



# Nature Notes



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### President's Corner

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#### *Rich Thoma*

The WGNSS calendar year finished off with our annual Spring Banquet. This year's featured speaker was **Dr. May Berenbaum** from the University of Illinois at Urbana-Champaign. Dr. Berenbaum is a respected researcher, teacher and chairperson within the Entomology Department with 30+ years of research on the chemical interactions between herbivorous insects and their host plants and the implications of such interactions on the organization of natural communities and the evolution of species. At the banquet, Dr. Berenbaum presented "**The Secret Life of Parsnips.**" Initially, one could ask why anyone would study for over 30 years the interaction of a small brown moth, the parsnip webworm, with its host, parsnip. Parsnip is eaten occasionally but for the most part, people consider it a weed. The insect at first look is small and has little impact on anything. From the very start however, Dr. Berenbaum drew the audience into the insect's world. She pointed out that every insect species is unique and, therefore, there are over a million ways to make a living. Each species has a story to tell. Part of May's way of speaking is to present the science by comparing it to something familiar. For example she used a familiar movie title "Postcards from the Edge...of a Leaf" with an added twist at the end, to describe the webworm's life. When she talked about the

coevolutionary arms race between plant and caterpillar, we were presented with the picture of missile. Dr. Berenbaum took a complex topic, filled with scientific jargon and presented it in a way everyone, from avid outdoor enthusiast to scientist, could enjoy and understand. We learned that furanocoumarins are extremely toxic to almost any animal that that eats them. People have to be very careful eating parsnips because the furanocoumarins can make us sick. Parsnips have lots of furanocoumarins, especially in the flowers which are considered the most toxic part of the plant. The parsnip webworm feeds on the most toxic part of the plant, the flowers and they survive. The roots, which are what people typically eat, are far less toxic. Dr. Berenbaum explained that parsnip webworms have highly specific detoxifying chemicals called cytochrome p450s that allow it to eat all the parsnip it needs. People also have p450s, but these are not as specific nor as effective at detoxifying furanocoumarins. Dr. Berenbaum was able to convincingly show that the interaction between parsnips and the parsnip webworm is a true coevolutionary arms race. Interestingly almost all of the data used for these studies was obtained from plants and insects found in the fields around the University of Illinois campus. Dr. Bernebaum had the audience enthralled throughout her presentation. Because the audience was so engrossed, I am convinced everyone went home knowing a little more about the hidden natural world around them.

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Congratulations to **Alice Tipton** from the University of Missouri-Columbia and **Steven Callen** from St. Louis University, who were presented as the recipients of the Menke and Mickey Scudder scholarship, respectively, at the banquet. Alice plans to do her research on restored dolomite glades. In particular, her experiments will look at the importance of mycorrhizal fungi in the reestablishment of glade plants. The test subject is *Rudbeckia missouriensis*. Her experiments will test if mycorrhizal fungi in the soil aid in the establishment of glade plants. Steven plans to build a greater understanding of the life history of the invasive kudzu, *Pueraria montana*. He is looking for trait variations in different kudzu populations with the idea that one or a small set of factors can be used to help control this species. Thanks to all the members of the scholarship committee, **Emily** and **John Christensen** (co-chairs), **Anne McCormack**, **Mark Paradise**, **Ted MacRae** and **Ed Schmidt** for giving of their time and doing all the work necessary to make sure that the most deserving students receive awards.

Also at the banquet, **Rose Ann Bodman** was recognized as recipient of the 2012 WGNSS Lifetime Achievement Award. Rose Ann has been a member of WGNSS for over 40 years, joining in 1970. She is an avid birder and has gone on countless WGNSS birding trips. Over these years she has gotten involved, taking on the President's

role for 2 years (1974-1975), and wrote the birding reports for *Nature Notes* for 20 years (1977-1998). At the banquet, longtime friend and fellow birder, **Jackie Chain**, presented Rose Ann with the Lifetime Achievement Award.

Photos from the banquet can be found later in this issue of *Nature Notes* [Editor's note: see pg. 17].

On a more somber note, long time member of WGNSS, **Betty Nellums**, recently passed away. She was active in the Botany Group and gave weekly wildflower walks at Shaw Nature Reserve. Her love of the outdoors was well known for anyone who had a chance to join her on one of her field trips. We in WGNSS will miss Betty greatly.

Please remember that the next issue of *Nature Notes* will arrive in late August. While *Nature Notes* is taking a summer break, however, WGNSS will continue to have many activities throughout the summer. Most are listed in this issue of *Nature Notes*. Additional information about summer activities can be found on our website, [www.WGNSS.org](http://www.WGNSS.org) and through e-mails sent by the Natural History Chairs. We on the board would like to wish everyone in WGNSS a fun, safe and outdoor-filled summer.



## March Bird Report

*David Becher*

This March was the warmest on record with temperatures reaching towards ninety degrees. This appeared to accelerate the migration of some earlier species migrating up from the southern parts of the United States and the departure of some wintering birds. In terms of birds except for a few earlier than normal movements it was a very typical March without any great excitement.

The winter ducks began to depart a bit earlier than usual, presumably because of the warm weather.

The first Blue-winged Teal were reported from several locations on about the fourth. At least one and possible two Long-tailed Ducks were seen at Riverlands by Charlene Malone on the 17<sup>th</sup>. Al Smith photographed what appeared to be a hybrid Blue-winged/Green-winged Teal at Columbia

Bottom on the 18<sup>th</sup>. It remained until at least the 25<sup>th</sup> when it was observed by the Saturday group.

David Becher found a Common Loon at the Borrow Pits near Horseshoe Lake in Granite City on the 24<sup>th</sup>. The first Common Egret of the year was reported at Horseshoe Lake by Archie Keiper. On March the fourth Dave Rogles and Tom Borman observed a Prairie Falcon at the Kings Lake unit of B. K. Leach CA.

The first shorebirds of the year began to arrive during the month. Rad Widmar reported a few Golden Plover from Columbia Bottom CA on the 10<sup>th</sup> and a few were seen in that area during the month. Tom Rauch found the first Avocet of the spring on the 28<sup>th</sup> at Riverlands. Bryan Prather reported a Pectoral Sandpiper from the Little Creve Coeur area on the sixth and more arrived thereafter. Greater Yellowlegs began to appear around the 10<sup>th</sup> when several were reported by Rad Widmar at Columbia Bottom CA. Wilson's Snipe were reported from many places in large numbers this spring.

