

ATBI QUARTERLY

Great Smoky Mountains National Park, Great Smoky Mountains Association, Friends of the Smokies, and Discover Life in America

Five, Six, Pick up Sticks: Hunting for Pyrenomycetes with Larissa Vasilyeva

Nancy Lowe, DLIA Volunteer

When volunteering to help ATBI scientists in the Park, I never know what I'm getting myself into. I slog through stagnant ponds searching for leeches, lug heavy batteries up a mountainside in pitch black darkness, coax salamanders into a plastic bag - it's good to come to the Smokies prepared for a surprise. What surprised me most about working with Larissa Vasilyeva was that her field work seemed like just a walk in the woods. Poking along with a plastic grocery bag over one arm, picking up sticks, peering over her glasses to look at tiny fruiting bodies of fungi, she seemed more like someone examining produce at a street market. But appearances can be deceiving—Vasilyeva is a world authority on Ascomycetes.

Vasilyeva came to this country from the Institute of Biology & Soil Science, the Far East Branch of the Russian Academy of Sciences in Vladivostok, as a result of a NATO grant. She brought her microscopes, a small library of books, and her computer but she did not bring a drivers' license and in fact does not



Fruiting bodies of *Diatrype virescens* erupting from a beech twig found at Cosby Creek (actual size about 1 mm). Illustration by the author.

drive. So I was asked to be her chauffeur for a few days. Not a bad gig considering I spent three days at Purchase Knob and walked in the woods right at the peak of the silverbell's bloom.

Silverbells seemed unusual to Vasilyeva. The genus does not exist in eastern Russia, whereas many of our botanical species are closely related to species in her

...finding many species of Pyrenomycetes new to the region, new to North America, and even some new to science.

part of the world. The Smokies are located within a fragment of ancient Tertiary flora, another fragment of which is in east Asia. Since many of our plants are morphologically similar to plants in the east Asian flora, it would follow that the fungi which live in their tissues might be closely related as well. Vasilyeva is eager to study this pattern of distribution, comparing species of fungi collected in the eastern U.S. with species collected in eastern Russia.

The Pyrenomycetous fungi which Vasilyeva studies occur on leaves, stems, branches, and trunks of vascular plants. Most decompose dead tissues, but some cause disease in living plants. Our infamous chestnut blight is one such disease-causing Pyrenomycete.

The flask-shaped fungi, or Pyrenomycetes, are members of the subdivision Ascomycotina, which is the largest subdivision of the true fungi. The Ascomycetes are a diverse group which include some charismatic members like the tasty morels and truffles and the colorful cup-fungi, but also humble powdery mildews and bread molds. Ascomycetes all share the microscopic characteris-

tic of bearing their spores inside sacs called asci.

In the more showy cup-fungi, elfin saddles and morels, these asci line an outer surface of the fruiting body, but in the Pyrenomycetes, the asci line the inner surface of flask-shaped nests called perithecia. The perithecia are usually embedded in the fruiting body but their

necks or mouths are visible to the naked eye, protruding like little pimples. The fruit-

ing bodies themselves often are little more than brown or black bumps on a stick (see illustration). Most of the pimply-bumps-on-sticks I eagerly produced turned out to be nothing more than insect frass, or were fruiting bodies past their prime, or were species too common to collect.

Over a period of several weeks, Vasilyeva collected bumpy sticks at many locations throughout the Park, finding many species of Pyrenomycetes new to the region, new to North America, and even some new to science. We were fortunate to have Vasilyeva's expert attention directed toward the Smokies and look forward to the publication of her findings here.

Larissa Vasilyeva wishes to thank Jeanie Hilten, Mary McCord, Nancy Headlee, Jim and Betsy Froyd, Bob and Nora White, and all the Park staff and volunteers who helped with her efforts.

Nancy Lowe
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[Nancy Lowe has contributed many fine illustrations to the ATBI -- Editor]

Note to our Readers:

The ATBI Quarterly is now available online and in color on our website, www.discoverlifeinamerica.org. If you no longer wish to receive the Quarterly in the mail, please contact Jeanie Hilten, jeanie@dlia.org or 865-430-4752.

We will keep your name in our general database, but will not send a hard copy of the newsletter to you. This will save us some money in printing and mailing.

