



# *The Taxonomic Report*

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## **A new subspecies of *Celastrina lucia* (W. Kirby) (Lycaenidae: Polyommatainae) in the central Appalachian Mountain region.**

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**ZooBank registration:** [urn:lsid:zoobank.org:pub:702B949C-4B02-47EB-ACB6-40CAA79306BF](https://zoobank.org/pub:702B949C-4B02-47EB-ACB6-40CAA79306BF)

**ABSTRACT.** The *Celastrina* (“Azure”) populations of the central Appalachian Mountain region have traditionally been identified as *Celastrina ladon* (Cramer) by numerous authors. However, the discovery of elongated dorsal wing scales in males of *C. ladon* (Wright & Pavulaan, 1999; Ômura et al., 2015) established that this diagnostic trait is limited to *C. ladon*, *C. nigra* (W. Forbes), and subsequently *C. iryna* (Pavulaan). Microscopic examination of male “Spring Azure” specimens from higher elevations in the Appalachian Mountains revealed a complete absence of these elongated scales in the resident populations, despite their outward resemblance to *C. ladon*. This finding demonstrates that *C. ladon* does not occur as a resident species at higher elevations. Additionally, the natural history characteristics of these populations strongly indicate their placement within the *C. lucia* species complex (“Northern Azures”).

**Additional key words:** Allegheny Plateau, Canadian Zone.

### INTRODUCTION

*Celastrina lucia valeriia* is here described as a new subspecies of the Northern Azure, long misidentified as *C. ladon* (Cramer) in the central Appalachian Mountains, primarily in the highlands of West Virginia, and adjacent areas of Virginia, Maryland and south-central Pennsylvania. Future research on the *C. lucia* complex may reveal this to be a separate species.

### ***Celastrina lucia valeriia* Pavulaan - new subspecies**

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**Description. Male (Fig. 2).** Dorsal color uniform bright metallic light blue; whereas individuals of nominotypical *lucia* (Fig. 1) have a slightly violet-blue tint, but not the brilliant blue reflectance of Appalachian populations. On the other hand, *ladon* (Fig. 3) is noticeably deeper violet blue (thus the name “violacea”). In *C. lucia valeriia* androconia are present, unlike *ladon*, in which the androconia are replaced by elongated scales (Ômura, et al, 2015). Wing fringes with black checkering present on secondaries, but primaries have darker fringes. Similar to the larger *neglecta* spring form (Fig. 5), which occurs in lowlands, but has not been taken at high elevations frequented by *lucia*. The *neglecta* spring form tends to be larger than *C. lucia valeriia*, has solid white fringes on the dorsal hindwing and the male has a more violet blue color. *C. neglecta* is primarily differentiated from *C. lucia* by being multivoltine, whereas *lucia* is an obligate univoltine species. At the TL of *valeriia*, a high-altitude ecotype of *neglecta* initially appears about two weeks later, in May, as the summer phenotype (Fig. 4), and is fully sympatric and synchronic with *lucia*. Ventral color uniform light gray, whereas nominotypical *lucia* has a slight brown pigment. Black maculations very reduced compared to nominate

*lucia*. Some individuals, form “*marginata*” (W. H. Edwards) display darkened margins on the primaries, more common in Pennsylvania. Rare individuals possess the dark ventral patch, but are considered aberrant. Allen (1997) illustrates a single specimen of the ventrally-patched form (pl. 10, row 5). Most individuals are lightly marked, similar to *Celastrina ladon* form “*violacea*”, though in *ladon*, the ventral ground color is darker gray. All broods of *neglecta* have whitish venters by comparison. **Female (Fig. 2)**. Dorsal color lustrous metallic light blue. Black on DFW costa and outer margin is narrower than other *Celastrina* species and nominotypical *lucia*. DHW with series of reduced submarginal black dots. By contrast, *ladon* females are deeper uniform violet blue. Spring form *neglecta* females display varying shades of dorsal blue and gray. Wing fringes and ventral color and pattern as in the male. Forewing length of all examined *valeriia* specimens: 10.2-15.1 mm (n=151).

