extending from Iran and the Middle East to India, and from the Indo-Pacific to New Guinea and Australia. The second was from Puerto Rico (See Homziak, N. T. and J. Homziak. 2006. *Papilio demoleus* (Lepidoptera: Papilionidae): A New Record for the United States, Commonwealth of Puerto Rico. Florida Entomologist 89(4): 485-488. Its principal host plants are members of the genus *Citrus* (Guerrero et al. 2004); secondary hosts include some other members of the family Rutaceae. The species is generally regarded as a pest of citrus, especially in nurseries where there is an abundance of flush.

The means by which this species was introduced into Jamaica is presently unknown. However the possibilities include:

(a) Unintentional introduction of immature stages of the butterfly on citrus material. The immature stages being very



Fig.1. *Papilio demoleus* collected in St. Catherine, Jamaica in October 2006.

inconspicuous and easily missed by the untrained eye.

(b) Unintentional introduction of immature stages of the butterfly on secondary food plants, i.e. non-citrus members of the Family Rutaceae.

(c) Deliberately imported for weddings. The species has been reared in some countries for release at weddings and such festivities; there have been unconfirmed reports of butterflies being imported into Jamaica for weddings.

(d) Migrant adults. The species is well known as a migrant in the southeastern Asia. (Dingle et al. 1999) The island of Hispaniola is only 200 km to the east-north-east of Jamaica. Adults may be able to travel this distance with the aid of the northeast trade winds. A single mated female is all that is necessary to establish a population. Guerrero, et al (2004) pointed out that *P. demoleus* is a successful invasive species with the potential to spread through out the Caribbean chain and to the mainland America.

Guerrero et al. (2004) suggested that introduction into the Dominican Republic may have occurred through importation on citrus material, or for weddings. Eastwood et al. (2006) using genetic markers showed that the Dominican Republic butterflies originated from Southeast Asia and there was lack of genetic variation in the population indicating a single introduction.

The citrus industry is one of the most significant agricultural endeavors in Jamaica, with about 10,000 hectares under cultivation. The economic impact of this introduction may be

significant. The potential for pest status of such invasive species is generally high as natural enemies may be absent. Jamaica has seven other species of Papilionidae, four of which are endemics. The eggs of the endemic *Papilio homerus* (F.) and the introduced *H. andraemon* are attacked by hymenopterous parasitoid, however it is not known at this time if *P. demoleus* will be attacked by the resident guild of natural enemies.

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## BOOK REVIEW

### Butterflies of the Cayman Islands (2008). Askew, R. R. & P. A. van B. Stafford.

Published by Apollo Books, Denmark, ISBN 978-87-8875785-9. 169 pp. 6 color plates, 100 + color images throughout the book. Laminated hard cover, glossy paper, 17 X 24 cm., \$69.50.

When I heard the title of the book, I was puzzled. Do such a small territory and fauna deserve a special treatment in a separate book, when we already have comprehensive works such as, for example, Smith, Miller & Miller's "The Butterflies of West Indies and South Florida," in which all of the 57 species found on the Caymans are already treated? I imagined that this new book would represent yet another local field guide, which, though perhaps useful to local residents, would not constitute a significant contribution to science. I was, however, wrong!

"Butterflies of the Cayman Islands" is well worthy of publication. Yes, of course, there are photographs of live butterflies and their immature stages, all taken on the Caymans, that can be found on practically every page of the book. This, however, is by far not its main value. Neither is its very respectable presentation: the book has a magnificent hard cover, which contains maps on the inside, and is printed on heavy-weight glossy paper. All these features already would make it a perfect gift for one of your nature-loving friends, or for a child, whom the parents are trying to steer away from computer games and TV and towards the healthy pursuits of exploring nature...

To me, however, the book's main value is in the science it contains. I was delighted to see on the very first pages a number of graphs and tables. Graphs, indicating the correlation between sizes of various Caribbean islands and butterfly species richness; tables, showing the change in the butterfly fauna of the Caymans over the last 70 years (since the first survey). I was delighted to read authors' thoughts on biogeography of butterfly fauna of the islands as well as comprehensive historical accounts of collecting for every species. I was even more delighted to find a table at the end of the book, showing the affinities of the Cayman Islands' butterfly species to various plants as nectar and larval food sources. The clear separation of speculative versus confirmed host plant records is an important feature of this particular table, since the proliferation of questionable hostplant

records based on mistaken identifications and ovipositions, make this side of Lepidoptera biology one of the fields of natural history that is most riddled with errors. The book is organized in a clear and logical manner, and end with six color plates depicting spread specimens, and comprehensive index and references sections.

Hence, whether you are looking for a gift for your seven-year-old granddaughter or for your uncle Jacques Paganel, "Butterflies of the Cayman Islands" is a safe choice.

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