Sempervirens
Fall 2023 The Quarterly of the Virginia Native Plant Society

VNPS awards two grants for native plant research

Masters candidate, Ivan Munkres, records data while undergrads Katie Barlow (left) and Mia Perry (right) measure milkweed.

The VNPS Board is happy to announce the awardees of the 2023 VNPS Grant Program. The Society received four proposals requesting over $36,529. Six reviewers carefully read and scored each proposal on its merits and projected contribution to Virginia's native flora as well as the research design, involvement of other researchers including undergraduate and graduate students and such. All received proposals were worthy of funding, but the Society's funds only allow around $15,000-$20,000 to be awarded each year.

The reviewers scores were close, and all the proposals were deemed important for unlocking the secrets of Virginia's native flora. However, two proposals stood out above all the others and the VNPS Board choose these two to support in 2023. One award for $10,913 was awarded to Dr. Harmony Dalgleish, Associate Professor in the Biology Department at William & Mary, for a project titled **"Clone or flower? – Uncovering the population consequences of clonal and sexual reproduction in plants."** A second grant for $6,656 was made to Melissa Burt, a Ph.D. candidate in the Department of Biological Sciences at Virginia Tech, for a study of **"Climate change impacts on seed dispersal in a common Virginia native wildflower, *Sanguinaria canadensis* (Bloodroot)."**

Dr. Dalgleish is a plant population ecologist whose research interests are focused on plant demography, the ecology of bud banks, and plant-animal interactions. For the past 11 years, she has focused on multiple aspects of our Virginia Common Milkweed, *Asclepias syriaca*. Along with Dr. Drew LaMar, also of William & Mary, they have constructed a population model for common milkweed using several years of collected demographic data. Their model suggests a clonal growth pathway, but they have no data to quantify a clonal structure and understand how clones reproduce, spread and/or decline within the milkweed populations. As many readers may know, plant reproduction in many species (estimated at 80%) is diverse in its capability to exhibit both sexual and asexual (clonal) reproduction. The clonal pathway to reproduction may be through corms, bulbs, rhizomes or budding from roots.

Preliminary genetic data indicates that milkweed populations are more diverse than they expected, leading them to pursue a more thorough analysis of genetic data to fully characterize the population dynamics of Common Milkweed. The VNPS funding will help support this fascinating line of research and help fill in the gap in the understanding of Common Milkweed population dynamics. The decline in North America milkweed populations is well known and due to increasing habitat loss through development, farming, increased herbicide use and mowing along roadways and powerline rights-of-ways. This has led to the decline in Monarch butterfly populations

(See Grants, page 10)

Melissa Burt with Mesocosms in greenhouse.

Enjoy native plants wherever you find them

From the President Nancy Vehrs

Fall is upon us, and we can put this oxymoronic humid but dry summer behind us. Despite the parched landscape that is my garden, there have been many botanical bright spots this past summer. Many of you know that I visit Huntley Meadows Park in Fairfax County every Monday morning, ostensibly for a bird walk, but I always monitor the plants. My favorite *Asclepias*, Purple Milkweed (*Asclepias purpurascens*) had another good year there, and its early summer blooms always delight me. As July unfolds, the Crimson-eyed Rose Mallows (*Hibiscus moscheutos*) light up the central wetland, truly a sight to behold. Native smartweeds now blanket the wetland in shades of white and light pink.

I'm always game to visit natural areas to catch special plants in bloom. A favorite place for spring flowers such as Trilliums and Lady's Slippers, the G. Richard Thompson Wildlife Management Area in Linden is also quite special in summer. On July 5 my friend Janis Stone and I sought out the delicate Canada Lilies (*Lilium canadense*) in bloom there. It was also the time for the enchanting Black Cohosh (*Actaea racemosa*), aka Fairy Candles, to be in peak form. We were also delighted to find White Bergamot (*Monarda clinopodia*) and Wild Hydrangea (*H. arborescens*) in full bloom and Tall Milkweed (*Asclepias exalta*) just beginning to flower.

Scaly Blazing Star (*Liatris squarrosa*) at Manassas National Battlefield Park. (Janis Stone)

Mid-July was the annual trip to Massachusetts for Harry's gathering of the Thoreau Society. With a European trip during that time last year, and two years off for the Covid-19 pandemic, it had been a few years since we had traveled there. Rain and stiflingly-humid weather made me forego some usual field trips, but I did manage to visit the Native Plant Trust's Garden in the Woods in Framingham. This is always a treat. Black Cohosh was in full bloom, and I managed to catch the tail end of the bloom time for the delightfully fragrant Sweet Azalea (*Rhododendron arborescens*), an imperiled species here in Virginia. Flame Azalea (*R. calendulaceum*) was also in bloom in its typical orange form. Virginia Meadow-beauty (*Rhexia virginica*) and Queen-of-the-Prairie (*Filipendula rubra*) were two pink flowers that I particularly enjoyed. The garden has an extensive native plant sales area and most of the plants were propagated at the Trust's nursery in western Massachusetts, Nasami Farm. I was astonished to find Trailing Arbutus (*Epigaea repens*) for sale there but resisted the urge

A summer walk at Huntley Meadows Park in Fairfax County revealed Purple Milkweed (*Asclepias purpurascens*) (left) and Crimson-eyed Rose Mallows (*Hibiscus moscheutos*). (Nancy Vehrs)

to buy this spring favorite because I don't have suitable conditions for it.

