

Executive Committee:	President	Fred Paras
	Vice President	Phil Kean
	Secretary	Richard H. Smith, Jr.
	Treasurer	Jay Sinha
	Newsletter Editor	Harold J. Harlan
	Journal Editor	vacant - Harold J. Harlan (Acting)
	Historian	Robert S. Bryant

The Maryland Entomological Society (MES) was founded in November, 1971, to promote the science of Entomology in all its sub-disciplines, to provide a common meeting venue for professional and amateur entomologists residing in Maryland, the District of Columbia, and nearby areas; to issue a periodical and other publications dealing with entomology and to facilitate the exchange of ideas and information through its meetings and publications.

Membership in the MES is open to all persons interested in the study of Entomology. All members receive the journal, *Maryland Entomologist*, and the monthly newsletter, *Phaëton*. Institutions may subscribe to the *Maryland Entomologist* but may not become members. Prospective members should send to the Treasurer full dues for the current MES year, along with their full name, address, telephone number, entomological interests, and e-mail address (if available).

Active members - annual dues \$5.00 Junior members - annual dues \$3.00
Institutional subscriptions - \$6.00

Send remittances, payable to the Maryland Entomological Society, and any address changes to: Jay Sinha, 924 Starbit Road, Towson, MD 21286-2953.

Back issues of the *Maryland Entomologist* and recent issues of the *Phaëton* are available to members, via the Treasurer. *Phaëton* is 50¢ per number and the *Maryland Entomologist* is \$1.50 per copy/No.

The MES is a non-profit, scientific organization. Meetings are held on the third Friday of October, November, February, March, April and May, at 8:00 p.m., in Room 4, of the Biological Sciences Building, University of Maryland Baltimore County (UMBC), or other announced site.

The *Maryland Entomologist* is published irregularly by the MES. There are four numbers per volume. Original articles or reports on geographic or temporal distribution, particularly pertaining to Maryland or nearby localities; ecology, biology, morphology, genetics, systematics, behavior, etc., are welcome. Book notices or reviews, requests for information, notes on distribution, behavior, occurrence, migration, life history and other biologic topics will be published. All articles are subject to editorial review and acceptance. Sent input to: Harold J. Harlan, (Acting Ed.), 621 Maple Hill Lane, Crownsville, MD 21032. Please indicate if you want your submission(s) "peer reviewed."

The MES logo features the Maryland Shield below a drawing of a specimen of *Euphydryas phaëton* (Drury), the Baltimore checkerspot [which became the official insect for the state of Maryland through the efforts of many MES members], with its generic name above and its specific epithet below (both in capital letters), all on a pale green field; all these are within a yellow ring double-bordered by red, bearing the message "Maryland Entomological Society . 1971 ."

NOTICE TO CONTRIBUTORS

Celastrina idella (Holly Azure) in Maryland and Delaware

David M. Wright and Harry Pavulaan¹

ABSTRACT. A new species of *Ilex*-feeding *Celastrina* inhabiting the Atlantic Coastal Plain was recently described by the authors (Wright & Pavulaan, 1999). The type locality of *Celastrina idella* Wright & Pavulaan is Chatsworth, Burlington Co., NJ, situated within the biogeographic region known as the New Jersey Pine Barrens. This region serves as the type locality for four other species of Icaenid butterflies: *Epidemia epixanthe* (Boisduval & Le Conte, 1833), *Deciduphagus polios* (Cook & Watson, 1907), *Mitoura hesseli* (Rawson & Ziegler, 1950) and *Deciduphagus irus* (Godart, 1824) by designation of a neotype by Gatrell (1999). It also serves as the type locality for one satyrid butterfly subspecies: *Neonympha helicta septentrionalis* (Davis, 1924). This paper deals with *C. idella* in Maryland and Delaware, and provides researchers with information necessary to locate and identify this newly recognized taxon. Differentiation of specimens of *C. idella* and *Celastrina ladon* (Cramer, 1780) is the foremost consideration in the descriptions.

BACKGROUND

The familiar Spring Azure, *Celastrina ladon* (Cramer), has long intrigued and puzzled entomologists. Various forms have historically defied precise classification and still do. For over 100 years, taxonomic alignment has shifted back and forth between *C. ladon*, *Celastrina argiolus* (L., 1758), and *Celastrina pseudargiolus* (Boisduval & Le Conte, 1833). Most recent publications have simply listed a single Spring Azure entity, treated as either *C. ladon* or *C. argiolus*. For this paper, we follow the treatment of Clench and Miller (1980) and consider *C. ladon* to be a valid North American species and *C. argiolus* a separate Palearctic species.