There were scattered reports of Bonaparte's Gulls and plenty of Ring-billed Gulls, but little else in the way of Larids.

More than the usual number of Great Horned Owl nests were found this year including one in the Chesterfield Valley as well as at Busch Wildlife, Forest Park and two in Tower Grove Park. Success in producing young was apparently also good.

The Northern Shrike continued to be seen at Broemmelsiek County Park until at least the 17<sup>th</sup>.

The first Blue-gray Gnatcatchers arrived at the end of the month. Scott Johnston reported two American Pipits near Teal Pond at RMBS on the seventh. Reports of this species were relatively few this spring.

The first Louisiana Waterthrush report was from Mike Brady at Castlewood on the 16<sup>th</sup>. This is a fairly early date, but not a record. Charlene Malone found Yellow-throated Warbler on the 17<sup>th</sup> at Rockwoods Reservation, which is a very early date. On the 27<sup>th</sup> Charlene found a Northern Parula and a Black-and-White Warbler also at Rockwoods. Vesper Sparrow reports were limited this spring, but Josh Uffman reported four at Columbia Bottom on the 18<sup>th</sup>.



American Coot, March 24, 2012. Photo by D. Becher.



Northern Shrike, March 11, 2012. Photo by D. Becher.



Rusty Blackbird, Columbia Bottom CA, March 8, 2012. Photo by D. Becher.

Great-tailed Grackles continued to be reported near the intersection of Church and Dwyer Roads, where they have occurred every winter for the last few years, during the month. More unusually, on the 18<sup>th</sup>, Josh Uffman reported one from

Columbia Bottom CA. An encouraging number of Rusty Blackbirds were reported this month. Numbers at Columbia Bottom CA appeared to be in the hundreds at times.

Al Smith had a backyard Pine Siskin on the 20<sup>th</sup> for perhaps the only report. Like most northern seed eaters, they were notable mainly for the absence this winter.



## March Botany Report

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*Compiled by George Van Brunt*

**March 5, 2012—Katy Trail State Park, St. Charles County, Missouri** (contributed by Steve Turner).

Time: 9:30 a.m.–12:30 p.m.

Conditions: Sunny, 31°–45°F.

Participants: Richard Abbott, Jerry Castillon, Wayne Clark, Nancy Clark, Jack Harris, Nels Holmberg, Jeannie Moe, Larry Morrison, John Oliver, Fr. Sullivan, Ruth TenBrink, Steve Turner, George Van Brunt (13 attendees).

The day's group of 13 botanists assembled at the Klondike boat launch parking lot on a freezing March morning, and over the next two hours strolled about 0.9 miles westward, generally along the Katy trail. One of the first flowering specimens noted was *Acer saccharinum* (silver maple), with beautiful red clusters of tiny flowers along the branches. On closer inspection these flowers appeared hermaphroditic, with red styles protruding and anthers appressed to the flower base. As *A. saccharinum* is supposed to be a monoecious species, this observation provoked discussion on plant sexual expression. Plants are often classified as being hermaphroditic (having flowers with both male and female parts) or diclinous (having separate male and female flowers), with the latter term being further subdivided into monoecious (male and female flowers on the same individual) or dioecious (male and female flowers on different individuals). However, plants in the real world do not always conform crisply to our definitions, thus necessitating additional terminology. Polygamy indicates both hermaphroditic and unisexual plants in a population, and polygamodioecious species

have bisexual and male flowers on some individuals and bisexual and female flowers on other individuals. Since the sexual characteristics of a plant's flowers can therefore depend upon the individual chosen for study, some knowledge of the species under examination is useful in correctly interpreting the observations.

In some cases, such as with *Acer*, the situation is further complicated by form which does not always predict function. In our specimen of *A. saccharinum*, the anther-like structures that were observed are likely staminodes, which are morphologically similar to anthers but which produce little or no fertile pollen. We are grateful to Richard Abbott for helpful discussion and clarification of these concepts.

As we moved toward the boat ramp, we noted that this area was filled with several feet of partially dried mud, the result of periodic flooding of the Missouri River. These transient mud flats were home to numerous lushly leafy rosettes, a few of which had open flowers. These were keyed to *Ranunculus sceleratus* (cursed crowfoot), a species known to inhabit alluvial mud plains and river sloughs. The flowers are small and inconspicuous, measuring well under 1 cm in diameter, with pale yellow petals. The plant is poisonous to cattle which graze upon it, turning their milk bitter and red-tinted, and can cause contact dermatitis in sensitive individuals.

Other plants flowering within the vicinity of the boat launch included *Lamium amplexicaule* (henbit), *L. purpureum* (dead nettle), *Cardamine hirsuta* (hoary bitter cress), and *Microthlaspi perfoliatum* (penny cress). In our experience, this last, despite its specific epithet, typically has cauline leaves which are auriculate but not perfoliate.

Proceeding along the trail proper, we encountered several specimens of *Gymnocladus dioica* (Kentucky coffee tree), along with numerous fruits of this species scattered upon the ground. The broad, dark brown pods each contain several large, hard, dull greenish seeds embedded in a mucilaginous matrix (see photo). The bark of the tree is distinctive, being ornamented with numerous sharp, stiff longitudinal ridges. The pith of twigs and smaller branches is also recognizable for its unusual peach-salmon color. Another tree noted along the way, sometimes in monospecific stands,

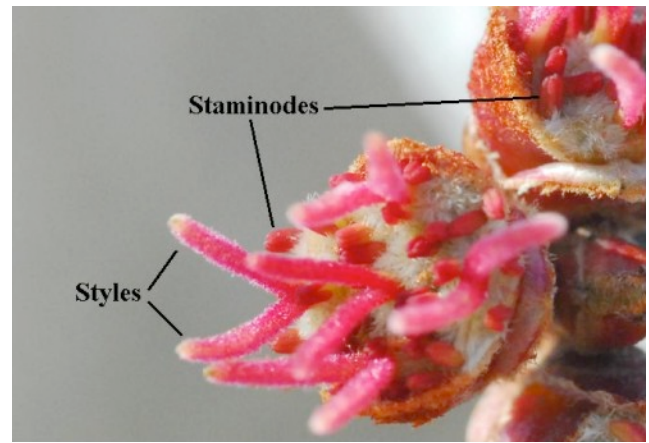
was *Ailanthus altissima* (tree of heaven). The fruits of this exotic and potentially invasive species are samaras, with a large papery wing surrounding a small, hard seed a few millimeters in diameter.