If you wish to continue to receive the Quarterly by post, please consider sending a donation of \$10 to DLIA and mail to Emily Jones, c/o Friends of the Smokies, P.O. Box 5650, Sevierville, TN 37864-5650.





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Chairman's Commentary

Frank Harris

We are now in the quiet of the new year. In contrast to recent years, the reports from the Smokies are of snow, wind and cold. Nature lies asleep, awaiting the warm winds of spring to stir her to awakening and activity—activity that we can once again observe as we seek to identify and understand the diverse complexity.

Our annual meeting (highlighted elsewhere in this newsletter) was well attended despite the weather and it reflected the successes of your activities and our maturity as a scientific project. The Board meeting that followed on Saturday similarly reflected the progress, challenges, and changes that mark a growing organization. I invite our readers to consider this message a broad solicitation for suggestions of individuals to serve on the Board. There was a clear consensus at our December meeting that we needed to recruit more Board expertise in areas of business, media, development, legal and accounting. Please give your suggestions to Tom Rogers <trogers@rollinscorp.com>, or Dave Scanlon <jltdhs@yahoo.com>, the new nominating committee members.

Not unlike other organizations, we are not immune to a weakened economy. Regrettably, this has led to our not having as rich a small grants program as in years past. Please see the adjacent article regarding the call for proposals in 2003.

While risking sounding like a broken record, I again point out the opportunity in the newsletter to make a monetary contribution to this important project. Your support provides an immediate and direct base to support activities and gives us the base we need to approach other donors. Thank you for your support.

In closing, may 2003 be personally and professionally rewarding for each of you. Peace.

Frank Harris
 Oak Ridge National Lab
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ATBI-DLIA 2003 Request For Proposals

DLIA Grant Proposals are due February 15th.

This is a call for proposals for grants to be awarded by Discover Life in America, Inc. (DLIA), for research to be conducted in Great Smoky Mountains National Park in the upcoming 2003 field season. Proposals for collecting expeditions to GSMNP and for identification of georeferenced specimens are especially encouraged. Award amounts will not exceed \$5,000. DLIA has allocated \$50,000 in the current funding cycle for research activities in support of the All Taxa Biodiversity Inventory.

Applications are more likely to be successful if they are fully integrated with the ATBI Science Plan, which is available on the DLIA website www.discoverlifeinamerica.org (click on "inventory"), and if one of the major products is to be georeferenced specimen/occurrence data. Proposals from previous awardees will be evaluated in part on their provision of products promised in earlier awards and their timely provision of expected reports and data from those awards for the ATBI annual meeting, the ATBI website, and the ATBI database.

Please submit a proposal of no more than 500 words, excluding literature cited, budget, and any additional supporting information. The 500-word proposal should provide a review of results of any previous DLIA awards, the reason for undertaking the proposed project, objectives, methods, schedule, and expected products (e.g., georeferenced specimen/occurrence data, webpages, keys, checklists, etc.).

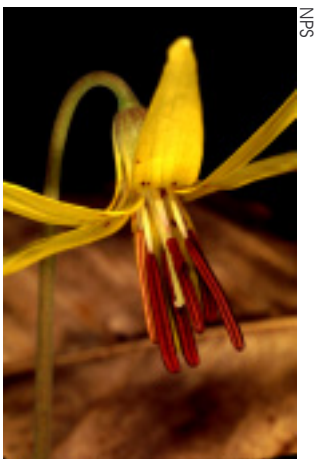
The budget should include a brief justification for each budgeted item and a short paragraph indicating any assured or anticipated funding (actual dollars or "in-kind" support) that would be leveraged by a DLIA grant award. The latter paragraph should contain, among other support, anticipated "in-kind" hours to be devoted to the project by all professionals, students, and technical assistants. DLIA policy does not permit use of these funds for the purchase of equipment or for the payment of indirect charges.

To conduct research in the Park, a collecting permit is required. Refer to the online application for your scientific collecting permit at <http://science.nature.nps.gov/research>. Your proposal should be sent electronically as an e-mail text file and as an MS Word attachment to John Morse <jmorse@clemson.edu> by 15 February 2003. If awarded, the first allotment of funds will be made available on or about 1 April 2003.