Clench (1972) was the first to fully describe a second North American species, *Celastrina ebenina* Clench, previously thought to be a melanic infrasubspecific form of *C. ladon*. Under current International Code of Zoological Nomenclature (ICZN, 4th ed. 2000) rules, an available senior name, *Celastrina nigra* (Forbes, 1960), superceded *C. ebenina* as the species name (Scott and Wright, 1991). More recently, Opler and Krizek (1984) elevated *Celastrina neglectamajor* Tutt (1908), long misunderstood as a large infrasubspecific form of *C. ladon* and the subject of considerable debate, to full species rank. By 1984, three species: *C. ladon*, *C. nigra* and *C. neglectamajor* were tentatively recognized in North America. However, *C. ladon*'s status as a unique North American species and the taxonomic status of *C. neglectamajor* continued to be debated for several more years. The latter was eventually confirmed as a full species by the authors (Pavulaan and Wright, 2000). The *C. ladon* issue was subsequently resolved by a close examination of that species' presumed seasonal polymorphism.

¹ Respective addresses are: Lansdale, PA; and Herndon, VA.

In recent years, we questioned whether the seasonal "broods" of the eastern Spring Azure represented a single species or if additional species were involved. A decade and a half of field

research and extensive laboratory analysis has yielded compelling evidence that establishes nominotypical *C. ladon* as a univoltine spring insect. Under natural conditions, *C. ladon* is subject to obligate pupal diapause and produces only one spring brood per year. One of us (DW), through microscopic analysis, discovered that *C. ladon* males possess a dorsal wing scale structure (Wright, 1995; Wright and Pavulaan, 1999) that is unique among *Celastrina* and is shared only with *C. nigra*. This *C. ladon* scale character is genetically controlled and is transmitted to subsequent annual generations and to "false brood" summer adults induced under laboratory conditions. The naturally-occurring ubiquitous summer flights of the familiar summer "brood" or "form," *neglecta* do not possess the unique wing scale structure and thus represent yet another species: *Celastrina neglecta* (Edwards, 1862). *Celastrina neglecta* is multivoltine, which further distinguishes it from *C. ladon*. Through extensive literature review and interpretation of the earlier works of William Henry Edwards (1862, 1883), we concluded that under ICZN rules the original description of *C. neglecta* is valid and the name is available. Several authors have since adopted this conclusion (Covell, 1999; Glassberg, 1999; Gochfeld and Burger, 1997; Layberry *et al.*, 1998; LeGrand and Howard, 1999; Nielsen, 1999; Opler and Wright, 1999; Wright, 1995), and *C. neglecta* has generally come to be accepted as the fourth species to be recognized in eastern North America. A fifth species, *Celastrina humulus* Scott & Wright, was recently described from the foothills of the Rocky Mountains in Colorado (Scott and Wright, 1998). This species has closer affinity to the eastern complex than it does to western North American taxa.

Through our fieldwork we further learned that the early spring flights of eastern North American *Celastrina* consisted not only of typical *C. ladon* populations, but also other populations with a dorsal scale structure atypical of *C. ladon*. We noticed that along the Atlantic Coastal Plain *C. ladon* specimens were conspicuously absent in many areas, especially in habitats nearer the coast. *Celastrina ladon* appeared to be most common in the Piedmont and Appalachian Mountain region and areas westward to the Ozarks. Coastal Plain specimens lacked the unique *C. ladon* dorsal wing scale character and were therefore something different.

This complex picture was further complicated in New Jersey by the presence of the northern subspecies *Celastrina ladon lucia* (Kirby, 1837) in the Pine Barrens region. The nominotypical subspecies *Celastrina ladon ladon* (Cramer) occupies deciduous forested areas immediately west of the Pine Barrens. The New Jersey Pine Barrens population of *C. l. lucia* is a coastal glacial relict and is more closely related to Canadian *C. l. lucia*, which may yet prove to be another species. It lacks the unique dorsal wing scale structure of nominotypical *C. l. ladon* with which it narrowly intergrades over an area from southern New England to Michigan. In the Pine Barrens, *C. l. lucia* flies several weeks earlier than other *Celastrina* in the mid-Atlantic region. The early flight of *C. l. lucia* begins in March during most years, but fluctuates dramatically depending on the severity of winter or the advance of spring. It usually lasts until mid-late April, but can continue into early May during years of delayed spring warming.

Over the years, as the spring flight of *C. l. lucia* waned in the Pine Barrens, we noticed a distinct second azure emergence, usually beginning in early May and lasting through the entire month. Though both of these spring emergences occurred in the same general region, we noted that the May flight seemed more common in the vicinity of white cedar swamps, in contrast to the wider variety of damp habitats and bogs used by *C. l. lucia* in New Jersey. It was previously known that *C. l. lucia* utilized *Vaccinium corymbosum* L. (highbush blueberry). Subsequently, it was discovered (by DW) that the May flight used *Ilex glabra* (inkberry) in the Pine Barrens. This situation strongly suggested the presence of two sympatric taxa. After several years of rearing and lab analysis, we were convinced that the two entities, *C. ladon* and *C. idella*, represented separate species (Wright and Pavulaan, 1999).