With "geezer pass" in hand, I made a solo visit to Shenandoah National Park in early August. I was pleased that I had not missed the flowering time for Turk's-cap Lilies (*Lilium superbum*), a particular favorite. Other highlights included Purple-flowering Raspberry (*Rubus odoratus*), Nodding Onion (*Allium cernuum*), and milkweeds, monardas, goldenrods, and Joe-pye-weeds that attracted multiple butterflies.

Closer to home, Janis and I set off to find a rare plant that was reported

Sweet Azalea (*Rhododendron arborescens*) (top) and Flame Azalea (*R. calendulaceum*) (bottom) found in the Native Plant Trust's Garden in the Woods in Framingham, Massachusetts. (Nancy Vehrs)

American Bluehearts (*Buchnera americana*) found at Manassas National Battlefield Park. (Janis Stone)

to be blooming in mid-August at Manassas National Battlefield Park: American Bluehearts (*Buchnera americana*), an imperiled species in Virginia. Though this species had been documented in the park, we were astonished at the great number of these purple flowers found in an uncut meadow. And, to our great surprise, as we were walking through the meadow, a park vehicle pulled up on the trail and out popped Marion Lobstein and Sally Anderson along with the park biologist and two interns. Besides the Bluehearts, we also found Green Milkweed (*Asclepias viridiflora*) and Scaly Blazing Star (*Liatris squarrosa*), and other meadow species. Our botanical appetites thus whetted after visiting the park, we drove over to a small remnant prairie in western Prince William. Whorled Milkweed (*Asclepias verticillata*), Rose-pinks (*Sabatia angularis*), and Southern Slender Ladies-tresses (*Spiranthes lacera*) were just a few of the beautiful species found blooming in this powerline easement along a gravel road.

I hope that your summer yielded some botanical treasures and that you are able to enjoy the wonderful flora of our great Commonwealth. ❖

Natural Heritage welcomes new staff member

From Your Natural Heritage Program

By Lesley Starke
Chief of Natural Areas Stewardship

Virginia Natural Heritage Program Welcomes Lesley Starke as the new Chief of Natural Areas Stewardship.

Lesley Starke started at the Virginia Natural Heritage Program in early April as the new Chief of Natural Areas Stewardship. A Virginia native, Lesley comes to the program by way of North Carolina where she was most recently the Plant Conservation Program Administrator. Below is a brief self-introduction from Lesley.

I was born and raised in the New River Valley where I developed a life-long love of the outdoors. My family shared with me their enthusiasm for camping, hiking, bird watching, and otherwise enjoying nature. I also grew to share my mother's love of plants.

I attended Hampshire College in Amherst, Massachusetts, where I studied biology. I became very interested in protecting endangered species. After college, I spent a summer as a field technician studying shorebirds on barrier islands. This was my first exposure to field biology and the study of landscape ecology—I was hooked. Soon after, I took a position in a New York state park where I was first exposed to invasive species management in protected areas, giving me a window into the world of natural resources management.

Shortly thereafter, I moved to North Carolina and earned a master's from Duke University's Nicholas School of the Environment, focusing on ecosystem science and conservation. While in this program, I studied the art and science of conservation, meaning not just the biology, ecology, and theory, but something about the work on the ground too. I interned with two local land trusts that gave me experience in conservation planning, land protection, and land stewardship.

One internship was a bridge to my first career-track job with the North Carolina Plant Conservation Program (NCPCP). Ten years later I was the Program Manager for NCPCP where I oversaw a statewide network of Plant Conservation Preserves, much like Virginia's Natural Area Preserves, but with a core focus on endangered plant conservation. Among myriad tasks and projects, I am most proud of our work to reintroduce extirpated species and to augment extremely vulnerable populations of imperiled plants. These projects required extensive networking and reliance on expertise and capacity of conservation partners throughout the Southeast, including US Fish and Wildlife Service, conservation horticulturalists with botanical gardens and universities, and a wide variety of other stakeholders. One thing I realized along the way was that most entities felt they had too few staff and too few resources to accomplish everything, but by partnering with each other, we were accomplishing effective projects impossible for any one entity on its own. I see similar success with the Virginia Natural Heritage Program and I am looking forward to supporting those successes.

Beyond the boots-on-the-ground work, I was also deeply involved in policy and regulatory efforts to protect imperiled species. Most notably I shepherded the most recent update of the North Carolina protected plant list as well as ushered plants onto North Carolina's State Wildlife Action Plan (SWAP) as species of greatest conservation need. Both efforts bring attention and valuable resources to plants as a critical component to the state's biodiversity. Upon arriving at Virginia's Natural Heritage Program at DCR, I was encouraged to learn that Virginia is actively working to also include plants into its SWAP, which will increase the scope of projects suitable for grants and governmental funding. I am eager to work with our Stewardship staff and our partners to find opportunities to fund habitat restoration and species recovery and enhancement projects with resources like wildlife grants and beyond.