Coordination and additional information may be obtained through Jeanie Hilten <jeanie@dlia.org>. We look forward to receiving your proposal and to working with you on the Great Smoky Mountains National Park's ATBI!

Taxa Tally

New species: 394
New to the Park : 2192



A trout lily, *Erythronium umbilicatum*



Adult female *Callibaetis* sp. (Ephemeroptera: Baetidae).

An Introduction to the Smoky Mountain Mayflies (Insecta: Ephemeroptera)

Luke M. Jacobus and W. P. McCafferty

Mayflies are an ancient order of aquatic insects that have fascinated people through the ages. In today's world, they are of premier ecological, recreational, and environmental importance, and this is no less the case in Great Smoky Mountains National Park (GSMNP) which is home to about 100 species. These delicate insects are an integral part of freshwater foodwebs: they process detritus and diatoms and themselves form a significant portion of the diet of animals of all kinds. It is with good reason that anglers entice fish with flies patterned after mayflies, both winged and aquatic stages. Also, the analysis of mayfly diversity has become part of environmental assessment protocols, because the diversity of larvae (or nymphs) found in an area reflect water quality. Therefore, it is clear that an accounting of GSMNP mayflies has benefits beyond contributing to the comprehensive inventory effort in the Park.

LIFE HISTORY

The diverse forms of mayfly larvae reflect the many niches that they fill in flowing and still water habitats. Larvae molt several times as they grow and when they reach maturity, they "hatch" from the water as flying subimagos. The subimago (or "dun" to anglers) is a life stage unique among all modern insects, being fully winged but not reproductively mature. Most species hatch at the water surface and fly to a nearby perch, such as on streamside vegetation. The subimago differs in part from the true adult stage (or "spinner" to anglers) by having dusky, rather than transparent wings with microscopic fringes of cilia. In 24 hours or more, the subimago molts to the adult, which is the reproductive stage. Adult mayfly characteristics give the order its scientific name, Ephemeroptera, because they are so fragile and short-lived, or ephemeral. Adults may live from a few hours to a few days, depending on the species. Adult males form nuptial swarms that attract females for mating, and gravid females lay their abundant eggs on or in the water.

Adult mayfly characteristics give the order its scientific name, Ephemeroptera, because they are so fragile and short-lived, or ephemeral.

COLLECTING AND REARING

After collection from the water, we suggest that larvae be placed into 90% ethanol for fixing and later transferred to 70% ethanol for storage. Winged stages are most commonly found at lights at night or swarming at various times of the day. Subimagos, which often are impossible to identify to species, usually will molt to the more readily identified adult if gently placed in a small, dry chamber. Adults may be placed directly into 70% ethanol. Many GSMNP mayfly species are known only from a single life stage, and association of adult and larva by rearing is a high priority.

AN INVITATION

We encourage other biologists to collect and study mayflies from the Park. We will be happy to examine specimens sent to us. Luke Jacobus may be contacted regarding collecting mayflies or submitting samples. For details on mayflies, habitats, and collecting information supplementing that given here, we suggest the book, "Aquatic Entomology," by W. P. McCafferty (Jones and Bartlett Publishers). We look forward to communicating our findings in future issues of *the ATBI Quarterly*.

To conduct research in the Park, a collecting permit is required. Refer to the online application for your scientific collecting permit at <http://science.nature.nps.gov/research>.

Luke M. Jacobus and W. P. McCafferty
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Visit MAYFLY CENTRAL on the World Wide Web-<http://www.entm.purdue.edu/entomology/research/mayfly/mayfly.html>



Trillium luteum



Trillium simile



Trillium grandiflorum
(all photos by the author)

Charismatic Triplet Flowers

Susan Farmer

Trilliums, members of the Trilliaceae, are an attractive and distinctive component of the spring flora of north temperate mixed forests, and are among plants that visitors specifically come to see in the spring. With a distribution across North America and eastern Asia, the center of highest diversity is in the southern Appalachian Mountains. There are five or possibly six species and four named hybrids of *Trillium* in Asia, eight species in western North America and 30 in eastern North America. While Tennessee has 17 species, and North Carolina has 15 species, only 10 are reported from GRSM with a possibility of an 11th.

Trilliums are reported from all counties in the Park. An identification chart to species found in the Park can be seen at <http://www.goldsword.com/sfarmer/Trillium/Keys/atbi.html>. These trilliums can be divided into three groups: the sessile-flowered species, the erectum group of pedicellate trilliums, and the non-erectum group.