Broadening our study of *Celastrina* populations on the Atlantic Coastal Plain, we learned that the new species was endemic to wooded habitats containing a dense holly (*Ilex*) component. Several additional *Ilex* hosts were identified and the insect's range was extended south to at least coastal Georgia (Pratt *et al.*, 1994; Wright, 1995). Given the widespread knowledge of our findings, some authors accepted the validity of the *Ilex*-feeding species and published informal descriptions [Gochfeld and Burger, 1997 ("Pine Barren Azure"); LeGrand and Howard, 1999 ("Holly Azure")] based on our work. We decided to properly describe and name the new species *Celastrina idella*, the Holly Azure, making this name available for future research.

DESCRIPTION

The best way to distinguish *C. idella* in our area is by direct comparison with *C. ladon*. Overall, *C. idella* males (fig. 1) are generally similar to *C. ladon* (fig. 2). Size, coloration, and dorsal markings differ only in subtle degrees, and should not be used as the only features to distinguish it from *C. ladon*. While New Jersey Pine Barrens *C. idella* is slightly smaller than *C. ladon*, *C. idella* approaches *C. ladon* in size in the Chesapeake Bay region from Delaware to Virginia's Dismal Swamp. Farther south, a small percentage of *C. idella* individuals are slightly larger than *C. ladon*.

The primary difference between spring males of *C. idella* and *C. ladon* is in their dorsal wing scales. Males of *C. idella* bear androconia scales on their dorsal wing surface; *C. ladon* males lack androconia and, instead, have long, overlapping hoary surface scales. This difference is immediately evident by examination through a dissecting microscope. Most field observers and collectors will not have access to this sort of equipment. However, with practice and the aid of a strong hand-lens, male specimens of *C. ladon* can be identified by the satiny matte appearance of the violet-blue dorsal surface. When held at different angles to a strong light source, this may appear as a milky sheen on *C. ladon* specimens. Males of *C. idella*, on the other hand, are highly reflective blue, lacking the satiny or milky sheen. In *C. ladon*, the hindwing margins are conspicuously "checkered", having alternating white and dark fringes. In *C. idella*, the hindwing margins are solid white, though the forewing margin may contain some checkering.

Females of nominotypical subspecies *C. ladon* are deep violet on the upper surface. Females of *C. ladon* also display strong checkering on the wing margins like their conspecific males. *Celastrina idella* females tend to be lighter violet blue, often with white scaling especially on the hindwing. Like the males, females have solid white hindwing margins.

The ventral surface of *C. idella* (both sexes) differs from *C. ladon*. The light whitish-gray underside of *C. idella* (fig. 1) is considerably lighter than that of *C. ladon* (fig. 2). Some specimens are almost pure white. The *C. ladon* venter (both subspecies) is usually gray. Subspecies *C. l. lucia* is heavily-marked on the ventral surfaces, often showing either a dark margin on the hindwing (form "*marginata*"), a dark hindwing discal patch (form "*lucia*"), or both (form "*lucimargina*"). There are rare *C. l. lucia* individuals lacking both the dark margin and patch (form "*violacea*"), which are still much grayer beneath and with a pattern of larger dots than *C. idella*. The subspecies of *C. ladon* most commonly encountered in our area is typically form "*violacea*" (though a very small percentage of form "*marginata*" may be present). The black macules of the hindwing median often are encircled by a thin rim of white. Interestingly, individuals of subspecies *C. l. ladon* from the Chesapeake Bay region, which overlap the range of *C. idella*, are often very white beneath. Some *C. ladon* specimens from the area around Bethel, Delaware, are almost indistinguishable from *C. idella*, except that they always retain the unique *C. ladon* male dorsal wing scales which differentiates specimens. The

reason for this convergence of phenotypes is unknown. It might be indicative of a small zone of intergradation, or local variation of *C. ladon*. Conversely, *C. idella* specimens from the western side of the Chesapeake Bay in southern Maryland, south of Annapolis, tend to be slightly grayer beneath and slightly larger than New Jersey and Delmarva specimens. These tend to approach *C. ladon* in overall appearance, however they lack the unique *C. ladon* male dorsal wing scales.

Opler and Malikul (1992, 1998) depicted specimens of *C. idella* as "*Celastrina argiolus* spring form" in the popular Peterson *Field Guide to Eastern Butterflies*. Plate 25 of their 1992 edition and Plate 16 of the 1998 edition both show male and female dorsal views and one female ventral view of *C. idella* from Sussex Co., Delaware. Note the typical solid white hindwing margin in both sexes, plus the whitish venter and tiny dot pattern. These entries need to be revised in future editions to maintain taxonomic accuracy.

An interesting and potentially confusing issue is the presence of sporadic spring individuals of *C. neglecta* (predominantly a summer insect) that occur in many places in our region. These individuals appear in small numbers and tend to fly earlier than *C. idella*. Whether these individuals are aberrant spring *C. neglecta* emergences, regular spring *C. neglecta* emergences, or yet another unidentified univoltine spring taxon is not yet known. The biology of this newly-recognized entity is being studied. Rearing experiments have produced complicated and often inconclusive results. Spring *C. neglecta* males are similar to *C. idella* in appearance, bearing the same type of dorsal wing scale structure that is typical of all *Celastrina* except *C. ladon* and *C. nigra*. Spring *C. neglecta* females are easier to differentiate by their bright metallic pastel blue color above, often with a greenish tint. In order to help find distinguishing characters that differentiate *C. idella* males from spring *C. neglecta* males, one of us (DW) performed microscopic examination of the male genitalia. The results were encouraging, showing that *C. idella* males differ from other *Celastrina* by having a very fine sparse cuticular spinosity on the upper surface of the apical process of the valve which is not present in *C. neglecta* (Wright and Pavulaan, 1999). This characteristic will not be discernable to the average field observer, thus expert analysis should be obtained.