Since April I have been working to get up to speed in my new role with the Natural Heritage Program. I have traveled to each of the stewardship regions and thus far visited one-third of the natural area preserves, with plans to get to them all before too long. I am impressed with the dedication, professionalism, and expertise among the stewardship staff and am keen to jump in with them this fall with several new and exciting projects. One new area I am eager to explore is seed-banking (and other ex situ conservation methods as needed) the most vulnerable rare plant populations from the natural area preserves as a safety measure against decline and damage. More than anything I am excited to be back in my home state where I can be part of the conservation present and future of the Commonwealth. ❖

Jocelyn Sladen 'returns to the earth'

Jocelyn Sladen at her beloved Wildcat Rocks.

Noted author, conservationist, and VNPS leader Jocelyn Arundel Sladen has rejoined the Earth at her beloved home ground on Wildcat Mountain. An ardent champion of efforts to protect nature, "Jocey" was born in Washington, D.C. She attended the National Cathedral School and Smith College before beginning her career as a journalist for the *Washington Daily News.*

Her passion and skill for sharing the wonders of the natural world were quickly noticed and put to good use. Jocey was the very first hire at IUCN (International Union for the Conservation of Nature), the world's first international conservation organization. There she joined the front lines of the nascent global movement for environmental protection. She never left. A perspective gleaned from "bush travel" in Africa and Nepal, South and Central America, and views into the ocean shared with her husband, marine engineer and inventor Ord Alexander, gave her a drive to improve human understanding and care for the natural world.

Launching from world travels into family life, she raised three children (and an endless line-up of other animals from raccoons to horses). She authored over 10 popular children's books, innumerable articles for *National Geographic*, children's nature magazine *Ranger Rick* and large portions of the first natural history encyclopedia for young readers, published by Funk & Wagnalls. Jocey (and the illustrator of many of her books, local artist Wesley Dennis), were award-winners and perennial favorites on book tours for the Children's Book Guild.

Jocelyn was an instigator–and she stuck by her chosen causes through all weather. In 1961, with her father Russell Arundel and brother Arthur Arundel, she donated land on Wildcat Mountain to create the Wildcat Mountain Natural Area–the Nature Conservancy's first preserve in the state of Virginia.

As an early member of VNPS and former president of the Piedmont Chapter, she hosted the Society's very first annual meeting on Wildcat Mountain. In addition to Wildcat Mountain, she went on to place her remaining land holdings under one of the first easements ever written by the Virginia Outdoors Foundation. Her partnership in work and life with biologist Dr. William Sladen resulted in the formation over 30 years ago of what is now known as the Clifton Institute–originating critical scientific studies for the protection of the natural integrity of the Piedmont. The institute provides education in natural history to people of all ages.

Jocelyn spearheaded all this important local work while maintaining an earth-wide perspective. She chaired national boards in times of great challenge: at the helm of Defenders of Wildlife in the 1970s leading the vanguard to protect "the animals nobody loves" such as coyotes and wolves. At the Center for Plant Conservation, she engaged many fellow conservationists to expand their thinking into plant ecology and biodiversity. She also took a founding role in the creation of Rachel's Network–an alliance of women environmental leaders, named in honor of Rachel Carson.

"Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts. The more clearly we can focus our attention on the wonders and realities of the universe, the less taste we shall have for destruction." ❖

Sempervirens (ISSN 1085-9632) is the quarterly newsletter of the Virginia Native Plant Society, Blandy Experimental Farm, 400 Blandy Farm Lane, Unit 2, Boyce, Va. 22620, 540-837-1600, info@vnps.org. Nancy Vehrs, President; Nancy Sorrells, Editor; Karen York, Office Manager. Original material in *Sempervirens* may be reprinted if credit is given to the Virginia Native Plant Society, to *Sempervirens*, and to the author of the material, if named. Readers are invited to send letters, news items, and queries for consideration. E-mail items to Nancy Sorrells at lotswife@comcast.net.

Next submission deadline: November 1, 2023

2023 WOY
Floral Nectar is Sugar Water

Article and photograph by W. John Hayden, Botany Chair

My first article for the 2023 VNPS Wildflower of the Year, *Eutrochium fistulosum*, Hollow Joe Pye Weed, addressed its general floral structure and that article was followed by another focused on its floral nectaries. For this article, let's turn our attention to the chemical and nutritional qualities of floral nectar. Unfortunately, I know of no detailed scientific literature on composition of floral nectar in the genus *Eutrochium*, but the general principles addressed here are certainly as pertinent to Joe Pye Weeds as they are for any other nectar-producing plants.

I have another motivation for exploring the dynamics of floral nectar and the pollinators that consume it: I have seen, from time to time, assertions made about floral nectar on VNPS-related social media that, frankly, strike me as significantly less than accurate. Most egregious, in my opinion, are statements I have seen claiming that floral nectar from native plants provides full and balanced nutrition for native pollinators whereas floral nectar from non-native plants provides nothing but sugar, in other words, as some have claimed, non-native nectar is nothing but "empty calories." Don't get me wrong, there are, indeed, numerous reasons to favor native over non-native plants in the landscapes that we humans attempt to manage; however, I believe that assertions about the alleged superior quality of native plant nectar over nectar from non-native species does not withstand critical scrutiny—this is a case that I endeavor to make in this article.