The sessile flowered species are the familiar yellow *Trillium luteum* and the brownish-maroon *Trillium cuneatum*. These plants are characterized by spotted leaves; a lack of a stem or pedicel between the leaves and the flower; and a flower with narrow, vertical petals.

The erectum group is complex. These species can be difficult to separate from one another, but they all have coarse, typically maroon or white petals that turn brown as they age. These species are *Trillium erectum*, *T. flexipes*, *T. rugelii*, *T. simile*, and *T. vaseyi*. *Trillium erectum* can be either red or white, *T. vaseyi* is typically a deep maroon, and the others are all white; in addition, *T. vaseyi* and *T. rugelii* have nodding flowers. The presence of *Trillium flexipes* with its pale ovary needs to be verified in the Park; there is a herbarium specimen, but the site needs to be rechecked. *Trillium sulcatum*, similar to *Trillium erectum*, is not known from the Park.

The other pedicellate trilliums include the familiar painted trillium, *Trillium undulatum*, the great white trillium, *Trillium grandiflorum*, and the nodding *Trillium catesbaei*. The petals of both *T. grandiflorum* and *T. catesbaei* turn a vibrant pink as they age; frequently the flower of *T. catesbaei* opens pink giving the appearance of a hot-pink miniature Turk's cap lily. *Trillium undulatum* is evidently closely related to the Himalayan endemic *Trillidium govanianum*.

It is possible that the dwarf trillium, *Trillium pusillum* also is found in the Park. This species is quite small (3-5" tall), and is an early flowering (March) plant. There is a herbarium record from the late 19th century of *T. pusillum* from Haywood County, NC. In addition, there is a population in the Nantahala Gorge in Clay County, NC. If present in the Park, these plants probably will be found in April and May in wet flood plains, swamps, or fens, but other varieties are found on rocky mountain slopes.

Quite a few trails in the Park were surveyed for the ATBI by Discover Life in America (DLIA) volunteers. GPS information and data were gathered and entered into the Park's mapping system.

Knowledge about trilliums is still far from complete. Continuing work in the Smokies will involve examination of pollinators, the relationships with soil types (some prefer a more alkaline soil), and distribution mapping. In addition, it is hoped that the relationship between the Appalachian endemic *Trillium undulatum* and the Himalayan endemic *Trillidium govanianum* can be better understood.

If you're interested, look for trilliums during the Spring Wildflower Pilgrimage in the Park.

Susan Farmer
sfarmer@goldsword.com

A Teacher's ATBI Adventure

In the summer of 2002, I worked as an ATBI teacher intern at Great Smoky Mountains Institute at Tremont. Much to my surprise, after more than forty years of shooing bees away, I found myself on a sunny mountainside in 90 degree heat, armed with a net and killing jars, actively searching them out! The "bee hunt" was just one of many biodiversity adventures. Other searches included moths, protists, granddaddy long legs, salamanders, birds, and slime molds. Finding these creatures meant shivering in a river during a rainstorm, sweating more than I thought was humanly possible, slipping on dry dusty mountainsides and on slimy sediment-covered river rocks, trudging through mud and muck, dodging stinging nettles and briars, and acquiring assorted insect bites.

Who could forget being acquainted with a whole new slime mold world inhabited by an infinite variety of organisms previously overlooked or dismissed? The obstinate refusal of a particular protist to lie still allowed admiration of the little fellow in a manner perhaps not scientific, but nonetheless appreciative of his lively zeal. Seven hours of identifying moths engendered awe over the diversity and complexity of these ethereal beings and the hard work it takes to catalog them. To hold a wild thrush in my hand, feeling her heart beat against my fingers, and releasing her back to the trees was no less than a spiritual privilege.

This ATBI adventure was an internship made possible by a grant from Discover Life in America specifically because I am a teacher, with the challenge to take my experiences and new knowledge back to my students. The majority of my students have not had authentic nature experiences, and nature indeed has a power to affect students—from the most troubled ones to the most successful ones.

In addition to science instruction, biodiversity studies are valuable across the curriculum in such ways as measuring and counting in math and use of vocabulary in language arts. It is always a struggle for a middle school teacher to keep students focused on their studies! ATBI activities provide those "hands-on" experiences that keep science engaging and give students the chance to be part of real science.