Because of the difficulty of identifying *C. idella* in the field, and differentiating *C. idella* individuals from *C. ladon* and spring *C. neglecta* individuals on the wing, we urge a very conservative approach in reporting this new species. Sight records for new localities, especially west of the Chesapeake Bay, should be considered "unverified" until specimens in hand can be examined. With vouchered specimens, proper species determination is possible.

FLIGHT PERIOD

In New Jersey, *C. idella* may generally be found over a four-week flight within the period from mid-April to the very end of May, though during most years the species emerges in the first week of May. The flight period may be adjusted by several days, depending on the advance of spring during any particular year. Extreme flight dates in the interior of the New Jersey Pine Barrens are April 25 through June 4. An interesting phenomenon is that *C. idella* emerges as much as two weeks earlier in deciduous forest areas immediately south and west of the Pine Barrens (Delaware River and Delaware Bay counties). It is believed that the richer soils in these areas lose heat at a slower rate than the sandy soils of the central Pine Barrens, thus affecting the eclosion of diapausing pupae in the leaf litter. For a considerable time, we had considered the offset *idella* emergences in southern New Jersey may be due to different *C. idella* ecotypes (one feeding on *I. glabra* in the Pine Barrens, and a second feeding on *Ilex opaca* Ait. in Delaware Bay counties), however, this does not seem to be the case. In the

laboratory, *C. idella* larvae from each area survive equally well on both *Ilex* species and show the same diapause intensity over the winter.

In our area, on the Delmarva Peninsula, *C. idella* may be found at approximately the same dates as the Delaware Bay counties of southern New Jersey (south of the Pine Barrens), but often it begins flight a few days earlier in the first half of April. On the west side of the Chesapeake Bay in southern Maryland, from Annapolis south, most specimens of *C. idella* that we have examined have been taken in mid-April and were slightly worn, but extreme flight dates have not yet been documented. There the flight may begin in early April. Look for *C. idella* after about a week of warm weather in very early April, and a few days after the first emergence of *C. ladon*.

Extreme flight dates for *C. idella* have not been fully documented to the south. In the Dismal Swamp of southeastern Virginia, and on North Carolina's Outer Banks, *C. idella* has been found as early as March 29, and as late as May 20. In southeastern North Carolina and further south, *C. idella* has been variously reported as early as mid-March, and on some dates as early as late February.

HOSTS

Celastrina idella larvae feed on the male flowers of host hollies (*Ilex* spp.). Females oviposit on the developing flower buds and the larvae feed on buds, flowers, and immature fruit of the hosts. In the New Jersey Pine Barrens, the select host is primarily *I. glabra* (inkberry or gallberry). The original species description of *C. idella* was compiled from an *I. glabra*-feeding population at the type locality (Wright and Pavulaan, 1999). Around the periphery of the Pine Barrens, *I. opaca* (American holly) is the primary host. In general, the earliest emerging *C. idella* in New Jersey feed on *I. opaca*, while those emerging later feed on *I. glabra*. *Ilex laevigata* (smooth winterberry) has also been documented as a host in southern New Jersey, and ovipositions were also observed on *Ilex vomitoria* (yaupon holly) on the North Carolina Outer Banks. The only non-*Ilex* host recorded to date has been *Ilex virginica* (Virginia willow) at Virginia Beach, Virginia, possibly selected as a secondary oviposition choice by females that were flying late in the flight period, when *I. opaca* was already in bloom. Females will not oviposit on previously opened flowers.

In Maryland, *I. opaca* is the primary host. Specimens attributable to *C. idella* have been taken in woodlands with a dense *I. opaca* component in the Annapolis area, around Cedarville, and at Lusby, as well as other locations on the southern peninsula. Populations have also been observed in close association with *I. opaca* at various locations on the Virginia side of the Potomac River and Chesapeake Bay. *Ilex opaca* is suspected by association to be the host on the Delmarva Peninsula, although other *Ilex* spp. could be used. At Nanticoke Wildlife Management Area in Sussex Co., Delaware, *C. idella* ova and larvae have been found only on *I. opaca*.