For starters, let us first consider floral nectar quality from a global perspective. Flowering plants exist on all continents and, if we set Antarctica aside, there are many nectar-seeking pollinators to be found on all the other continents. Is there any compelling reason to suppose, a priori, that nectar quality of plants native to Virginia would stand out as significantly more nutritious for pollinators than the nectar produced by all the flowers native to other continents? Is there any compelling reason to suppose that the dynamics of floral nectar production and nectar consumption by pollinators would be significantly different here in Virginia than anywhere else in the world? Are there any data, anywhere, to support the notion that floral nectar of Virginia native plants provides a more complete or more balanced nutritional package than can be found in the floral nectar of plants from other parts of the world? I know of no data to support claims that floral nectar from Virginia plants is any more beneficial than the floral nectar from other parts of the world.

At the core of the symbiotic relationship between flowering plants and their pollinators is the concept of pollinator reward. Pollinator rewards are things that plants provide to pollinators as inducement to elicit floral visits that result in successful transfer of pollen from anthers to stigmas. In the temperate zone, globally, pollen and/or nectar are, by far, the most common pollinator rewards. Of these two reward substances, pollen is a reasonably well-balanced, complete, nutritional resource. Angiosperm

Figure 1. Two Tiger Swallowtail Butterflies visiting *Eutrochium* flowers and consuming tiny sips of nectar produced by the nectaries present in each small floret.

pollen grains contain two or three living cells and those living cells are packed with the diverse molecules of life: carbohydrates, lipids, protein, and nucleic acids, along with an assortment of mineral nutrients. As food for pollinators—or for their young—pollen is nutritious stuff. Some readers may remember wild food enthusiast Euell Gibbons who extolled the nutritional value of easily gathered pollen from pine trees and cattails. Pollinators that gather pollen reap a rich nutritional reward and, most often, the pollen gathered serves to feed the next generation of developing pollinators—this makes sense, because flower-pollinating adults are already full-grown, but their offspring need a complete diet for proper growth and development. Pollen provides significant nutritional support for pollinators and their young.

Floral nectar, on the other hand, is essentially sugar water. Yes, there can be TRACE amounts of amino acids, other organic acids, proteins, vitamins, and mineral salts, but these substances are present in truly minor amounts. The nectar secreted by floral nectaries is supplied by phloem tissue, and the chemistry of phloem

contents is similar: sugar water, with TRACE amounts of amino acids, proteins, vitamins, and minerals. The sugars involved are sucrose and/or glucose and/or fructose. The proportions of the three sugar molecules that dominate floral nectar varies from species to species. However, metabolically, virtually any cell from any kind of living organism can interconvert these three sugars. Consequently, variations in the proportions of glucose, fructose, and sucrose found in nectar of different species has negligible effect on the nectar's overall nutritional quality. Further, total amount of sugar in floral nectar varies widely, from 10 to 70% (grams/100 ml; Nicolson 2021). Floral nectar is sugar water; seldom are non-sugar components of floral nectar any more than a fraction of one percent. Rest assured, floral visitors that do not intentionally gather pollen, are sipping nectar because of its sugar content **(Figure 1).**

Can humans survive or raise healthy children on a diet consisting only of sweet soft drinks? Of course not, and neither can pollinators, or their offspring, thrive on nectar alone.

What about hummingbirds? Hummingbirds consume prodigious amounts of naturally occurring floral nectar or sugar water from feeders, and casual backyard observations seldom document hummers consuming anything else. One might be lulled into thinking that sugar water is all the nutrition that hummingbirds need. But the truth is that hummingbirds also consume lots of insects. Insects provide much more nutrient dense food than nectar, and without insects in their diet, female hummingbirds would not be able to lay eggs, nor would hummer hatchlings develop to the point of fledging and foraging on their own. Hummingbird flight requires lots of energy; it should be no surprise that plants adapted for pollination by hummingbirds tend to have floral nectar with relatively high concentrations of sugar.

What about bees? Bees gather both nectar AND pollen from flowers. Without the ensemble of nutrients contained in pollen, larval bees would never reach adulthood. And sugars stored as honey are essential for survival of the hive through winter.

So, if not for healthy balanced nutrition, why do pollinators gather floral nectar? The answer is a matter of the basic physiology and biochemistry of sugar. Sugars, whether they be sucrose, glucose, or fructose, are readily metabolized by cells to provide the energy that fuels life processes. At the cellular level, it is convenient to think of sugar as a fuel molecule. Sugar fuels myriad energy-requiring physiological processes in animals and among those processes, locomotion is of major importance. Of course, movement is required for pollinators to find the flowers they visit. There are exceptions, but most pollinators arrive at flowers by the process of flight, and flight is, energetically, expensive. Simply put, the sugars of floral nectar fuel the animal movement component of the pollination symbiosis, which is an essential part of the process.

