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THE LARGER MOTHS FOUND IN WASHINGTON STATE

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Introduction

The insect order Lepidoptera includes moths and butterflies and is the most recognized group of insects in the world. Perhaps this popularity is due to the wide range of colorful wing patterns that adult moths and butterflies display. These wing patterns range from brightly to dull colored, single- or multicolored, simple to highly intricate designs, but all wings have one thing in common—microscopic scales of "color". Thousands of microscopic scales cover the two pairs of wings that most moths and butterflies have, and these scales easily rub off like dust in your hand (Figure 1). The presence of scales is the key character that distinguishes the moths and butterflies from nearly all other insect orders, and certainly contributes to the beauty and popularity of Lepidoptera.

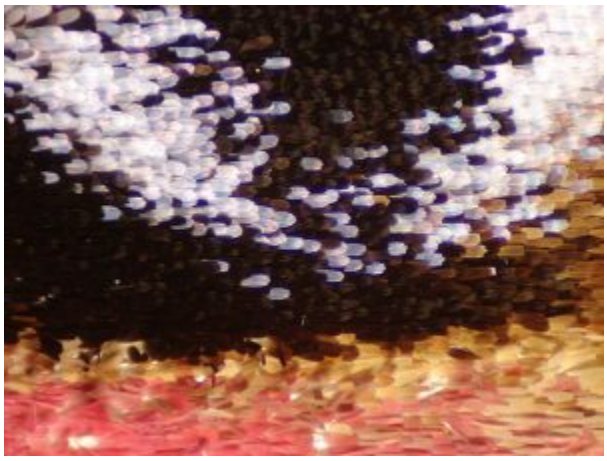

Figure 1. Moth scales under 100-fold magnification. Photo—M. Bush, WSU Extension.

One goal of this publication is to help Washington residents recognize all life stages of Lepidoptera and to distinguish adult moths from butterflies. There are over 1,200 species of moths in Washington State (Pacific Northwest Moths 2017). This publication seeks to help Washington residents recognize and appreciate the biggest and most spectacular moths native to our state.

Moths versus Butterflies

A general rule of thumb is that moths are active at dawn, dusk, and at night, while butterflies are active during the day. Thus, moths tend to be more subdued in coloration, while butterflies can be very bright and colorful. Not all moth colors follow these rules, as a few moths are not only bright and colorful, but active during the day. Moths tend to have thick and sturdy bodies covered with hair, while butterflies have thinner bodies. Moth antennae are highly variable ranging from a slender thread to highly plumose (feathery) antennae, while butterflies have antennae that are threadlike with a knob at the furthest tip of the antennae. Finally, moths usually hold their wings tent-like over their back at rest (Figure 2), while butterflies hold their wings perpendicular when at rest (Figure 3).

Figure 2. Moths like this carpenter moth (*Prionoxystus robiniae*) tend to be more subdued in color, have thicker bodies, fold wings like a tent over their backs, and have variable shaped antennae (but never knobbed at the tip). Photo—M. Bush, WSU Extension.

Figure 3. Butterflies like this western tiger swallowtail, *Papilio rutulus*, tend to be brilliant in color, have thinner bodies, hold wings perpendicular over the body, and have thread-like antennae with knobs at the tip. Photo—M. Bush, WSU Extension.

Moth Life Cycle

All moths and butterflies go through complete metamorphosis, or a change in shape and size from egg to larva, larva to pupa, and finally from pupa to the adult stage.

The egg stage (Figure 4) can be found as single or clusters of eggs near the host plant that the larvae will feed on. The larvae, commonly known as caterpillars (Figure 5), tend to eat all the time. Thus, caterpillars are often the most serious pests of garden and ornamental plants in the home landscape. Mature caterpillars stop eating and seek out a quiet place to overwinter as pupae (Figure 6) in the soil or wrapped and hidden in leaves of the host plant. The adult moth (Figure 7) is built for dispersal (flying) and for mating (reproduction). Adult moths feed only on pollen and nectar (if they feed at all) and some species are recognized as beneficial flower pollinators (Figure 8).