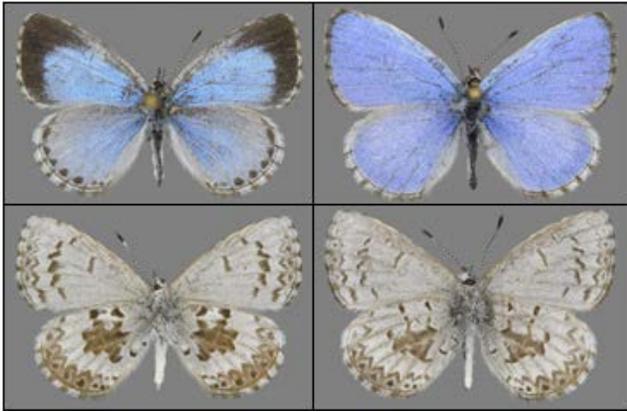
**Hosts:** Females were observed in association with, and ovipositing on several species of Blueberries in the Appalachian region: *Vaccinium angustifolium* (Common Blueberry) in Virginia, *V. pallidum* (Lowbush Blueberry) in Virginia and Pennsylvania, and *V. corymbosum* (Highbush Blueberry) in West Virginia. *Prunus serotina* (Black Cherry) flower buds and leaf galls were documented as additional hosts in Virginia (Pavulaan, 2014) and *Prunus virginiana* (Chokecherry) in Pennsylvania (Monroe & Wright, 2017). LeGrand, et al (2024) list *Viburnum* (*Viburnum* sp.).

**Flight Period:** Single brood, determined from rearing studies. While precise dates are undetermined due to unpredictable weather conditions in the central Appalachians, flight dates range from March 26, at lower elevations in Virginia, to May 17, at high elevations in West Virginia. Individuals have been observed as late as June 5 but not included in this study. In Pennsylvania, flight dates span March 17 to June 1 (Monroe & Wright, 2017).

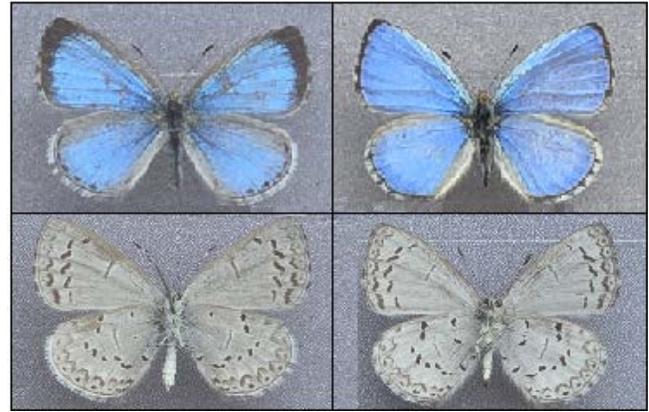
**Habitat:** This species is commonly encountered in high-elevation forests, montane meadows, bogs, blueberry heaths, and other wooded habitats associated with the Canadian Zone of the Allegheny Plateau and Mountains in West Virginia, but occurs at substantially lower elevations within Transition Zone forests along the northern Blue Ridge in Virginia, north into southwestern Pennsylvania. In Virginia, Maryland and Pennsylvania, it becomes more of a dry ridgetop species, but generally associated with Blueberries. It is reliably found in areas where *Vaccinium* spp. (blueberries) are abundant, as well as in habitats characterized by significant growth of *Prunus serotina* (Black Cherry).