To me, assertions that floral nectar from native plants is nutritionally superior to floral nectar from non-native plants simply miss the point. Floral nectar is all about sugar and the energy-boost that it can provide to pollinators. And that basic fact of pollination biology holds true across the globe. Floral nectar provides, at best, mere trace amounts of the many molecules that make up balanced nutrition required for healthy growth and development.

So where did the misleading idea that native plants provide floral nectar with balanced nutrition come from? I suspect the error traces back to a garbled version of an oft-told parable about certain non-native plants like the Butterfly Bush (*Buddleja davidii)*. Flowers of Butterfly Bush produce abundant nectar and the plants are extremely effective at attracting pollinators, including butterflies, wherever it may be planted—whether here in Virginia or in its native China. Chinese butterflies need the sugars found in floral nectar just as much as the butterflies of Virginia do. Providing nectar for pollinators is, without doubt, a beneficial attribute of Butterfly Bush. The same can be said for many other non-native plants that are readily visited by native pollinators. However, the problem with non-native Butterfly Bush and other non-native plants here in Virginia is that few insects, whether pollinators or not, are adapted to lay their eggs on non-native plants. So, the floral nectar (sugar water) of these non-native plants is consumed by flower-visiting insects, but the living and more nutritious cells of their stems, or their leaves, are eaten by very few native animals. One may accurately characterize Butterfly Bush, the whole plant, as providing most native pollinators with nothing but sugar water—and from that point about the whole plant resembling a candy store, the story morphed, erroneously, to a supposed truth about nutritional quality of floral nectar.

The natural world is marvelously complex and endlessly fascinating. I applaud the enthusiasm about native plants that I see every day on social media. But, if we, as a society, want to be taken seriously, if we want our message to be heard, understood, and adopted by others, we must be careful about the accuracy of our communications. Floral nectar is sugar water, period. ❖

LITERATURE CITED

Nicolson, S.W. 2022. Sweet solutions: nectar chemistry and quality. Philosophical Transactions Royal Society B 377:2021.0163.

Maypop Flowers and Pollination: A Photographic Essay

By W. John Hayden, Botany Chair

Maypops, *Passiflora incarnata*, are common vine-like plants of Virginia's Piedmont and Coastal Plain regions. Its flowers are relatively large and, arguably, one of the most complexly structured flowers in our flora. Maypops thrive in my yard, where I let some vines grow among my flowers and vegetables, and where I can observe them frequently at various times during the day. Presented here is a photo essay that explores the morphology of these truly remarkable flowers, culminating in a description of how their intricate structure promotes pollination by carpenter bees.

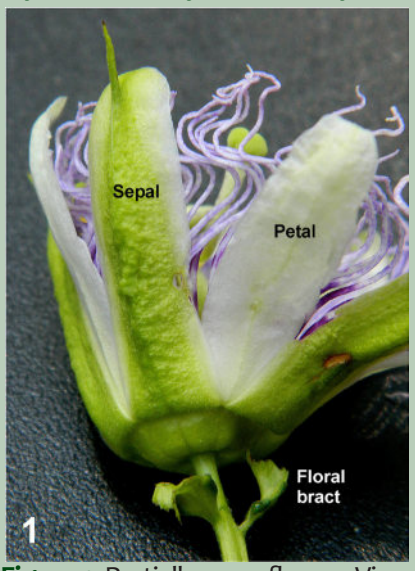


Figure 1. Partially open flower. Viewed from this angle, sepals and petals are easily distinguished: sepals are green, with a soft, subterminal, horn-like appendage; petals are nearly white and clearly positioned internal to the sepals. There are three gland-bearing floral bracts attached to the pedicel below the flower.

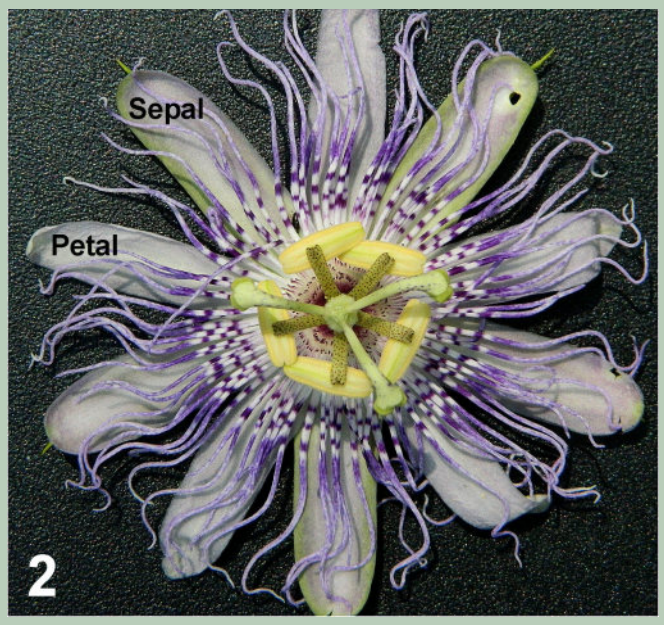


Figure 2. Fully open flower, viewed from above. From this angle, sepals and petals are similar in size, shape, and color, but sepals can be distinguished by their slightly green margins and horn-like appendages. Numerous elongate, banded, coronal filaments lie atop the sepals and petals. See Figure 3 for additional details.