Around Cedarville and in the Annapolis area, both *C. ladon* and spring *C. neglecta* flights are also found in close association with *I. opaca*, making field identification difficult. *Celastrina ladon* primarily utilizes *Cornus florida* L. (flowering dogwood) in these areas, but it is also associated with *I. opaca* and has been observed ovipositing on male flower buds. In captivity, *C. ladon* females freely oviposit on *I. opaca*. Subsequent rearing experiments prove that *C. ladon* larvae from these areas can successfully utilize *I. opaca* and develop into healthy adults. To what extent *I. opaca* replaces *C. florida* as the *C. ladon* host in the western Chesapeake region is unclear. However, *C. ladon* is generally absent from the outer coastal plain where *I. opaca* is abundant. Interestingly, these populations of *C. ladon* converge on *C.*

idella in appearance, though they retain the unique male dorsal wing scale structure of *C. ladon*. The host of the spring *C. neglecta* individuals remains unknown in these areas (*C. neglecta* do not survive on *Ilex* flowers in the laboratory). Populations of spring *C. neglecta* in extreme southern New Jersey and the Appalachian Mountain region (MD, VA) freely oviposit on the flower buds of *Prunus serotina* Ehrh. (black cherry) in captivity and the larvae will develop into healthy adults. Careful rearing studies from the Chesapeake Bay region should be conducted to answer these questions.

IMMATURE STAGES

Eggs of *C. idella* are white, similar to those of other species of *Celastrina*. Females deposit eggs on the male floral buds of *Ilex* hosts. The first instar larvae are uniformly light green in color. The young larvae bore a hole into the floral buds, extending their head in a telescoping manner to feed on highly nutritious inner contents (mostly pollen). The mature fourth instar larvae are variable in ground color, ranging from light green to creamy white. A few are lightly contrasted with dorsal white chevrons. A maroon-tinted prothoracic shield is present in some individuals, and rarely there is a faint rosy mid-dorsal stripe. The mature larvae are tended by ants, which aggressively defend the larvae from predators (parasitic flies and wasps). The diapausing pupae are light brown.

HABITAT AND HABITS

On the outer Coastal Plain, *C. idella* prefers wet areas such as cedar swamps, cypress swamps, pocosins, rich bottomlands and wet thickets. Closer to the coast, it occurs in dry maritime forests and forested portions of barrier islands. On the inner coastal plain near the Fall Line, the species is found along streams in deciduous forest habitats with a dense *I. opaca* component. The species is rarely recorded in Piedmont habitats (only at a few locations on the west side of the Potomac River in northern Virginia).

Early in the spring flight period, look for *C. idella* along sandy roadways in woodlands containing holly. The adults fly along the wooded road edges, stopping to nectar at clusters of small white flowers of a wide variety of shrubs. Males have been known to engage in "mud puddle parties" at damp spots along sandy roads and at the edges of waterways or ponds. The males have also been observed imbibing minerals (and amino acids?) from animal dung and carcasses. Females do not engage in this behavior, but rather tend to remain close to the wooded edge or within the woodland habitat seeking host plants. Frequent associates in this habitat are Hessel's Hairstreak, *Mitoura hesseli* Rawson & Ziegler and Henry's Elfin, *Deciduphagus henrici* Grote & Robinson. The latter shares *C. idella*'s holly host plants.

TYPE LOCALITY, RANGE, AND DISTRIBUTION IN MARYLAND AND DELAWARE

The type locality of *Celastrina idella* is Chatsworth, New Jersey; specifically a cedar bog along Risley Branch of Wading River, 2.2 km. south of the village. The holotype male is deposited in the Academy of Natural Sciences in Philadelphia, PA. The original paratype series comes entirely from New Jersey. The species ranges from central New Jersey south across the entire Delmarva Peninsula. It also occurs on the west side of the Chesapeake Bay and is known from the vicinity of Annapolis south to near Point Lookout. Careful search of holly habitats along the entire western shore of Chesapeake Bay to Delaware may turn up additional populations.

In Virginia, it occurs along the immediate western shore of the Potomac River from southern Fairfax County south to the Tidewater region and Great Dismal Swamp. The range continues south into North Carolina along the Coastal Plain from the Outer Banks to the Green Swamp, and inland to approximately where the Piedmont begins. It follows the Coastal Plain into South Carolina, ranging west to the edge of the outer Piedmont. There are several records from extreme eastern Georgia along the coast, marking the southernmost known extent of the range. Future work may find that the species ranges further south, possibly even west along the Gulf Coast.

Specific Maryland distribution (fig. 3) is as follows: Anne Arundel Co. (Annapolis area); Calvert Co. (Lusby area); Caroline Co. (Templeville area); Charles Co. (Cedarville State Forest); Dorchester Co. (Hurlock area); Prince Georges Co. (Cedarville area, esp. Cedarville State Forest); Wicomico Co. (Salisbury area White Cedar Swamps); Worcester Co. (Wango area). Specific Delaware distribution (fig. 3) is as follows: Kent Co. (Mispillion River west of Milford); Sussex Co. (Nanticoke Wildlife Management Area, Bethel and Lincoln areas).

