

Oeneis melissa lucilla (Colorado Melissa Arctic)



Steve Cary,

Taxonomy

- **Class:** INSECTA
- **Order:** LEPIDOPTERA
- **Family:** NYMPHALIDAE
- **Genus:** Oeneis
- **Scientific Name:** *Oeneis melissa lucilla* W. Barnes and McDunnough, 1918
- **Common Name:** Colorado Melissa Arctic
- **Synonyms:**
- **Taxonomic Name Source:** Pelham, J. P. 2008. A catalogue of the butterflies of the United States and Canada with a complete bibliography of the descriptive and systematic literature. The Journal of Research on the Lepidoptera. Volume 40. 658 pp. Revised 14 February, 2012.

Agency Status

- **NMDGF:**
- **Federal Status:**
- **BLM Sensitive:**
- **USFS:**
- **IUCN Red List:** [Not Evaluated](#)
- **Nature Serve Global:** [TNR](#)
- **NHNM State:** S1
- **NM Endemic:** NO

Description

On Melissa Arctic, the translucent ventral hindwing is mottled to resemble lichens, with no eyespots or (usually) banding. Uniform mottling covers the entire hindwing in females, but males have dark basal mottling and lighter distal mottling. **Comments.** We have Rocky Mountain subspecies *Oeneis melissa lucilla* W. Barnes and McDunnough 1911.

Description courtesy of Steven J. Cary, [Butterflies of New Mexico](#), 2024

Habitat and Ecology

This butterfly is known to use high alpine tundra meadows as its habitat. Due to this habitat association there is a lack of data as searching for butterflies in the high elevation mountains of New Mexico can be quite challenging in the summer due to their remoteness and afternoon monsoon storms which often bring lightning, rain, and hail by early

afternoon (Cary and Toliver 2024). However, flight for this butterfly is recorded as falling between June 19th and July 24th in a single brood (Cary and Toliver 2024). During flight adults are often found near the ground or on the ground on windy tundra perches (Cary and Toliver 2024). This butterfly is camouflaged and blends in very well with the lichen covered rocks found on many of these summits which can further complicate its study (Cary and Toliver 2024). The only known host plant for this butterfly is Curly Sedge (*Carex rupestris drummondiana*) (Scott 1992, Cary and Toliver 2024). Eggs are generally laid on their host plants or on rocks nearby to these sedge host plants (Cary and Toliver 2024). Like several other Arctics this butterfly appears to have a two year life cycle for larvae to mature (Cary and Toliver 2024).

Geographic Range:

Melissa Arctics mostly live across Alaska and the Canadian Arctic, east to the White Mountains of New Hampshire. In the West, Pleistocene relict colonies extend across the high elevation peaks of the Rocky Mountains, as far south as northern New Mexico (Cary and Toliver 2024). The southern Rocky Mountain subspecies, the Colorado Melissa Arctic, occurs from northern New Mexico north through the Colorado Rocky Mountains, usually residing above 3,414 m (11,200 ft) (Cary and Toliver 2024, Pelham 2024).

Conservation Considerations:

There are no known conservation actions being taken for this butterfly and no known previous conservation assessments. Due to its high alpine distribution much of its distribution does fall within federal government lands managed by the United States Forest Service and National Park Service however, no specific actions are being taken for the taxa. Ultimately, conservation for this butterfly starts with more research focusing on identifying if there are any other host plants for the butterfly as well as better documentation of its distribution, population size and population trends. Further analysis of threats and especially of the risk of inbreeding depression may also be crucial for this butterfly's long term survival.

Threats:

As an extreme high elevation endemic at the far south of its parents range the main threat to this butterfly is likely climate change. It has been documented that many butterfly species respond to climate change by moving to higher elevations or higher latitudes; however, this butterfly already lives at the altitude extreme of its habitat and likely already exist at the altitudinal limit of their physiological and ecological requirements and/or those of their larval host plants (Gradish 2014). In the south of its range in New Mexico the butterfly is recorded as living above 3414 meters (11,200 feet) in the north of its range this butterfly may be a little less heat stressed but is still limited to high elevation tundra (Cary and Toliver 2024). With moving to higher elevations not being an option for this taxa and it being barred from moving farther north by large stretches of desert, a moderate amount of climate change threatens to push this taxa into thin air (Thomas 2005, Habel *et al.* 2010, Holland 2010, Gradish 2014). As the western United States is expected to continue to get hotter and drier over the next century things are looking dire for this mountaintop resident (Cook *et al.* 2009, Cook *et al.* 2015, Williams *et al.* 2022). Climate change also threatens this subspecies with phenological mismatch with both host and nectar sources which could result in steady declines in population numbers or in the event of an extreme phenological mismatch the extirpation of entire populations (Singer and Parmesan 2010, Patterson *et al.* 2019).

This threat is intensified by the fact that this butterfly's host plant is also an arctic species at the extreme southern edge of its range (Svitkova *et al.* 2019, GBIF.org 2024). Modeling done on the host plant has shown a very narrow and cold temperature range and shown that with any climate change many areas of suitable habitat will be lost (Svitkova *et al.*

2019). As the butterflies sole known host plant this projected loss of the host plant especially in the south of its range puts the Colorado Melissa Arctic in an unfortunate predicament.

Another major threat to this butterfly is inbreeding depression which is magnified by the often isolated nature of these mountaintop colonies. As climate change has pushed this butterfly further up in elevation or even off the edge into oblivion the distance between colonies has increased drastically leaving this butterfly with relatively little connectivity and genetic flow especially in New Mexico. This butterfly, also being univoltine, likely has somewhat limited dispersal capabilities which can further stress this butterfly (Lotts and Naberhaus 2021, Forster *et al.* 2023). In these small isolated populations deleterious alleles can begin to allele along with a reduction in heterozygosity which has been shown to reduce survival rates at several important life stages in butterflies, including those that have an effect on population stability and persistence, even after just one generation of mating between full-siblings (Saccheri *et al.* 1998, Nieminen *et al.* 2001).

Furthermore this butterfly completes its life cycle in two years rather than just a single year this provides more opportunity for things to go wrong for the larvae due to environmental stochasticity, or predation which they must survive for two years in order to become adults and be able to reproduce.

Population:

The population size and trend are not known for this subspecies. Determination of population size and monitoring of population trends is necessary to ensure the population is stable. Especially as several widespread, relatively common species of butterfly are in decline across the American west (Forster *et al.* 2021).

References:

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More Information