My testimony would not be complete without mention of the fantastic folks with whom I was privileged to work last summer. Good works bring together good people. Many, many thanks to you all. It was a grand time.

Sarah Doyi
ATBI Teacher Intern at GSMIT, Summer 2002
Vine Middle Magnet School, Knoxville, TN

Highlights of the 2002 Annual ATBI-DLIA Conference

Jeanie Hilten

In spite of some rather nasty weather in areas surrounding the Smokies, over 115 people attended the 6th ATBI-DLIA Conference December 4-6 in Gatlinburg, Tennessee. The gathering served as a forum for exchange of ideas, presentations of research, visiting friends, learning, and renewing inspiration. There were approximately 30 different sessions on the wide array of research conducted during the 2002 field season, including DLIA grants, the NPS Vertebrate Study, soil mapping with NRCS, vegetation mapping with University of Georgia partnership, as well as reports on Bio-Quests, education programs, volunteer contributions, audio-visual shows, and continuing scientific studies on various taxa from crane flies to fungi to moths. The “Bids for Biodiversity” fundraising auction at *Rainforest Adventures* was not only fun and entertaining, but it garnered \$6,000.

Heron Productions showed the final draft of the ATBI video developed for Resource Education in the Smokies. Although (or perhaps because) the film is designed for and features young people, the audience of scientists, Park staff, educators, and volunteers enjoyed it greatly—laughing and applauding. The video will be part of an exhibit at Sugarlands Visitor Center and will be of great use presenting the Inventory to the community at large.

The DLIA volunteer photography team, headed by Rebecca Shiflett, Don McGowan, Milt Butterworth, Steve Bohleber, and Joe Conn, organized another fine ATBI Photo Workshop, taught by special guest Connie Toops. They also displayed a magnificent photo exhibit, “Documenting Life, a Visual Baseline”,

with images from the new high resolution scanner, microscope photography, and 35 mm shots all illustrating the intricate beauty of life in the Smokies.

Richard Conniff, conference keynote speaker, focused his excellent talk on the importance of invertebrates—creatures near and dear to the hearts of many ATBI participants. Drawing from his book, *Spineless Wonders*, Mr. Conniff gave five reasons for caring about these creatures:

1. Backyard Serengeti: We can all be pilgrims and explorers in our own backyards, seeing new and astonishing things among the billions of insects that are just outside.

2. The “Yuck”! Factor: The weird and disgusting (to our minds) facts of the invertebrate world can be used in teaching, because “yuck” can be “cool” and as E.O. Wilson writes, “We secretly crave the sweet sensation of horror.”

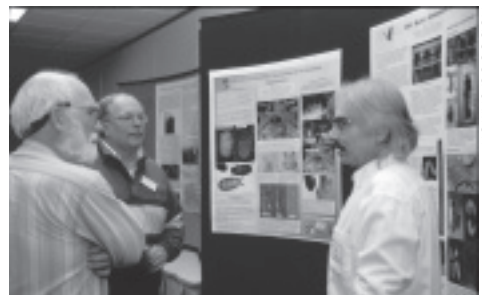
3. Amazing Diversity: Invertebrates range in size from tiny hair follicle mites (note “yuck” factor again here) to the giant squid. Their ability to adapt to worldwide and extreme habitats is remarkable.

4. The Unexamined Life: It is a challenge to learn about creatures that are often ignored.

5. Everything Else Depends Upon Them: This is a hard concept to convey, but how true it is. Mr. Conniff emphasized that the world of scientific investigation contains great stories. By using these stories, it is possible to engage the public and help everyone understand and appreciate the “un-charismatic mini-fauna” which in reality and upon closer inspection are full of charisma and significance. This is a message we can all keep in mind as we try to convey what we are doing!

Grateful thanks are extended to Park staff, DLIA volunteers, scientists, Friends of the Smokies, the Great Smoky Mountains Association and business and community people who made the Conference a success and to our hosts at the Glenstone Lodge. Discover Life in America greatly appreciates the donations given for registration and other Conference events. The income helps us meet costs and thus have more funds for ATBI research.