Probably the most abundant herbaceous species in evidence along the trail was *Stellaria media* (common chickweed), whose creeping habit and small roundish leaves formed a green carpet in many places. Interestingly, in a few small areas very close to exposed rock faces, the morphology of the plant was altered significantly, with leaves that were several times the size of those of plants growing elsewhere. There was some discussion about the possibility of these larger plants representing a different species, such as *S. pallida* (pale chickweed) or *S. neglecta* (greater chickweed), but the tentative conclusion is that the altered morphology was probably due to environmental factors, perhaps resulting from the thermal inertia of the rock face. A sample of the large-leaved plants was vouchered.

At the far end of our excursion along the Katy Trail, a few members of the group also explored a side trail running southeasterly along Bigelow Creek down to the Missouri River. In the mud banks near the river were found a few specimens of *Erigeron philadelphicus* (Philadelphia fleabane), which were actually flowering two months ahead of the plant's normal early May bloom time. The flowering habit in this case was anomalous, with the flowers appearing more or less directly out of the basal rosette rather than on stalks.

Miscellaneous other plants found in bloom included *Corydalis flavula* (pale corydalis) and *Taraxacum officinale* (dandelion), and vegetative features of various other plants not in bloom included lush ferny growths of *Conium maculatum* (poison hemlock), the spotted leaves of *Phacelia bipinnatifida* (forest phacelia), dried stalks of *Hydrangea arborescens* (wild hydrangea), large and fuzzy leaves of *Verbascum thapsus* (flannel plant), small but already armed individuals of *Urtica dioica* (stinging nettle), the distinctly four-angled twigs of *Fraxinus quadrangulata*, stalks of the ever-present *Alliaria petiolata* (garlic mustard), and vines of *Campsis radicans* (trumpet creeper) and *Ampelopsis cordata* (raccoon grape).

**March 12, 2012—Young Conservation Area,** Jefferson County, Missouri (contributed by Wayne



*Acer* flower morphology. Photo by Steve Turner.



*Gymnocladus dioica*, fruits and seeds. Photo by Steve Turner.

Clark, with additional contributions by Steve Turner).

Those in attendance were: Wayne Clark, Nancy Clark, Bob Coffing, Jack Harris, Pat Harris, Nels Holmberg, Louise Langbein, Larry Lewis, Ruth Lewis, John Oliver, Fr. Sullivan, Steve Turner, Kathy Thiele, Kera Thiele, Dave Tylka (15 attendees).

The weather was sunny with the temperature around 75 degrees F at the end of the field trip around noon. The high of the day was in the mid 80's. The trip began on the Taconic Loop Trail on the north side of the parking lot. We followed the trail around and crossed the new bridge over LaBarque Creek. Later on, some of us left the trail and explored the LaBarque Creek floodplain. Near the end of the trip we found a shallow place to cross the creek and headed back to the parking lot.

Many of the plants in bloom were about a month early. A couple of plants in bloom that you may find in your yard were *Lamium amplexicaule* (henbit) and *L. purpureum* (dead nettle). Dried specimens

from last season that could be identified were *Elephantopus carolinianus* (elephant's foot), *Chasmanthium latifolium* (river oats), *Aristolochia tomentosa* (woolly pipevine), *Cirsium discolor* (field thistle), *Helianthus mollis* (ashy sunflower), and *Solanum carolinense* (horse nettle). Examples of plants in bloom were *Claytonia virginica* (spring beauty), *Cardamine hirsuta* (hoary bitter cress), *Isopyrum biternatum* (false rue anemone), *Lindera benzoin* (spice bush), *Erigeron bulbosus* (harbinger of spring), *Danthonia spicata* (poverty grass), *Polemonium reptans* (Jacob's ladder), *Mertensia virginica* (blue bells), *Dicentra cucullaria* (Dutchman's breeches). Trees noted were *Carya cordiformis* (bitternut hickory), *Juniperus virginiana* (red cedar), *Asimina triloba* (pawpaw), *Carpinus caroliniana* (blue beech), and *Gymnocladus dioica* (Kentucky coffee tree). Other plants are *Allium vineale* (field garlic), the most common garlic found in yards, *Reboulia hemisphaerica* (liverwort), *Asplenium platyneuron* (ebony spleenwort), *Asplenium rhizophyllum* (walking fern), *Anemone acutiloba* (hepatica), *Equisetum hyemale* (scouring rush), and *Galium concinnum* (shining bedstraw).

**March 19, 2012—Silver Mines Recreation Area (NFS)** (contributed by John Oliver).

Time: 9:30–11:30 a.m.

Participants: Fr. Sullivan, Wayne Clark, Nancy Clark, Steve Turner, Ruth TenBrink, Alan Brant, Larry Morrison, Jack Harris, Pat Harris, Richard Abbott, John Oliver.

To the uninitiated, the role of the botanist would seem to be restricted to the study of plants, while the soil, rock, and water profile of an area would be of more interest to a geologist. In reality however, as students of nature we benefit from a more global understanding of the interactions of the natural communities we visit grouped together with their surroundings that may include soil moisture, rock substrates, topography, as well as natural and occasionally man-made processes. The distribution of plant species and plant associations are generally related to different rock types and soil pH, a relationship noted repeatedly by Julian Steyermark in his descriptions of the flora of Missouri. These associations are most obvious in areas where the underlying rock is close to the surface as it often is in the Ozark area south of the Missouri River. In the vicinity of St. Louis we can make distinctions between the dolomite glades of

Jefferson County and the sandstone areas of Labarque Creek, and expect to see two different suites of plant species in the two areas. Another type of community is associated with the igneous areas of the St. Francois Mountains centered in Iron and Madison Counties. This geology is rare enough to attract University field trips from fairly distant states for the unique opportunity to study the only extensive outcrops of Precambrian rocks in the continental interior of the United States. These rock units take the names of well-known features such as Taum Sauk rhyolite. The Silver Mines Recreation Area is along the wildest and most scenic section of the St. Francois River, which extends upstream to the Tiemann Shut Ins, another favorite field trip location. The rapids which challenge kayakers are the result of the river's cutting a path through intensely fractured but extremely resistant igneous rock, here known as the Silver Mine granite formation. The name of the recreation area and the granite is a reminder of the historic mining activity common in much of Missouri's old mountains, where ancient layers of rock, with their mineral treasures, lie close to the surface. (The use of the plural in naming the area is not accidental; records show the location of at least 19 silver mines in Madison County.) The silver was produced for many decades as a by-product of lead mining, but never profitable enough to be mined for its value alone. Nonetheless, the lead ore in this area contains a relatively high content of silver and was noted as early as 1855 when the area along the St. Francois was recorded as "mineral land," and systematic prospecting began in 1877. Silver was obtained from the argentiferous galena in the quartz veins. Approximately 50 tons of lead and 3,000 ounces of silver were produced up to the time of closing the mines which was about the middle 1880's. In 1916, tungsten was produced during the war years and again for a short time beginning in 1927 and continuing sporadically until 1946. An estimated 120 short tons of tungsten concentrates were produced, largely by high-grading the old dumps, and from shallow surface diggings.