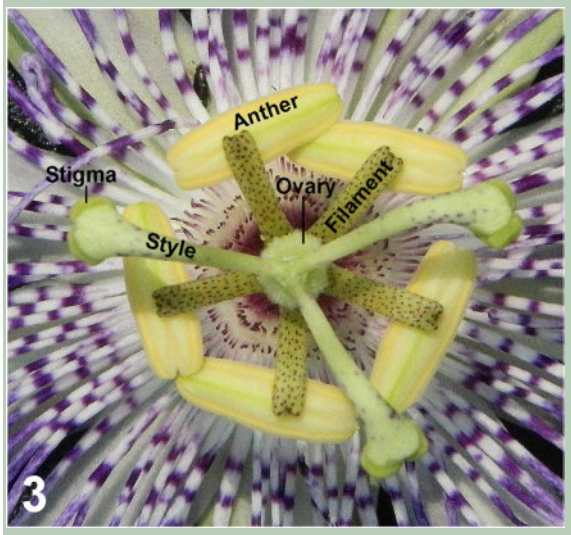


Figure 3. Higher magnification view of the same flower shown in Figure 2, highlighting the reproductive organs. Five stamens are attached directly below the ovary, and each stamen consists of a filament and a pollen-producing anther. Three styles emerge above the ovary and each bears a terminal, bilobed, stigma.

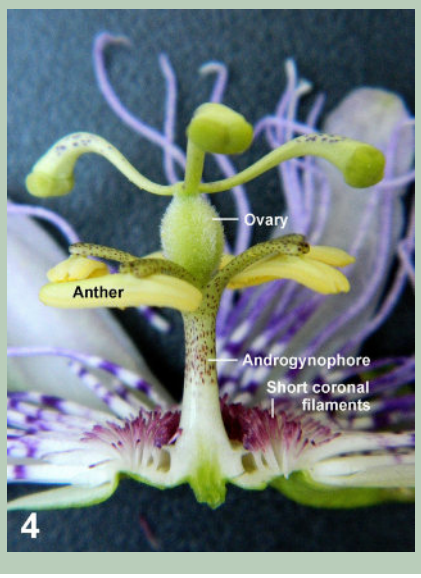


Figure 4. Partially dissected lateral view of a fully open flower. The androgynophore, an elongate extension of the central portion of the receptacle, elevates stamens and gynoecium above the rest of the flower, an essential aspect of the pollination mechanism for this species. Multiple short coronal filaments arise from the broad receptacle at the base of the flower.

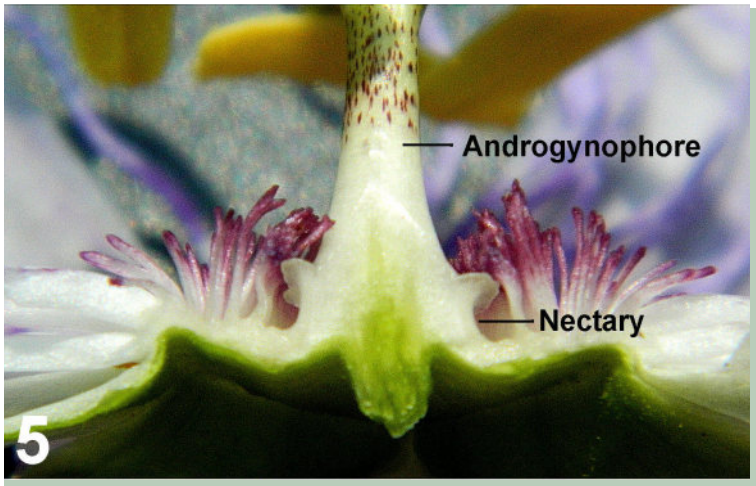


Figure 5. Nectary. A ring-like circle of cells located at the base of the androgynophore and the adjacent floor-like inner portion of the receptacle secrete nectar into the adjacent gap bounded externally by the innermost short coronal filaments.

Figure 6. Pollination. Maypop flowers are fragrant and adapted for pollination by carpenter bees. As bees arrive, they orient towards the center of the flower and probe the base of the androgynophore for nectar; usually, bees walk along the zone of short coronal filaments, as they search for fresh nectar secretions in different sectors of the flower. As the bees work the central portion of the flower, hairs on the top of the bee's thorax pick up pollen grains from the downward-facing anthers. Note that stigmas in this newly opened flower are elevated to a position well above potential contact by visiting carpenter bees.

Figure 7. Pollination, continued. Over the course of the day, anthers shed all their pollen and the styles progressively reposition the stigmas so that contact with the pollen-bearing dorsal thorax becomes inevitable. Notice how many fewer pollen grains remain on the bee's thorax at this time of day in comparison with the earlier stage shown in Figure 6. Each flower remains open for just one day. (Note: this is a different flower from a different location than the rest of the images shown here.)

