EENY479

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Black and yellow lichen moth (suggested common name) *Lycomorpha pholus* (Drury) (Insecta: Lepidoptera: Noctuidae: Arctiinae: Lithosiini)[1]

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Introduction

The black and yellow lichen moth, *Lycomorpha pholus* (Drury), is a member of the subfamily Arctiinae, tiger moths and woolly bears. The common names of the subfamily refer to the bright wing color patterns found in adults and the long setae covering many of its caterpillars.

Tiger moths are found in all of the zoogeographical regions (six geographical divisions of the world that are used to study the occurrence of land animals) including the Nearctic (North America). However, they are most common in the Neotropics (Mexico south of the Tropic of Cancer, Central and South America, and the West Indies) (Scoble 1995). Species found in Florida include the bella moth, *Utetheisa bella* (Linnaeus); the oleander moth, *Syntomeida epilais* (Walker); and the giant leopard moth, *Hypercompe scribonia* (Stoll).

Some caterpillars in the tiger moth subfamily are considered nuisance species, including the fall webworm, *Hyphantria cunea* (Drury). Others, such as the caterpillar of the cinnabar moth, *Tyria jacobaeae*

Figure 1. Adult black and yellow lichen moth, *Lycomorpha pholus* (Drury). Photograph by: Tom Murray

(Linnaeus), are beneficial. The cinnabar moth caterpillar is used as a successful biological control agent of tansy ragwort in the Pacific Northwest.

The black and yellow lichen moth is also a member of the tribe Lithosiini (subfamily Arctiinae), the lichen moths. The common name of the tribe

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Figure 2. The banded woolly bear caterpillar, *Pyrrharctia isabella* (Smith). Photograph by: Whitney Crenshaw, Colorado State University, Bugwood.org

Figure 3. Adult bella moth, *Utetheisa bella* (Linnaeus), a tiger moth. Photograph by: Don Hall, University of Florida

Figure 4. Adult oleander moth, *Syntomeida epilais* (Walker), a tiger moth. Photograph by: Howard Ensign Evans, Colorado State University, Bugwood.org

refers to the frequent choice of lichens as food sources by the caterpillars. Like other tiger moths, the lichen moths are also most common in the Neotropics. They are generally smaller than other

Figure 5. Adult giant leopard moth, *Hypercompe scribonia* (Stoll), a tiger moth. Photograph by: USDA Cooperative Extension Slide Series, Bugwood.org

Figure 6. Fall webworm larvae, *Hyphantria cunea* (Drury), in protective webbing. Photograph by: G. Keith Douce, University of Georgia, Bugwood.org

Figure 7. Adult cinnabar moth, *Tyria jacobaeae* (Linnaeus), nectar feeding on tansy ragwort. Photograph by: Eric Coombs, Oregon Department of Agriculture, Bugwood.org

Figure 8. Caterpillar of a cinnabar moth, *Tyria jacobaeae* (Linnaeus), feeding on tansy ragwort. Photograph by: David Cappaert, Michigan State University, Bugwood.org

tiger moths, and the adults may be either brightly colored or drab.

Figure 9. The painted lichen moth, *Hypoprepia fucosa* Hübner, an example of a brightly colored adult lichen moth. Photograph by: John Himmelman

The caterpillars in Lithosiini also have much fewer setae covering their bodies, making them appear bare in comparison to the woolly bears.

Synonymy

Sphinx pholus Drury 1773

Distribution

The range of the black and yellow lichen moth is restricted to North America. It occurs as far north as Ontario and Quebec, Canada. It is found in the eastern United States from Maine to Florida and as

Figure 10. Adult little white lichen moth, *Clemensia albata* Packard, an example of a lichen moth with drab coloration. Photograph by: Phil Huntley-Franck

Figure 11. Yellow woolly bear caterpillar, *Spilosoma virginica* (Fabricius). Photograph by: David Cappaert, Michigan State University, Bugwood.org

Figure 12. Lichen moth caterpillar of *Hypoprepia miniata* (Kirby) feeding on lichens. Photograph by: Jason Dombroskie, University of Alberta

far west as the Rocky Mountains (Powell and Opler 2009).