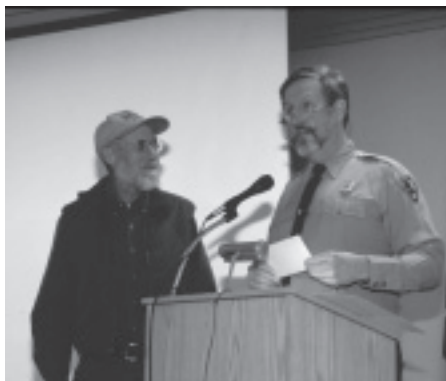
Jeanie Hilten
Discover Life in America
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Ed Clebsch, Ernie Bernard, and Dennis Krusac discussing exhibits.



Keynote speaker Richard Conniff visits with Charles Muisse and Mark Wetzel.



Keith Langdon presents award to Steve Waters, Cades Cove Maintenance.



Banded tussock moth, *Halysidota tessellaris*. This scanned image by Rebecca Shiflett was part of the photography exhibit.

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Reminder:

December 1-6, 2003
Annual ATBI Conference
and associated meetings in Gatlinburg.



Nancy Lowe's illustration of the moth *Ligdia* sp.



An ant lion (*Dendroileon absoletus*). Image scanned by Rebecca Shiflett.



Jeanie Hilten

ATBI volunteers Bob Hightower and Jim Burbank collecting from a beetle trap.



Jeanie Hilten

ATBI researchers Ernie Bernard and Ulf Scheller searching for pauropods on the bottomside of rocks.

Volunteering for Biodiversity: A New Year's Invitation

Jeanie Hilten

Have you ever noticed that if you choose to do something, it doesn't seem as much like work as when you have to do something? That's one of the great features of volunteering. Even though you might be plugging away on a project in the hot sun or cold rain, or spending hours at a computer, or shepherding kids through the woods, you are dedicating your time and talents for your worthwhile cause. And that makes all the difference in the approach you take to the work.

The All Taxa Biodiversity Inventory is a unique project which can at times appear to be an overwhelming venture; and so it would be, without the support of volunteers who share skills in all arenas: science, education, computer, web, databases, photography, field work, fund-raising, and community outreach. There is truly something for everyone to do, and everyone can do something!

Scientists, teachers, students, and any citizen caring about the Smoky Mountains and their rich array of beautiful life can jump into the ATBI. If you are an outdoorsy type, how about being on the Adopt-a-Plot volunteer team? You'll make regular visits to the study plots located throughout the Park and collect insects from traps. If your interests tend to the scientific, there is the Science/Taxonomy team that works with researchers on sorting specimens, trail surveys, and special collecting efforts called "Bio Quests." You can head for the mountains with a world-renowned scientist and turn over logs looking for everything from beetles to millipedes. Artists and photographers also make fine contributions to the ATBI, as they illustrate both the creatures found and the scientists in search of them.

Those with a flair for public relations and development join in spreading the work and helping staff raise money for the project. Volunteers who enjoy being out in the woods with school groups have introduced them to the tremendous diversity of life "underfoot and all around." Other DLIA volunteers have opened their homes to host scientists visiting the Smokies from across the country and around the world.

Both the ATBI and the volunteers grow from this symbiotic relationship. The inventory gains support and gets more work done. Discover Life in America volunteers benefit in many ways, finding friendship, knowledge, new skills, and the great feeling of being involved with something that matters. The inventory will probably take another 10 years or so. Why not be a part of it? There are so many ways we contribute to the stewardship of Great Smoky Mountains National Park and beyond. Let's do it!

To volunteer for the All Taxa Biodiversity Inventory with Discover Life in America, contact Jeanie Hilten, 865-430-4752, or jeanie@dlia.org



GSMIT

Sarah Doyi and Tremont students (story on page 4).



A stone centipede (*Lithobiomorpha* sp.). Scanned image by Rebecca Shiflett.