The earlier period of mining saw a short-lived boom in the area: a town with a post office, school, bank, and businesses was established about a half mile west of the Einstein Mine. Of the several quartz veins mined and prospected in the area, vein no. 1, the Einstein, was the most

productive; it accounted for the bulk of the early lead and silver production. It was entered by the River Tunnel, the entrance to which may still be seen about 50 feet above river level. At the height of the mining activity, when some 200-300 miners were employed by the Einstein Mining Company, the population of the town was between 800 and 900. A prominent feature of the area is a breached dam constructed in 1879. Foundation remnants on the west bank south of the dam are all that remains of the large mill constructed during the silver and tungsten mining periods. Examples of the minerals that were once mined can still be found in the abundant tailings just downstream of the stone dam. They consist of metallic-appearing sulfides such as sphalerite, arsenopyrite, and marcasite embedded in opaque veins of quartz. Careful searchers can also find crystals of wolframite, a tungsten ore that was mined briefly during World War II when access to other sources was cut off, and small grains of topaz, which caused the earlier silver miners of the area considerable economic grief by wearing out their diamond-tipped drills more quickly than anticipated. Small granules of highly magnetic magnetite and slightly magnetic ilmenite (a titanium ore which also contains iron) can be found and extracted with a strong magnet from the patches of black sand left along the beach-like margins of the pools below the dam.

Not surprisingly botanists find species here that are not common in the sedimentary rock soils nearer to St. Louis. Though not restricted to igneous areas, the following species observed on the trip are certainly more common in Silver Mines R.A. than in the immediate St. Louis area: *Cerastium velutinum* (field chickweed), *Erythronium americanum* (yellow trout lily), *Hamamelis vernalis* (Ozark witch hazel), *Krigia virginica* (dwarf false dandelion), *Phlox bifida* (cleft phlox), *Pinus echinata* (shortleaf pine), and *Sedum ternatum* (woodland stonecrop). We were happy to welcome Alan Brant who joined us for a too-infrequent visit. He is a well-known botanist from southeast Missouri who has well over 2,000 collections in the Missouri Botanical Garden herbarium and was a contributor of treatments for four families to Volume 2 of *The Flora of Missouri* (Yatskievych, 2006)—Balsaminaceae, Cabombaceae, Ceratophyllaceae, and Elaeagnaceae. Beautiful spring weather,



The distinctive bark of *Populus alba* (white poplar), an introduced species naturalized at Silver Mines R.A. Photo by John Oliver.



*Sanguinaria canadensis* (bloodroot), a member of the Poppy family. Photo by John Oliver.

combined with the sounds of the wind whispering in the pines overhead and the answering rush of the rapids through the granite shut-ins were the perfect accompaniment for a great outing.



*Glandularia canadensis* (rose verberna) in bloom at Silver Mines R.A. Photo by John Oliver.



It's always a treat to find *Erythronium americanum* (yellow trout lily). Photo by John Oliver.

The complete list of plant species observed on this trip: *Allium vineale* (field garlic), *Amelanchier arborea* (common serviceberry), *Aplectrum hyemale* (Adam and Eve orchid), *Asplenium platyneuron* (ebony spleenwort), *Barbarea vulgaris* (yellow rocket), *Boechera laevigata* (smooth rockcress), *Cardamine concatenata* (cutleaf toothwort), *Cardamine hirsuta*

(hairy bittercress), *Carex albicans* (whitening sedge), *Carpinus caroliniana* (blue beech), *Cerastium velutinum* (field chickweed), *Chaerophyllum procumbens* (spreading chervil), *Claytonia virginica* (Eastern spring beauty), *Corydalis flavula* (yellow fumewort), *Dicentra cucullaria* (Dutchman's breeches), *Draba brachycarpa* (shortpod draba), *Draba verna* (whitlow grass), *Enemion biternatum* (eastern false rue anemone), *Erigenia bulbosa* (harbinger of spring), *Erythronium albidum* (white trout lily), *Erythronium americanum* (yellow trout lily), *Euonymus fortunei* (winter creeper), *Euphorbia commutata* (wood spurge), *Galium aparine* (cleavers), *Glandularia canadensis* (rose verberna), *Hamamelis vernalis* (Ozark witch hazel), *Houstonia pusilla* (tiny bluet), *Juniperus virginiana* (eastern red cedar), *Krigia virginica* (dwarf false dandelion), *Lamium amplexicaule* (common henbit), *Lamium purpureum* (purple deadnettle), *Lindera benzoin* (spice bush), *Mertensia virginica* (Virginia bluebells), *Microthlaspi perfoliatum* (claspleaf pennycress), *Muscari botryoides* (common grape hyacinth), *Notboscordum bivalve* (false garlic, crowpoison), *Oenothera filiformis* (longflower gaura), *Ostrya virginiana* (hop hornbeam), *Phlox bifida* (cleft phlox), *Phlox divaricata* (woodland phlox), *Pinus echinata* (shortleaf pine), *Poa annua* (annual blue grass), *Podophyllum peltatum* (mayapple), *Populus alba* (white poplar), *Prenanthes altissima* (tall white lettuce), *Ranunculus harveyi* (Harvey's buttercup), *Ranunculus micranthus* (rock buttercup), *Rhus aromatica* (fragrant sumac), *Sambucus canadensis* (American black elderberry), *Sanguinaria canadensis* (bloodroot), *Saponaria officinalis* (bouncing bet), *Securigera varia* (crown vetch), *Sedum ternatum* (woodland stonecrop), *Stellaria media* (common chickweed), *Symphoricarpos orbiculatus* (buckbrush), *Taraxacum officinale* (common dandelion), *Thalictrum thalictroides* (rue anemone), *Viola bicolor* (field pansy), *Viola sororia* (common blue violet), *Woodsia obtusa* (blunt-lobe woodsia), *Zanthoxylum americanum* (prickly ash).

