

Zebra Swallowtail, Pawpaw Butterfly, Kite Swallowtail, Ajax *Eurytides marcellus* (Cramer) (Insecta: Lepidoptera: Papilionidae)¹

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Introduction

The zebra swallowtail, *Eurytides marcellus* (Cramer), is our only native kite swallowtail (tribe Leptocircini [=Graphiini]). Two other species rarely stray into Texas and Florida. The zebra swallowtail is one of our most beautiful swallowtails. Unlike most of our other native swallowtails, they are not involved in a mimicry complex. The zebra swallowtail has also been called the pawpaw butterfly, kite swallowtail and ajax.

Distribution

The zebra swallowtail is widely distributed from southern New England west to southern Minnesota and south to eastern Texas and Florida.

Description

The wingspread of males is 3.0 to 4.6 cm and females 2.9 to 4.9 cm. The upper surface of the wings is white with black stripes. The hindwings have very long tails. The zebra swallowtail exhibits seasonal dimorphism. Early spring specimens are lighter in color, smaller, and have tails only about half as long as summer forms.

Eggs are pale green. Young larvae are dark colored with many transverse black, yellow, and white bands. Older



Figure 1. Adult summer form of the zebra swallowtail, *Eurytides marcellus* (Cramer).

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larvae are green with broad blue, black, and yellow transverse bands between the thorax and abdomen and usually yellow bands between abdominal segments and numerous fine transverse black lines on thorax and abdomen. However, larvae exhibit color polymorphism. The osmeterium is yellow. Pupae are green or brown with light lines simulating a leaf-like texture and are supported with a silken girdle.

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Figure 2. Young larva of zebra swallowtail, *Eurytides marcellus* (Cramer), in *Asimina angustifolia* Raf. flower.
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Figure 4. Pupa of zebra swallowtail, *Eurytides marcellus* (Cramer).
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Figure 3. Full-grown larva of zebra swallowtail, *Eurytides marcellus* (Cramer), with osmeterium extruded.
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Life Cycle

There are two flights in the north and many flights in Florida from March to December. Males patrol for females in the vicinity of host plants, and females frequently may be observed ovipositing on host foliage. Adults seek nectar at a variety of flowers and also obtain moisture from mud.

Females select plants with young leaves for oviposition. Eggs are laid singly on the young leaves, and larvae feed on foliage (and flowers when available). This requirement for new leaves may limit reproduction of *E. marcellus* in summer and fall. Production of new leaves is often stimulated

during this period by defoliation of the host plant by the pyralid moth, *Omphalocera munroei* Martin. Therefore, abundance of late flights of *E. marcellus* may be dependent on the abundance of this moth.

Larvae have an extrusible osmeterium that is coated with strongly smelling chemicals (isobutyric and 2-methyl butyric acids). When disturbed, they extrude the osmeterium and smear the offender with the chemicals. This has been shown to be an effective defense against small ants and spiders, but not against most other predators. Osmeterial defense is also ineffective against the ichneumonid parasitoid of papilionids, *Trogus pennator* (Fabricius), which does not trigger extrusion of the osmeterium with its attacks. Other defensive measures utilized by the larvae are to drop off the host plant when disturbed by a potential predator and for third, fourth, and fifth instar larvae to rest off the plant in leaf litter when not feeding.

Pupation usually occurs on the under sides of leaves of the host plant. Some pupae of each flight overwinter. Short photoperiod produces diapausing pupae that hibernate.

Hosts

The host plants are *Asimina* species (pawpaws) (Annonaceae). Throughout most of the range of the zebra swallowtail, *Asimina triloba* (L.) Dunal is the only host. In the southeast U.S., a variety of other *Asimina* species are utilized.



Figure 5. The slimleaf pawpaw, *Asimina angustifolia* Raf. (Annonaceae) is a commonly-used host in central Florida for the zebra swallowtail, *Eurytides marcellus* (Cramer).
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Figure 6. Smallflower pawpaw, *Asimina parviflora* (Michx.) Dunal (Annonaceae), a larval host for the zebra swallowtail, *Eurytides marcellus* (Cramer).
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Figure 7. *Asimina triloba* (L.) Dunal (Annonaceae), is a larval host for the zebra swallowtail, *Eurytides marcellus* (Cramer).
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