**Holotype, allotype, paratypes:** Holotype (male) (**Fig. 2, right side**): April 21, 2014, Great North Mountain, nr. Hayfield, Frederick County, VA., leg. H. Pavulaan. Type label shown in **Fig. 6**. Allotype (female) (**Fig. 2, left side**), April 30, 2018, Great North Mountain, nr. Hayfield, Frederick County, VA., leg. H. Pavulaan. Holotype and Allotype deposited in the McGuire Center for Lepidoptera and Biodiversity. Paratypes: The following specimens are labelled “paratype” with a green label. Number of paratypes in each county are in parentheses. Paratypes are in the collection of the author (final disposition to be determined): Maryland: Garrett Co. (27). Virginia: Clarke Co. (1), Fauquier Co. (70), Frederick Co. (18), Page Co. (5), Rockingham Co. (2). West Virginia: Pendleton Co. (2), Pocahontas Co. (2), Randolph Co. (8), Tucker Co. (26).

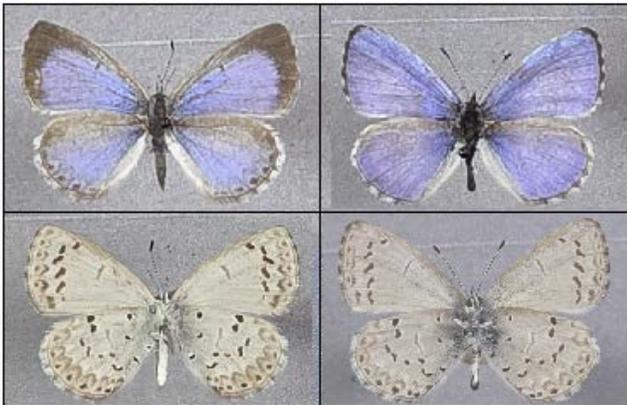
**Distribution:** MARYLAND: Allegany Co., Garrett Co. VIRGINIA: Augusta Co., Clarke Co., Fauquier Co., Frederick Co., Loudoun Co., Page Co., Rockingham Co., Shenandoah Co. WEST VIRGINIA: Berkeley Co., Hampshire Co., Hardy Co., Morgan Co., Pendleton Co., Pocahontas Co., Randolph Co., Rockingham Co., Tucker Co. PENNSYLVANIA: Distribution remains to be determined. It is likely that *valeriia* grades into nominotypical *lucia* in Pennsylvania. Counties bordering Maryland likely have ssp. *valeriia*. Monroe & Wright (2017) show distribution of *C. lucia* throughout much of Pennsylvania.



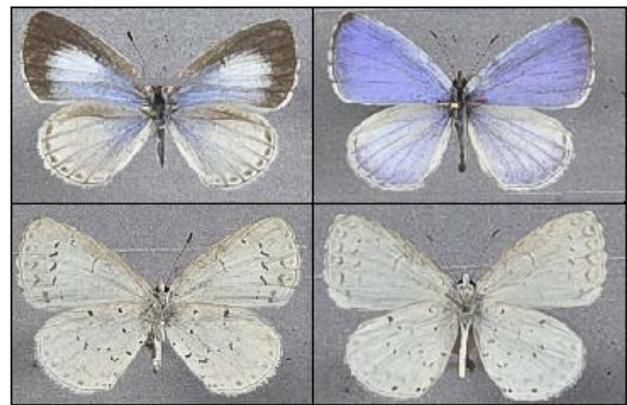
**Fig. 1.** *C. lucia lucia*: May 20, 2015, nr. St. Laurent Ferry, South Saskatchewan River, Saskatchewan. Photo courtesy Norbert G. Kondla. (Female, left side; male, right side).