DISCUSSION

Host plant adaptation among the *Celastrina* has clearly played a key role in the evolution of this genus in eastern North America. Their larvae are adapted to feed almost exclusively on the developing flowering parts of their host plants, a short-lived food source. By necessity, local or regional adult flights are phenologically coupled to the flowering period of available hosts, emerging at about the time that the flower buds are forming. Plant-feeding insects, such as the *Celastrina*, seem to be particularly adept at finding vacant ecological niches and exploiting floral opportunities. Since host plants often bloom at different times of the season, host specialization can result in asynchrony of the adult flight times and mating periods. Over many thousands of years, this has resulted in populations with well-defined seasonal isolation and has translated into genetic isolation. Eventually, within isolated *Celastrina* populations, morphological differences emerge which help differentiate them from other host-specific populations. Formal descriptions of these populations are required to delineate them for future studies in molecular systematics, phylogenetics, and possible conservation measures.

LITERATURE CITED

- Clench, H.K. 1972. *Celastrina ebenina*, a New Species of Lycaenidae (Lepidoptera) from the Eastern United States. *Annals of the Carnegie Museum* 44: 33-44.
- Clench, H.K., and L.D. Miller. 1980. *Papilio ladon* Cramer vs. *Argus pseudargiolus* Boisduval & Leconte (Lycaenidae): A Nomenclatorial Nightmare. *J. Lepid. Soc.* 34(2):103-119.
- Covell, C.V., Jr. 1999. The Butterflies and Moths of Kentucky: An Annotated Checklist. Kentucky State Nature Preserves Commission. *Sci. and Technical Series*. No. 6.
- Edwards, W.H. 1862. Descriptions of Certain Species of Diurnal Lepidoptera Found within the Limits of the United States and British America - No. 2. *Proc. Acad. Nat. Sci., Philadelphia*. 14: 54-58.
- Edwards, W.H. 1883. On the polymorphism of *Lycaena Pseudargiolus*. *Papilio* 3: 85-97.
- Forbes, W.T.M. 1960. Lepidoptera of New York and Neighboring States - Part IV. Memoir

371. Cornell Univ. Agric. Exper. Sta., New York State College of Agric., Ithaca, NY. 188 pp.

Gatrelle, R.R. 1999. An Evolutionary Subspecific Assessment of *Deciduphagus henrici* (Lycaenidae) Based on its Utilization of *Ilex* and Non-*Ilex* Hosts: Description of a Third *Ilex* Associated Subspecies. Designation of a Neotype and Type Locality for *Deciduphagus irus*. *The Taxonomic Report*, Vol. 1(6). 14 pp.

Glassberg, J. 1999. *Butterflies Through Binoculars - The East: A Field Guide to the Butterflies of Eastern North America*. Oxford Univ. Press, New York, NY. 242 pp.

Gochfeld, M., and J. Burger. 1997. *Butterflies of New Jersey*. Rutgers Univ. Press, New Brunswick, NJ. 327 pp.

Layberry, R.A., P.W. Hall, and J.D. Lafontaine. 1998. *The Butterflies of Canada*. Univ. of Toronto Press, Toronto, CANADA. 280 pp.

LeGrand, H.E., Jr., and T.E. Howard, Jr. 1999. Notes on the Butterflies of North Carolina. Sixth Approximation. 183 pp. Online: <http://www.ncsparks.net/butterfly/ncnc.html>

Nielsen, M.C. 1999. *Michigan Butterflies and Skippers: A Field Guide and Reference*. Michigan State Univ. Extension, Lansing, MI. 248 pp.

Opler, P.A., and G.O. Krizek. 1984. *Butterflies East of the Great Plains*. Johns Hopkins Univ. Press, Baltimore, MD. 294 pp.

Opler, P.A., and V. Malikul. 1992, 1998. *A Field Guide to Eastern Butterflies*. Peterson Field Guide Series. Houghton Mifflin Co., Boston, MA. 468 pp.

Opler, P.A., and A.B. Wright. 1999. *A Field Guide to Western Butterflies*. Peterson Field Guide Series. Houghton Mifflin Co., Boston, MA. 540 pp.

Pavulaan, H., and D.M. Wright. 2000. The Biology, Life History, and Taxonomy of *Celastrina neglectamajor* (Lycaenidae: Polyommatainae). *The Taxonomic Report*, Vol. 2(5). 19 pp.

Pratt, G.F., D.M. Wright, and H. Pavulaan. 1994. The Various Taxa and Hosts of the North American *Celastrina* (Lepidoptera: Lycaenidae). *Proc. Entomol. Soc. Wash.* 96(3): 566-578.

Scott, J.A., and D.M. Wright. 1991. *Celastrina nigra* and its Synonym *Celastrina ebenina* (Lepidoptera: Lycaenidae). *J. Res. Lepid.* 30(3-4): 257-260.

