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Celebrating natives  
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## The Grapevine

By Maryann Whitman

### Gotcha' by Dorothy Boyer

In the last "Grapevine," a squib appeared under the title "Preserving biodiversity: An interesting twist." It was noted that, "Cup plant (*Silphium perfoliatum*) is the only known host plant of a moth (*Eucosma*), whose larvae feed voraciously on its rapidly growing terminal structures."



Wild Ones member Dorothy Boyer tried to pursue this subject, and found that I had given the wrong species of *Eucosma* – it should have been *giganteana*. Dorothy explained that this was important information to her, as something had been feeding on the "rapidly growing terminal structures" of her cup plants, with serious effects. She sends this reference site, <http://nathist.sdstate.edu/eucosma.html>, to show the damage wrought by the larva of *Eucosma giganteana*. For photos of the open wing of an adult, see #3098 at <http://mothphotographersgroup.msstate.edu/TG/Plate18a.shtml>.

### DNA bar coding of plants

In much the same way that a supermarket scanner uses the black lines in a bar code to identify its wares, small snippets of plant DNA may be coded and used to identify plants. A team of North Carolina researchers suspected that a fern sold in commercial nurseries might not be what the labels said it was, so they took a specimen to the lab to analyze its DNA. This led to the discovery that plants marketed as American natives may actually be exotics from other parts of the world.

As partial absolution, Kathleen Pryer, associate professor of biology at Duke University offered this explanation: "Ferns don't have flowers or fruits to help with identification, like many other plants. Fern species are particularly hard to contain in the close quarters of a greenhouse, where their spores can drift into neighboring pots. After a while, who's to know whether a plant is what the label says it is?" said Pryer. Eric Schuettpelz, another member of the team added: "Probably 50 percent of the plants I've collected from botanical gardens and greenhouses were incorrectly identified."

Since DNA bar coding was first proposed in 2003, the technique has caught on more quickly in animals than plants. A standardized botanical bar code remains elusive, partly because of the greater complexity of plant genetics, but also due to ongoing debate over which combination of genes will work reliably for the more than 400,000 species of land plants. For those in the business of buying and selling exotic plants, DNA bar coding could help identify harmful or invasive species, or prevent the sale of species which are rare or endangered. "This might eventually be able to help prevent people from taking things out of [or into ed.,] countries illegally," said Pryer.

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Some scientists foresee a future in which biologists, customs officials, and port inspectors can feed a piece of leaf or root into a handheld DNA scanner, which will then sequence a handful of genetic markers, and spit out the species name. Meanwhile, let's concentrate on buying plants of local genotype from local producers, whose ID skills we trust.

### **Superweeds**

The fears of many have been validated. The goose that might have laid golden eggs for a long time has been gutted. Monsanto's discovery of the herbicide glyphosate had the potential, given wise use, to be a boon to both farmers, who deal with weeds, and restorationists, who deal with invasives, for decades to come.

With the advent of Monsanto's genetically modified crops that could withstand the application of Roundup, farmers sprayed so much Roundup that the weeds it was meant to control, quickly evolved to survive it. "What we're talking about here is Darwinian evolution in fast-forward," Mike Owen, a weed scientist at Iowa State University said.

Farmers are now battling Roundupresistant weeds in their fields, and wondering why they bought into Monsanto's technology in the first place. For a recap on Roundup go to [www.wildones.org/download/roundupmyth.pdf](http://www.wildones.org/download/roundupmyth.pdf).

### **Spring creep**

As verbs these words are innocent enough, but as nouns together they represent a serious problem. People who pay attention to such things tell us that in the spring of 2010 natural events ran approximately 10 days ahead of schedule.

Jake Weltzin, the executive director of the U.S.A. National Phenology Network, and an ecologist at the U.S. Geological Survey, found that an earlier spring creates "mismatches" when some plants bud earlier, and the animals that depend on them have not adjusted their internal clocks. For example, bees might fly to an area that provides habitat for plants they historically pollinate, only to find those plants already

have bloomed. Weltzin says many insects, including caterpillars, are emerging earlier, too, but some birds have maintained their traditional migratory schedule. As a result, birds are arriving after the insects have metamorphosed into butterflies or other inedible forms.

Other scientists are finding that spring creep is affecting vegetation in New England. Charles Davis, an assistant professor of evolutionary biology at Harvard University, together with researchers at Boston University, discovered that in Concord, Massachusetts, climate change is especially harmful to certain groups of native plants linked by common ancestry.

Using data taken by Henry David Thoreau, Davis and his colleagues published a study in 2008 that found native plants that have maintained their historic flowering schedule tend to be the "losers." These groups include many of the area's most "charismatic" wildflowers: Orchids, roses, lilies, and dogwoods. Dr. Davis said that about 30 percent of the native species Thoreau documented in the 1850s are extinct in the area. Another 30 percent are so scarce that they likely will disappear.

Davis and his co-authors published a follow-up study in January that found invasive plants in Concord that flower earlier with the early arrival of spring are, by and large, the "winners." Davis believes the fact that they can adjust their flowering time to changing temperatures may give them an edge, allowing them to flourish and spread at the expense of native plants.

These findings, which Davis says likely hold true across New England and possibly the Mid-Atlantic, are significant.

Dr. Davis speaks as a classic, responsible scientist, couching his terms carefully, referring only to the ecoregion his study considered. It is very likely that his observations also hold true, to some degree, in all eco - regions of the country.

For more information on global climate change visit the Union of Concerned Scientists' site at [www.ucsusa.org](http://www.ucsusa.org).