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A new species of *Celastrina* from the northwestern United States and southwestern Canada with a lectotype designation of *Lycaena pseudargiolus* var. *nigrescens* Fletcher (Lycaenidae: Polyommatinae)

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ABSTRACT. A new western azure species, *Celastrina asheri*, is described from the northwestern United States and southwestern Canada. A lectotype is designated for *Lycaena pseudargiolus* var. *nigrescens* Fletcher, 1903 to secure the identity of that name. *C. asheri* broadly overlaps with the northeastern range of *C. echo* (W. H. Edwards, 1864) but is usually very distinct from that species. *C. lucia* (W. Kirby, 1837) is narrowly sympatric with *C. asheri* in British Columbia, the southwest corner of Alberta and along the Rocky Mountains in Montana. As far as is known, *C. asheri* uses only red osier dogwood (*Cornus sericea*) and possibly oceanspray (*Holodiscus discolor*) as larval foodplants, while *C. echo* and *C. lucia* use a wide variety of larval foodplants. A lack of past research and confusion as a "form" of *C. echo* obscured the identity of *C. asheri*.

Additional key words: new species, sympatry, life history, larvae, *Cornus sericea*

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INTRODUCTION

The history of *Celastrina* has long been a complex and fascinating puzzle. Downey (1961) and Langston (1975) treated all North American azures as *Celastrina argiolus* (Linnaeus, 1758). Miller & Brown (1981) treated North American species as *C. ladon* (Cramer, 1780) and *C. nigra* (=*ebenina*) (Clench, 1972). By 2008, nine species of azures were recognized and have persisted to this day (Pelham 2008 & 2022). This increasing taxonomic complexity and consequent confusion is notable in southwestern Canada and northwestern United States. Layberry, et al. (1998) considered the taxa *lucia* (W. Kirby, 1837), *echo* (W. H. Edwards, 1864) and *nigrescens* (Fletcher, 1903) as subspecies of *C. ladon* in western Canada. They stated that *nigrescens* may exhibit either the 'lucia' (dark patches on the VHW) or 'violacea' (no dark patches) form. Guppy & Shepard (2001) elevated *C. echo* to the species level and considered the

taxon *nigrescens* as synonymous with the nominate subspecies, *C. e. echo*. They gave the range: Southern BC to the tip of Baja California and south through the Rocky Mountains to northern Mexico. This is accurate for at least the coastal portion of its range. Between 1997 and 2002, the third author began closely investigating *Celastrina* in the vicinity of the *nigrescens* type locality in southeastern British Columbia. He noticed both a phenotypic and flight phenology difference separate from *C. echo*, leading him to suspect the ventrally darker, lucia-like phenotype was an undescribed subspecies of *C. lucia* or an undescribed species of *Celastrina*.

The confusion with these azures is illustrated by what Newcomer (1964) said about them: "Two forms occur, one typical of ssp. *echo* and the other with the dark markings as in ssp. *lucia*, and both may be taken at the same place on the same day." It is conceptually impossible for two subspecies to occur sympatrically and synchronically. Time has revealed that Newcomer was right, but he did not correctly identify the taxa concerned. It is not obvious. In 1999, David Nunnallee discovered the Cowiche Canyon colony which came to be known as *C. lucia* Central WA segregate (Warren, et al. 2017). This butterfly is accessible and regularly recorded at this locality. In 2001, Andrew Warren visited the collection at Burke Museum of Natural History and Culture and identified these and other Washington specimens as *C. lucia*. These small colonies exhibited heavy ventral markings consistent with Canadian *C. lucia*, and the species became a familiar butterfly in the Washington butterfly community, believed to only occur on the east slope of the central Washington Cascades, far from its range across Canada and the northeastern United States (Pyle, 2002; Warren, 2005; Pyle & LaBar, 2018). Warren (2005) discussed *Celastrina* populations in northeastern Oregon and suggested there may be more than one species, noting that most males were a paler blue above than typical *C. echo*, as well as the wing fringes being darker and usually strongly checkered, and the ventral hindwing having highly variable maculation. Warren stated that *C. lucia* should not be applied to those variable forms in Oregon but was uncertain how they should be classified based on data available at the time, suggesting either *nigrescens*, *bakeri*, or an as-yet undescribed species. These less bold, lucia-like individuals found in eastern Washington and Oregon were considered part of the taxon *nigrescens* but questions about it possibly being a distinct species persisted (Warren, 2005; Pyle & LaBar, 2018).

In May 2020, another clue emerged when Melanie Weiss photographed a "*C. lucia*" at lower Reecer Canyon in Kittitas County, Washington. Variably marked individuals had long been known from this frequently visited location, but specimens with heavy ventral maculation were uncommon, and the pale blue dorsal of Melanie's butterfly had not been noticed there before. In April 2021, the discovery of a new colony of "*C. lucia*" by Dan Dunphy and Cathy Clark in central Washington provided new clues about their habitat preferences and prompted us to investigate further. The results of this investigation are reported here.

MATERIALS AND METHODS

There has been a concerted three-decade effort to accumulate butterfly distribution records in Washington and the surrounding states and provinces. This has resulted in tens of thousands of individual recordings. Most of these represent specimens that reside in either personal or institutional collections, in particular the Burke Museum of Natural History and Culture (UWBM) and Oregon State Arthropod Collection. The current research intends to reduce the confusion that prevailed when *Celastrina* records were initially gathered and depends more directly on specimens at hand. We examined specimens from the collections of UWBM, Caitlin C. LaBar (CCL) and Norbert G. Kondla (NGK), images of live adults reported to the authors by members of the Washington Butterfly Association, and records from iNaturalist, Butterflies and Moths of North America and Symbiota Collections of Arthropods Network. Larvae of the new taxon were collected and reared from two locations in Washington: Ringer South Trail, Kittitas County, and Sinlahekin Wildlife Area, Okanogan County. These were compared with life histories of *Celastrina* reared by the second author and those reported in James & Nunnallee (2011).

RESULTS AND DISCUSSION

Assessment of phenotypes, phenology and habitat clearly show three *Celastrina* species in northwestern United States and southwestern Canada: *C. echo*, *C. lucia* and an undescribed species. In this region, *C. lucia* occupies boreal forest habitats north of approximately latitude N50.7 in British Columbia, extending further south in Alberta and rarely west of the Rockies in Montana. *C. echo* overlaps with *C. lucia* around the periphery of its range and is widespread and common from southern British Columbia to southern California. The undescribed species occurs at lower elevations throughout much of the northeastern range of *C. echo*. All three species co-occur in southwest Alberta where they are distinguishable in appearance and exhibit slightly different flight periods. With the undescribed species being more closely associated with *C. echo*, determining what name to apply to it involved the identity of the taxa *nigrescens* and *bakeri*. Both have been intermittently attributed to a mix of *C. echo* and the undescribed species.

The holotype of *Lycaenopsis pseudargiolus bakeri* Clench, 1944 (synonym of *C. echo nigrescens*) has a dark blue dorsal (Fig. 9a), a pale, white-gray ventral with greenish blue coloration of the thorax and the basal to postbasal region of the wings, faint spots and caps on the wing margins and small, rounded discal maculation (Fig. 9b). Clench (1944) described the hindwing fringe of *bakeri* as white and only occasionally with a faint, charcoal-colored line at the vein ends, which is seen on the holotype. All of these features are typical of *C. echo*. While researching the taxon *nigrescens*, we discovered that it has no defined holotype and the type series is primarily *C. echo* with a few specimens of the undescribed species. This requires the designation of a lectotype, establishing the identity of *nigrescens* as a subspecies of *C. echo* and enabling the definition of the undescribed species.

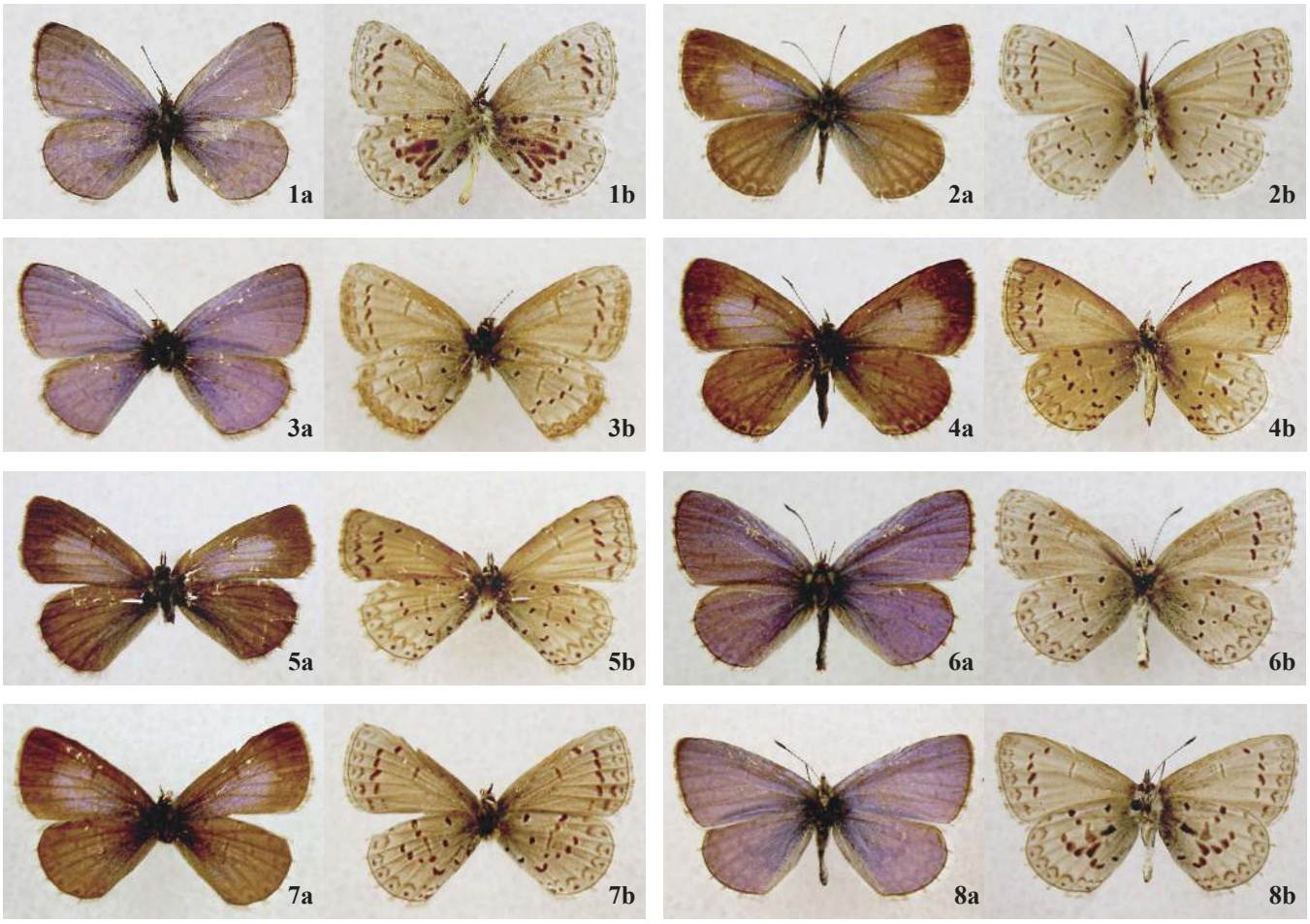
Designation of a lectotype for *Lycaena pseudargiolus* var. *nigrescens* Fletcher, 1903

(Figs. 1-8)

In the original description of *C. echo nigrescens*, two specimens, a male and female, are illustrated and 16 total (8 males and 8 females) were stated as the types (Fletcher, 1903). Per I.C.Z.N. Article 74.7, in the absence of a single, designated holotype, all specimens are thereby treated as syntypes. Eight of these specimens (4 males and 4 females) were located by David M. Wright in 2006 at the National Museum of Natural History, Smithsonian Institution (Figs. 1-8). Of the four male specimens, one has a slightly dusky VHW margin (Fig. 3b) and two have heavier maculation on the VHW disc (Figs. 1b and 8b), but otherwise display characteristics typical of *C. echo*. All four females exhibit light ventral maculation, a dark blue DFW discal area bordered with a dark charcoal DFW margin extending almost to the median, a prominent black bar in the DFW cell bar, very little blue on the DHW, and mostly white fringes; all features typical of female *C. echo*, particularly on the eastern side of the Cascades. Fletcher (1903) described *C. echo nigrescens* as being distinct from other members of the species because of the "large amount of black on the upper surface of the females." He described the males as having deep violet-blue dorsals and variably marked ventrals, with the VHW discal dark blotches being "most typical of the variety" according to J. W. Cockle, who provided the type specimens to Fletcher. There is no description of their habitat or details of exactly where each specimen was collected other than the vicinity of Kaslo, Kootenay Lake, British Columbia. Considering all this, the description of *nigrescens* appears to be primarily dependent on the females while the males are a mix of *C. echo* and an undescribed species. We designate the female specimen numbered '4' in the photo plate as the lectotype for *Celastrina echo nigrescens*. Lectotype and paralectotype labels will be mailed to the curator of the National Museum of Natural History, Smithsonian Institution to be placed on the specimens of the type series.