Figure 4. This is the egg stage of the big poplar sphinx, *Pachysphinx modesta*. True to the name, each egg is relatively "big" for a moth egg and measures nearly 1/8-inch long. Photo—M. Bush, WSU Extension.

Figure 5. This is the larval stage (caterpillar) of the big poplar sphinx. Photo—Marcie O'Connor, Buffalo County, WI.

Figure 6. This is the pupal stage of the big poplar sphinx that may be found buried in the soil not far from the host plant. Photo—M. Bush, WSU Extension.

Figure 7. The big poplar sphinx. Moth size ranges from 3.0 to 4.7-inch wingspan. Photo—Jeff Fast, East Haddam, CT.

Figure 8. The white-lined sphinx, *Hyles lineata*, visiting and pollinating pink phlox during the day. Photo—Sue Spain, Master Gardener volunteer, Yakima County, WA.

Finding Big Moths

In Washington State, the larger moths belong primarily to two moth families—the Saturniidae, known as the giant silk moths, and the Sphingidae, sphinx, or hawk moths. We include a few of the larger moths from other families that homeowners are likely to encounter. Often, moths are drawn to lights at night, and can be found resting near the light source come dawn. Many moths, including these large species, may be found on a wall near a porch light or other bright light source near wooded or forested areas where larval host plants are abundant. Another option would be to hang a white sheet behind any source of light (black lights or ultraviolet are most attractive) at night. The moths drawn to the light may rest on the white sheet and be observed or collected. It is important to minimize contact with the wings and dislodging, or rubbing off, the delicate scales on the moth's wings.

Our Top Ten List (in absolutely no particular order):

1.) Big Poplar Sphinx or Modest Sphinx, *Pachysphinx modesta*

The big poplar sphinx is one of the largest (3.0 to 4.7-inch wingspan) of the sphinx moths in Washington State (more common in eastern Washington). This moth (Figure 7) has a bright pink underwing which it flashes to startle potential predators and escape. The larvae (Figure 5) feed on the leaves of poplar, aspen, cottonwood (*Populus*), and willow (*Salix*).

2.) Five-spotted Hawk Moth, *Manduca quinquemaculata*

One of several large (3.5 to 5.0-inch wingspan) sphinx moths native to Washington and is named for the five rows of orange to white spots on the abdomen (Figure 9A). Adults are active from May to September. The larvae (Figure 9B), commonly known as tomato hornworms, have eight rows of v-shaped stripes along the abdomen and one blue-black horn at the tail end. The larvae feed on tomato, pepper, potato, and other related plants in the nightshade family, and are considered an occasional pest in home gardens.

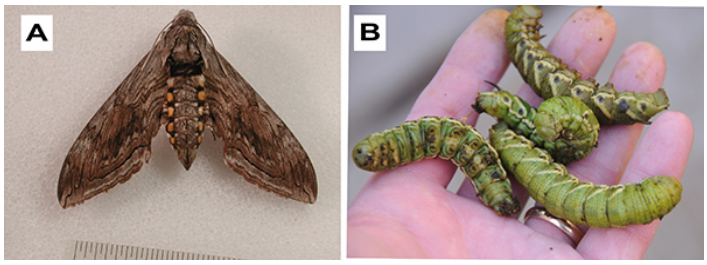

Figure 9. Five-spotted hawk moth (3.5 to 5.0-inch wingspan) (A); and caterpillar (up to 4 inches long), also known as the tomato hornworm (B). Photos—M. Bush, WSU Extension.

3.) Blinded Sphinx, *Paonias excaecata*

Moths (2.0 to 3.5-inch wingspan) are found in late spring to early summer. Note that the center of the eye on the hindwings has no black spot in the center of the 'blue eye' (Figure 10). The hornworm caterpillars feed on various deciduous trees including basswood (*Tilia*), willow (*Salix*), birch (*Betula*), hawthorn (*Crataegus*), poplar (*Populus*), oaks (*Quercus*), ocean spray (*Holodiscus*), and cherry (*Prunus*).

