Plant taxonomy at 60 mph

Biology professor and arboretum founder Norlyn Bodkin leads adventurous field course

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“See that on the right?” Norlyn Bodkin squawks into the CB handset. “What is that with the yellow flower? Anybody know?”

Too late, heads swivel, necks crane and eyes strain at the roadside rushing past the two JMU vans carrying Bodkin's Flora of Virginia May term field class east on U.S. 33 toward Swift Run Gap. The yellow specks blur hopelessly behind them. "Do you think that's going to be on the test?" a perplexed student asks another.

“This is plant taxonomy at 60 miles an hour,” Bodkin yells as he guns the van toward Skyline Drive and Big Meadows.

For the last 26 years, Bodkin's Flora of Virginia has offered a hands-on introduction to the identification, nomenclature and classification of 250 of Virginia's 3,000+ plant species in their native habitats. Students spend 13 of May term's 16 class days in the field and travel from Big Meadows on the Blue Ridge to Parsons, W.Va., on the Allegheny Plateau and visit most of the diverse plant communities in between. They study habitats that include floodplains, rocky outcroppings, mountain slopes, shale barrens and sphagnum bogs. With Bodkin's highway lectures carried on CB between the two vans, Flora of Virginia is educational outreach carried to the extreme.

“Truckers cut in and ask what a particular word means,” Bodkin says, "and often the language is not botanical."

The professor says he intends his high-speed commentary to teach students that the flora of Virginia surrounds them, on the roadside, underfoot, often under the lawnmower. He doesn't expect them to identify a particular plant on the fly. So, no, those yellow blurs - yellow sweet clover (*Melilotus officinalis*), by the way - will not be on the exam.

Serious plant identification and site inspection begin when the vans disgorge their passengers beside U.S. 33 near Swift Run Gap. They venture into the forest and spy cucumber tree (*Magnolia acuminata*); sweet birch (*Betula lenta*); Virginia spicebush (*Lindera benzoin*); witch hazel (*Hamamelis virginiana*) (Virginia’s only native fall-flowering shrub); pinxter flower (*Rhododendron periclymenoides*); tulip tree (*Liriodendron tulipifera*); false hellebore (*Veratrum viride*); gorgeous stands of yellow lady’s slipper (*Cypripedium parviflorum*); sedges (Cyperaceae), rushes (*Juncus* spp.), cinnamon (*Osmundastrum cinnamomeum*) and interrupted (*Osmunda claytoniana*) ferns; the showy orchis called *Orchis spectablis* [now *Galearis spectabilis]*; Allegheny blackberry (*Rubus allegheniensis*);

three kinds of trillium (*Trillium* spp.); wild geranium (*Geranium maculatum*); and the much despised garlic mustard (*Alliaria petiolata*) - all within 50 square yards.

"This is practical field work," Bodkin says. "I could go out and drag plant specimens into the classroom each day, but students wouldn't see the habitats, wouldn't see the plant associations. One of my professors conducted 'clothesline botany.' He'd bring in bags of plants and hang the specimens upside-down on a rope. For the duration of that course, my idea of plants were dried-up upside-down things. There's more to plant taxonomy than a mere list of names. This field course shows students the relationships between plants and other organisms, the community structure. After 26 years, this is still my favorite class. I love to teach it."

From its vantage point in the midst of the Eastern Deciduous Forest Biome and within easy reach of at least six distinct plant habitats, JMU is one of just a handful of institutions that offers a botanical field course. JMU's only other biology field course is Jim Grimm's Insects of Virginia May term course, which is on hiatus this year. [Fortunately, today, there are now many more field courses].

"We're lucky in this part of Virginia because we have all these habitats within 70 to 100 miles," Bodkin says.

In the course of a month, students acquaint themselves with the Oak Hickory Forest Association of the Blue Ridge and the Mixed Mesophytic and the Beech Maple Associations of West Virginia. They also climb more than 4,200 feet into the Appalachian Extension of the Boreal Forest Biome (the Taiga), where Red Spruce (*Picea rubens*) and Balsam Fir (*Abies balsamea*) predominate - a plant complex more Canadian than Virginian.

After the stop along Route 33, it's back into the vans for a stop along Skyline Drive. On this trip, biology's Emily Baxter (Branscome) is along to share her expertise on the native plants.

"Oh, this is going to make your eyes pop out," she exclaims upon reaching a stretch of yellow lady's slipper (*Cypripedium parviflorum*) ahead of everyone else.

"What did you find?" Bodkin calls and hurries ahead for a botanical huddle.

"This is going to be an incredibly long trip with both of them going at it," murmurs one student - who's been on these trips before apparently.

American basswood (*Tilia americana*), spiderwort (*Tradescantia virginiana*), toothwort (*Cardamine concatenata*), star of Bethlehem (*Ornithogalum umbellatum*), and cancer root (*Conopholis americana*), a diet staple of the thick woods' black bears, are among the finds.

The day's last stop is a trek across Big Meadow, where the deer stand their ground and where years ago Baxter (Branscome) had surveyed all 245 plant species for her master's degree.