Lectotype label is red, printed: / LECTOTYPE / *Lycaena pseudargiolus* / var. *nigrescens*

Fletcher, 1903 / designated by / LaBar, Pelham & Kondla 2022 /. Paralectotype labels are yellow, printed: / PARALECTOTYPE / *Lycaena pseudargiolus* / var. *nigrescens* Fletcher, 1903 / designated by / LaBar, Pelham & Kondla 2022 /.





1) Kaslo, B.C., no date, J. W. Cockle, NMNH

2) Kaslo, B.C., 9-V-1902, J. W. Cockle, NMNH

3) Kaslo, B.C., Apr 24-30, J. W. Cockle, NMNH

4) Kaslo, B.C., 9-V-1902, J. W. Cockle, NMNH

5) Kaslo, B.C., Apr 24-30, J. W. Cockle, NMNH

6) Kaslo, B.C., Apr 24-30, J. W. Cockle/ Barnes, NMNH

7) Kaslo, B.C., Apr 24-30, J. W. Cockle/ Barnes, NMNH

8) Kaslo, B.C., Apr 24, J. W. Cockle/ Barnes, NMNH

Figs. 1-8: Dorsal (a) and ventral (b) images of four male (1, 3, 6, 8) and four female (2, 4, 5, 7) type specimens of *Lycaena pseudargiolus* var. *nigrescens* Fletcher, 1903 located at the National Museum of Natural History, Smithsonian Institution (NMNH) and photographed by David M. Wright in 2006.

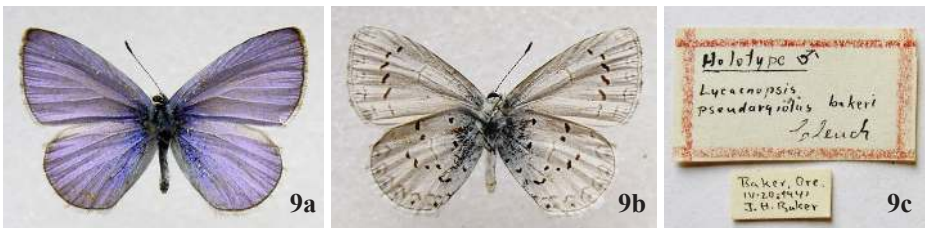


Fig. 9: Dorsal (a), ventral (b) and specimen label (c) of *Lycaenopsis pseudargiolus bakeri* Clench, 1944 holotype at the National Museum of Natural History, Smithsonian Institution, photographed by David M. Wright in 2006.

Celastrina asheri LaBar, Pelham & Kondla, new species
(Asher's Blue)

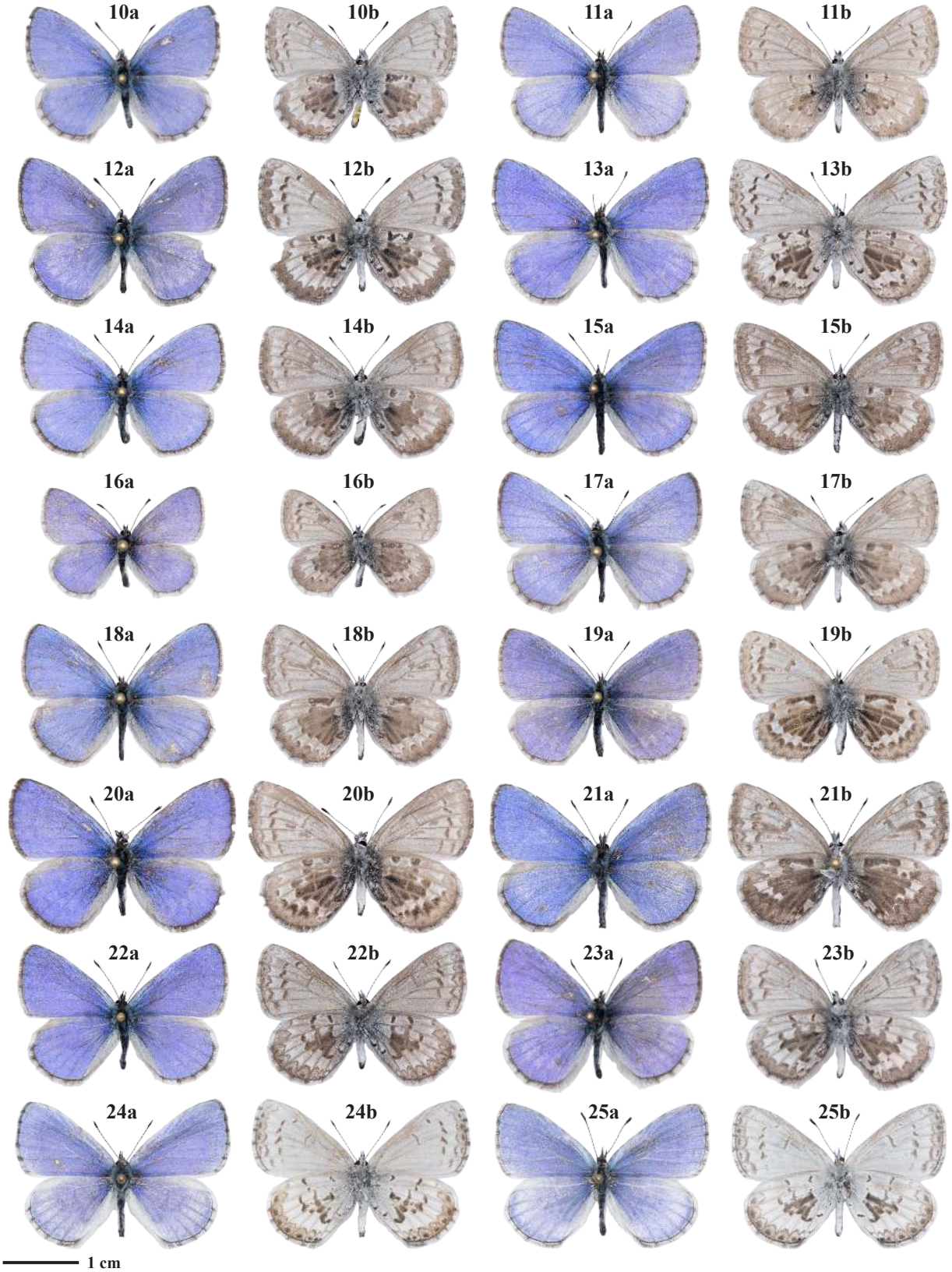
(Figs. 10-41)

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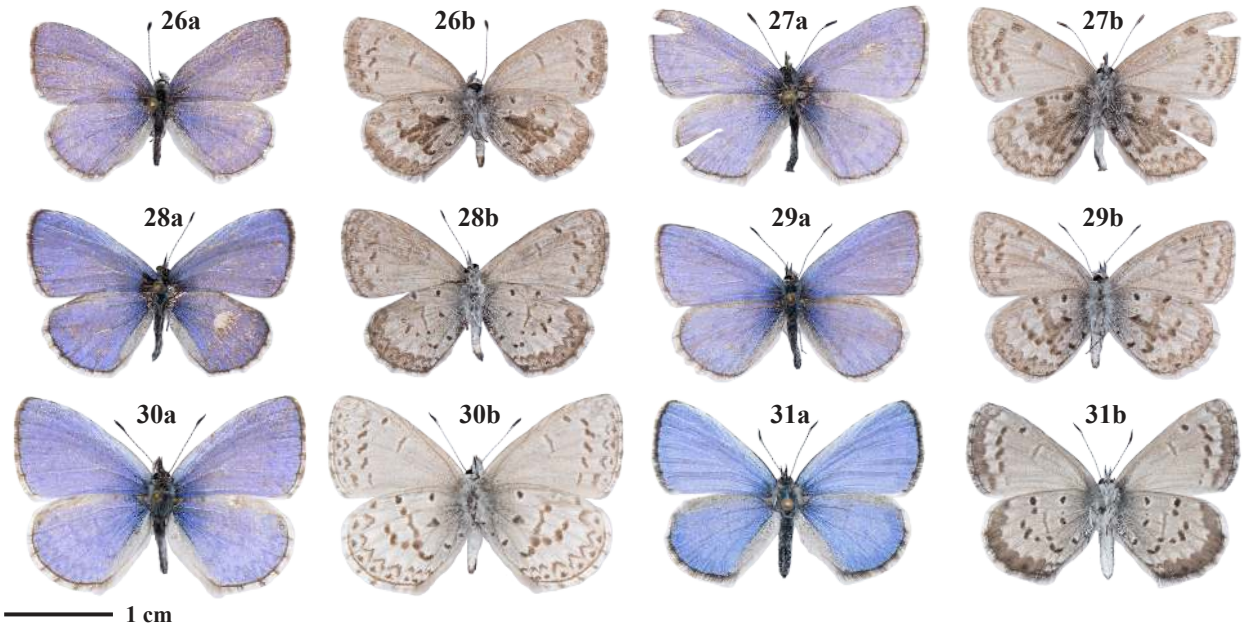
Description. MALE (Figs. 10-31, 41): mean forewing length =13.4 mm (10.7-15.1 mm, n=37, holotype =13.3 mm). Dorsal is blue, varying in tint from ice blue to lavender, edged with thin black border on all wings. Some individuals may exhibit white scaling in a broad postmedian band across the DHW (Figs. 12a, 13a, 15a, 17a, 24a, 25a). DFW fringe is always dark gray to black from apex to M2 or M3; remainder of DFW, all of DHW and ventral wing fringes range from slightly checkered to mostly black. Ventral ground color ranges from pale gray to dusky medium gray, often with a brownish tint that becomes stronger as specimens age (Fig. 41). Ventral maculation is colored medium to dark gray and is highly variable in size and shape. This dark gray maculation fades to brown in older specimens (Fig. 41). Spots may be round or irregular. The VHW frequently exhibits a large charcoal patch which ranges in size from only filling the discal cell (Fig. 11b) to covering the entire disc from the postmedian to postbasal region (Fig. 21b). In live, fresh specimens, the ventral maculation often has a pearlescent sheen in sunlight (Fig. 41a). VHW marginal pattern ranges from a series of small- to medium-sized dark gray spots which may or may not be surrounded by pale to dark gray scales, to a solid, dark gray marginal band. The VHW marginal spots or band are usually capped with prominent dark gray crescents. VFW margin usually a slightly lighter version of the VHW margin. In individuals with heavy maculation, these crescents often form thick, dark caps above the marginal band and in rare cases merge into the solid discal patch in cells CuA1 and CuA2 (Fig. 21b). Ventral wings are frequently frosted with white outside of the dark maculation, especially in the VHW postmedian band, where it often resembles fuzzy white arrowheads (Figs. 12b, 14b, 15b, 22b). No dorsal discal cell bars. Thin to somewhat blocky discal cell bar on VFW equal to or slightly lighter than other maculation. When not incorporated into a discal patch, the VHW discal cell bar is of similar width and shade as surrounding discal spots, or only slightly lighter (Figs. 28b, 30b, 31b). Veins on ventral side frequently stand out as they tend to be covered in scales slightly darker than the background color and lighter than the maculation. Ventral thorax and basal area of ventral wings is gray-black or dark gray-blue, almost never with greenish tint, and rarely reaching submedian area. Second brood phenotype tends to have a brighter dorsal color, often with white in the DHW postmedian band, a paler ventral ground color, and reduced VHW discal maculation (Figs. 24, 25, 31). Genitalia of North American *Celastrina* have not proven useful taxonomically and are not considered herein.

FEMALE (Figs. 32-40): mean forewing length =12.7 mm (11.6-13.6 mm, n=7). Dorsal ranges from ice blue to lavender, occasionally with a dark charcoal patch in CuA1 and CuA2 cells on DFW and DHW (Fig. 33a). DFW dark gray or black margin is often narrow, but may extend into the postmedian region, especially in northern populations (Figs. 36a, 39a, 40a, 97a). The dark gray border widens at the DFW apex and may extend down the costal margin. Blue on the DHW often extends to the border and may be mixed with dark gray (Fig. 38a) or white scales (Fig. 35a). When the DHW exhibits a dark gray margin, it is usually wider along the costal margin and flecked with blue scales around gray spots in the outer margin, giving it the appearance of indistinct gray crescents riming the marginal band. DHW marginal spots usually fuzzy or absent. Wing fringe as in males. Thin, dark gray cell bars sometimes occur on DFW and are almost always absent from DHW. Ventral ground color, cell bars and other maculation as in males. Females exhibiting dark gray patches in CuA1 and CuA2 cells on the DFW and DHW also tend to have heavier ventral maculation (Fig. 33). Similar to males, females of the second brood phenotype tend to have more white on the DHW, a paler ventral ground color,

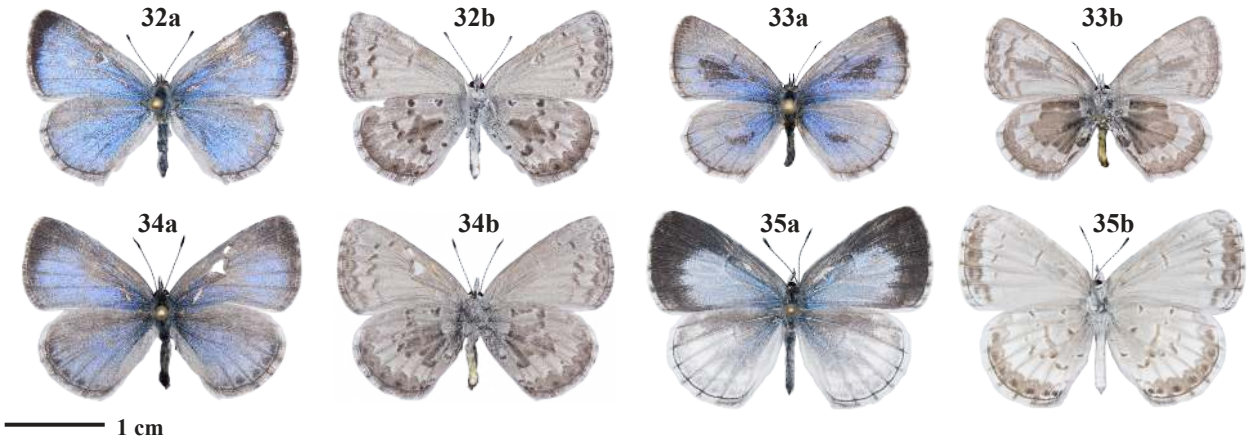
and reduced VHW discal maculation (Fig. 35). The "summer form" female depicted in the *Celastrina echo* account by Guppy & Shepard (2001) on page 227 is a second brood *C. asheri*. It was collected by J. and S. Shepard on 1981-08-04 at the north end of Osoyoos Lake, BC.