Figure 8. In summary, sepals, petals, and coronal filaments provide visual attraction which, augmented by fragrance, serves to attract carpenter bees to the flower. Notably, bees have good vision in the blue to violet wavelengths of the spectrum. The androgynophore plays a key role: it elevates essential organs high enough to allow the bee's access to nectar and it places the downward facing anthers where pollen can be deposited on the bee. As bees visit multiple flowers, the pollen they carry will have come from multiple different flowers. Because stigmas reposition late in the day, the pollen they capture will likely be sourced from multiple different flowers, increasing the chances for beneficial cross pollination. Pollination of Maypop flowers by carpenter bees provides another example of the general biological axiom that form and function are intimately related.

Grants advance understanding

(Continued from page 1)

along with the other more than 450 insects known to feed on Common Milkweed. Not only will Dr. Dalgleish's research increase our understanding of clonal reproductive ecology in plants but it will aid land managers seeking to increase milkweed populations throughout North America. Further, thinking about the more than 450 other insects feeding on Milkweed, Dr. Dalgleish points out that, in Virginia, insect pollinator communities provide ecosystem services estimated in 2006 to be worth over $50 million annually – absolutely vital to Virginia's agricultural economy and ecosystem functioning.

In the second grant, Burt has focused her dissertation research on the effects of global change on seed dispersal by ants. We all have seen this year that climatic change is appearing to alter and restructure our ecosystems – the strange winter-spring climate along with the drought throughout this summer suggest potentially vast changes are upon us. As Burt points out in her proposal, mean annual temperatures are expected to rise by ~3°C by 2050, with simultaneous increases of up to 10% in mean annual precipitation though not evenly distributed thought the year. A lack of research involving controlled experiments to investigate the multifactorial effects of climate change on organisms and ecological communities hinders our ability to predict the consequences of these potential changes.

Ants are a significant disperser of seeds of the understory plants in our eastern deciduous forest, estimated around 30%. Ant dispersal of seeds is known as myrmecochory. Many of these plants are early spring ephemerals and very little is known as to how climate change will affect the flora. This seed dispersal mutualism with ants and our native wildflowers may be especially at risk under climate change due to the potential differences in the ability to move to different locations/ sites between the plants and the ants. Some studies examining the effects of increased temperature on ant activity or seed dispersal rates have found differing effects – some positive effects, some negative effects, and some no apparent effects. Certainly, other climate factors such as precipitation are involved, so to better predict the impacts of climate change on seed dispersal mutualisms, Burt proposed to study multiple climate factors that affect the plant and ant partners. She will be using our native early spring ephemeral Bloodroot, *Sanguinaria canadensis*, and its mutual partner the Winnow Ant, *Aphaenogaster rudis,* as her study organisms.

Her research will focus on the manipulation of both temperature and precipitation in seed dispersal in a controlled outdoor experimental natural environment (i.e., mesocosm). This will help to understand the combined effects on the mutualism between the ant-dispersed plant, (Bloodroot), and its seed disperser. Her goal for this experiment is to gain a mechanistic understanding of how human caused climate change factors independently and interactively affect ant-plant seed dispersal mutualisms. This work will give insights into predicting the fate of the Bloodroot under ongoing climate change. This work is also funded, in part, by the Translational Plant Sciences Center at Virginia Tech.

Ants with Bloodroot seeds in a mesocosm.

VNPS began this grant program in 2015, with a goal to "advance our understanding of the biology of native plants and their relationship to their ecosystems; teach students about the importance of native plants and habitat preservation; measure the benefits of native plant habitats to the economic and environmental health of the Commonwealth; or address similar topics."

Since then, VNPS has awarded over $100,000 to principal investigators and students from a variety of academic institutions and non-profit organizations. Information about the research grant program can be found under Resources on the VNPS website at https://vnps.org/research-grant-program/ or by emailing grantmanager@vnps.org.

Proposals for 2024 funding will be accepted from December 1, 2023, to the deadline of February 1, 2024.

––Kevin Howe, VNPS Grants Manager

New leaders elected at Annual Meeting

Society members and friends gathered in early October at the Virginia Institute of Marine Science in Gloucester. In addition to the exciting speakers and field trips, a slate of candidates was also elected to serve in a leadership capacity for the Society. Take a moment to read through these biographies and learn about the dedicated volunteers who are passionate about native plants and the VNPS mission of furthering the appreciation and conservation of our native plants and habitats.
Unless noted, all terms expire in Nov. 2026.=incumbents*

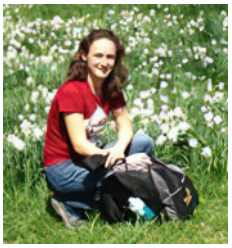
Second Vice President: Sally Anderson*

Sally Anderson has been a native plant enthusiast for many years and has served as Secretary, President and Second Vice President on the state board in addition to holding several offices on the Piedmont Chapter board. She has been the VNPS representative on the board of the Flora of Virginia Project since 2013 and co-teaches the botany section and leads a field trip for the Shenandoah Master Naturalists. She first learned botany in Texas where she was raised. These days she likes hiking with frequent plant stops, mostly in the mountains of Virginia and in the West Virginia highlands. She volunteers at the Native Plant Trail at Blandy Experimental Farm as well as Sky Meadows State Park.

