

Pest Alert

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Lime Swallowtail in the Caribbean and Possible Impacts for Florida Citrus

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INTRODUCTION: In March 2004, the lime (or lemon) swallowtail, *Papilio demoleus* Linnaeus (Lepidoptera: Papilionidae), was discovered in the Caribbean, at the eastern end of the Dominican Republic. A well-known citrus pest in Asia, the 2004 detection is the first confirmed report for the New World. As of early 2006, it had spread to Puerto Rico. The lime swallowtail is a strong flier, so it is likely this butterfly pest will soon reach Florida.

A similar Asian pest, the citrus swallowtail, *Papilio xuthus* Linnaeus, has become established in Hawaii, but thus far has not reached the American mainland or elsewhere in the New World other than some interceptions in southern California. There is also an old California record (1968) for the lime swallowtail, but not confirmed. The lime swallowtail and citrus swallowtail are sometimes confused in the literature by the mixed use of their common names. In Africa, the related African lime swallowtail, *Papilio demodocus* Esper, is also called the citrus swallowtail.

IDENTIFICATION: Although some native swallowtails appear superficially similar, upon closer examination, no American swallowtail can be confused with the lime swallowtail. A suffusion of basal yellow marks on the forewing, large blue eye-spot on the upper margin and red spot on the inner margin of the tail-less hindwing easily distinguish this species from our native fauna, all of which have tailed hindwings among the yellow-colored species. The rest of the upper wings are black with yellow submarginal and inner banded yellow spots and markings. Ventral maculation is similar, but the hindwing is darker yellow and both fore- and hindwings have some black areas replaced with tan-orange. Caterpillars are green in later stages and resemble some American swallowtail species, but do not have eye-spots on the thorax. Young larvae look similar to other species with bird-dropping type coloration in early stages.

DISTRIBUTION: The lime swallowtail occurs throughout tropical Asia and nearby regions such as Australia and into the Middle East (Iraq and Saudi Arabia). Current Caribbean records include only the Dominican Republic and Puerto Rico.

HOSTS: Lime swallowtail larvae feed on all species of citrus, as well as related plants in the plant family Rutaceae. Larvae prefer young leaves or nursery plants. In Florida, the species would be able to feed on citrus and probably could also feed on native Rutaceae.

HAZARD ASSESSMENT FOR FLORIDA: Although it is a well-known citrus pest in Asia, lime swallowtail may only have a slight impact on established citrus groves in Florida, similar in scale to our own giant swallowtail or orange dog (*Papilio cresphontes* Cramer). Nonetheless, since it could be a more prolific breeder than our native species, there could be more extensive impacts from the lime swallowtail. It prefers young trees and it is mainly a serious pest of citrus nursery stock and other young citrus trees in Asia and the Middle East. In Florida, younger groves may be more impacted than older groves. This is similar to the Asian citrus leafminer (*Phyllocnistis citrella* Stainton), which became established in Florida in 1993 and mostly impacts citrus nursery stock and new leaf flush. Without eradication in the Caribbean, it is likely the lime swallowtail will reach Florida very quickly. It has been highly expansive in Asia due to it being a strong flier. There is a strong likelihood of eventual spread throughout the tropical regions of central and northern South America now that the butterfly is in the Dominican Republic and Puerto Rico. Also, it is expected that after arrival and establishment in Florida, spread of the lime butterfly through the entire southern United States to the West Coast is very likely within a few years.



Florida Department of Agriculture and Consumer Services
Adam H. Putnam, Commissioner

REFERENCES:

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Narayanamma, V. L., P. Savithri, and R. Rao. 2001. *Influence of citrus butterfly *Papilio demoleus* L. damage on growth parameters of the sweet orange host plant.* *Indian Journal of Plant Protection* 29: 140-141.



Fig. 1a. Male lime swallowtail, *Papilio demoleus*, dorsal view.

Photo credit: National Taiwan Museum, in Taipei



Fig. 1b. Male lime swallowtail, *Papilio demoleus*, ventral view

Photo credit: National Taiwan Museum, in Taipei



Fig. 2a. Female lime swallowtail, *Papilio demoleus*, dorsal view.

Photo credit: National Taiwan Museum, in Taipei



Fig. 2b. Female lime swallowtail, *Papilio demoleus*, ventral view

Photo credit: National Taiwan Museum, in Taipei



Fig. 3. Lime swallowtail, *Papilio demoleus*, larva

Photo credit: National Taiwan Museum, in Taipei