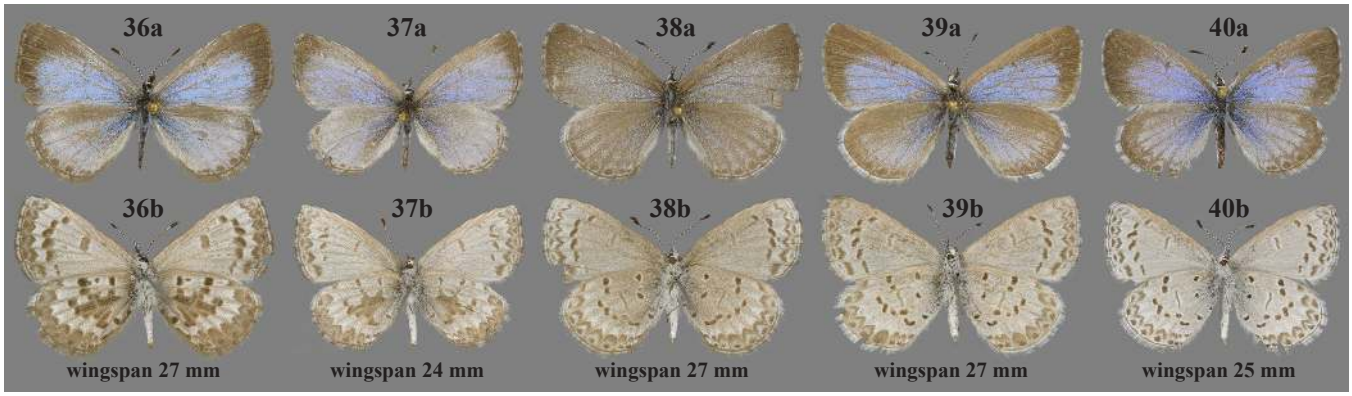
Figs. 10-25: *Celastrina asheri* sp. n. male type specimens. **10**: holotype male dorsal (a) and ventral (b). **11-25**: selection of male paratypes. Specimens collected from Ringer South Trail, Kittitas County, WA on 2021-04-21 (Figs. 10-23, first brood) and 2021-06-21 (Figs. 24-25, second brood). Photos by C. C. LaBar.



Figs. 26-31: *Celastrina asheri* sp. n. males (not paratypes). **26**: from lower Reecer Canyon, Kittitas County, WA on 2005-04-26. **27-31**: from upper Sinlahekin Creek, Sinlahekin Wildlife Area, Okanogan County, WA on 2013-05-11 (27-30) and 2020-07-08 (31, ex larva collected 2021-06-18). Photos by C. C. LaBar.



Figs. 32-35: *Celastrina asheri* sp. n. female type specimens. **32**: allotype female dorsal (a) and ventral (b). **33-35**: selection of female paratypes. Specimens collected from Ringer South Trail on 2021-04-21 (32, 34) and 2021-06-12 (35, second brood, ex larva collected 2021-05-28), and McCabe Pond fishing access area on 2021-04-22 (33), Kittitas County, WA. Photos by C. C. LaBar.



Figs. 36-40: *Celastrina asheri* sp. n. females, all from Kettle Valley Rail Trail near Carmi, BC, leg. D. L. Threatful, 2009-05-22 to 24. Photos by N. G. Kondla.

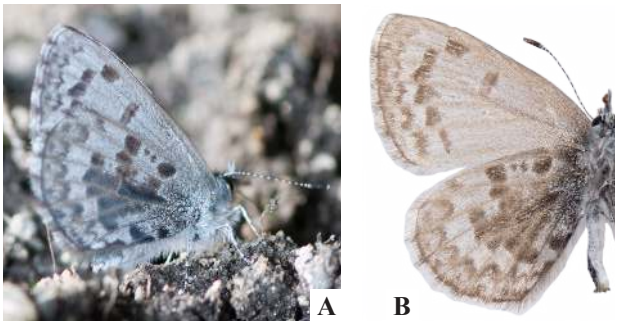


Fig. 41: Comparison of same *Celastrina asheri* sp. n. individual from upper Sinlahekin Creek, Sinlahekin Wildlife Area, Okanogan County, WA. **A)** live male on 2013-05-11 exhibiting pearlescent sheen and blue-gray coloration. **B)** same specimen photographed 2021-05-08 showing ventral coloration faded to brownish gray (=Fig. 27). Photos by C. C. LaBar.

Specimens examined. Holotype male (Fig. 10) with the following labels: white, printed: / WA: Kittitas Co. 2021-Apr-21 / Ringer South Trail, Ringer Loop Rd. / short walking trail at the Yakima River / N46.92757 W120.51949 elev. 1430' / coll. Caitlin C. LaBar / ; red, printed: / HOLOTYPE / *Celastrina asheri* / LaBar, Pelham & Kondla 2022 /. Allotype female (Fig. 32) with same data. The holotype, allotype and a selection of male paratypes will be deposited at the McGuire Center for Lepidoptera & Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville (MGCL). Twenty-four male and 1 female paratypes, same data as holotype. Five additional paratypes from same locality: 2021-06-12, C. C. LaBar (1♂ and 1♀, ex larvae); 2021-06-21, C. C. LaBar (2♂, wild-caught), 2022-03-15 (1♂, ex larva). Three paratypes from McCabe Pond fishing access area southeast of Ringer South Trail, Kittitas Co., WA, 2021-04-21 (2♂) and 2021-04-22 (1♀), C. C. LaBar. Data for additional specimens (not paratypes) examined are provided only for specimens in CCL collection, UWBM and a selection of specimens from NGK collection. **CANADA: ALBERTA:** Crowsnest River near Hillcrest, N49.5504 W114.3480 elev. 1230m, 2009-05-29, N. G. Kondla (5♂, NGK); South Castle River Valley, vic. N49.3081 W114.2938 elev. 1400-1460m, 1988-05-16, N. G. Kondla (1♂, NGK); same locality, 1982-05-24, N. G. Kondla (1♂, NGK); same locality, 1983-05-22, N. G. Kondla (1♂, NGK); **BRITISH COLUMBIA:** Beaver Creek at Columbia River, vic. N49.0658 W117.6103 elev. 410-450m, 1999-04-11, N. G. Kondla (1♂, NGK); same locality, 2006-04-24, N. G. Kondla (1♂, NGK); Blackwater Rd near Clearwater, N51.573 W120.149 elev. 408m, 1994-05-22, N. G. Kondla (1♀, NGK); Brilliant, vic. N49.3177 W117.6439 elev. 420-430m, 2002-04-18, N. G. Kondla (1♂, NGK); same locality, 2002-04-19, N. G. Kondla (3♂, NGK); same locality, 2002-05-01, N. G. Kondla (7♂, NGK); same locality, 2002-05-10, N. G. Kondla (4♂, 1♀, NGK); same locality, 2002-05-13, N. G. Kondla (1♂, NGK); same locality, 2002-06-03, N. G. Kondla (1♀, NGK); Charbonneau Creek, vic. N49.0470 W117.4753 elev. 560-870m, 1998-04-26, N. G. Kondla (5♂, NGK); same locality, 1998-04-29, N. G. Kondla (3♂, NGK); same locality, 2000-04-08, N. G. Kondla (1♂, NGK); same locality, 2000-05-19, N. G. Kondla (1♂, NGK); same locality, 2002-04-27, N. G. Kondla (12♂, NGK); same locality, 2002-05-11, N. G. Kondla (5♂, NGK); same locality, 2002-05-12, N. G. Kondla (27♂, 1♀, NGK); same locality, 2002-05-19, N. G. Kondla (20♂, 1♀, NGK); same locality, 2002-05-31, N. G. Kondla (6♂, NGK); same locality, 2003-04-20, N. G. Kondla (3♂, NGK); same locality, 2003-04-21, N. G. Kondla (1♂, NGK); same locality, 2003-04-28, N. G. Kondla (112♂, NGK); same locality, 2004-04-25, N. G. Kondla (1♂, NGK); same locality, 2004-04-26, N. G. Kondla (35♂, NGK); same locality, 2006-04-30, N. G. Kondla (1♂, NGK); Ellison Ridge, vic. N50.1264 W119.4129 elev. 460-1040m, 2001-04-26, D. L. Threatful (7♂, 2♀, NGK); Fort Shepherd flats, N49.0025 W117.62 elev. 411m, 2006-05-05, N. G. Kondla (2♂, NGK); same locality, 2006-05-14, N. G. Kondla (1♂, NGK); km 2-3 Handley Road, Pend-d'Oreille, vic. N49.0270 W117.5348 elev. 580-610m, 2002-06-02, N. G. Kondla (3♂, NGK); Hulme Creek Rd, N49.0885 W119.0237 elev. 1030m, 2009-06-01 or 03, D. L. Threatful (1♂, NGK); Kettle Valley Rail Trail near Carmi, vic. N49.4896 W119.1187 elev. 820-840m, 2009-05-22 to 24, D. L. Threatful (2♂, 5♀, NGK); Kid Creek Forest Service Road at Hwy 3, vic. N49.1626 W116.2853 elev. 760-770m, 2003-05-24, N. G. Kondla (2♂, NGK); Marsden Road west of Nelson, vic. N49.4957 W117.3818 elev. 530-550m, 2002-04-29, N. G. Kondla (9♂, NGK); Ootischenia, vic. N49.2787 W117.6326 elev. 430-550m, 2002-06-25, N. G. Kondla (1♂, NGK); same locality, 2003-04-30, N. G. Kondla (2♂, NGK); same locality, 2006-04-27, N. G. Kondla (1♀, NGK); 1 km south of Ootischenia, vic. N49.2690 W117.6240