**March 26, 2012—Creve Coeur County Park, St. Louis County, Missouri** (contributed by George Van Brunt).

Jack Harris, Pat Harris, Burt Noll, Jerry Castillon, John Oliver, Dick Russell, Jim Wiant, Richard Abbott, Paul Corley, and George Van Brunt joined Fr. Sullivan at the gravel parking area on Street Car Drive in Creve Coeur Park. We have been doing plant surveys of the upland area of the park for the



St. Louis Audubon Society's Upland Forest Restoration Project. This was our third survey, the previous ones taking place on July 5, 2010 and June 6, 2011. The goal of the project is to restore natural habitat through the removal of bush honeysuckle and planting of native species. As in our previous surveys, we botanized around the parking lot area and then walked the Bootlegger's Run Trail, both on the western and the eastern sides of the parking lot.

A very early spring has followed the 4th warmest winter on record in St. Louis. Fr. Sullivan remarked that, botanically speaking, it looked like mid April rather than late March. During our field trip the sky was sunny and temperatures were in the upper 60°Fs to low 70°Fs. Plants blooming in the grassy area in the vicinity of the parking lot: included *Planodes virginicum* (formerly *Sibara virginica*) (Virginia rock cress), *Capsella bursa-pastoris* (shepherd's purse), *Duchesnea indica* (Indian strawberry), *Lamium amplexicaule* (henbit), *Cercis canadensis* (redbud), *Taraxacum officinale* (common dandelion), *Viola sororia* (common violet), *Stellaria media* (common chickweed), *Viola bicolor* (Johnny-jump-up), and *Quercus palustris* (pin oak).

It was obvious that the people working on the restoration project had done considerable work in the forested area west of the parking lot. The forest floor had been opened up by the removal of honeysuckle and was covered by a carpet of spring ephemerals. In this area along the Bootlegger's Run Trail, color was provided by the blooms of *Claytonia virginica* (spring beauty), *Ranunculus micranthus* (small-flowered buttercup), *Trillium recurvatum* (purple trillium), *Chaerophyllum procumbens* (wild chervil), *Veronica hederifolia* (ivy-leaved speedwell), *Phlox divaricata* (wild sweet William), *Asarum canadense* (wild ginger), *Asimina triloba* (pawpaw), *Cardamine concatenata* (toothwort), *Viola pubescens* (yellow violet), *Dicentra cucullaria* (Dutchman's breeches), *Lindera benzoin* (spicebush), *Galium aparine* (cleavers), *Erythronium albidum* (white trout lily), *Osmorhiza claytonii* (sweet cicely), *Delphinium tricornis* (dwarf larkspur), *Boechera laevigata* (smooth rock cress), *Geranium maculatum* (wild geranium), *Uvularia grandiflora* (bellwort), *Arisaema triphyllum* (Jack-in-the-pulpit), *Alliaria petiolata* (garlic mustard)(unfortunately), *Boechera dentata* (formerly *B. shortii*)(toothed rock cress), and



*Asarum canadense* (wild ginger) in bloom. The flower is the fuzzy thing with 3 reddish petals. Photo by Pat Harris.



*Asimina triloba* (pawpaw) flowers and leaves. Photo by Pat Harris.



*Delphinium tricornis* (dwarf larkspur) flowers. Photo by Pat Harris.

*Ranunculus abortivus* (small-flowered crowfoot). Other plants not yet blooming were *Gymnocladus dioica* (Kentucky coffee tree), *Hydrophyllum virginianum* (Virginia waterleaf), *Podophyllum peltatum* (mayapple), *Polygonatum biflorum* (Solomon's seal),



*Tilia americana* seed leaves. Photo by George Van Brunt.



*Tilia americana* seed leaves (top photo) and true leaf, August 17, 2005 (bottom photo). Photos by George Van Brunt.

*Persicaria virginiana* (jumpseed), *Morus rubra* (red mulberry), *Menispermum canadense* (moonseed), *Ellisia nyctelea* (Aunt Lucy), and *Tilia americana* (basswood).

On the Bootlegger's Run Trail east of the parking lot there was a much denser, shrubby understory. There we found *Botrychium virginianum* (rattlesnake fern), *Sassafras albidum* (sassafras), *Ophioglossum*



*Boechera dentata* (toothed rock cress), flowers and fruits. Leaves of *Dicentra cucullaria* (Dutchman's breeches leaves) also visible. Photo by Jack Harris.

*vulgatum* (southern adder's tongue), *Hackelia virginiana* (stickseed), *Elaeagnus umbellata* (autumn olive), and *Berberis thunbergii* (Japanese barberry). The riotous carpet of spring flowers was absent from this part of the trail. The autumn olive, an invasive species, was in bloom and we smelled it before we could see it.

The genus *Boechera*, pronounced boo'-ker-a, was named for the Danish botanist Tyge Wittrock Böcher, 1909-1983, an authority on arctic vegetation and the flora of Greenland. Missouri hosts four species of *Boechera*; *B. canadensis* (sicklepod), *B. laevigata* (smooth rock cress), *B. missouriensis* (Missouri rock cress), and *B. dentata* (formerly *B. shortii*) (toothed rock cress). All are fairly widespread across the state. These species were formerly classified in the genus *Arabis*, but molecular and cytological data indicate that they should be in the genus *Boechera*. For example, one indication that these species should be classified in separate genera is that the *Arabis* base

chromosome number is 8 while the *Boecheera* base chromosome number is 7. *Boecheera* is found mostly in North America, but some species range into Greenland and others into the Russian Far East.

Every angiosperm seed has one (monocots) or two (dicots) seed leaves called cotyledons. Cotyledons and true leaves have different developmental origins and often bear little resemblance to one another. Both, however, may function as photosynthetic organs. Richard Abbott identified the leaves pictured below as the cotyledons of *Tilia americana* (basswood). He pointed out that the lobing was characteristic of *Tilia* cotyledons.