Discover Life in America would like to thank the following individuals and organizations for their support in 2002:

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Genus Level (\$50-\$99) Walter Ahearn Susan Ahearn Rep. & Mrs. Joe Armstrong Charles Bartlett Nunally Benzing Rich & Claire Boggs Chris Carlton Sid Carroll Shelaine Curd Matt Dakin Mary Lynn Dobson Ricky Fiorillo Marion Fox Vicki Funk			

Discover Life in America 2003 Calendar of Events

In the coming year, Discover Life in America is coordinating a variety of ATBI volunteer training—both general orientations for new volunteers and specialized classes for experienced folks interested in learning more and continuing contributions to ATBI work. If you are interested in becoming a volunteer and have not yet participated in one of the initial orientation sessions, please note the two we will offer in 2003—one in Tennessee and one in North Carolina. Enroll soon because space is limited. There will also be training and other educational programs in conjunction with the Bio-Quests. Beginning and advanced Sorting Classes will be offered too, but the dates have not been set. For more detailed information about DLIA's volunteer "project teams" and to sign up for activities, contact Jeanie Hilten, <jeanie@dlia.org> or 865-430-4752. To assist with community outreach, fundraising, and development please contact Emily Jones, <fotsej@bellsouth.net> or 865-453-2428.

Please note there have been some changes since the last calendar.

Feb. 21, Friday, 9:00am-4:00pm: Annual ATBI House "Deep Cleaning". Volunteers who can help sweep, dust, wipe, scrub, and mop the Cades Cove and/or Cosby houses, please contact Jeanie Hilten for details of where and when to meet. Believe it or not, this is fun!

March 22, Saturday, 9:00am-4:00pm: Volunteer Orientation Day. Sugarlands Training Room. We will follow this with a **Millipede March Bio-Quest** in the evening. Contact Jeanie Hilten.

April 10-13, Thursday-Sunday morning, 9:00am-4:00pm: Bio-Quest, Fern Foray, and Trail Surveys Pre-Training. Sugarlands Training Room. There will be instruction on field methods to use in each event. Volunteers, students, and teachers who wish to participate in these activities should attend.

May 3, Saturday, 9:00am-4:00pm: Volunteer Orientation Day. Haywood Community College, Waynesville, NC. Contact Jeanie Hilten or Paul Super <paul_super@nps.gov>.

May 31, Saturday, 9:00am-4:00pm: Fern Foray. Greenbrier area. Contact Dr. Patricia Cox, University of Tennessee, <pcox@utk.edu>.

June 14, Saturday, 10:00am-4:00pm: Smoky Mountain Field School Class: Wondrous Diversity: Surveying Life in GSMNP. Indoor and field sessions taught by Jeanie Hilten and Discover Life in America volunteers. Meet at Sugarlands Training Room. To register call the University of Tennessee at 865-974-0150.

June 15-20, Sunday - Friday, 9:00am-4:00pm: Tennessee Geographic Alliance "Toolkit of Skills" Teacher Workshop. Great Smoky Mountains Institute at Tremont. Contact Kurt Butefish, University of Tennessee <kbutefish@utk.edu>, or Michelle Prysby, GSMIT, <michelle@gsmit.org>.

June 21, Saturday, 9:00am-4:00pm: Fern Foray. North shore of Fontana Lake ("Road to Nowhere"). Contact Dr. Patricia Cox, University of Tennessee <pcox@utk.edu>.

July 12, Saturday, 9:00am-4:00pm: Fern Foray. Purchase Knob area? Contact Dr. Patricia Cox, University of Tennessee <pcox@utk.edu>.

July 17-20, Thursday - Sunday morning, 9:00am-4:00pm: Beetle Blitz. Coleopterists from around the nation will participate, with the help of trained volunteers, teachers, and students. Scientists contact Victoria M. Bayless of the Louisiana State Arthropod Museum at 225-578-1838 or <vmosele@lsu.edu>.

July 31- Aug. 3, Thursday - Sunday morning, 9:00am-4:00pm: High Country Quest. We are interested in surveying for a variety of taxa, including slime molds, snails, soil and aquatic insects, and a **Fern Foray**. We will concentrate on upper elevation ecosystems such as beech gaps, balds, and spruce-fir forests. Interested scientists please contact: Tom Rogers <trogers@rollinscorp.com>.

September 12-14, Friday - Sunday, 9:00am-4:00pm: Citizen Science for Teachers. Great Smoky Mountains Institute at Tremont. Contact Michelle Prysby <michelle@gsmit.org>.

December 1-6: Annual ATBI Conference and associated meetings in Gatlinburg.

ATBI QUARTERLY
DISCOVER LIFE IN AMERICA
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