elev. 550-570m, 2002-05-16, N. G. Kondla (1♂, NGK); Rock Mountain Forest Service Road near Rock Creek, N49.0336 W119.053 elev. 970m, 2001-05-06, N. G. Kondla (1♂, NGK); km 2 west of Salmo River, Pend-d'Oreille valley, vic. N49.1912 W117.3077 elev. 690-700m, 2002-04-27, N. G. Kondla (4♂, NGK); same locality, 2002-05-12, N. G. Kondla (33♂, NGK); same locality, 2002-06-23, N. G. Kondla (2♂, NGK); km 2.7 west of Seven Mile Dam, N49.0221 W117.5338 elev. 480m, 2002-04-27, N. G. Kondla (18♂, NGK); same locality, 2002-05-11, N. G. Kondla (57♂, 2♀, NGK); same locality, 2002-05-12, N. G. Kondla (18♂, NGK); same locality, 2002-05-19, N. G. Kondla (5♂, NGK); same locality, 2002-05-31, N. G. Kondla (41♂, NGK); same locality, 2002-06-02, N. G. Kondla (20♂, 1♀, NGK); same locality, 2002-06-12, N. G. Kondla (7♂, NGK); same locality, 2003-04-20, N. G. Kondla (16♂, NGK); same locality, 2003-04-21, N. G. Kondla (35♂, NGK); same locality, 2003-04-28, N. G. Kondla (26♂, NGK); same locality, 2003-05-01, N. G. Kondla (19♂, NGK); same locality, 2004-04-09, N. G. Kondla (3♂, NGK);same locality, 2004-04-25, N. G. Kondla (8♂, NGK);same locality, 2004-04-26, N. G. Kondla (6♂, NGK); same locality, 2005-04-22, N. G. Kondla (3♂, NGK); same locality, 2006-04-20, N. G. Kondla (1♂, NGK); same locality, 2006-05-04, N. G. Kondla (1♂, NGK); same locality, 2006-05-04, N. G. Kondla (4♂, NGK); km 4 west of Seven Mile Dam, N49.0160 W117.5430 elev. 480m, 2002-05-11, N. G. Kondla (3♂, NGK); same locality, 2002-05-12, N. G. Kondla (9♂, NGK); same locality, 2003-05-23, N. G. Kondla (2♂, NGK); same locality, 2006-05-10, N. G. Kondla (1♂, NGK); km 3 east of Seven Mile Dam, N49.0446 W117.4823 elev. 585m, 2003-05-10, N. G. Kondla (1♀, NGK); km 3.5 east of Seven Mile Dam, N49.0469 W117.4762 elev. 600m, 2002-05-11, N. G. Kondla (1♂, NGK); same locality, 2002-05-19, N. G. Kondla (1♂, NGK); same locality, 2002-05-31, N. G. Kondla (5♂, NGK); same locality, 2002-06-02, N. G. Kondla (3♂, NGK); same locality, 2002-06-12, N. G. Kondla (1♂, NGK); same locality, 2003-05-01, N. G. Kondla (3♂, NGK); same locality, 2003-05-28, N. G. Kondla (1♂, NGK); same locality, 2003-05-29, N. G. Kondla (1♂, NGK); km 5.1 east of Seven Mile Dam, N49.0486 W117.4596 elev. 585m, 1999-04-24, N. G. Kondla (1♂, NGK); same locality, 2002-04-20, N. G. Kondla (3♂, NGK); same locality, 2002-04-27, N. G. Kondla (6♂, NGK); same locality, 2002-05-11, N. G. Kondla (33♂, 1♀, NGK); same locality, 2002-05-12, N. G. Kondla (6♂, NGK); same locality, 2002-05-19, N. G. Kondla (6♂, NGK); same locality, 2002-05-31, N. G. Kondla (12♂, NGK); same locality, 2002-06-02, N. G. Kondla (1♂, NGK); same locality, 2002-06-21, N. G. Kondla (2♂, NGK); same locality, 2003-04-21, N. G. Kondla (1♂, NGK); same locality, 2006-04-24, N. G. Kondla (2♂, NGK); same locality, 2004-03-29, N. G. Kondla (1♂, NGK); same locality, 2006-04-20, N. G. Kondla (3♂, NGK); same locality, 2006-04-24, N. G. Kondla (2♂, NGK); km 5.2 east of Seven Mile Dam, N49.0486 W117.4576 elev. 585m, 2002-06-23, N. G. Kondla (2♂, NGK); km 6 east of Seven Mile Dam, N49.0483 W117.4483 elev. 590m, 2002-05-31, N. G. Kondla (14♂, 1♀, NGK); same locality, 2005-04-22, N. G. Kondla (1♀, NGK); km 6 to 7 east of Seven Mile Dam, vic. N49.0490 W117.4398 elev. 580-610m, 2002-05-12, N. G. Kondla (17♂, 2♀, NGK); km 7 east of Seven Mile Dam, N49.0490 W117.4347 elev. 580m, 2002-04-20, N. G. Kondla (2♂, NGK); same locality, 2002-04-27, N. G. Kondla (7♂, NGK); same locality, 2002-05-31, N. G. Kondla (3♂, NGK); same locality, 2002-06-23, N. G. Kondla (1♂, NGK); same locality, 2003-04-19, N. G. Kondla (5♂, 3♀, NGK); same locality, 2003-04-21, N. G. Kondla (2♂, NGK); same locality, 2003-05-01, N. G. Kondla (2♂, NGK); same locality, 2003-05-23, N. G. Kondla (1♂, NGK); same locality, 2004-04-25, N. G. Kondla (1♂, NGK); same locality, 2005-04-10, N. G. Kondla (1♂, NGK); same locality, 2006-04-20, N. G. Kondla (2♂, NGK); same locality, 2006-04-30, N. G. Kondla (4♂, NGK); Shadey Creek Road, 2005-04-30, N. G. Kondla (1♂, NGK); Silver Star Mountain, vic. N50.3884 W119.0941 elev. 1150m, 2002-06-04, D. L. Threatful (1♀, NGK); Tillicum Creek/Meadow, Pend-d'Oreille valley, vic. N49.0387 W117.4297 elev. 580-980m, 2002-06-23, N. G. Kondla (3♂, NGK); same locality, 2003-05-01, N. G. Kondla (54♂, NGK); same locality, 2002-05-12, N. G. Kondla (7♂, NGK); same locality, 2007-04-30, N. G. Kondla (18♂, 1♀, NGK); same locality, 2006-04-30, N. G. Kondla (8♂, NGK); same locality, 2006-05-04, N. G. Kondla (15♂, NGK); mountainside above Waneta Dam, vic. N49.007 W117.611 elev. 450-518m, 2006-04-30, N. G. Kondla (1♂, NGK); **USA: MONTANA: *Lincoln Co.*:** Bad Medicine campground, Bull Lake, N48.22 W115.858 elev 2370ft (722m), 2006-05-19, N. G. Kondla (1♀, NGK); Dorr Skeels campground, Bull Lake, N48.268 W115.855 elev 2350ft (716m), 2006-05-19, N. G. Kondla (1♂, NGK); ***Missoula Co.*:** Miller Creek, vic. N46.765 W113.942 elev. 3730-4000ft (1137-1219m), 1976-05-12, S. Kohler (1♂, NGK); ***Sanders Co.*:** Forest Road 1022 (McKay Creek Rd) near Noxon, N47.968 W115.696 elev. 2450-2850ft (747-869m), 2006-05-19, N. G.

Kondla (11♂, NGK); **WASHINGTON:** ***Columbia Co.*****:** Hompegg Falls, North Fork Touchet River, N46.1656 W117.8126 elev. 3300ft (1006m), 1971-05-22, J. P. Pelham, R. E. Miller & F. Van Buskirk (11♂, 4♀, UWBM); same locality, 1975-05-21, J. P. Pelham & T. S. Pelham (6♂, 5♀, UWBM); Wolf Fork Touchet River at Whitney Creek, N46.18109 W117.8624 elev. 2720-2760ft (830-840m), 1989-04-09, L. G. Crabo & J. P. Pelham (1♂, UWBM); ***Kittitas Co.*****:** State Hwy 10, Yakima River, N47.1342 W120.7863 elev. 1845ft (562m), 1961-05-04, R. Cheyne (5♀, UWBM); Reecer Creek Road parking loop, N47.1703 W120.5923 elev. 3400-3500ft (1036-1067m), 1978-07-01, J. P. Pelham & R. Massey (2♂, UWBM); "azure corner" at the mouth of Reecer Canyon, N47.17526 W120.58819 elev. 3560ft (1085m), 1979-05-24, J. P. Pelham, T. S. Pelham & S. F. Jones (1♂, UWBM); same locality, 2005-04-26, C. C. LaBar (1♂, CCL); same locality, 2009-05-22, C. C. LaBar (2♂, CCL); Naneum Basin/Naneum Road at bottom of talus slope in *Cornus sericea* thicket, N47.17788 W120.44789 elev. 2980ft (908m), 2021-05-29, C. C. LaBar (6♂, 3♀, CCL); Naneum Basin/Naneum Road at pullout along creek, N47.17965 W120.44689 elev. 2980ft (908m), 2021-05-29, C. C. LaBar (3♂, 2♀, CCL); Dawson Road seep, N47.12705 W120.40138 elev. 3220ft (981m), 2021-05-30, C. C. LaBar (1♂, CCL); Robinson Canyon, [N47.0142 W120.7107] elev. 2200-2400ft (670-731m), 1967-05-15, R. Cheyne (1♀, UWBM); Wilson Creek (Canyon), [N47.1542 W120.5077] elev. 2800-3000ft (853-914m), 1966-07-15, R. Cheyne (1♂, UWBM); Wilson Creek Road at Bar 14 Road, N47.0734 W120.4961 elev. 2050-2060ft (625-628m), 1966-07-18, R. Cheyne (2♀, UWBM); Yakima River at US Hwy 90, N47.1858 W121.0432 elev. 2010-2025ft (613-617m), 1958-04-05, D. Carney (1♀, UWBM); same locality, 1958-04-11, D. Carney (5♂, UWBM); same locality, 1958-04-28, D. Carney (2♂, UWBM); same locality, 1958-05-28, D. Carney (1♀, UWBM); same locality, 1972-05-28, D. Carney (1♀, UWBM); ***Klickitat Co.*****:** Satus Creek at US Hwy 97, N46.0268 W120.6244 elev. 2139ft (652m), 1955-05-07, G. Schenk (10♂, 4♀, UWBM); ***Okanogan Co.*****:** Chiliwist Rd, N48.3085 W119.8479 elev. 2640ft (805m), 1978-04-28, R. M. Pyle (2♂, 3♀, UWBM); Chiwiliken Valley Road, N48.5813 W119.2525 elev. 4415-4425ft (1346-1349m), 2006-06-17, D. & J. Nunnallee (1♂, UWBM); Sinlahekin Wildlife Area, west canyon, N48.68861 W119.74018 elev. 2765ft (843m), 2013-05-11 (3♂, CCL); same locality, 2020-07-08, C. C. LaBar (1♂, ex larva collected 2021-06-18, CCL); same locality, 2022-03-03, C. C. LaBar (1♂, 1♀, ex larvae collected 2021-06-18, CCL); same locality, 2022-03-13, C. C. LaBar (1♂, 1♀, ex larvae collected 2021-06-18, CCL); same locality, 2022-03-14, C. C. LaBar (1♀, ex larva collected 2021-06-18, CCL); same locality, 2022-03-15, C. C. LaBar (1♂, ex larva collected 2021-06-18, CCL); ***Pend Oreille Co.*****:** Sullivan Lake Rd, N48.8605 W117.3285 elev. 2400ft (732m), 1982-06-16, R. M. Pyle (1♀, UWBM); State Hwy 31 at Threemile Creek, N48.8938 W117.3280 elev. 2550ft (777m), 1982-06-16, R. M. Pyle (1♂, UWBM); East Fork Leclerc Creek Rd, N48.561 W117.2724 elev. 2500ft (762m), 1982-06-18, R. M. Pyle (1♀, UWBM); Horseshoe Lake Road, N48.09033 W117.4276 elev. 2225ft (678m), 2018-05-26, C. C. LaBar (1♂, 1♀, CCL); ***Yakima Co.*****:** Bear Canyon, N46.7096 W120.9043 elev. 2000-2500ft (700-762m), 1968-04-09, J. P. Pelham, L. Obata & H. Wiles (1♂, UWBM); same locality, 1968-04-28, J. P. Pelham & H. Wiles (1♂, UWBM); same locality, 1989-05-06, J. P. Pelham, K. Hiruma, L. Crabo (5♂, 1♀, UWBM); Bear Canyon, N46.6997 W120.9383 elev. 2985-3040ft (910-927m), 1973-04-07, J. P. Pelham (1♂, UWBM); Cowiche Canyon, N46.6281 W120.6605 elev. 1465-1470ft (447-448m), 2003-04-03, J. P. Pelham, K. Hiruma, D. Nunnallee & S. Wechsler (2♂, 2♀, UWBM); Cowiche Creek Canyon, N46.625019 W120.650809 elev. 1430ft (436m), 2003-04-12, J. P. Pelham, Z. A. Pelham, D. Nunnallee & K. Hiruma (6♀, UWBM); Cowiche Mill Rd, N46.6488 W120.8479 elev. 2330-2550ft (710-777m), 2004-04-24, J. P. Pelham, K. Hiruma, M. W. Robinson, et al. (1♂, UWBM); Oak Creek, N46.7303 W120.8395 elev. 1900-2100ft (579-640m), 1995-05-07, J. F. Rial (1♂, UWBM); Oak Creek Rd, N46.7338 W120.9292 elev. 2800ft (853m), 1993-05-18, J. F. Rial (1♂, UWBM); Signal Peak Road, N46.2954 W120.7592 elev. 1800ft (549m), 1959-04-25, D. Carney (1♀, UWBM).



Fig. 42: Ringer South Trail, type locality of *Celastrina asheri* sp. n.

Type locality. Ringer South Trail, five miles south of Ellensburg in Kittitas County, Washington. This is a Bureau of Land Management river access site next to the Yakima River at the south end of Ringer Loop with a short loop trail through a thicket of red osier dogwood (*Cornus sericea*), wild rose (*Rosa* spp.) and willow (*Salix* spp.) shaded by black cottonwood (*Populus trichocarpa*) and scattered ponderosa pine (*Pinus ponderosa*) (Fig. 42). It is subject to occasional flooding by the Yakima River.

Etymology. *Celastrina asheri* is named in honor of 8-year-old Asher (Fig. 43). Surname is not given in accordance with family wishes. Asher suffers from an extremely rare neurological disease called 4H (or POLR3B-related) Leukodystrophy. His perseverance and kind heart inspire everyone around him, bringing rays of sunshine into the daily struggle of living with a disease that has no cure. Asher loves blue, which is also the representative color of Leukodystrophy, and he loves spending time outdoors, especially in the mountains. In naming this butterfly *Celastrina asheri*, Asher's Blue, it is our wish to bring joy to Asher and his family and help promote awareness of this disease with the hope that one day a cure will be found.



Fig. 43: Asher, our butterfly's namesake.