Figure 10. The blinded sphinx moth has a 2.0 to 3.5-inch wingspan. Photo—M. Bush, WSU Extension.

4.) Willow or One-eyed Sphinx, *Smerinthus cerisyi*

Large (2.5 to 3.4-inch wingspan) moths are often found in spring (May to June) to summer (August to September). Note the black spot in blue eye (Figure 11A, 11B). The hornworm caterpillars feed on the leaves of willow (*Salix*), poplar (*Populus*), pear (*Pyrus*), and plum (*Prunus*).

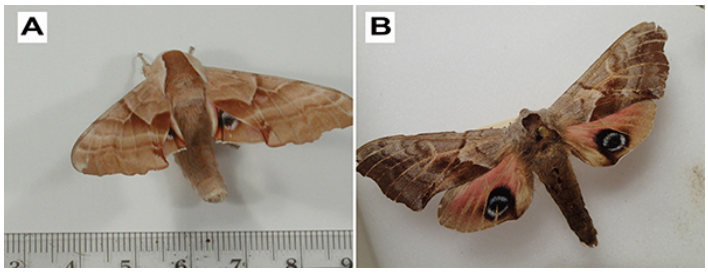

Figure 11. One-eyed sphinx moth has a 2.4 to 3.5-inch wingspan. Light phase of moth (A), and darker phase of moth (B). Photos—M. Bush, WSU Extension.

5.) White-lined Sphinx, *Hyles lineata*

This sphinx moth (2.4 to 3.5-inch wingspan) has distinctive white cross-lines over a broad line down the middle of the forewing and bright pink underwings (Figure 12A). These moths can be found flying during the day from late spring to late summer. The larvae (Figure 12B) feed on a great diversity of plants including willow weed (*Epilobium*), four o'clock (*Mirabilis*), apple (*Malus*), evening primrose (*Oenothera*), elm (*Ulmus*), grape (*Vitis*), tomato (*Lycopersicon*), purslane (*Portulaca*), and fuschia (*Fuschia*).

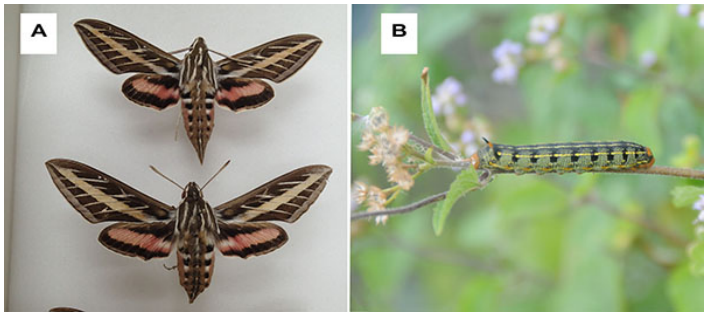

Figure 12. White-lined sphinx moth (2.4 to 3.5-inch wingspan) (A), and caterpillar (B). Photos—M. Bush, WSU Extension.

6.) Gallium Sphinx, *Hyles gallii*

This sphinx moth (2.5 to 3.1-inch wingspan) is increasingly found in our area. Note that there are no cross-lines over the more undulating white wing stripe and no stripes on the tawny thorax (Figure 13). The hornworm larvae feed on bedstraw (*Gallium*), willow weed (*Epilobium*), woodruff (*Asperula*), and godetia (*Godetia*).

Figure 13. Gallium sphinx moth. Photo—Jeff Fast, East Haddam, CT.