On our walk we found two very interesting *Trillium recurvatum* (purple trillium) plants; each had nine leaves instead of the normal three. I had a brief on-line discussion with George Yatskievych about these plants and he said "normally a *Trillium* has one whorl of three leaves, one whorl of three sepals, one whorl of three petals, two whorls of three stamens each, and a three-carpellate ovary. It appears in this case that the plant produced extra whorls of leaves." Each of these whorls is the product of the apical meristem. Meristems, at the tips of shoots and roots, are composed of undifferentiated, actively dividing cells. As the meristem grows, cells at its tip remain undifferentiated, but cells behind the tip differentiate and develop into the various tissues and organs of the plant. Meristematic cells are the plant's equivalent of stem cells. "There are several gene clusters that affect the expression of meristems and there are regulator genes that turn these developmental genes on and off. If the regulator genes turn on or off at the wrong time, interesting things happen to organs like flowers or leaves." The development of each whorl could be modified by such factors as weather or damage from disease agents such as viruses or mycoplasmas that affect the meristematic tissues. Although it is not possible for us to know the exact cause of the 9-leaved *Trillium* plants we observed without further investigation or experimentation, the existence of these developmental anomalies is both interesting and instructive in our understanding of plants.



*Trillium recurvatum* with nine leaves. Top photo: two 9-leaved plants (normal 3-leaved plant is in lower left corner; flowering stalk between the two 9-leaved plants is *Dicentra cucullaria*, Dutchman's breeches). Middle photo: 9-leaved plant from above. Bottom photo: 9-leaved plant from side. Photos by George Van Brunt.



## April Entomology Group Meeting: *Insect Ecosystem Engineers*

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*Jane Walker*

The Entomology Group met for their last meeting at the Butterfly House before the summer break (we will have one more meeting as a field trip on Saturday, May 19). Our guest speaker for the evening was Dr. Bob Marquis, Professor of Biology at the University of Missouri-St. Louis. The title of his talk was *Caterpillars and Other Insects as “Ecosystem Engineers”*: *Build It and They Will Come*.

Dr. Marquis defined “ecosystem engineering” as when an insect or other animal modifies the environment such that it changes the habitat resources which can positively or negatively impact other species in that habitat. Dr. Marquis’ studies look primarily at shelter building caterpillars as ecosystem engineers.

Shelter-building caterpillars can make up a large number of the species of all caterpillars in a given geographic location. In Canada and Britain, shelter building caterpillars make up 20% and 25%, respectively, of all the caterpillar species in those two countries. In the Brazil forest, they can make up as many as 65% of the species, and in the dry forests of Costa Rica they make up 60% of the caterpillar species.

Shelter-building provides the caterpillars with three benefits: 1) protection from enemies, 2) increased food quality, and 3) protection from the abiotic environment. Shelters provide a place for the caterpillar to hide from birds, spiders, and parasitoid wasps.

Dr. Marquis and former student John Lill (WGNSS scholarship recipient) have studied leaf tying caterpillars on white oak trees and the effects of the leaf ties on leaf environment. Leaf-tiers make “sandwiches” of two touching leaves. This environment protects them from the dry air. Some leaf-tiers are messy housekeepers with lots of frass in their homes, while others are very clean. In their experiments, they created artificial leaf ties using hair clips. Using sapling oak trees that they could easily access, they left some trees alone (control), removed all of the leaf-tiers from a

second group, and removed all of the leaf-tiers from and added 10% artificial ties to a third group. They found that the greater the number of leaf ties, artificial or natural, the greater the number of arthropods on the plant, including predators, parasitoids, and other leaf-tiers, and the greater the diversity of arthropods. In another experiment they found that frass in new and old ties attract other leaf-tiers to lay eggs.

Currently, Dr. Marquis and his students are looking at stem boring beetles in the Cerrado of Brazil. The stem boring beetles they are studying are in the families Buprestidae and Cerambycidae. The larvae of these beetles create chambers up and down a stem and drill an exit hole, leaving behind a hollow chamber. Arboreal ants subsequently inhabit these hollow chambers. So far, they have found that the final size of the beetle, determines the size of the ant occupying the hollow chambers left behind, i.e., the larger the beetle, the larger the ant occupier. Dr. Marquis and his group are continuing to look at the relationships of stem borers and secondary occupiers and their effects on the plants.



## Friday Flower: *Phacelia purshii*

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*Ted C. MacRae*<sup>1</sup>

It’s been rather a long time since I’ve featured a botanical subject here, so it seems a good time to resurrect my [“Friday Flower”](#) meme with this delightful little wildflower seen on my birthday field trip a few weeks ago. *Phacelia purshii* (family Hydrophyllaceae), also known as Miami mist, is one of only four species in this rather large genus (159 species in North America according to the [USDA Plants Database](#)) found in Missouri. Though the flowers are small, their deeply fringed petals are quite striking. The late Dan Tenaglia<sup>2</sup>

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<sup>1</sup> Originally posted May 11, 2012 at *Beetles in the Bush*:

<http://beetlesinthebush.wordpress.com>

<sup>2</sup> Dan Tenaglia was not only an expert botanist but an enthusiastic cyclist. He died in February 2007 after being struck by a car while riding his bicycle. Dan’s wife has kept MissouriPlants.com up and running since then in honor of his passion for plants. You can help support its maintenance by making a donation to the “Dan Tenaglia Foundation”: 1416 Victoria Avenue, Opelika, Alabama 36801.



*Phacelia purshii* (Miami mist) | Sam A. Baker State Park, Wayne Co., Missouri. Photo by Ted C. MacRae.

noted at his [Missouriplants.com](http://Missouriplants.com) website that the species is limited in Missouri to the extreme eastern portions of the state—the plant shown here was one of several I saw in rich, bottomland forest along Big Creek at Sam A. Baker State Park in Missouri’s southeastern Ozark Highlands.

This particular woods is one of the richest I’ve seen in the state, and in the past two years I’ve featured a number of interesting plants ([Phlox bifida](#) and [Tradescantia longipes](#)), invertebrates ([Drosophila](#) sp., [Meligetha](#) sp., [Calosoma scrutator](#), [Pleurolooma flavipes](#), [Graphisurus triangulifer](#), [G. fasciatus](#), [Arrhenodes minutus](#), [Neoclytus scutellaris](#), [Corydalus cornutus](#) and [Panorpus belena](#)) and even snakes ([Crotalus horridus](#) and [Agkistrodon contortrix phaeogaster](#)) from there. This year marks the third consecutive birthday that I’ve visited these woods, and since I’ve found something I’ve never seen before each time (hint: just wait till you see what I still have coming from there!), I have a feeling the trend will continue next year as well.