Horticulture Chair: Laura Beaty*

Laura Beaty has been working outdoors since she was old enough to hold a rake. As the current VNPS Horticulture Chair and Potowmack Chapter Propagation Committee Chair, Laura manages the native plant beds of the Potowmack Chapter at Green Spring Gardens in Alexandria, growing and selling plants. Laura also volunteers to help restore nearby parks, and rescues native plants from development. She is a popular speaker on native plant-insect relationships and has presented the "Native Plant" component for Green Spring Garden's Master Gardener candidates. She worked for the U.S. Senate Committee on Energy and Natural Resources and the National Parks Conservation Association.

Secretary: Anna Finch



Anna Finch learned about the wonders of native plants at Huntley Meadows Park where she volunteered and worked. She is a Virginia and Oregon Master Naturalist. She loves to travel and hike with her husband. She also loves spring wildflowers especially *Claytonia virginica* (Spring Beauty). She resides in Staunton and is a Park Ranger at Grand Caverns in Grottoes. She recently completed her Certificate of Applied Positive Psychology where she is interested in encouraging others to connect to nature and themselves.

Fundraising Chair: Emilia Godwin

[To fill an unexpired term ending November, 2024]
Emilia Godwin comes to VNPS with more than 20 years experience in fundraising, development, communications, and nonprofit management, gained in a variety of cause-driven organizations. Born in Bulgaria, she moved to the U.S. in 1995.
She has master's degrees in business, history and cultural anthropology; she has been educating herself in horticulture, and growing native plants for many years. In addition to VNPS, Emilia is a member of the American Horticultural Society. She is married and has a daughter, Audrey, a sophomore at Christopher Newport University.

Treasurer: Melissa Korzuch

Melissa Korzuch is a graduate of Penn State University and has a degree in horticulture business. She spent the early part of her career as a director of a nonprofit in Washington, D.C., and currently works for Prince William County. She is the president and treasurer of the Prince William SPCA. She was active in Girl Scout leadership for many years. Melissa lives in Woodbridge with her husband Bill, daughter Natalie (currently a freshman at Penn State), and rescued Maine Coon cat, Roary.

Conservation Chair: Barbara Ryan*

Barbara Ryan has devoted herself to conservation and environmental issues since retiring from her 40 year professional career in 2018. In addition to degrees in economics, she holds a masters in sustainable landscape design and is a Virginia Certified Horticulturist, certified Level 2 Chesapeake Bay Landscape Professional, and certified Fairfax Master Naturalist. Through her sustainable landscape design firm, Barbara designs native landscapes

(See VNPS leaders, page 12)

VNPS Leaders

(Continued from page 11)

and stormwater solutions. She serves as the Tree Commissioner for the Fairfax County Dranesville District and on the county's Chesapeake Bay Preservation Ordinance Exception Review Committee. She is also on the McLean Trees Foundation and the McLean Citizens Association Environment, Parks, and Recreation Committee.

Registry Co-Chair: Rod Simmons*

Rod Simmons is a plant ecologist, with a background in biology, geology, and ecology who has extensively surveyed the flora and natural communities of the mid-Atlantic region. He is a Research Associate with the National Museum of Natural History, Smithsonian Institution; a member of the Virginia Botanical Associates; former contract botanist for National Park Service, NatureServe, and others and works closely with the Virginia and Maryland natural heritage programs. He has authored numerous technical reports, papers, and articles. He is a member and past president of the Botanical Society of Washington and serves on the boards of the Virginia and Maryland native plant societies. He is a frequent lecturer and field trip leader and is the Natural Resource Manager and Plant Ecologist for Alexandria.

Registry Co-Chair: Charles Smith*

Charles Smith is an ecologist with 31 years of experience in natural resource management, ecological restoration, large-scale project coordination, policy development, and public speaking. He has worked in public lands management overseeing natural resource inventory, planning and management for systems as large as 23,000 acres including forested ecosystems, grasslands, wetlands creation and restoration and riparian corridor and riverine system restoration. He also has a broad background in wildlife management, water quality assessment and monitoring, and regulatory review and permitting. Charles is a Certified Ecological Restoration Practitioner with the Society for Ecological Restoration (SER) and serves on the SER Marketing and Outreach Committee and the international Large Scale Ecosystem Restoration (LERS) Board. He has served VNPS as Co-Registry Chair and Membership Chair and is past President of the Prince William Wildflower Society. ❖

Support the VNPS 2023 Fundraiser for The Virginia Natural Area Preserves Fund.

Printed on recycled paper

Please note the expiration date on your mailing label and renew accordingly.

VIRGINIA NATIVE PLANT SOCIETY

Virginia Native Plant Society
Blandy Experimental Farm
400 Blandy Farm Lane, Unit 2
Boyce, VA 22620
www.vnps.org

Non-Profit Org
US Postage
PAID
Staunton, VA
Permit No. 80