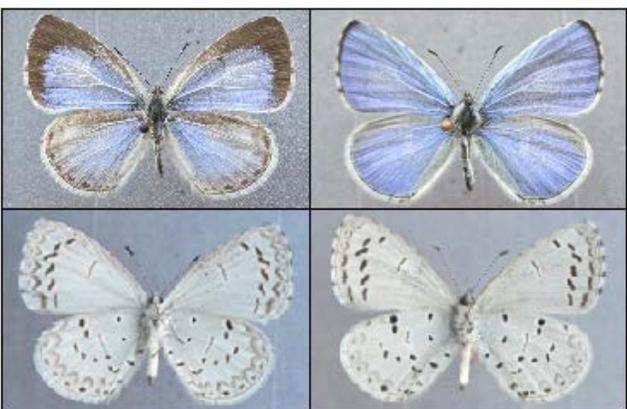
**Fig. 2.** *C. lucia valeriia*: ALLOTYPE female (left side), April 30, 2018, Great North Mountain, nr. Hayfield, Frederick County, VA., leg. H. Pavulaan. HOLOTYPE Male (right side), April 21, 2014, Great North Mountain, nr. Hayfield, Frederick County, VA., leg. H. Pavulaan.



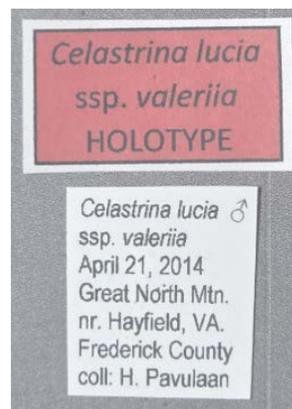
**Fig. 3.** *C. ladon*: female (left side), April 15, 1997, Cedarville, Prince Georges County, MD., leg. H. Pavulaan. Male (right side), March 30, 2002, Clifton, Fairfax County, VA., leg. H. Pavulaan.



**Fig. 4.** *C. neglecta*: female (left side), May 13, 2012, Spruce Knob Lake, nr. Osceola, Randolph County, W.V., leg. H. Pavulaan. Male (right side) same data as female.



**Fig. 5.** *C. neglecta* spring form: female (left side), April 5, 2013, Veterans Memorial Park, Leesburg, Loudoun County, VA., leg. H. Pavulaan. Male (right side), same data as female.



**Fig. 6.** Holotype label with data.

**Etymology.** I am naming this butterfly after a friend, Valeriia Zarutskia, who immigrated from Ukraine in August 2022 to start a new life in America. Common name: Valeriia's Azure.

### ACKNOWLEDGMENTS

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### LITERATURE CITED

- Allen, T. J. 1997. The Butterflies of West Virginia and Their Caterpillars. University of Pittsburgh Press, Pittsburgh, PA.: xi + 388 pp.
- Kondla, N. G., H. Pavulaan & D. M. Wright. 2021. Type locality of *Polyommatus lucia* (W. Kirby, 1837) (Lycaenidae: Polyommatinae) with an inspection of the species' phenotypic expression. The Taxonomic Report 9(8): 1-13.
- LeGrand, H. E. Jr., J. S. Phippen, D. S. Carter Jr., & Pierre Howard. 2024. Butterflies of North Carolina, South Carolina, Virginia, and Georgia. A Field Guide. Southern Gateways Guides, University of North Carolina Press, Chapel Hill, N.C.: xi + 442 pp.
- Monroe J. L. & D. M. Wright. 2017. Butterflies of Pennsylvania, a field guide. University of Pittsburgh Press, Pittsburgh, PA.: xiii + 304 pp.
- Ômura, H., T. Itoh, D. M. Wright, H. Pavulaan & S. Schröder. 2015. Morphological study of alar androconia in *Celastrina* butterflies. Entomological Science 18(3): 353-359.
- Pavulaan, H. 2014. A case of sympatric *Celastrina ladon* (Cramer), *Celastrina lucia* (W. Kirby) and *Celastrina neglecta* (Edwards) (Lycaenidae: Polyommatinae) in Northern Virginia, with additional records of *C. lucia* in Virginia. The Taxonomic Report 7(7): 1-10.
- Wright, D. M. & H. Pavulaan. 1999. *Celastrina idella* (Lycaenidae: Polyommatinae): A new butterfly species from the Atlantic Coastal Plain. The Taxonomic Report 1(9): 1-11.

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