Description

Adults: Both male and female adult black and yellow lichen moths are similar in appearance. Their wingspan ranges from 2.5 to 3.2 cm or 1 to 1.3 inches (Covell 1984). The head, thorax (chest), legs, and abdomen are all black with an iridescent blue sheen. The tegula (shoulders), the half of the forewing closest to the body (basal half), and a patch on the front (costal) margin of the hind wing next to the body are all orange-yellow.

Figure 13. Adult black and yellow lichen moth, *Lycomorpha pholus* (Drury). (pinned specimen) Photograph by: Clare Scott, University of Florida

The orange-patched smoky moth, *Pyromorpha dimidiata* Herrich-Schäffer, has a similar color pattern. This moth has a range that partially overlaps that of the black and yellow lichen moth. However, it only occurs as far west as Missouri (Covell 1984). Both moths can be found flying at the same time of the year and both are diurnal (active during the day). The orange-patched smoky moth can be distinguished from the black and yellow lichen moth because the former has no orange-yellow scales on its hind wing. Also, its wings appear somewhat translucent, unlike the black and yellow lichen moth.

Larvae: The caterpillars of the black and yellow lichen moth are described as having sparse hairs and being similar in appearance to those of the genus *Hypoprepia* (Forbes 1960).

Life Cycle

The black and yellow lichen moth flies from July to September in Eastern North America (Covell 1984) and from late June to August in Western North America (Powell and Opler 2009). This moth is only active during the day. It is found nectar feeding at flowers of goldenrod (*Solidago* spp.), *Apocynum* spp., and *Ericameria nauseosa* (Powell and Opler 2009).

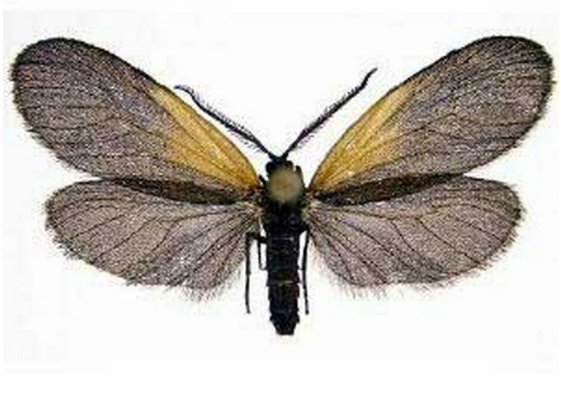

Figure 14. Adult orange-patched smoky moth, *Pyromorpha dimidiata* Herrich-Schäffer, with wings spread to demonstrate the lack of orange-yellow scales on the hindwing. Photograph by: Jim Vargo

Wagner et al. (2008) found that multiple generations can occur during the time when the adults are flying, and third instar larvae from later generations will overwinter by entering diapause. This is a period of no growth that can only be broken by receiving an appropriate number of cold hours.

The adults and caterpillars of the subfamily, Arctiinae, are often defended from predators, including birds and bats, and from parasitoids, such as some flies and wasps, by chemical compounds. The compounds are often obtained from the hosts on which the caterpillars feed. The compounds are transferred to the adults when the caterpillar pupates. For the black and yellow lichen moth, these chemicals are lichen phenolics, defensive compounds produced by the fungal component of the lichen.

Hosts

Caterpillars of the black and yellow lichen moth have been raised to adults on the lichen *Physcia millegrana* (Wagner et al. 2008).

Mimicry

The color pattern found on adult black and yellow lichen moths occurs on other species in the tiger moth subfamily: members of the genera *Dycladia* and *Correbia*, the orange-patched smoky moth in the family Zygaenidae, and in some net-wing beetles in the family Lycidae. All of these individuals are regarded as Müllerian mimics (Simmons 2009, which means that all of them possess chemicals of some kind that make them distasteful to predators.

Figure 15. Adult black and yellow lichen moth, *Lycomorpha pholus* (Drury). Photograph by: Tom Murray

Figure 16. Adult orange patched smoky moth, *Pyromorpha dimidiata* Herrich-Schäffer. Photograph by: Robert Patterson, Moth Photographers Group

Figure 17. *Caenia dimidiata* (Fabricius), an adult lycid beetle. Photograph by: Tom Murray

Caterpillars and adult moths from the family Zygaenidae, including the orange-patched smoky moth, are chemically defended by hydrocyanic acid that they release when threatened (Powell and Opler 2009).

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