

Goatweed Butterfly, Goatweed Emperor, Goatweed Leafwing *Anaea andria* Scudder (1875) (Insecta: Lepidoptera: Nymphalidae: Charaxinae)¹

Donald W. Hall and Jerry F. Butler²

The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids, and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

The goatweed butterfly is an attractive, fascinating, and widespread species that is not often observed by the general public because of its cryptic coloration (Figure 1) and somewhat spotty distribution within its range. Both larvae and adults are cryptically colored. Adults play dead when handled (Scott 1986). This species provides dramatic examples of adaptive coloration and behavior to escape predators in both the larval and adult stages.



Figure 1. Resting goatweed butterfly, *Anaea andria* Scudder.

Credit: Jerry F. Butler, UF/IFAS

Distribution

The goatweed butterfly is widely distributed throughout the southern Midwest and South ranging from West Virginia to Kansas and south to Texas and central Florida (Opler and Krizek 1984).

Description

The wingspread of goatweed butterflies is 5.7–7.6 cm (2 1/4–3 inches) (Daniels 2003) with males being slightly smaller than females. The upper surface of the wings of adult goatweed butterflies exhibit sexual dimorphism in both shape and color (Figures 2 and 3). The wings of males are more or less uniformly orange-brown with a dark margin. The wings of females have an irregular lighter submarginal band with broad darker margins. The apex of the forewing is hooked (falcate) and each hindwing bears a short, pointed, backward-projecting tail.



Figure 2. Summer form of male goatweed butterfly, *Anaea andria* Scudder.

Credit: Jerry F. Butler, UF/IFAS



Figure 3. Summer form of adult female goatweed butterfly, *Anaea andria* Scudder.

Credit: Jerry F. Butler, UF/IFAS

Both sexes exhibit marked seasonal dimorphism in wing shape. In the summer forms, the forewing apex is less hooked and the hindwing tail is shorter than in the winter form. They also exhibit seasonal color dimorphism. Summer males are slightly less orange with a narrower marginal band. Summer females are lighter in color than winter females. The undersides of the wings mimic dead leaves and are similar in both sexes.

Both the appearance of the adult seasonal forms and reproductive diapause in the winter forms are controlled by responses of the larvae to photoperiod (daylength) (Riley 1988a, Riley 1988b). Larvae exposed to short photoperiods during late summer and early fall produce winter form adults that are in reproductive diapause.

Eggs are spherical and cream colored (Figure 4).



Figure 4. Egg of goatweed butterfly, *Anaea andria* Scudder.

Credit: Jerry F. Butler, UF/IFAS

Full-grown larvae are approximately 3.8 cm (1 1/2 in) in length and are gray-green with many minute tubercles covering both the head and body (Figure 5). The head also has a small number of larger orange tubercles. The color and tuberculation of the larvae match the surface texture and appearance of twigs of some common host plants.



Figure 5. Full grown caterpillar of goatweed butterfly, *Anaea andria* Scudder.

Credit: Jerry F. Butler, UF/IFAS

Pupae are light green with darker green lines simulating a leaf-like texture (Figure 6). There is a small heavily sclerotized black anal ring just below (anterior to) the cremaster.



Figure 6. Pupa of goatweed butterfly, *Anaea andria* Scudder.

Credit: Jerry F. Butler, UF/IFAS

Life Cycle

The goatweed butterfly has two flights per year in the North with possibly three or four flights in parts of the South (Scott 1986). Its flight is swift and erratic (Opler and Krizek 1984). Overwintering adults mate in the spring (Scott 1986). Males wait for females for mating in clearings or on ridge tops.

Adults feed on sap flows, decaying fruits, and dung (Heitzman and Heitzman 1987). The proboscis is too short to allow feeding on most flowers (Scott 1986). Goatweed

butterflies are found in open wooded areas (particularly sandhills) and along edges of hammocks near streams (Glassberg et al. 2000).

Eggs are laid on new growth of the host plants (Minno et al. 2005). First and second instar larvae eat the leaf blade away from the midrib and rest at the tip. They attach fecal pellets with silk to their backs and to the base of the leaf midrib (Figure 7)—probably to repel ants and other predators. Older larvae fold and silk the sides of leaves together and hide inside with their heavily sclerotized heads blocking the entrance to the leaf roll (Minno et al. 2005) (Figure 8). Larvae often pupate on the undersides of leaves of the host plant (Heitzman and Heitzman 1987).



Figure 7. Second instar larva of goatweed butterfly, *Anaea andria* Scudder, resting at tip of leaf midrib.
Credit: Jerry F. Butler, UF/IFAS



Figure 8. Goatweed butterfly larvae (one on stem, one in leaf roll), *Anaea andria* Scudder.
Credit: Jerry F. Butler, UF/IFAS

Host Plants

Larval hosts for the goatweed butterfly are various species of plants in the genus *Croton* (Euphorbiaceae). A commonly used host-plant species in central Florida is silver croton, *Croton argyranthemus* Michx. (Figure 9), a common inhabitant of longleaf pine (*Pinus palustris* Mill.) high pine communities.



Figure 9. Silver croton, *Croton argyranthemus* Michx., host for goatweed butterfly, *Anaea andria* Scudder.
Credit: Donald W. Hall, UF/IFAS

The pine sandhill and scrub habitats that support silver croton are rapidly diminishing in Florida and elsewhere because of urban encroachment (Cech and Tudor 2005).

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² Donald W. Hall, professor emeritus, Department of Entomology and Nematology; Jerry F. Butler, professor emeritus, Department of Entomology and Nematology; UF/IFAS Extension, Gainesville, FL 32611.

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