

2018

## Butterfly, Dogwood Linked in Circle of Life

W. John Hayden

*University of Richmond*, [jhayden@richmond.edu](mailto:jhayden@richmond.edu)

Nicky Staunton

Follow this and additional works at: <https://scholarship.richmond.edu/biology-faculty-publications>



Part of the [Plant Sciences Commons](#)

---

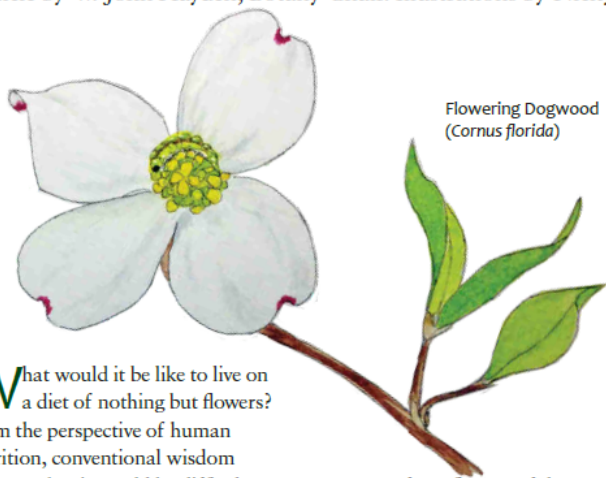
### Recommended Citation

Hayden, W. John. "Butterfly, Dogwood Linked in Circle of Life." *Sempervirens* Summer 2018: 6-7.

This Article is brought to you for free and open access by the Biology at UR Scholarship Repository. It has been accepted for inclusion in Biology Faculty Publications by an authorized administrator of UR Scholarship Repository. For more information, please contact [scholarshiprepository@richmond.edu](mailto:scholarshiprepository@richmond.edu).

# Butterfly, Dogwood linked in circle of life

Article by W. John Hayden, Botany Chair. Illustrations by Nicky Staunton.



Flowering Dogwood  
(*Cornus florida*)

What would it be like to live on a diet of nothing but flowers?

From the perspective of human nutrition, conventional wisdom suggests that it would be difficult to obtain a well-balanced diet from flowers alone. We do, however, have the legend of the lotus-eaters, people encountered by Odysseus and his crew on their epic return journey from Troy. As recounted in the *Odyssey*, lotus-eaters lived life in a perpetual stupor, and the two crew members who sampled lotus flowers immediately lost all interest in returning to their homes in Ithaca. Upon seeing the danger of consuming these flowers—the botanical identity of which is the subject of some debate—Odysseus hastily departed the strange land of lotus-eaters. That story, of course, is legend, and I doubt that there have been any successful human cultures that have subsisted entirely on flowers.

But insects are another story. In particular, many butterflies in the genus *Celastrina*, known as blues or azures, truly do live on a diet of flowers. In many *Celastrina* species, female blues lay their eggs directly on flower buds, the caterpillars consume buds and open flowers, and the short-lived adult butterflies

sip nectar from flowers of diverse plants. Further, some of the blues are highly selective in their choice of larval food flowers. As described recently, the Appalachian Azure (*C. neglecta-major*) specializes on flowers of Common Black Cohosh (*Actaea racemosa*) (Staunton 2015; Hayden 2017). Similarly, the Spring Sooty Azure (*C. nigra*), a.k.a. the Dusty Azure, specializes on the flowers of Goat's-beard (*Aruncus dioicus*). And our 2018 Wildflower of the Year, Flowering Dogwood, has its own specialist, the Spring Azure (*C. ladon*).

Actually, the situation with Spring Azures is somewhat complicated. Lepidopterists recognize two subspecies of Spring Azures. The northern subspecies (*C. ladon* ssp. *lucia*) occurs from the Canadian subarctic to southern New Jersey and a few high-elevation locations in Virginia and West Virginia; they are specialists on the flowers of the Highbush Blueberry (*Vaccinium corymbosum*). The southern subspecies (*C. ladon* ssp. *ladon*), the Flowering Dogwood specialist, is

found from (roughly) mid-Ohio and mid-Pennsylvania south, but is found only somewhat sparsely in the coastal plain of the mid-Atlantic states (Wright & Pavulaan 1999).

Promoting native plants for the benefit of butterflies has the inevitable downside that caterpillars eat their host plants. You can't really have butterflies without accepting some loss (and sometimes considerable loss) of plant tissue. In the case of Spring Azures and Flowering Dogwoods, however, the downside of this unavoidable trade-off is relatively minor. The showy parts of Flowering Dogwood in bloom are leaf-like bracts, which are not particularly nutritious. Little damage from caterpillars is found on the bracts. Rather, the caterpillars consume the small yellow flowers that are tightly packed in the spaces within each group of four bracts. Consequently, damage from Spring Azure caterpillar herbivory is not easily noticed without careful, closeup inspection. The advantage for the insect is clear: pollen-containing anthers provide protein, nectar—produced because it entices pollinators—yields carbohydrates, and the succulent cells of floral tissue include at least a modicum of minerals, lipids, and nucleic acids. In general, floral organs, especially anthers and ovaries, are highly nutritious, providing much more food value than leaves or floral bracts. In this case, appreciative naturalists can have their pretty dogwoods and cute little azure butterflies too.

Evidently, the small yellow dogwood flowers provide an abundance of sugary molecules (carbohydrates). Not only do sugars



Spring Azure (*C. ladon*)

from dogwood flowers satisfy the caterpillar's metabolic needs, they also enable Spring Azure caterpillars to secrete sugary droplets that are fed upon by ants. In return, the ants protect the caterpillars from potential predators. (The same mutualistic relationship occurs between ants

and Appalachian Azure caterpillars feeding on Black Cohosh; ditto for several other species of *Celastrina*.) Of course, active feeding by Spring Azure caterpillars is limited to the relatively brief time that Flowering Dogwoods are in bloom. Nevertheless, in this brief period, the caterpillars manage to accumulate sufficient food to feed the ubiquitous and protective ants, grow to a size appropriate for pupation, and store enough food for the dormant pupa to survive until the following spring when it emerges as an adult Spring Azure butterfly. There really is no other food source; from egg to the emergence of adults, Spring Azures are wholly fueled by Flowering Dogwoods.

When you think about it, little Spring Azure butterflies flitting in the springtime sun are, literally, bits of Flowering Dogwood molecules, reconfigured by biochemistry into the body of a butterfly—just another of the many everyday miracles of life on planet Earth that we are privileged to observe and, in this case at least, understand. ❖

#### WORKS CITED

- Hayden, W. J. 2017. Black Bugbane and the blues. *Sempervirens Spring* 2017: 3–4.
- Staunton, N. 2015. Fairy candles, butterflies and ants. *Blazing Star* 16(2): 13–15. [Reprinted in *Wild News* 2015(4): 3–4.]
- Wright, D. M., and H. Pavulaan. 1999. *Celastrina idella* (*Lycidae: Polyommattinae*): a new butterfly species from the Atlantic Coastal Plain. *The Taxonomic Report* 1(9): 1–11.