Hackberry Emperor, *Asterocampa celtis* (Boisduval & Leconte) (Insecta: Lepidoptera: Nymphalidae: Apaturinae)[1]

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Introduction

The hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte), is also known as the hackberry butterfly (Miller 1992) although the latter name is somewhat misleading because there are two other eastern United States butterflies—the American snout, *Libytheana carinenta* [Cramer], and the tawny emperor, *Asterocampa clyton* [Boisduval & Leconte]—and also a number of other *Asterocampa* species, in other areas, that use hackberries as their exclusive caterpillar host plants (Scott 1986).

The hackberry emperor is a common butterfly of river bottoms and other areas where its host plants are common, but it also may be found in upland areas. Historically, dense swarms have been documented in some southern states (Lambremont 1984).

Detailed historical information on the taxonomy and nomenclature of the hackberry emperor is found in the *Catalog of the Butterflies of the United States and Canada* (Pelham 2008).

Figure 1. Dorsal wing view of an adult hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
Credits: Jerry Butler, UF/IFAS

Distribution

The hackberry emperor is found from northeastern Mexico northward into the southwestern United States and to Nebraska and throughout most of the eastern United States

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except for the northern half of Wisconsin, Michigan, and New York and all of New England (Opler and Krizek 1984; Opler et al. 2009). It is common in northern and central Florida but is infrequent in southern Florida (Minno et al. 2005).

Description

Adults

The wing spread of adults is 2.0 to 2.6 inches (Daniels 2003). Adults are somewhat variable regionally and the variants (races) are sometimes given subspecific names. The northern (and Florida panhandle) race is "*celtis*." The peninsular Florida race is designated "*reinthali*" (Cech and Tudor 2005; Minno and Minno 1999).

The upper surface of the wings is light brown with the distal half of the forewing darker. The hackberry emperor is readily distinguished from the closely related and similar tawny emperor by the white spots near the apex of the front wing and the sub-marginal black eyespot (also on the forewing), characters that are lacking in the tawny emperor. The ventral aspect of the hind wing is characterized by a row of post-median eyespots with powdery blue-green centers.

Males are smaller and have narrower wings than females (Minno and Minno 1999).

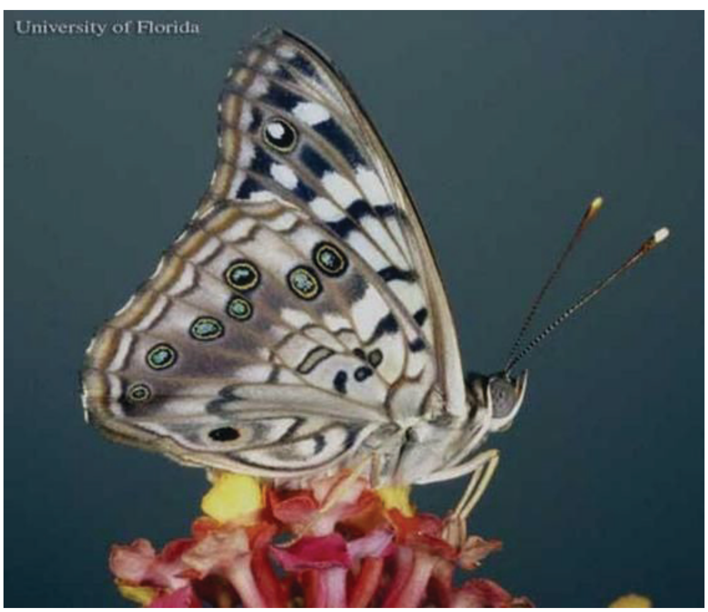

Figure 2. Ventral wing view of an adult hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
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Eggs

Eggs are white or pale yellow and surrounded by a series of vertical ridges.

Figure 3. Eggs of the hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
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Larvae

Full grown larvae are approximately 1.4 inches in length (Minno et al. 2005). The lower half of the head is green with short green spines laterally. The upper half of the head is brown with a pair of stout black horns dorsally. See Wagner (2005) for excellent drawings of the cephalic horns and lateral spines of the hackberry emperor and tawny emperor.

The body has numerous tiny yellowish-white, raised, seta-bearing bumps (chalazae). Some of the chalazae are arranged to form narrow stripes on the back and sides. There are also oblique whitish-yellow stripes on the sides and two short tails on the posterior end.

Figure 4. Larva of the hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
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Pupae

The pupae are green with small white spots and a white mid-ventral line that branches and runs to the tips of two horns at the anterior end of the pupa. There are also two white lateral lines and diagonal white lines on the sides of the abdomen. The pupae are attached to a silk pad by the cremaster.

Figure 5. Pupa of the hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
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Life Cycle and Biology

There are two generations per year throughout most of the range (Opler et al. 2009) and possibly three in Florida (Glassberg et al. 2000).