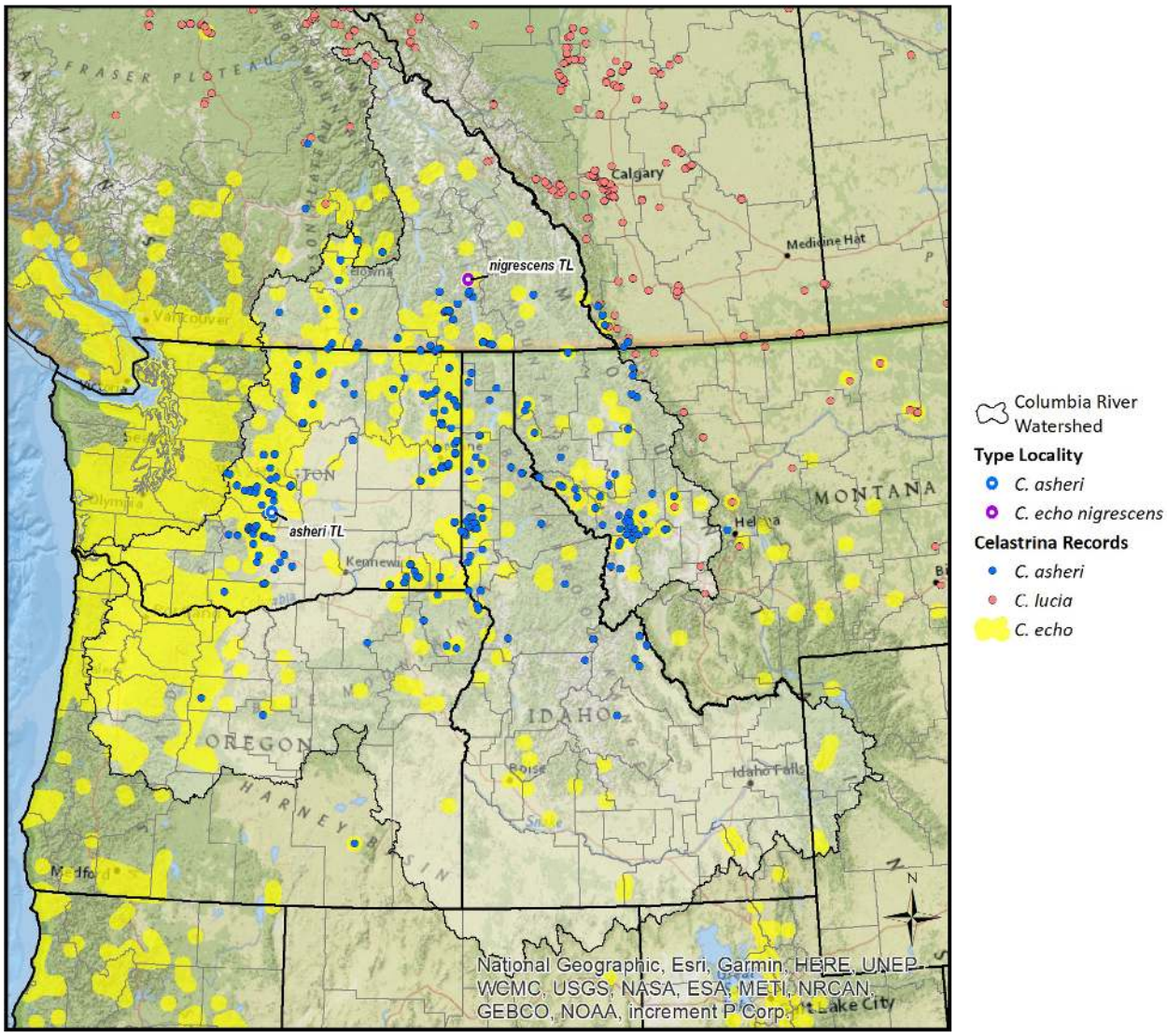


Fig. 44: Map of *Celastrina asheri* sp. n., *C. lucia* and *C. echo* records in northwestern United States and southwestern Canada. Some *C. echo* records may turn out to be *C. asheri* but unless we were able to confirm this via images or specimens, we chose to accept the data as they are currently recorded.

Distribution and phenology. The range of this species encompasses most of the Columbia River Basin from southeast British Columbia, through Washington east of the Cascade crest, south to the Blue Mountains in northeast and central Oregon and east through Idaho into western Montana and the southwest corner of Alberta (Fig. 44). There is one record from the base of Steens Mountain in Harney County, Oregon. A described "aberration" of *C. echo* from Lake County, Oregon may in fact be *C. asheri*, see Diagnosis and discussion section below. Currently, the extent of the southeastern edge of the range is uncertain, in part due to the taxonomic uncertainty over the past several decades of record keeping. Examination of specimens from this region and additional field work is needed to clarify the entire distribution of *C. asheri*.

Celastrina asheri is primarily univoltine, flying from late March to mid-June depending on elevation and latitude; however, in some areas a small second flight appears approximately two months after the first, peaking in mid-July (Fig. 45). *C. lucia* from Montana, southern British Columbia and southern Alberta exhibit a similar pattern but the flight is shifted one to two weeks after *C. asheri* (Fig. 45). In contrast, the flight period of *C. echo* varies widely: the overall peak flight east of the Cascades occurs mid to late May, but a smaller peak occurring in late April at lower elevations and warmer habitats and another small peak occurring in mid-

June are likely a combination of high elevation first brood and low elevation second brood emergence records (Fig. 45). Where *C. asheri* flies in sympatry with *C. echo*, which species emerges first seems to vary by location based on the personal observations of the authors. In central Washington, the first and second authors usually observe *C. asheri* emerging prior to *C. echo*, while in the Pend-d'Oreille River valley in south-central British Columbia, the third author has observed *C. echo* emerging prior to *C. asheri* (Fig. 46).

The second brood of *C. asheri* is interesting both in phenotype and comparative phenology with *C. echo*. While *C. echo* frequently has a partial second brood in coastal areas, and possibly even a third brood in some places as evidenced by late records into November, multiple emergences of *C. echo* are rarer east of the Cascades. For example, iNaturalist records dated between June and August show 5 *C. echo* and 25 *C. asheri* records east of the Cascades and over 300 records of *C. echo* west of the Cascades. James & Nunnallee (2011) reported around 30% of their lab-reared *C. asheri* ("*C. lucia*") emerged as a second brood. A similar ratio was observed by the first author from *C. asheri* larvae collected at the type locality: 2 males and 1 female

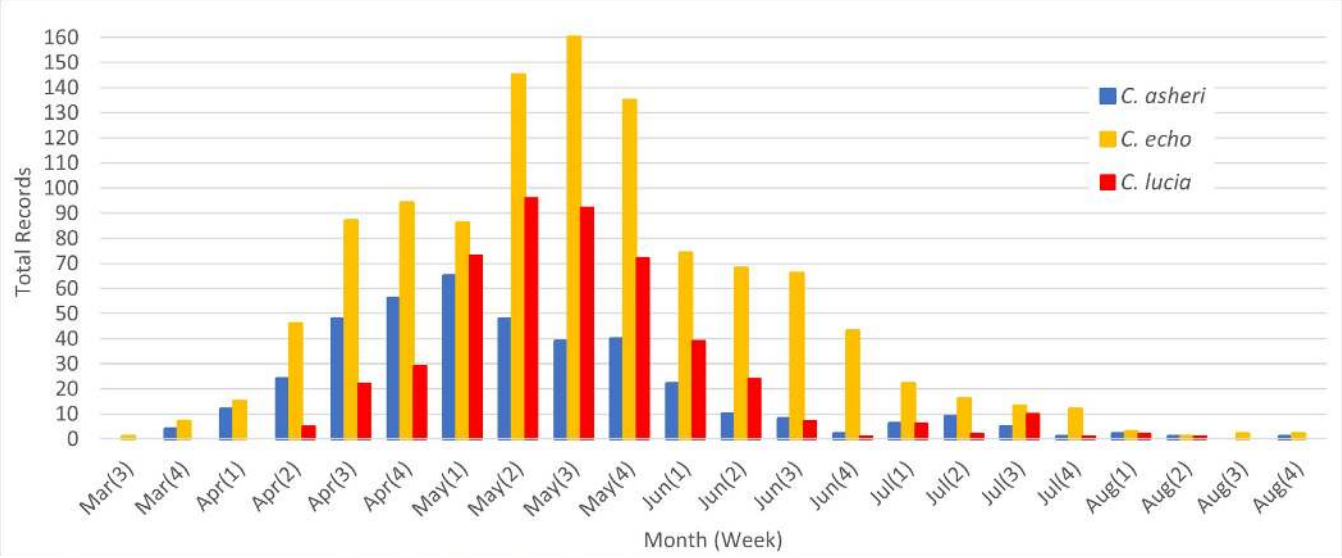


Fig. 45: Flight period of *Celastrina asheri* sp. n. compared with *C. lucia* and *C. echo* from within the same geographical area east of the Cascade crest. Records are grouped into weeks.

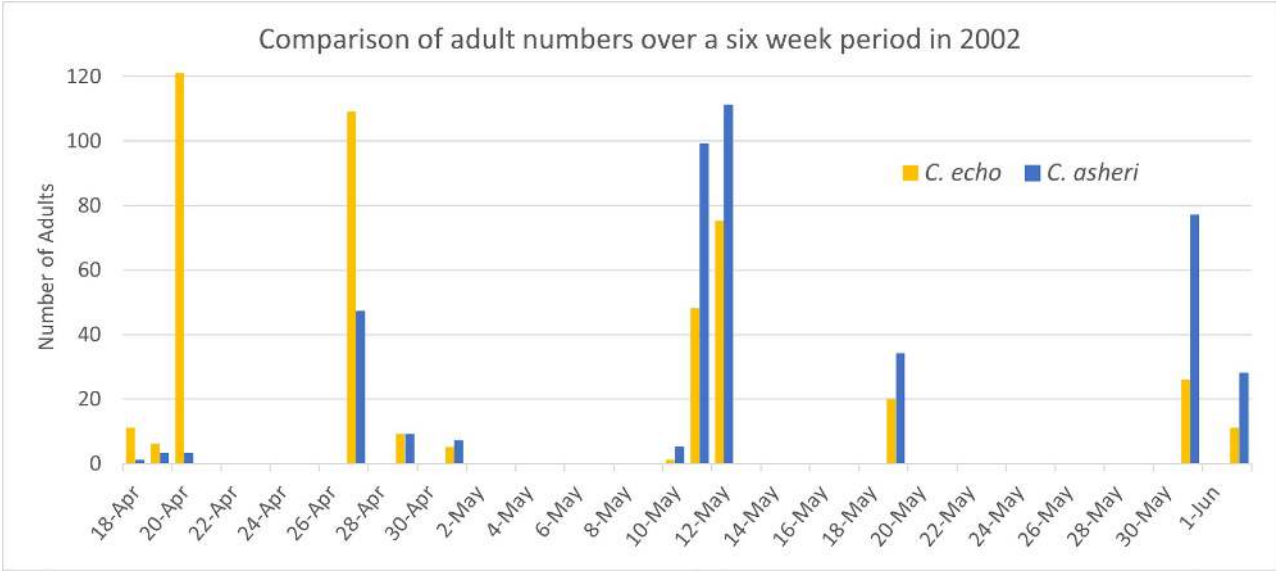
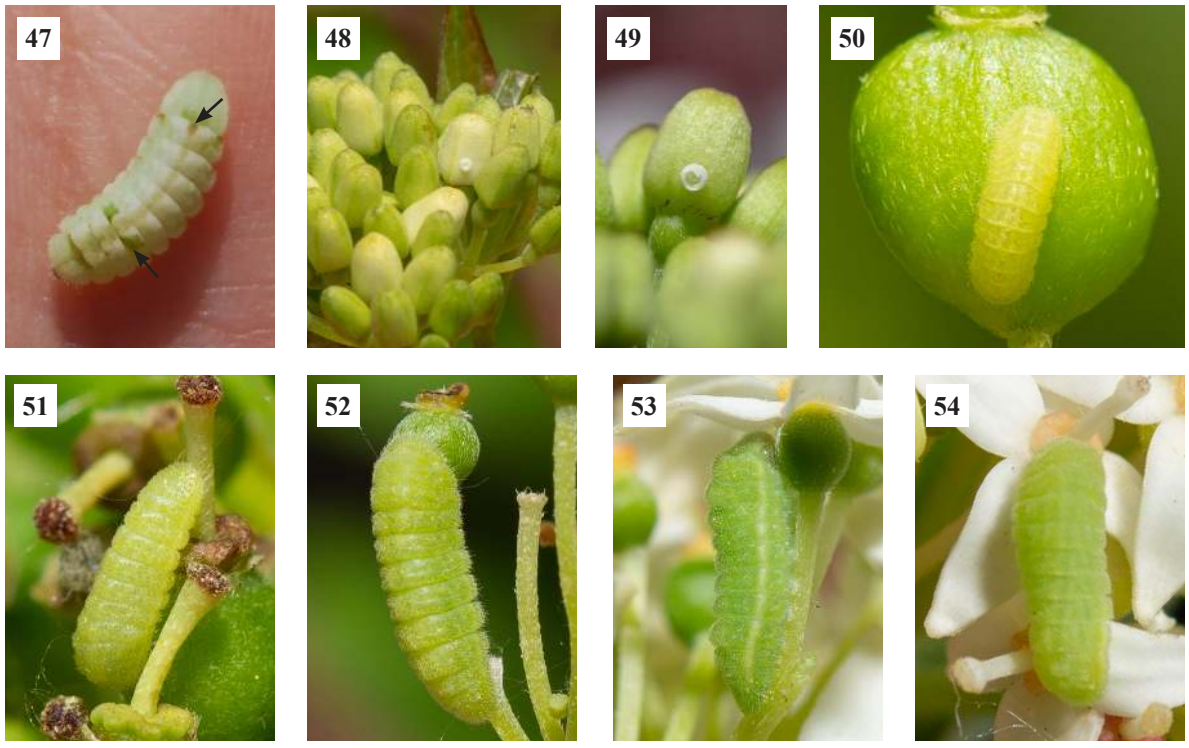


