

ESP NEWSLETTER

The News Bulletin of the Entomological Society of Pennsylvania



First Entomological Society in the United States

<http://www.entsocpa.org>

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PRESIDENT MESSAGE

I want to begin by thanking the executive committee members for selecting me as this year's president. I want to give credit to all those that have served in the past and contributed to our long standing as a society, to those presently serving and to our members who give shape to our group with new ideas and knowledge. Membership is the backbone of our society and a lot has been done to attract new members including the ESP website, annual field trip and meeting, involvement in public out reach, recognition and awards, membership brochure, and creation of a list serve to name a few. If anyone has any suggestions for membership recruitment or any other issues please feel free to contact me or another committee member. We want to hear from you.

Insects were not a passion of mine from a young age, maybe as a frightening curiosity from a respectable distance, but as time went on and I became interested in organic gardening and the interactions that take place, I became intrigued with the diversity of life and it's fragile balance. I studied and worked at a number of places that helped me to appreciate the importance of insects. I attended SUNY at Cobleskill where I studied Plant Science, worked on an organic farm in Michigan, worked with New York County extension on a crop management program with brassicaceae (cole crops) and sweet corn. I attended the Rodale Institute in Kutztown, Pennsylvania for a semester to complete a required internship where we collected data comparing organic and conventional farming methods. I worked at the Fruit Research and Extension center in Biglerville monitoring a variety of insect pest control measures including mating disrupting methods and insect predators in the orchards. I'm presently employed with the Pennsylvania Department of Agriculture entomology laboratory.

I've come to appreciate the benefits of all groups of insects, and that all have their place in the web of life, each contributing in its way. Let's continue our mission to intrigue those at a young age about how fun and interesting insects are so they don't suffer from entomophobia, and those that already do, lets work on relieving their unnecessary phobia.

I look forward to working with the society as a whole and welcome any suggestions toward making this another successful year.

Sandy Gardosik – ESP President 2009
sgardosik@state.pa.us



Sandy Gardosik, ESP's new president, receives gavel from Past-President, Betsy Leppo

ANNUAL MEETING



ESP ANNUAL MEETING SUMMARY

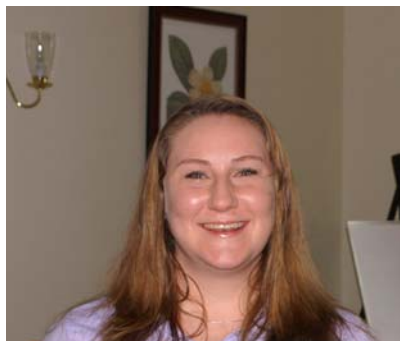
The 85th Annual Meeting of the Entomological Society of Pennsylvania took place on November 14-15, 2008 at Kings Gap State Park in Cumberland County. The meeting was in a renovated stone mansion that sits high on South Mountain with expansive views of the Cumberland Valley. The mansion dates back to 1908, and today serves as the William C. Forrey Training Center for the Commonwealth of Pennsylvania. Attendance varied each day but peaked at thirty-five on Saturday.



DAY ONE

The meeting kicked off with a presentation by David Schmidt of the PA Bureau of Forestry on methods to control the hemlock wooly adelgid (*Adelges tsugae*), which is weakening and killing many hemlocks throughout the Commonwealth. David explored the current effectiveness of several chemical and biological controls and a promising new strategy involving a fungus. David offered some hopeful news for Pennsylvania's hemlocks though the road will be long and difficult.

David's program was followed by a double feature on the Regal Fritillary (*Speyeria idalia*), a majestic butterfly that was once found throughout Pennsylvania but is now restricted to one site in the Commonwealth.



Biologists Mark Swartz and Virginia Tilden from Fort Indiantown Gap illustrated the key components of suitable habitat for the Regal. They are also leading efforts to identify and restore habitats where the Regal Fritillary historically occurred in hopes that the butterfly may be re-established in those



locales. Mark and Virginia provided unique perspectives on the life history of this butterfly and beautiful photographs of the animal and its habitat. Virginia was also our Student Award winner this year (see AWARDS).



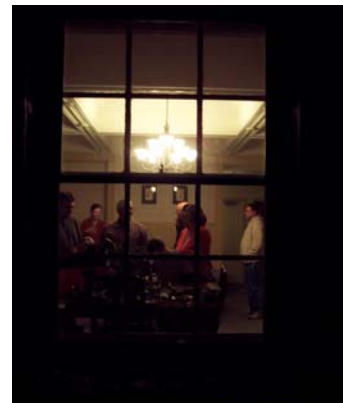
Dr. Matt Wallace from East Stroudsburg University delivered a presentation on treehoppers (Hemiptera: Membracidae). Matt presented the results of research he conducted with students at East Stroudsburg. Their efforts will add greatly to the body of research of this relatively understudied group. Matt also covered many fascinating aspects of treehopper life history and ecology. As semi-social insects, treehoppers communicate via vibrations transmitted by drumming their abdomens on twigs. The sound of their drumming is typically inaudible to humans, but recordings can be altered so that we can listen in on their conversations. Matt concluded with altered audio recordings of treehoppers ‘talking’ to each other. The drumming patterns varied greatly. To human ears some calls sounded other-worldly, some pleasantly rhythmic, others quite humorous.