There's golden Alexander (*Zizia* sp.), wild ginger (*Asarum canadense*), early meadow rue (*Thalictrum dioicum*), tall meadow rue (*Thalictrum pubescens*), red elderberry (*Sambucus racemosa*), Allegheny blackberry (*Rubus allegheniensis*), bluets (*Houstonia caerulea*), rare sedges (Cyperaceae) and rushes (*Juncus* spp.), deerberry (*Vaccinium stamineum*), maleberry (*Lyonia* sp.), blueberry (*Vaccinium* sp.), red chokeberry (*Aronia arbutifolia*), meadowsweet (*Spiraea* sp.), golden ragwort (*Packera aurea*), panicled dogwood (*Cornus* sp.), Turk's cap lily (*Lilium superbum*), fly poison (*Amianthium muscitoxicum*), hawthorn (*Crataegus* sp.), gray birch (*Betula populifolia*), slope bunchflower (*Veratrum* sp.), the non-native red spruce, gooseberry (*Ribes* sp.), hay-scented fern (*Dennstaedtia punctilobula*), white oak (*Quercus alba*) and marsh blue violet (*Viola cucullata*).

Throughout the month, students learn to walk with their heads down and their eyes searching the landscape for native specimens. They take notes on plant characteristics, habitats and botanical and common names, make drawings, and, where legal, collect specimens for poster display projects and for herbarium sheets bound for the JMU Herbarium in Burruss Hall (now the Norlyn L. Bodkin Herbarium). Bodkin has crammed as many field visits as possible into the month-long course, including a camping overnight at Dolly Sods in West Virginia and a stop at the state's federal FERNOW Experimental Forest along the Black Cheat River. There the U.S. Department of Agriculture's horticulturists and foresters study clear cutting, selective aged cutting and plant successional trends. The climatic conditions, with more than 60 inches of precipitation each year, produce a luxurious plant community very different from the Valley of Virginia.

"I guess it's not possible to see all 3,000 Virginia species in four weeks," Bodkin says with consternation, as though even after 26 years he still hasn't accepted the idea.

For career botanists, field work traditionally occurs at a less harried pace. Bodkin and colleague James Reveal traveled on hands and knees in 1981 when they discovered and named a rare plant to find growing in the mountains, *Trillium pusillum var, monticulum* (listed as *Trillium pusillum* var. *virginianum* in Flora of Virginia) or Shenandoah Wake-Robin. It was possibly the first new discovery of a flowering plant in the Mid-Atlantic States in 30 years. The plant is now a feature of the JMU Arboretum (now Edith J. Carrier Arboretum), of which Bodkin was the first director (as of 2018, not featured). He co-authored a treatment of the genus *Melanthium* (now *Veratrum* in Flora of Virginia) in the Lily Family for *Flora North America*, a sweeping multi-volume epic documenting the plants of North America.

On another day, the class is off to Waynesboro's Big Levels, where the wooded land is flat, rutted with seven sink holes and host to plants at the wet end of the moisture spectrum.

"It's easy to get lost here," Bodkin says as he notches a tree at the fork of a trail with his machete. "There are no vantage points in these woods. It's all flat. I got lost once - we made it out, obviously - but I had to climb a tree to see where we were."

Students tramp five miles through the woods and meadows, noting plant species and avoiding poison ivy (Toxicodendron radicans), and then into the woods at bog's edge. Bodkin removes his boots and jumps in, but sinks only to his ankles. He's saved from a full bath by a thick raft-like carpet of sphagnum moss (*Sphagnum* sp.) just below the waterline that, as Bodkin bounces on it, heaves and ripples like a giant trampoline for yards across the pond.

In and around the water grow sphagnum moss (*Sphagnum* sp.), golden club (*Orontium aquaticum*), swamp pink (*Helonias bullata*), pitcher plant (*Sarracenia* sp.) (not native), swamp azaleas (*Rhododendron viscosum*), blueberries (*Vaccinium* sp.), and huckleberries (*Gaylussacia* sp.).

For some students, Flora of Virginia is the first time they see the wild plants and fruits that their great-grandparents spoke about or first associate nursery hybrids and specialty stores' "exotic" fruits with their uncultivated relatives.

"It's an opportunity for them to see the natural fabric of their environment before the future encroachment of growth and development reduces or destroys plant habitats and native species," Bodkin says.

While students are busy trudging up mountains and into bogs matching names to plants, Bodkin encourages them to retain more than information. By learning nature's parts, he hopes, students will embrace the whole.

"Natural history isn't being taught much anymore," he says. "The field of biology has gone inside the cell to study molecular structure — which is essential," he insists, "but we need the other too. How can people appreciate and preserve what's around them if they don't *know* what's around them? Natural history should be a fundamental part of everyone's education. And students don't have to go live in the woods to study it. After all," Bodkin shouts as he guns the engine, "it's all within driving distance."

For this story, Pam Brock accompanied the Flora of Virginia class on two excursions in May 1995. Notes in blue reflect updates.