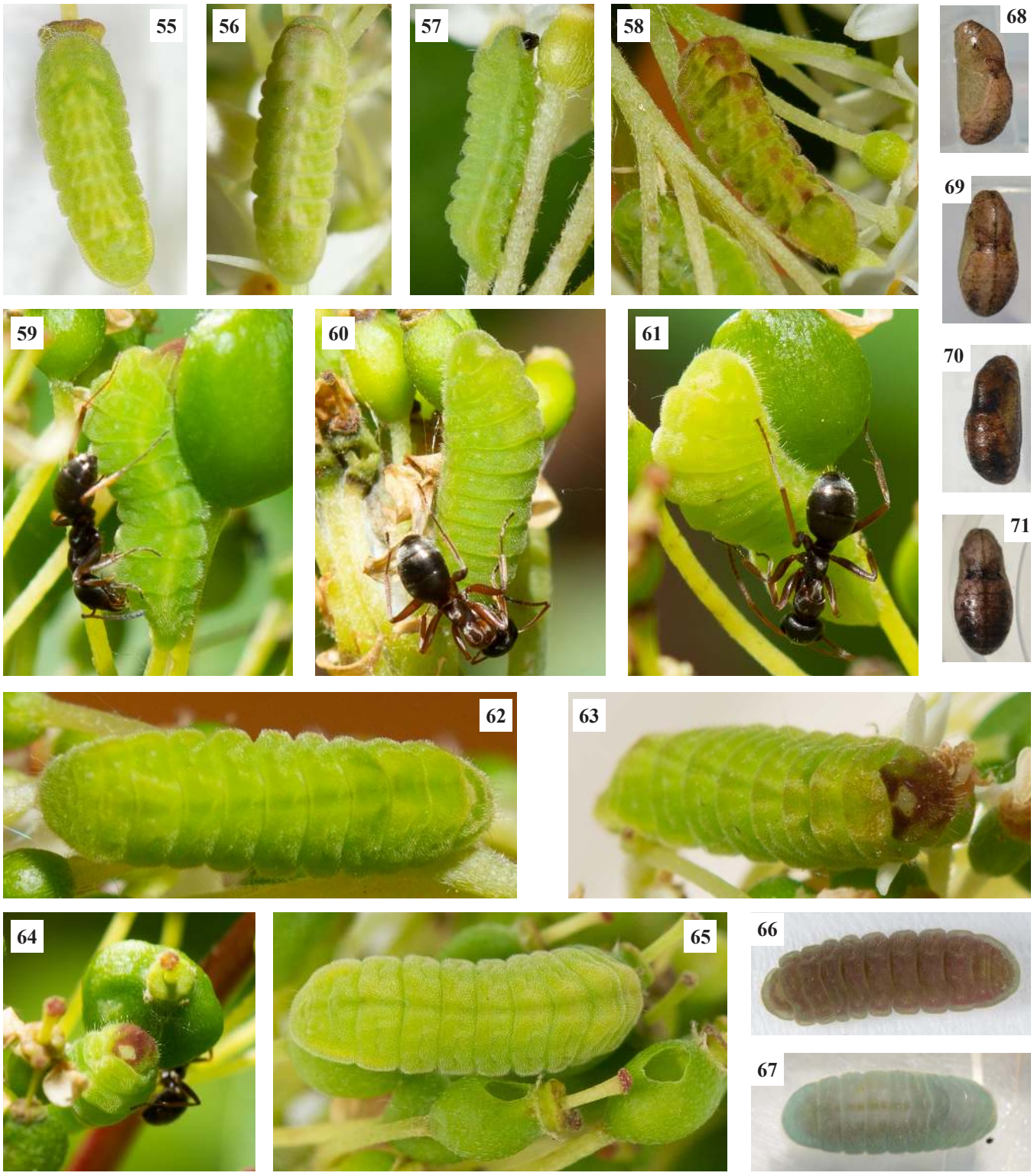
Fig. 46: Comparison of adult *Celastrina asheri* sp. n. and *C. echo* collected (n=866) over a six week period in 2002 from multiple locations in the vicinity of the Pend-d'Oreille River valley near the Columbia River in southeast British Columbia by Norbert Kondla. Specimens collected on a "next up" basis with no bias for phenotype.

eclosed from 12 larvae reared to pupae in June 2021. The first author also collected 2 males and observed at least one other male flying at the type locality on 2021-06-21 and Melanie Weiss observed more adults over the following two weeks at the same location in numbers roughly equaling 20-25% of the first brood. In contrast, from 14 larvae collected by the first author at the Sinlahekin Wildlife Area in Okanogan County, Washington, only 1 male eclosed in the same year. Additionally, the first and third authors have visited northern Okanogan County, Washington and the Pend-d'Oreille Valley, British Columbia, respectively, numerous times in June and July over several years. During these visits, no *Celastrina* were ever recorded by the first author and only a very small number were recorded by the third author.

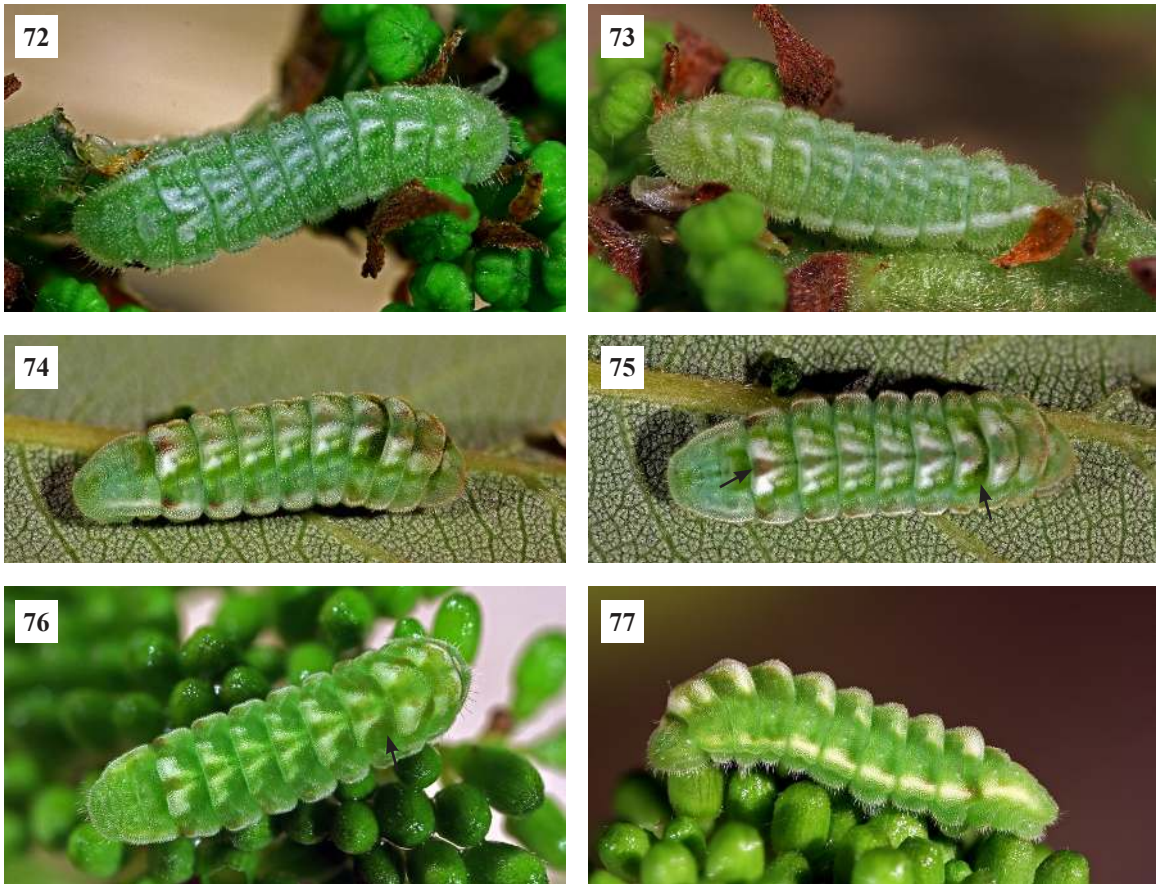
Biology. *C. asheri* eggs were photographed at Naneum Basin, Kittitas County, Washington on 2021-05-29 (Figs. 48, 49), where five female *C. asheri* were observed ovipositing on *Cornus sericea*. Eggs were tucked between the flower buds. Two female *C. echo* were also captured flying around the dogwood where *Ceanothus velutinus* was abundant on the opposite slope across the road. Around 20 third and fourth instar larvae were found (12 collected) at the Ringer South Trail type locality on 2021-05-28. All were medium green, one had extensive dorsal and lateral rose-brown markings (Fig. 58), at least three had a rose-brown patch on the prothoracic shield (Fig. 63), three had a pale green ventrolateral line (Figs. 53, 57), one had faint whitish dorsal chevrons (Fig. 58), and most had a slightly darker green dorsal stripe (Figs. 62, 63). Around 24 larvae were found (14 collected) at the Sinlahekin Wildlife Area, Okanogan County, Washington on 2021-06-18. The second instars were pale yellow-green (Figs. 50, 51). All third and fourth instar larvae were medium green with a slightly darker green dorsal stripe (Fig. 65), one had some white dorsal markings and white ventrolateral line in the third instar (Fig. 55) which persisted through the fourth instar. At least four had a rose-brown patch on the prothoracic shield (Figs. 59, 64), all others were unmarked (Figs. 60, 61, 65).



Figs. 47-54: Immature stages of *Celastrina echo* (47) and *C. asheri* sp. n. (48-54). **47**: *C. echo* third instar larva found on *Ceanothus velutinus* at Swakane Canyon, Chelan County, WA, 2009-06-28. **48-49**: *C. asheri* unhatched (48) and hatched (49) eggs on *Cornus sericea* at Naneum Basin, Kittitas County, WA, 2021-05-29. **50-51**: *C. asheri* second instar larvae on *Co. sericea* at the Sinlahekin Wildlife Area, Okanogan County, WA, 2021-06-18. **52-54**: *C. asheri* third instar larvae on *Co. sericea* at Ringer South Trail, Kittitas County, WA, 2021-05-28.



Figs. 55-71: Immature stages of *Celastrina asheri* sp. n. **55**: *C. asheri* third instar larva on *Co. sericea* at the Sinlahekin Wildlife Area, Okanogan County, WA, 2021-06-23. **56-58**: *C. asheri* late third or early fourth instar larvae on *Co. sericea* at Ringer South Trail, Kittitas County, WA, 2021-05-28. Photos by C. C. LaBar. **59-61 & 64**: fourth instar larvae on *Co. sericea* at the Sinlahekin Wildlife Area, Okanogan County, WA, 2021-06-18, all being tended by *Formica* sp. ants. **62-63**: fourth instar larvae on *Co. sericea* at Ringer South Trail, Kittitas County, WA, 2021-05-28. **65**: fourth instar larva on *Co. sericea* at the Sinlahekin Wildlife Area, Okanogan County, WA, 2021-06-17. **66**: early pre-pupal larva that has recently stopped feeding, from the Sinlahekin Wildlife Area, Okanogan County, WA, 2021-06-17. **67**: late pre-pupal larva from Ringer South Trail, Kittitas County, WA, 2021-06-04. **68-71**: newly formed (68-69) and few-day-old (70-71) pupae from Ringer South Trail, Kittitas County, WA, 2021-06-02 (68, 69, 71) and 2021-06-04 (70). Photos by C. C. LaBar.



Figs. 72-77: Immature stages of *Celastrina echo* (72-75) and *C. asheri* sp. n. (76-77). **72-73**: *C. echo* third instar larvae on *Ceanothus velutinus* at Reecer Canyon, Kittitas County, WA, 2009-06-06. **74-75**: *C. echo* fourth instar larva on *Ceanothus velutinus* at Reecer Canyon, Kittitas County, WA, 2009-06-10. **76-77**: *C. asheri* fourth instar larva on *Cornus sericea* at Black Canyon, Okanogan County, WA, 2009-05-16. Photos by D. Nunnallee.

