

Red-Spotted Purple *Limenitis (=Basilarchia) arthemis astyanax* (Fabricius) (Insecta: Lepidoptera: Nymphalidae: Limenitidinae)¹

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Introduction

The red-spotted purple, *Limenitis arthemis astyanax* (Fabricius), is a beautiful forest butterfly that is also commonly seen in wooded suburban areas. It is considered to be a Batesian mimic of the poisonous pipe vine swallowtail, *Battus philenor* (Linnaeus), with which it is sympatric. For detailed taxonomic information on the red-spotted purple, see Warren et al. (2009a).

The white admiral, *Limenitis arthemis arthemis* (Drury), is a more northern subspecies and is not mimetic. It is believed to benefit from its disruptive banded coloration for protection in the absence of a poisonous model (Platt and Brower 1968). For photos and detailed taxonomic information on the white admiral, see Warren et al. (2009b). The red-spotted purple interbreeds with the white admiral in the zone of overlap, and the hybrids are healthy and fertile (Scott 1986).

The red-spotted purple also interbreeds with the closely-related, congeneric viceroy butterfly, *Limenitis archippus* (Cramer), both in the laboratory and occasionally in the field (Platt 1975, Platt and Greenfield 1968, Covell 1994, Platt and Maudsley 1994, Platt et al. 2003, Ritland 1990). Ritland (1990) discussed factors favoring increased rates of hybridization in southern Georgia and northern Florida.



Figure 1. Adult red-spotted purple, *Limenitis arthemis*. Ventral view of wings.

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Distribution

The red-spotted purple is resident from Florida westward to eastern Texas and northward into Minnesota, Wisconsin, Michigan, New York, Vermont, and New Hampshire.

Description

Adults

The wing spread of adults is 3.0 to 3.5 inches (Daniels 2003). The upper surface of the front wings are black with thin marginal white dashes and submarginal, rows of oblong white and orange spots. The upper surfaces of the hind wings are black with iridescent blue patches and spots on the distal half. The undersides of the wings are brownish black with iridescent blue areas and with large orange basal spots, a row of bright orange spots, and two rows of curved iridescent blue dashes near the margins of the wings. The undersides of both wings have a row of curved marginal white dashes.



Figure 2. Adult red-spotted purple, *Limenitis arthemis*. Dorsal view of wings.

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Eggs

The eggs are whitish to pale green when first laid but later change to gray (Minno et al. 2005, Scott 1986). The egg surface is sculptured with small hexagons with spikes arising from the corners of the hexagons.

Larvae

Full grown larvae are approximately 1.6 inches in length (Minno et al. 2005) The head is brown and fringed with short spines and has a cleft on top. The body is olive green to greenish brown with a pinkish white saddle and a white lateral line. There are a pair of long, thick, branched horns on top of the prothorax and a small pair of branched spines on top of the posterior end and several humps on the back.

The larvae are bird-dropping mimics. They are very similar in appearance to viceroy larvae but are less spiny (Minno et al. 2005). Caterpillars of species in the genus *Limenitis* are our only horned bird dropping mimics (Wagner 2005).



Figure 3. Egg of the red-spotted purple, *Limenitis arthemis*.

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Figure 4. Full grown larva of the red-spotted purple, *Limenitis arthemis astyanax* (Fabricius).

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Pupae

The pupae are brown and white (possibly bird-dropping mimics). They hang vertically attached by the terminal end to a small silk pad by a cremaster.



Figure 5. Prepupa of the red-spotted purple, *Limenitis arthemis astyanax* (Fabricius).

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Figure 6. Pupa of the red-spotted purple, *Limenitis arthemis astyanax* (Fabricius).

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Life Cycle and Biology

There are two generations per year in Florida. Eggs are laid near the tips of leaves, and the young larva eats most of the leaf tip, except for the midrib, on which it rests. The larva attaches pieces of leaves and fecal pellets to the base of the exposed midrib with silk, presumably to protect itself from predators.



Figure 7. Young larva of the red-spotted purple, *Limenitis arthemis*, feeding. Notice empty egg at bottom center.

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Third instar larvae overwinter in a small leaf shelter (hibernaculum) that is attached to the stem of the host plant with silk.

Adults prefer to feed on tree sap, fermenting fruit, or dung, but they do occasionally take nectar from flowers, and also

frequently feed at mud or drink from mud puddles (Allen 1997; Glassberg et al. 2000; Opler and Krizek 1984; Scott 1986).

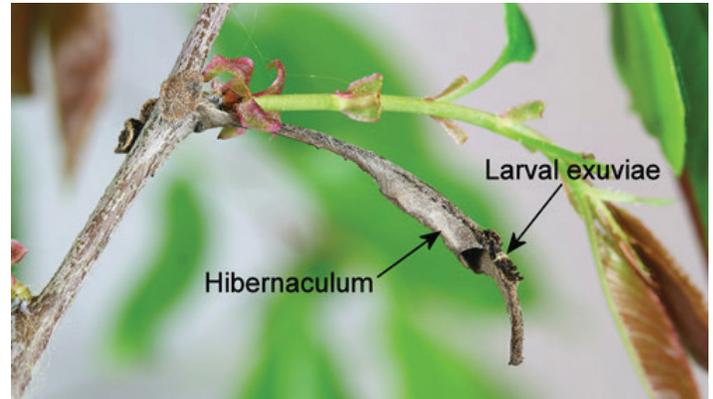


Figure 8. Hibernaculum of the red-spotted purple, *Limenitis arthemis astyanax* (Fabricius).

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Hosts

Preferred plant hosts for red-spotted purple larvae in Florida are black cherry (*Prunus serotina* Ehrh.) and deerberry (*Vaccinium stamineum* L.), occasionally willows—particularly Carolina willow (*Salix caroliniana* Michx.) and possibly species in the family Betulaceae. Plant names for Florida plants are from Wunderlin and Hansen (2008). In the Northern US, a variety of other plants are used including aspens, poplars, cottonwood, hawthorn, birches, black oak, and serviceberry (Allen 1997; Cech and Tudor 2005; Opler and Krizek 1984; Scott 1986).



Figure 9. Black cherry, *Prunus serotina* Ehrh., a host of the red-spotted purple, *Limenitis arthemis*.

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Figure 10. Deerberry, *Vaccinium stamineum* L., a host of the red-spotted purple, *Limenitis arthemis*.

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Figure 11. Carolina willow, *Salix caroliniana* Michx., a host of the red-spotted purple, *Limenitis arthemis*.

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Figure 12. Carolina willow, *Salix caroliniana* Michx., a host of the red-spotted purple, *Limenitis arthemis*.

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