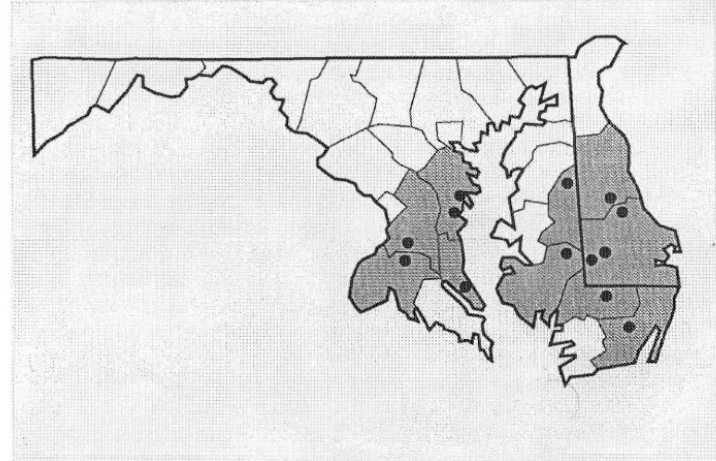
Scott, J.A., and D.M. Wright. 1998. A New *Celastrina* From the Eastern Slope of Colorado. *Papilio (New Series)*, No. 9. 15 pp.

Wright, D.M. 1995. The American Azures: Our Blue Heaven. *American Butterflies*

3(1): 20-28 & 30.

Wright, D.M., and H. Pavulaan. 1999. *Celastrina idella* (Lycaenidae: Polyommatainae): A New Butterfly Species From the Atlantic Coastal Plain. *Taxon. Report*, Vol. 1(9). 11 pp.

Fig. 3. Map showing *Celastrina idella* distribution in Maryland and Delaware. Counties are shaded. Documented locations shown as dots.



APPENDIX I

Current North American *Celastrina* taxa.

Recent changes and additions to North American *Celastrina* require us to reexamine the nomenclatorial status of named taxa. Until a more thorough work is produced, we maintain a conservative approach in treating the western subspecies.

Celastrina ladon (Cramer)a. *l. ladon* (Cramer)

- = *pseudargiolus* (Boisduval & Le Conte)
- = *violacea* (Edwards)

b. *l. lucia* (Kirby)

- = f. *marginata* (Edwards)
- = f. *lucimargina* Scott
- = ab. *fumida* (Scudder)
- = ab. *pseudora* (Scudder)
- = ab. *brunnea* Tutt
- = ab. *subtusjuncta* Tutt
- = ab. *inequalis* Tutt

c. *l. nigrescens* (Fletcher)

- = *quesnelli* (Cockle)
- = f. *maculatasuffusa* (Cockle)

d. *l. sidara* (Clench)e. *l. echo* (Edwards)

- = *bakeri* (Clench)
- = ab. *nunenmacheri* (Strand)

f. *l. gozora* (Boisduval)g. *l. cinerea* (Edwards)

- = f. *arizonensis* (Edwards)

Celastrina neglecta (Edwards)a. *n. neglecta* (Edwards)b. *n. argentata* (Fletcher)*Celastrina nigra* (Forbes)

- = *ebenina* Clench
- = f. *nig* (Strecker)
- = f. *intermedia* (Strecker)
- = f. *nigra* (Edwards) [dimorphic male]

Celastrina neglectamajor Tutt

- = f. *obsoletalunulata* Tutt

Celastrina humulus Scott & Wright*Celastrina idella* Wright & PavulaanRed-banded Hairstreak with "Beak Tears" Taken
in Baltimore City Beneath Lights at Night

A. P. Platt

Baltimore, MD

Upon returning home at 2200 hrs. (10:00 P.M., EDT) on the evening of 25 September, 2002, I found what at first glance I thought was an unusual geometrid moth, with its wings folded over its back, clinging to a glass pane on the storm door of my house, along with several other Noctuid and micro-heterocera, directly beneath the porch light, and about 1.22 m above the ground. The 2.63 m high porch light held a 60W G.E. cool white incandescent bulb that was surrounded by a thick rectangular black metal and clear glass lamp housing. The glass sides and base of the lamp housing had wide tapering beveled edge facets which act as prisms when viewed at right angles to their surfaces. This same light had previously attracted a specimen of the green darner, *Anax junius* (Drury), (Odonata: Anisoptera: Aeschnidae) in late April, 1989 (Platt and Harrison, 1994). [See Ch. 7, No. 5: 169-189, "Collecting at Lights" in Winter (2000) for a further discussion of how to attract Lepidoptera (mainly moths) to light sources of various wave-lengths.]

Closer inspection revealed that the moth-like insect was, in fact, a male red-banded hairstreak, *Calycopis cecrops* (Fab.) (Lepidoptera: Lycaenidae), which had suffered severe "beak tears" to all four of its wings. Except for the sharp triangular "beak tears," the specimen appeared to be quite a fresh one, so that the presumed bird attack likely had occurred earlier in the same day. Pyle (1981) noted that this species hides among leaves until it is disturbed, and that it is often active at dusk.