Some of the fourth instar larvae were tended by *Formica* sp. ants (Figs. 59-61, 64). The rose-brown coloration on some fourth instar larvae appears to offer excellent camouflage among the *Cornus sericea* seedpods which are tipped with the same color (Fig. 64). It is unknown if this pattern occurs widely in *C. asheri* larvae. All larvae from both locations lost all markings and turned rose-brown after leaving the food plant and searching for a spot to pupate (Fig. 66). Pre-pupal larvae are translucent turquoise and beige (Fig. 67). Newly formed pupae are light pinkish brown with a dark brown dorsal stripe and numerous dark brown speckles (Figs. 68, 69), darkening to purplish or reddish brown and black within several days (Figs. 70, 71).

The only other known documentation of *C. asheri* immature stages is by James & Nunnallee (2011). In their "*C. echo nigrescens*" account (pp. 192-193), all images are of *C. asheri* reared from eggs gathered on April 10 and May 1 from Black Canyon, Okanogan County, Washington (also see Figs. 76, 77) on *Cornus sericea*. A female collected on May 29 from Bear Canyon, Yakima County, Washington, which laid eggs on *Ceanothus sanguineus*, was most likely *C. echo*. Larvae from that female did not reach the final instar. In their "*C. lucia*" account (pp. 194-195), all images and descriptions are of *C. asheri* on *Cornus sericea* from Cowiche Canyon, Yakima County, Washington. In both accounts, some adults emerged within two weeks of pupating and either exhibited a smaller VHW discal patch (Cowiche Canyon "lucia") or no discal patch but heavy charcoal marginal markings (Black Canyon "*nigrescens*"). These second brood phenotypes are also seen on some UWBM specimens and iNaturalist observations of *C. asheri* dated between June and July, as well as the individuals collected by the first author (Figs. 24, 25, 31, 35).

Eggs and first and second instar larvae of *C. asheri* are identical to *C. echo* and *C. lucia*. Larvae of all three species begin developing markings in the third instar and these usually become stronger in the fourth (final) instar. *C. echo* larvae are known to be extremely variable in coloration and markings throughout their range (James & Nunnallee, 2011; Stout, 2022; and personal observations of the second author, J. P. Pelham). When *C. echo* larvae are closest in appearance to *C. asheri*, there are a few identifiable differences. Pale green *C. echo* larvae with only faint markings still have a pair of relatively dark green squares sometimes forming a bar or "saddle" on the third segment behind the prothoracic shield and three dark green or brown spots near the posterior (Fig. 47). These markings are even darker on fourth instar *C. echo* that are also strongly marked with white dorsal chevrons (Figs. 74, 75) but may not always be visible on third instar larvae (Figs. 72, 73). When visible on *C. asheri*, these spots are less pronounced relative to the background color (Figs. 55, 56, 58, 62, 76). Also, when *C. echo* exhibit dorsal white chevrons or lateral lines, they appear to be a brighter white (Figs. 72-75) than the yellowish or greenish white seen on some *C. asheri* (Figs. 53, 55-57, 76, 77). Further rearing studies are needed to determine the full range of variation in *C. asheri* larvae.

Very little is published about the immature stages of *C. lucia* and even fewer images are available. Schmidt & Layberry (2016) illustrate a range of variation in *C. lucia* larvae from Ottawa, Ontario, of which a consistent pattern appears to be a dark "saddle" on the third segment behind the prothoracic shield and a dark dorsal stripe. These markings are both very similar to *C. echo* and some *C. asheri*, but the dorsal stripe appears to stand out even on the palest *C. lucia* larvae, unlike most *C. echo* and *C. asheri*. *C. lucia* are known to use a variety of larval foodplants, including *Cornus* spp., *Prunus* spp., *Rhododendron* [*Ledum*] spp., *Vaccinium* spp., and *Viburnum* spp. (Bird, et al., 1995; Guppy & Shepard, 2001; Schmidt & Layberry, 2016).

A photo by Larry Everson (Pyle, 2002, p. 231) depicts an apparent *C. asheri* female ovipositing on *Holodiscus discolor* flower buds in Jefferson County, Oregon. Warren (2005) reported flushing several females and some males from *H. discolor* bushes along the Metolius River near Camp Sherman, Jefferson County, Oregon. He confirms that these individuals were of the lucia form (A. Warren, pers. comm.). Considering that his observations were of more females than males, and most were worn, while typical *C. echo* males were seen at mud and flying nearby, this seems to align with *C. asheri* usually having a peak flight slightly before *C. echo*, further pointing to the strong probability of *C. asheri* using *H. discolor* as a larval food plant in addition to *Cornus sericea*. Further research is needed to confirm if these are indeed *C. asheri* using *H. discolor* as a larval food plant in Oregon and possibly elsewhere.



Fig. 78: *Celastrina asheri* sp. n. puddle party in the Pend-d'Oreille River valley, BC, 2003-04-28. Photo by N. G. Kondla.



Fig. 79: Left to right: *Celastrina asheri* sp. n., *C. echo*, *asheri*, *echo* in the Pend-d'Oreille River valley, BC, 2007-04-23. Photo by N. G. Kondla.

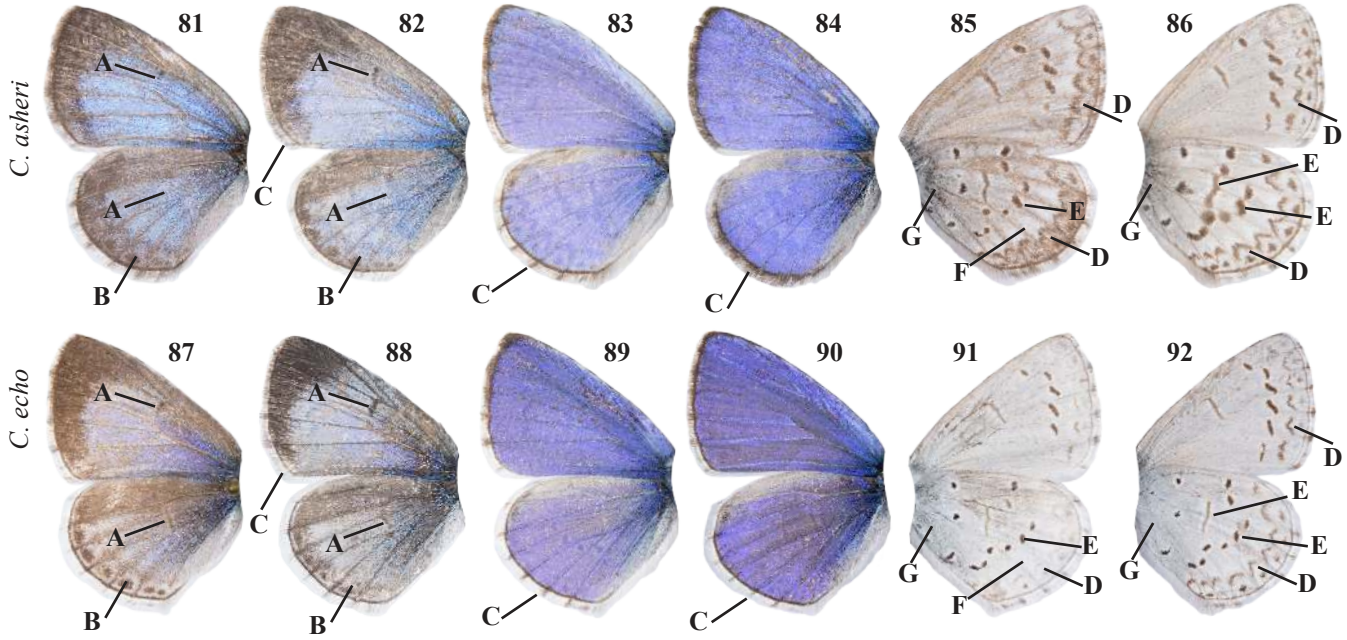


Fig. 80: *Celastrina asheri* sp. n. and *C. echo* puddle party in the Pend-d'Oreille River valley, BC, 2007-04-30. Photo by N. G. Kondla.

C. asheri appears to be highly adapted to xeric valleys and lowlands primarily within the Columbia River watershed east of the Cascade crest. It is frequently associated with riparian corridor habitats in at least the Washington and Montana parts of its range. These riparian habitats are often devoid of flowers and many of the shrubs are only beginning to leaf out when *C. asheri* begins its flight period, which historically led to the species being overlooked in these areas by many lepidopterists early in its flight period. *C. asheri* males frequently visit *Salix* spp. and were observed by the first author feeding on the sap around the catkins. Males are also frequently observed at mud throughout their range, often mixed with *C. echo* (Figs. 78-80, 93, 94). Adults nectar on *Crataegus* spp., *Ribes viscosissimum*, *Astragalus* spp., *Erythronium grandiflorum*, *Linum lewisii*, *Lomatium* spp., *Maianthemum stellatum*, *Myosotis scorpioides*, *Tanacetum vulgare*, and likely other flowering shrubs and forbs.

Diagnosis and discussion. The dorsal color of male *C. asheri* is variable but almost never as silvery blue as *C. lucia* (Fig. 96a vs. 96c) and rarely as violet as many *C. echo* (Figs. 89, 90). The dorsal blue coloration of female *C. asheri* tends to be more silvery and reaches the DHW margin more often in central Washington populations (Figs. 32a-35a, 81, 82), similar to *C. lucia* (Fig. 97c), while the northern populations of *C. asheri* tend to be more lavender with broader dark gray margins (Figs. 36a-40a, 97a) similar to female *C. echo* (Figs. 2a, 4a, 5a, 7a, 87, 88). Thin, dark gray cell bars sometimes occur on the DFW of female *C. asheri* and are almost always absent from the DHW (Figs. 81A, 82A) in contrast to *C. echo* females in which the dorsal cell bar is almost always visible on both fore and hindwings (Figs. 87A, 88A) and *C. lucia* females in which these cell bars are almost always absent (Fig. 97c). The DHW margin of female *C. asheri* ranges from having small, fuzzy gray spots on a mostly blue wing (Fig. 32-34a, 36a, 37a, 82B) similar to female *C. lucia* (Fig. 97c), to having indistinct submarginal gray crescents separating the blue discal area from a partially blue marginal band around the spots (Figs. 38a, 40a, 81B, 97a). The area between the ventral marginal spots and

submarginal crescents of both sexes usually contains varying amounts of dark gray scales (Figs. 85D) compared to *C. echo* in which this band never contains dark gray scales (Figs. 91D, 92D). The dorsal wing fringe of *C. asheri* varies from lightly checkered, usually with light gray mixed into the white scales between the dark gray fringe at the tips of each wing vein (Figs. 81-83C) to solid gray or black (Fig. 84C), compared to *C. echo* in which the fringe is solid white or white with a thin black line at the tips of each wing vein (Figs. 87-90C), and *C. lucia* in which the fringe is usually heavily checkered with very little variation (Figs. 96c, 97c). *C. echo* never exhibit the large, dark gray VHW discal patch seen in some *C. asheri* and *C. lucia*. When *C. asheri* exhibits a lighter ventral phenotype resembling *C. echo*, the two species may be differentiated by the bolder markings on *C. asheri*, particularly of the VHW discal cell bar and median spots (Fig. 86E), the appearance of fuzzy, white postmedian arrowheads on some *C. asheri* (Fig. 85F) or the frequent duskiness in the VHW marginal band (Figs. 28b, 39b, 40b, 85D, 94), compared to the pale ventral and thin VHW discal cell bar on *C. echo* (Figs. 91E, 92E, 93). A less consistent but somewhat useful identifier is the coloration of the basal area of the ventral wings: *C. echo* tends to have a dusting of greenish-blue scales over this area (Figs. 91G, 92G), *C. asheri* may have a very small amount of greenish-blue (less often) or dark gray (more often) scales in this area (Figs. 10b-40b, 85G, 86G, 96b, 97b), while *C. lucia* has dark gray to black scales in this area (Figs. 95, 96d, 97d). *C. asheri* and *C. lucia* are sympatric in only a few places in British Columbia, Alberta and Montana and may be differentiated by a combination of features. In addition to the dorsal color tint and other differences already described, *C. asheri* average slightly larger than *C. lucia* and the ventral of sympatric *C. lucia* populations tends to be more evenly mixed with dark gray and light gray scales giving it a "dirty" appearance overall (Fig. 95) compared to the lighter gray of *C. asheri*. *C. lucia* from Saskatchewan and eastward exhibit "cleaner" ventrals very similar to some *C. asheri*.



Figs. 81-92: Comparison of *Celastrina asheri* sp. n. (females 81-82, males 83-86) and *C. echo* (females 87-88, males 89-92), all specimens from Washington. Letters indicate key features: **A)** presence or absence of dorsal cell bar on females, **B)** presence or absence of marginal spots and surrounding blue and charcoal shading on DHW of females, **C)** dorsal wing fringe color, **D)** clarity and color of ventral marginal band pattern, **E)** size of VHW median spots and discal cell bar, **F)** postmedian pattern of white "arrowheads" standing out from ground color, and **G)** presence or absence of basal greenish-blue scales. Photos by C. C. LaBar.