Adults have a very rapid flight. Males perch on foliage or other parts of the host plants to await females (Opler and Krizek 1984). A detailed description of the mating behavior is given by Langlois and Langlois (1964).

Females tend to be less active than males and are seen less frequently, but both sexes can be attracted to fermenting fruit baits. Adults feed on tree sap, fermenting fruit, dung, carrion, and rarely flower nectar (Opler and Krizek 1984). They also sip moisture and minerals from mud and readily land on people to drink sweat for salts (Allen 1997, Glassberg et al. 2000). Males are attracted to bright objects, and Glassberg et al. (2000) state that males can be attracted from their perches to land on pieces of white paper held in the sun.

Eggs are laid singly or in small groups on the undersides of leaves (Allen 2000, Opler and Krizek 1984, Scott 1986). Caterpillars rest on the undersides of leaves. They are particularly easy to see at night by shining a flashlight up into small trees. Third instars (probably even a few from the first generation [Opler and Krizek 1984, Cech and Tudor 2005]) attach to the undersides of leaves, turn brown and overwinter (diapause) in the rolled leaves (Allen 2000). According to Opler and Krizek (1984), the leaves with the diapausing larvae drop from the trees in the fall, and the larvae must then climb the tree to resume feeding in the spring. However, Minno and Minno (1999) state that the young larvae overwinter in leaf nests on the tree.

Natural Enemies

In addition to the generalist predators that prey on Lepidoptera larvae, there is at least one tachinid fly parasitoid (Arnaud) and at least one ichneumonid parasitoid listed from *Asterocampa celtis* larvae.

Table 1.

Tachinid parasitoid listed from *Asterocampa celtis* (Arnaud 1978)	
Name from Arnaud (1978) p. 600	**Updated name from O'Hara (2013)**
Euphorocera edwardsii	*Chetogena edwardsii* (Williston)
Ichneumonid parasitoid listed from *Asterocampa celtis* (Krombein et al. 1979)	
Microcharops tibialis (Cresson) (Ichneumonidae), p. 681	

Hosts

The larval hosts of the hackberry emperor are hackberry trees (*Celtis* spp.) in the family Celtidaceae. The two most common hackberries in the eastern United States, the more northern hackberry, C*eltis occidentalis* Linnaeus, and the more southern sugarberry, *Celtis laevigata* Willd., can usually be recognized by the slightly to heavily warty appearance (or pronounced ridges on mature *Celtis occidentalis*) of the bark. More information and a key to the *Celtis* species is available at efloras.org (undated).

Economic Importance

Hackberry emperor larvae are rarely numerous enough to seriously affect host trees. However, there are accounts of complete defoliation of both *Celtis occidentalis* (Langlois and Langlois 1964) and *Celtis laevigata* (Solomon et al. 1975). Control measures are not required.

Figure 6. Hackberry, *Celtis occidentalis* L. (Celtidaceae), a larval host for the hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
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Figure 7. Sugarberry, *Celtis laevigata* Willd., a host of the hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
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Figure 8. Warty trunk of the sugarberry, *Celtis laevigata* Willd., a host of the hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
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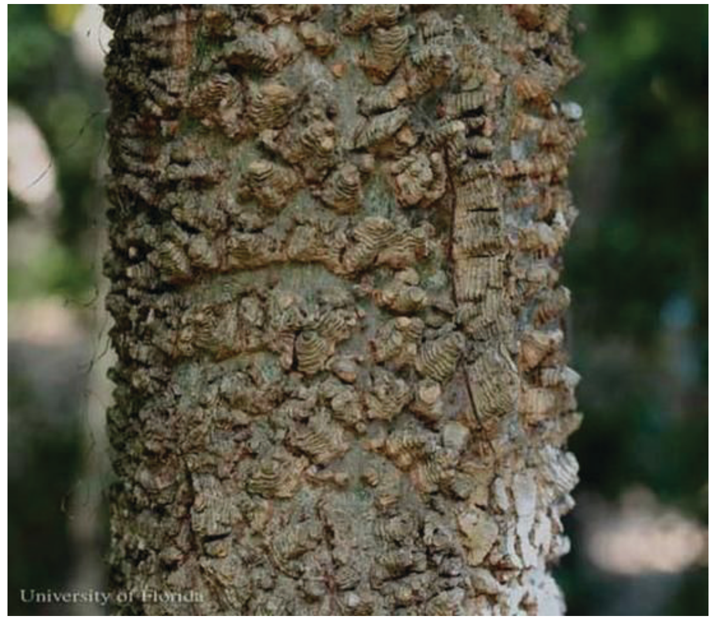

Figure 9. Heavily warty trunk of the sugarberry, *Celtis laevigata* Willd., a host of the hackberry emperor, *Asterocampa celtis* (Boisduval & Leconte).
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