My home is located in the Ten Hills section of southwestern Baltimore City in a typical suburban setting, with nearby undeveloped woodland patches, small intermittent streams, and lawns. Yew shrubs *Taxus* spp., forsythias (*Forsythia* spp.), and azaleas (*Rhododendron* spp.) surround the front of the house, and our front yard contains several large tulip poplars (*Liriodendron* spp.) and a several-hundred year old sycamore (*Platanus* sp.). Hairstreaks of any species are unusual finds in the area. I have seen only one other red-banded hairstreak during the 33 years I have lived in the neighborhood. D. Flaim informs me (pers. comm.) that lycaenids and other hairstreaks are known to be occasionally attracted to lights. However, Bob Robbins of the USNMNH (pers. comm.) indicates hairstreaks being attracted to light must represent "a very rare phenomenon," and that such attraction

Noctua pronuba (L.) (Lepidoptera: Noctuidae). Koehn stated that this species was first reported from North America in 1979, and that it had spread southwestward through Virginia and Tennessee, reaching the gulf coast and Louisiana by 1996. His first Kentucky records (taken in baited traps) were from early May, 2001. He also reported records from Indiana and Ohio. J. Grehan of the Frost Museum, Pennsylvania State University recently informed me that he has collected this species in Vermont, and that it is spreading very rapidly.

Bryant (1999) estimated that this cutworm moth likely arrived in Maryland sometime between 1988 and 1990, having first been reported at Halifax, Nova Scotia in 1979 by Wright (1983). In the late summer of 1998, Bob Bryant collected nine specimens attracted to a porch light at his home in the Ten Hills section of Baltimore City. He noted further that five of those nine specimens bore "beak marks," probably from previously unsuccessful bird attacks.

South (1907: 232-233) illustrated the eggs and larvae of this species. Hargreaves and Chinery (1981: 181) provided color illustrations of the adult moth, its resting position, and its larva; which is yellowish-brownish gray, with dorsolateral segmental darkened stripes. Their illustration, South's colored Fig. 6, Plate 115, and Koehn's lower specimen all are nearly identical to the one I collected from UMBC. The British common name for this species is the large yellow underwing. The larva is considered to be a pest in flower and vegetable gardens where it feeds on a variety of low herbaceous plants and grasses.

Dispositions. Both of these specimens have been pinned and placed in the Platt Collection at UMBC.

Literature Cited

- Bryant, R.S. 1999. Two European moths find a home in Maryland. *News & Views*, Maryland Nat. Hist. Soc. Newsletter 38: 1-3.
- Covell, C.V., Jr. 1984. *A Field Guide to the Moths of Eastern North America*. The Peterson Field Guide Series. Houghton-Mifflin Co., Boston, MA. 496 pp.
- Hargreaves, B., and M. Chinery. 1981. *Butterflies and Moths*. Collins Gem Guides. Wm. Collins Sons, & Co., London UK. 240 pp.
- Holland, W.J. 1905. *Moths*. The Nature Library. Vol. 7, Doubleday, Page & Co., New York, NY. 479 pp.

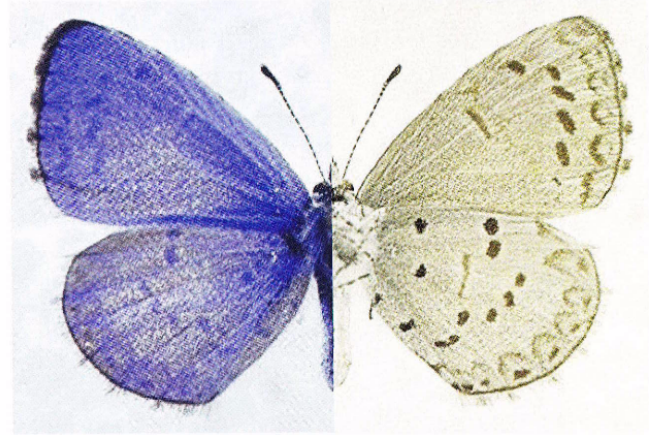


Fig. 1. *Cellastrina idella*. Paratype male. 16 April 1995, Bevan WMA, Cumberland Co., N.J. Left (dorsal view), right (ventral view).

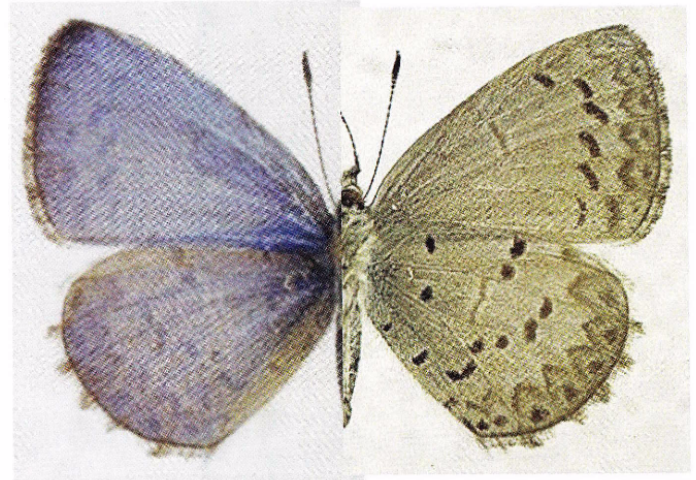


Fig. 2. *Cellastrina ladon*. Male. 22 April 1988, nr. Rancocas SP, Burlington Co., N.J. Left (dorsal view), right (ventral view).