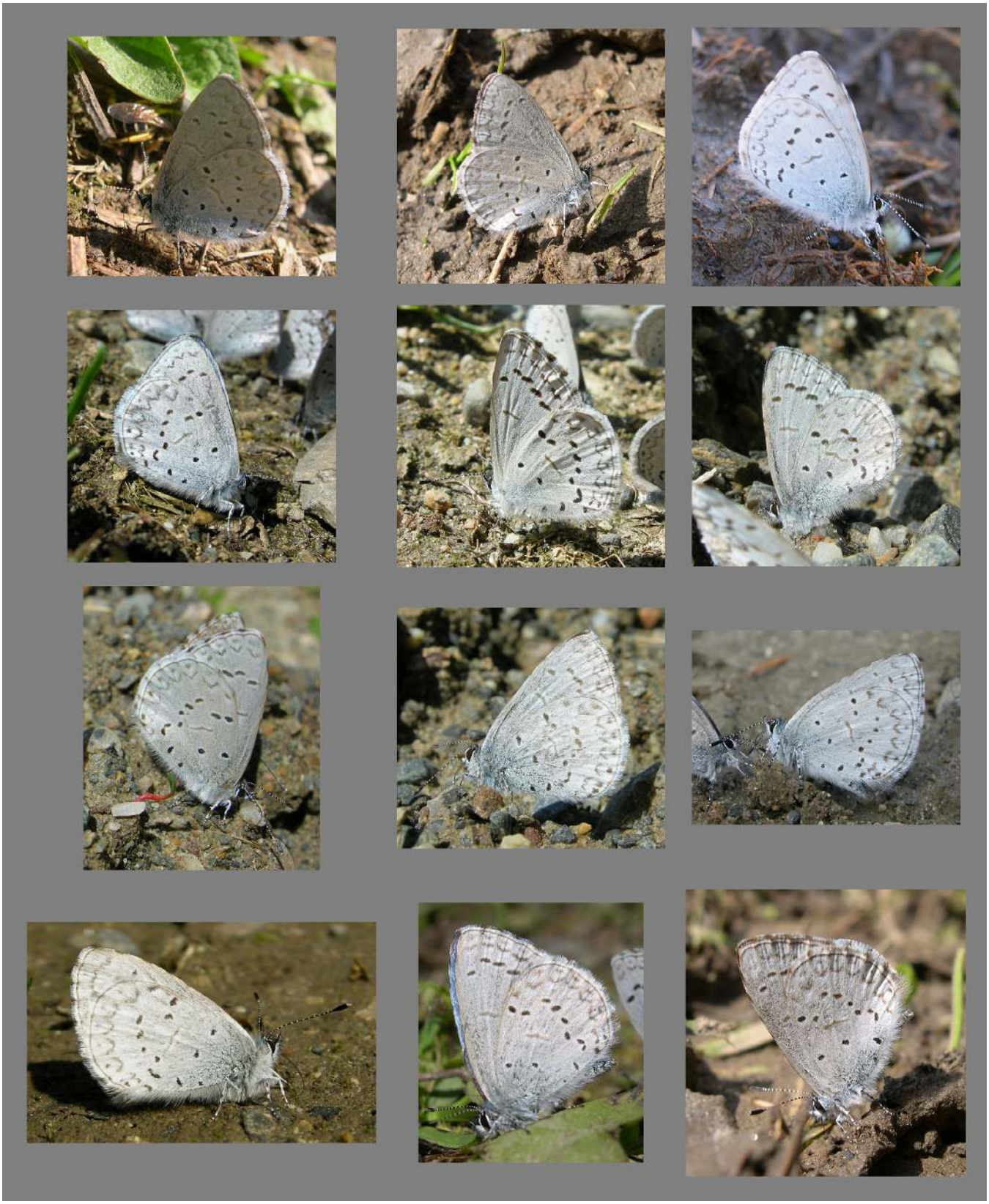


Fig. 93: A sample of *Celastrina echo* from the Pend-d'Oreille River valley, BC. Photos by N. G. Kondla.



Fig. 94: A sample of *Celastrina asheri* sp. n. from the Pend-d'Oreille River valley, BC. Photos by N. G. Kondla.



Fig. 95: *Celastrina lucia* near Nazko, BC, 2004-05-09. Photo by N. G. Kondla.

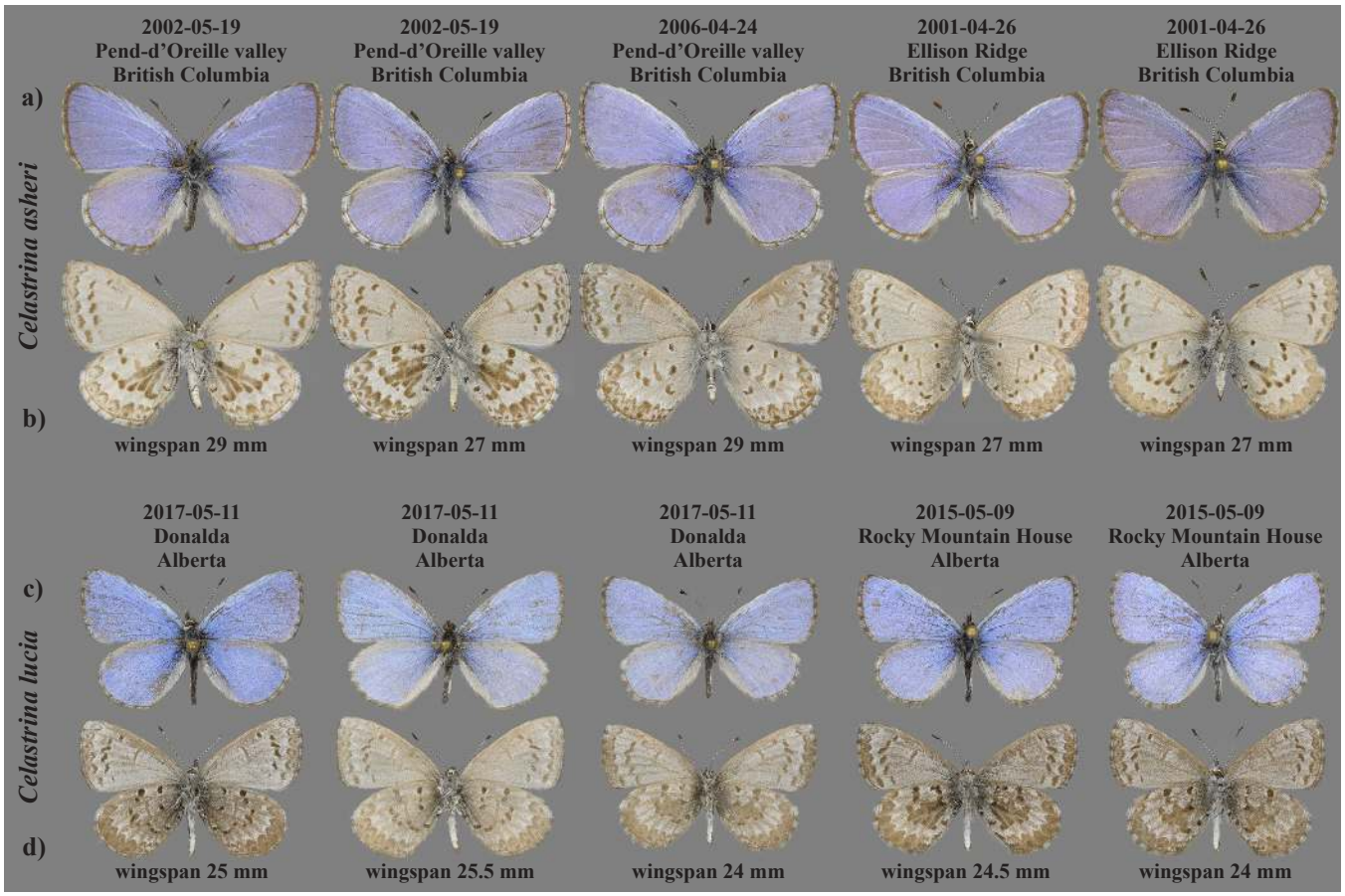


Fig. 96: Comparison of *Celastrina asheri* sp. n. (rows a & b) and *C. lucia* (rows c & d) males. Photos by N. G. Kondla.

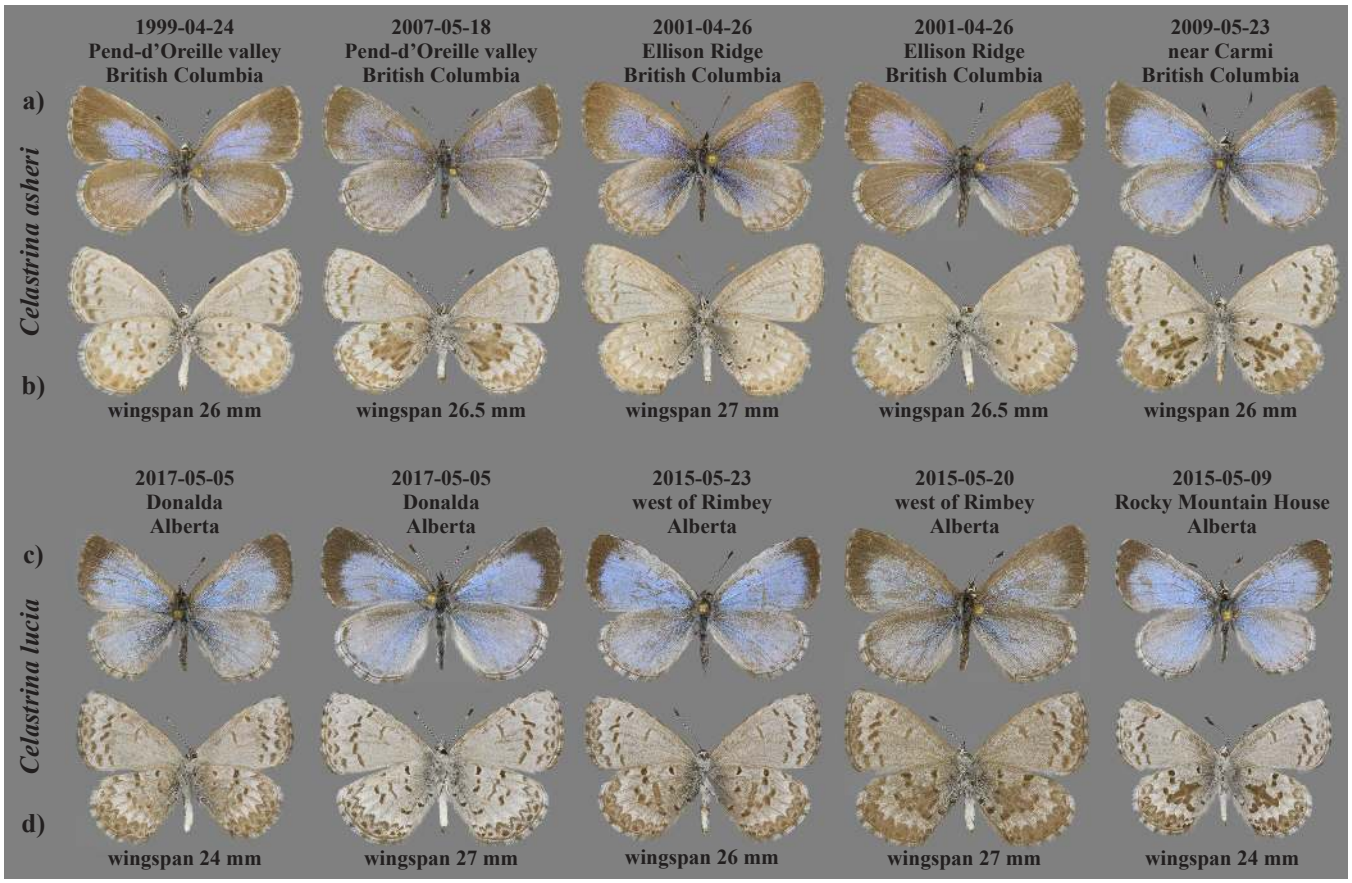


Fig. 97: Comparison of *Celastrina asheri* sp. n. (rows a & b) and *C. lucia* (rows c & d) females. Photos by N. G. Kondla.

The type specimen of *Cyaniris ladon* ab. *nunenmacheri* Strand, 1915 exhibits a discal patch on the VHW and brownish coloration on the VFW typical of *C. asheri*, but has a mostly-white dorsal wing fringe typical of *C. echo* (http://butterfliesofamerica.com/L/ih/celastrina0004_i.htm and http://butterfliesofamerica.com/L/ih/celastrina0003_i.htm). It is described as an aberration, therefore the name *nunenmacheri* is unavailable to use for a new taxon. Also, it is from Lake County, Oregon, where no other records of *C. asheri* have been located. At this time, we consider it likely to be a normal *C. asheri* and not an aberration of *C. echo*, but until further evidence is gathered indicating the occurrence of *C. asheri* in Lake County, it will remain a synonym of *C. echo echo*.

CONCLUSION

The presence of lucia-like phenotypes in Washington noted by Newcomer in 1964 has not been resolved until now. From that time forward, individual azures exhibiting lucia-like features were recorded irregularly in a largely non-geographic pattern. When purported *C. lucia* was identified as a second azure species in Washington, it was speculated that introgression between it and *C. echo* explained the occurrence of these phenotypes among otherwise "normal" *C. echo* populations. We demonstrate that *C. asheri* is widely sympatric with *C. echo*, narrowly sympatric with *C. lucia* and all three species are separated by subtle but consistent phenotypic features accompanied by habitat, phenology, foodplant and life history differences.

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