7.) Ceanothus Silkmoth, *Hyalophora euryalus*

This large (3.5 to 5.0-inch wingspan) silk moth is found from April to August. Note crescent markings on wings (Figure 14A). Ceanothus caterpillars feed on a variety of trees and shrubs including bitterbrush (*Purshia*), gooseberry (*Ribes*), *Ceanothus* species, saskatoon serviceberry (*Amelanchier alnifolia*), oak (*Quercus*), willow (*Salix*), maple (*Acer*), and birch (*Betula*) (Figure 14B).

Figure 14. Ceanothus moth (A); and multiple instars of the caterpillar (B). Photos—Edna Woodward, Wolf Creek, OR and Jeffery C. Miller, USDA-Forest Service.

8.) Polyphemus Moth, *Antheraea polyphemus*

An even larger (3.9 to 6.0-inch wingspan) silk moth is the polyphemus moth (Figure 15A) that has become more common in the last few years. Moths appear in late spring (April) to midsummer (July). Larvae (Figure 15B) feed on maple (*Acer*), willow (*Salix*), birch (*Betula*), oak (*Quercus*), as well as plants in the rose family. Larvae pupate in wrapped leaves on the host plant.

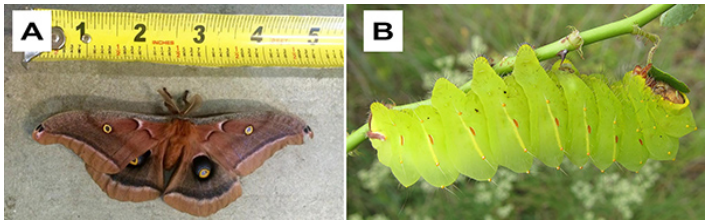

Figure 15. The polyphemus moth has a 3.9 to 6.0-inch wingspan (A); the mature caterpillar is nearly 4 inches long (B). Photos—Lagene Taylor, WSU Extension, and Seth Ausubel, Washington Crossing, PA.

9.) Carpenterworm Moth or Carpenterworm, *Prionoxystus robiniae*, Moth Family Cossidae

This gray and black mottled moth has a 1.7 to 3.3-inch wingspan (Figure 16A). Larvae (Figure 16B) bore in wood of living deciduous trees including locust (*Robinia)*, oak (*Quercus*), chestnut (*Castanea*), poplar (*Populus*), willow (*Salix*), maple (*Acer*), and ash (*Fraxinus*).

Unlike the other larvae in this publication, carpenterworms may take three to four years of feeding before reaching maturity. Thus, they are pests in home landscapes as well as in forestry and lumbering operations.

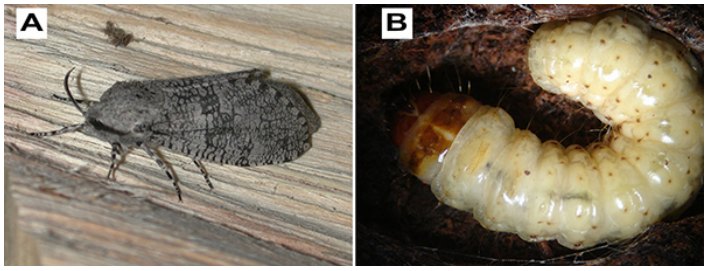

Figure 16. Carpenterworm moth (1.7 to 3.3-inch wingspan) (A); carpenterworm (B). Photos—M. Bush, WSU Extension.

10.) Underwing Moths, *Catocala*, Moth Family Erebidae

There are several species of underwing moths found in Washington State that have 0.7 to 3.5-inch wingspans. Typically, the forewings are cryptically colored, so the adult moth can blend in with the background tree bark or branch (Figure 17). When disturbed, underwing moths will flash their hindwings that feature orange, red or whitish concentric markings that may startle potential predators allowing the moths an opportunity to fly away and escape. Common host plants for the caterpillar includes oak (*Quercus*), birch (*Betula*), walnut (*Juglans*), alder (*Alnus*), beech (*Fagus*), poplar (*Populus*), and willows (*Salix*).


Figure 17. The underwing moths. Photo—M. Bush, WSU Extension.

Further Readings

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