

SCIENTIFIC NAME (Species and Family)	COMMON NAME
<i>Trachelospermum</i> sp. (Apocynaceae)	Rhynchospermum
<i>Trachelospermum jasminoides</i> Lem. (Apocynaceae)	Starjasmine
<i>Trachycarpus fortunei</i> H. Wendl. (Palmaceae)	Fortunes palm; windmill palm
<i>Trevesia palmata</i> Vis. (Araliaceae)	
<i>Viburnum</i> sp. (Caprifoliaceae)	Virburnum
<i>Viburnum tinus</i> L. (Caprifoliaceae)	Laurestinus
<i>Vinca major</i> L. (Apocynaceae)	
<i>Washingtonia</i> sp. (Palmaceae)	Washingtonia palm
<i>Wisteria</i> sp. (Leguminosae)	Wisteria
<i>Zamia</i> sp. (Cycadaceae)	

In addition to these host plants, the following have been found in St. Lucie County:²

<i>Bidens pilosa radiata</i> Sch. Bip. (Compositae)	Beggarticks
<i>Carica papaya</i> L. (Caricaceae)	Papaya
<i>Croton glandulosus</i> L. (Euphorbiaceae)	Croton (wild)
<i>Smilax tamnifolia</i> Michx. (Liliaceae)	Smilax

DESCRIPTION OF THE STAGES

Egg:

The egg is oval in shape, lemon yellow in color, and has a smooth chorion that is slightly sticky. The color remains about the same from the time the egg is oviposited until it hatches. The first noticeable change in the shape is a considerable flattening and widening, which occurs immediately before hatching. One hundred eggs, measured before any change in shape occurred, averaged 0.18 mm. in length and 0.10 mm. in width.

First Instar:

The active larva, or first instar, is bright yellow, broadly oval in outline, and widens toward the anterior end of the body. The antennae are 5-jointed, and two very short setae are found on the posterior end of the body. One hundred active larvae averaged 0.20 mm. in length and 0.15 mm. in width. The dorsal scale of the settled larva is dark gray with a white tip (the remains of the white cap) in the center. No change, except growth, occurs in the body of the larva from the time it settles until the first molt. As the larva enters the first molt, the body becomes tightly stuck to the dorsal scale, the color of which changes to a light brown.

Second-Instar Female:

The larva sheds its legs, setae, and antennae during the first molt. The upper portion of the cast skin is incorporated with the dorsal scale, and the lower portion forms the first part of the very thin ventral scale. The dorsal scale in this stage has two distinct rings, the inner one being light brown and the outer one much darker. As in the first instar, the body becomes tightly stuck to the dorsal scale immediately before the second molt, and the color of the dorsal scale becomes reddish brown.

² Identification of these plants was made by the Bureau of Plant Industry, Soils, and Agricultural Engineering.

Adult Female:

The cast skin from the second molt of the female is incorporated with the dorsal and ventral scales, as in the first molt. The dorsal scale is circular and convex, and has three distinct rings. The innermost one, which is nearly central, is light brown, the second is reddish brown, and the third varies from a dark reddish brown to black, with a thin gray margin. The third ring is wider than the other two combined. The measurements of 100 dorsal scales averaged 2.1 mm. in diameter. Ferris (4, SII-201) gives the following description of the female body:

"Length about 1.1 mm. Derm at full maturity membranous or at times with very slight sclerotization in the cephalothoracic region. Pervivulvar pores present in five groups of three to six pores in each. Pygidium short and broad, the apex quite obtuse. Three pairs of well developed lobes present, these all of about the same size and shape; fourth lobe indicated merely by a rounded projection. Beyond the fourth lobe the margin is sclerotized and is twice notched. Plates from the meson to the third lobe all finely and evenly fimbriate at the apex, those beyond the third lobe of a different form, the first two normally showing two large and somewhat club-shaped processes, the third with one club and a varying number of variously shaped fimbriations. Marginal scleroses or paraphyses distributed in the manner described for the genus, [From the description of the genus by Ferris: (4, SII-198) 'Slender scleroses or paraphyses arise from the bases of the median to third lobes and from the margin in the intersegmental areas . . .'] there being none beyond the third lobe. Dorsal ducts of the pygidium of two sizes. Three or four stout ducts arise from pores between the median and second lobes and extend to about the center of the pygidium. From near the bases of the third and fourth lobes there extend zones of small pores from which arise long and slender ducts, the anterior-most of which extend beyond the anterior margin of the pygidium. These bundles of slender ducts are conspicuous features of the species. In the zones of pores the striations of the derm tend to lie transversely. A conspicuous, submarginal cluster of small, short ducts is present on the dorsum of what is here considered to be the second abdominal segment, other than these there being not more than one or two small ducts on any segment anterior to the fifth. Thoracic spur well developed, acute, sclerotized. Anal opening."

The body of the female decreases in size as the eggs are oviposited, and if the oviposition period is completed, the remains of the body are practically clear and very much shriveled.

Second-Instar Male Larva:

Under field conditions, no distinction can be made between the sexes until 3 or 4 days after the first molt, when the second ring of growth, which is in the process of being formed, becomes noticeably darker in the male than in the female. As growth continues, the scale covering of the male becomes more convex than that of the female. As the larva nears the end of the second period of growth, purple eye spots are formed which are retained through all the succeeding immature stages, eventually becoming eyes in the winged adult. The eye spots can hardly be seen at

first, but become very conspicuous as development continues. After they are formed, the last external change occurs, in which a thin gray lip is formed at the posterior end of the scale covering. The pygidial characteristics and color are the same for the two sexes during this stage.

Male Prepupa:

After the second molt the male enters the prepupal stage. In this stage the width of the body at the anterior, middle, and posterior parts is almost the same, and the tip of the abdomen is very blunt, except for two small spines. The color is about the same as that of the larva, and by the time the growth for this stage is completed, the outlines of the antennae and wings can be seen. One hundred prepupae averaged 0.62 mm. in length and 0.40 mm. in width.

Male Pupa:

The pupa has the general shape of the adult male, and the outlines of the wings, antennae, style, and legs can be seen clearly. The color varies from a bright yellow to a yellowish brown. One hundred pupae averaged 0.72 mm. in length.

Adult Male:

The adult male is a delicate, two-winged insect, light orange-yellow in color, with a dark-brown band around the thorax, purplish-black eyes, and vestigial mouth parts. The average length of the male, including the style, was about 0.74 mm., and the wing expanse was 1.36 mm.

LIFE HISTORY AND HABITS

The Egg:

The eggs are deposited underneath the dorsal scale of the female, where they remain until they hatch. Since no observations could be made under natural conditions because of the dorsal scale, it was lifted from females that were on fruits, and observations were made on those found ovipositing. Females continued to oviposit for a time after the scale covering was removed, and under this condition the eggs were laid in chains, being lightly stuck together end to end. During the summer months the rate of oviposition was fairly rapid, as 2 eggs were laid by a female in 1 hour, and 334 crawlers were removed from an isolated female on a fruit in a 51-day period.

The length of the incubation period at various temperatures was determined from tests in which ovipositing females were held in a constant-temperature cabinet. With one group of 70 eggs held at 90° F. the first egg hatched in less than 1 hour; with a group of 37 eggs held at 80° the first egg hatched after 3 hours and the last one after 26 hours. The last egg from a group of 14 held at a mean room temperature of 67° hatched after about 48 hours.

After the egg flattens, the covering splits at the anterior end, and the larva gradually works the skin back over its body. During the summer months the hatching is very rapid, and the larva may be seen crawling before the cast skin is completely off, but during cool weather the crawler may remain partially hatched for several days.