## Tiger Beetles in Southeast Missouri

Ted C. MacRae<sup>3</sup>

Volume 43(3) of the journal *CICINDELA* was published a few weeks ago, and I can truly lay more claim to the issue than anybody else (except perhaps Managing Editor Ron Huber). In addition to having one of my photos (a face-on shot of

<sup>3</sup> Originally posted February 17, 2012 at *Beetles in the Bush*: <http://beetlesinthebush.wordpress.com>

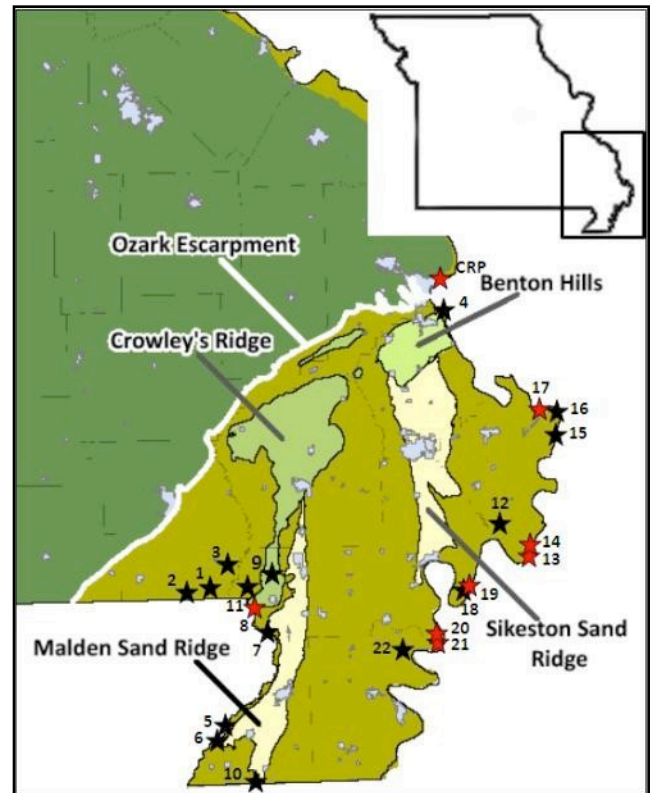


Figure 1. Sites surveyed in southeastern Missouri for *Cylindera cursitans* during 2007–2010. Site numbers are referenced in Table 1 (CRP = Cape Rock Park), with red stars indicating sites where *C. cursitans* was observed. Black box on inset map of Missouri denotes main map area (bordering states include AR to the south and TN, KY, and IL to the east).

*Tetracha carolina*) featured on the cover. I was coauthor on the first of two papers included in the issue and lead author on the second. (And to complete my stamp of ownership, I did the final assembly of the issue as the journal’s Layout Editor.) The two included papers each report the results of surveys conducted in the Mississippi Alluvial Plain of southeastern Missouri (also called the “boothel” in reference to its shape—see Fig. 1) for tiger beetles whose occurrence in that part of the state was previously not well known. In the first, Fothergill et al. (2011) used a novel survey technique that involved searching beneath irrigation polypipe in agricultural fields to find *Tetracha carolina* (Carolina Metallic Tiger Beetle); while the second paper (MacRae et al. 2011) reports the results of a multi-year survey to characterize the distribution, habitat associations and conservation status of *Cylindera cursitans* (Antlike Tiger Beetle). Together with our three papers on [Habroscelimorpha circumpicta johnsonii](#) (Saline Spring Spring Tiger Beetle), [Dromochorus pruina](#) (Loamy Ground Tiger Beetle) and [Cylindera celeripes](#)



Figure 2. *Cylindera cursitans* in southeast Missouri: a) New Madrid Co., Girvin Memorial Conservation Area, 6.vii.2007; b-c) Mississippi Co., Dorena Ferry Landing, 6.vii.2008; d) Mississippi Co., Hwy 60 at Mississippi River bridge, 20.vi.2009. Photos by Christopher R. Brown (a) and Ted C. MacRae (b-d).

(Swift Tiger Beetle)—all published in the past year—these two papers officially complete the battery of publications that describe our survey efforts for the five tiger beetle species considered of potential conservation concern in Missouri when Chris Brown and I began our faunal studies of the group more than ten years ago.

The first three papers clearly painted a rather gloomy picture—*H. circumpecta johnsonii* is possibly extirpated from saline spring habitats in central Missouri, *D. pruinina* is limited to a 2.5 mile stretch of roadside habitat in western Missouri, and *C. celeripes* is restricted to a few patches of critically imperiled loess hill prairie habitat in extreme northwestern Missouri. Happily, prospects for *T. carolina* and *C. cursitans* in Missouri are much better. While both are limited in the state to the southeastern lowlands, our surveys indicated that populations are sufficiently robust and widespread in the area to alleviate any concerns about the potential for extirpation. *Tetracha carolina* in particular was found abundantly in agricultural habitats and appears to have adapted well to the extensive modifications caused by conversion of

the cypress-tupelo swamps that formerly covered the region. *Cylindera cursitans* (Fig. 2) hasn't shown nearly the same adaptive capability as *T. carolina*; however, it has nevertheless found suitable refuge in the ribbons of wet, bottomland forest that persist between the Mississippi River and the levee systems that protect the region's farmland. For a time it seemed that the same habitats along the St. Francois River that bound the western side of the region weren't suitable for the species, but after much searching (in often tough conditions!) Kent finally managed to locate a population on the Missouri side of the river opposite a [known population in Arkansas](#).

Both of these species illustrate how healthy populations of insects are able to hide right beneath our noses. Previous to our surveys, records of *T. carolina* and *C. cursitans* in southeastern Missouri were scarce (the latter consisting of a single specimen in the Enns Entomology Museum at the University of Missouri in Columbia, and with considerable searching required before the first field population was finally located). In both cases, perceived rarity was

a result not of actual rarity, but rather specific habitat requirement or unusual behavior. While I get great satisfaction out of finding populations of “rare” species and increasing our understanding of their habitat requirements, I also can’t help but wonder if they truly are rare and how many populations I might still have missed—populations that I would have found had I searched in a slightly different manner or at a slightly different time.

## REFERENCES:

[Fothergill, K., C. B. Cross, K. V. Tindall, T. C. MacRae and C. R. Brown. 2011.](#) *Tetracha carolina* L. (Coleoptera: Cicindelidae) associated with polypipe irrigation systems in southeastern Missouri agricultural lands. *CICINDELA* 43(3):45–58.

[MacRae, T. C., C. R. Brown and K. Fothergill. 2011.](#) Distribution, seasonal occurrence and conservation status of *Cylindera* (s. str.) *curvitans* (LeConte) (Coleoptera: Cicindelidae) in Missouri. *CICINDELA* 43(3):59-74



## Group Activity/Walk Schedules

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### BOTANY GROUP

Chair—George Van Brunt

- **Monday Botany Walks**, Leader—Fr. James Sullivan; now in his **45<sup>th</sup> year!** The WGNSS Botany Group visits many of the same locations as the Bird group: Busch Conservation Area, Shaw Nature Preserve, the Missouri Botanical Garden, Babler State Park and Cuivre River State Park. Learning plants will help you learn butterfly host plants. Sign up for WGNSS Botany Group emails from Jack Harris by contacting him at [jahar@mac.com](mailto:jahar@mac.com) or (314) 368-0655 and receive an email no later than Sunday about the following Monday’s trip.

### ENTOMOLOGY GROUP

Co-Chairs—Phil Koenig and Jane Walker

Monthly meetings are held September through May and normally occur on the third Monday of the month.

- **Saturday, May 19, 8:00 a.m.–3:00 p.m.** We will be taking a collecting trip to property owned by Jennifer Picker’s mother in southeastern Missouri. The property is

approximately 90 miles SOUTH of the Hwy 55 and Imperial Exit. Approximately 1 hour 45 minute drive:

- Take I-55 SOUTH into Jefferson Co.
- Just south of Festus take US 67 SOUTH.
- Continue on US 67 SOUTH ~70 miles.
- Pass Farmington, Fredericktown and Cherokee Pass exits.
- After Cherokee Pass (several miles) take Co. Rd N (on the right).
- Go ~8 miles to Co Rd 445 on the LEFT.
- On Co Rd 445 (gravel) go ~1 mile; on the left will be a gravel driveway with wagon wheels propped up against an OPEN gate, on Right will be a mail box with the name "Danny Miller."
- Take the wagon wheel drive on LEFT ~1 mile; go past a small house and barn on the right and continue forward. We will meet at the end of this NARROW gravel road.

**LUNCH:** Between Cherokee Pass and Hwy N is Scherer’s (sp?) General Store. This place makes AWESOME fresh sandwiches and provides probably the last ideal rest station before getting to our property.

- [\(314\) 954-0898](tel:3149540898) Jennifer Picker
- [\(314\) 825-2291](tel:3148252291) Gayle Picker
- Mobile coverage is sketchy this far out.

The property has a glade and a creek, and most of the terrain requires moderate hiking. The site is primitive as far as facilities are concerned: no shelter, no water, and no toilets. We will have maps and directions at the commuter lot. To let us know if you are coming or need more information, contact Jane Walker at (314) 965-6522 or [pterisWalk9@gmail.com](mailto:pterisWalk9@gmail.com) no later than Tuesday, May 15.

### NATURE BOOK CLUB

Chair—Lisa Nansteel

The Nature Book Club is a group of naturalists who meet once a month to discuss a book chosen for its general interest from botany to zoology. The group meets at the Evangelical United Church of Christ in Webster Groves on the second Tuesday of the month from 1:30-3:00 p.m. For more information and directions contact Lisa Nansteel at (636) 391-4898. All are welcome—especially newcomers!! Upcoming books:

- **June 12.** *Longitude* by Dava Sobel
- **July 10.** *Long for This World* by Jonathan Weiner
- **August 14.** *Four Fish* by Paul Greenburg

## ORNITHOLOGY GROUP

Chair—David Becher

- **Saturday Bird Walks**, Leader—David Becher. All walks begin at Des Peres Park at 8:00 a.m. (May 19 is at Tower Grove Park, Gaddy Garden). Walks normally go through early afternoon, so bring lunch if you wish to stay out. Everyone is welcome. The leader reserves the right to change the schedule if necessary. Contact David at (314) 576-1146 or [DavidBecher@msn.com](mailto:DavidBecher@msn.com) if you have questions.
- **Thursday Bird Walks**, Leader—Jackie Chain. The WGNSS Birding Group meets at 8:30 a.m. at Des Peres Park parking lot off Ballas Road just north of Manchester Rd. and east of West County Mall. Contact Jackie at (314) 644-5998 or [chainjac@sbcglobal.net](mailto:chainjac@sbcglobal.net) if you have questions. If there is a change in meeting time or place, we will advise by posting on MOBIRDS.

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For general information about WGNSS activities, contact Membership Chairman Joe Whittington at [whittex@aol.com](mailto:whittex@aol.com) or (314) 645-3272.



## Editor's Corner

*Ted C. MacRae*

### **NATURE NOTES BY EMAIL**

*Nature Notes* is available by regular post or email; however, there are significant advantages to

receiving it by the latter method. These include elimination of printing and mailing costs (reducing not only the cost of your subscription, but also decreasing its environmental impact) and the ability to view *Nature Notes* **in full color**. Embedded hyperlinks allow instant navigation to email addresses and websites. Of course, you can always print your electronic copy of *Nature Notes* if you wish (please use recycled paper and print on both sides). *Nature Notes* by email is sent as a PDF, which can be opened using Adobe Reader (download free at <http://get.adobe.com/reader/>). Contact Joe Whittington, Assistant Treasurer, at [whittex@aol.com](mailto:whittex@aol.com) to convert your subscription.

### **CALL FOR SUBMISSIONS**

We welcome announcements of nature related events in the St. Louis area, notices of publications, and original nature oriented articles. Suggested topics include field trip accounts, information about local natural areas, interesting nature sightings, or reviews of nature related books. Articles reprinted from other sources must obtain permission from copyright holders.

Send submissions to [ted.c.macrae@monsanto.com](mailto:ted.c.macrae@monsanto.com). Limit text formatting to bold for emphasis and italics for scientific names. Avoid tabs, extra spaces, multiple hard returns, underlining, etc. (these will be removed during final formatting). Photographs will be included on a space-available basis. Contributions are welcome from all—remember, this is your newsletter!



WGSS Annual Spring Banquet Photos



Everyone having a great time in the Orlando Gardens Medici Ballroom. Photo by Ryan Fairbanks.



Honored Speaker Dr. May Berenbaum talks about her life's passion, plant-insect interactions. Photo by Ryan Fairbanks.



Emily (left) and John Christensen (right-center) award Alice Tipton (left-center) the Menke Scholarship and Steven Callen (right) the Mickey Scudder Scholarship. Photo by Ryan Fairbanks.



Ornithology Chair, Jackie Chain (left) presents Rose Ann Bodman (right) with the WGNSS Lifetime Achievement Award. Photo by Steve Turner.