The final presentation of the first day was by a team of environmental scientists from Wallace and Panther, Inc. Jennifer Barborak and Josh Kelly showed how they use aquatic macroinvertebrates to assess impacts to streams from underground longwall mining.

Their presentation illustrated the comprehensive field and laboratory methods used to evaluate streams before and after mining takes place. They also showed a restoration project they undertook to rehabilitate a stream that subsided due to mining. This presentation generated a lively discussion about the complex issues surrounding mining and stream monitoring and restoration.



AFTER HOURS



After the conclusion of Friday's presentations, meeting participants gathered for good food and fellowship. After dinner, some folks gathered in the meeting room to share photos of interesting places with cool insects and to discuss insect identification and life history. ESP member Karl Gardner provided a particularly educational slide show full of beautiful photographs. Other members gathered to look at specimens such as those found in the collection of Alex Busato, winner of the Young Entomologist Award.



Some folks braved a cold walk over to the environmental center where a group of volunteers were running a Saw-whet Owl (*Aegolius acadicus*) banding station. The volunteers set up nets that catch owls as they migrate south in the fall. Information on the size, age, and even eye color of each owl is recorded. An identification band is placed on the owl's leg before it is released to continue on its journey south. Some birds are fitted with a small radio transmitter back-pack so that researchers can follow their movements and learn more about their behaviors. Unfortunately weather conditions were not very good the night we were there and no owls were caught. But walking through dark cool mountain mist, listening to the repetitive hoot of a recording of a Saw-whet, was an adventure of its own.

DAY TWO



After breakfast and a little time for everyone to warm up their brains, we had our first presentation from Rick Donovan of the PA Department of Agriculture. Honey bees have been in the news lately, but Rick provided information on a group of bees that don't garner as much publicity. Pennsylvania's native bees are a diverse group of animals, with an estimated 400-450 species in the Commonwealth. Like honey bees, native bees play a crucial role in pollination of plants in

natural and agricultural settings. Rick also provided information on issues surrounding non-native bees. The introduction of non-native bees to the Commonwealth may have a chain effect of consequences, such as assisting the spread of non-native plants.

Dr. Nancy Ostiguy from the College of Agricultural Sciences at Penn State University followed with a topic that nicely complemented Rick's presentation. Nancy's information-packed talk explored how sustainable practices in beekeeping, agriculture, and even backyard habitats can help support healthy native and honey bee populations. Nancy delineated important differences between sustainable and organic practices. She made the case that sustainable practices can be implemented in any situation, even if higher organic standards cannot be met.



Dr. Greg Paulson of Shippensburg University provided a talk that spanned science and art. Greg explained the extensive technology, equipment, and technique that makes transmitting and scanning electron microscopy possible. Greg specializes in scanning electron microscopy, which uses a stream of electrons to generate an image of the surface of a prepared specimen. This technique yields amazingly crisp and enlarged images of small specimens such as insects, or even the tiny parasites living on an insect host. Greg's artistic eye combined with the SEM technology captures the complex, beautiful, and at times alien world of very small life.



Dr. Paulson also served up a quick entomological note of interest. While replacing the sidewalk in front of his home in Chambersburg, he uncovered a colony of insects apparently living in association with an ant colony. Greg learned that these critters are classified in the same order as silverfish (*Thysanura*), but in a different family (*Nicoletiidae*). Prior to Greg's discovery *Nicoletiidae* were only known from the United States in Georgia, Arizona, and New Mexico. This family of insects may be

difficult to find and easily overlooked. Greg showed that even in the midst of a mundane project in your own front yard, you should keep your eyes open and your aspirator in your back pocket.

Charles Bier of the Western Pennsylvania Conservancy pulled us away from insects into the fascinating world of spiders. Like insects, spiders are a highly diverse group with great ecological significance but disproportionately little human study. Charles illustrated amazing qualities of spider silk, venom, physiology, and life history. His quip that we are never more than two meters from a spider had many of us casting glances under chairs to see if we could find our nearest spider neighbor!



The last presentation of the day was surprisingly entertaining despite the serious topic. Sven-Erik Spichiger of the PA Department of Agriculture provided an overview of several big projects the Department is running to stay ahead of potentially devastating insect infestations.



Creatures on the most-wanted list include the Emerald Ash Borer (*Agilus planipennis*), Brown Marmorated Stink Bug (*Halyomorpha halys*), Asian Longhorned Beetle (*Anoplophora glabripennis*), and the Sirex woodwasp (*Sirex noctilio*) New species to Pennsylvania continue to arrive from other regions of the U.S. and overseas.

Sven discovered this personally one day as he prepared a bacon-lettuce-tomato sandwich with some romaine lettuce from California. Small moving dots on the lettuce leaves caught his attention, and led to the first known record of the Lettuce Aphid (*Nasonovia ribis-nigri*) in Pennsylvania. So Greg taught us to stay alert when replacing a sidewalk, and Sven shows that we should keep an eye on the contents of our supper as well!

AWARDS

We had the privilege of recognizing three people at our annual meeting that represent different stages of a life journey in entomology.

Our Young Entomologist Award recipient this year was nine year old Alex Busato of the “Just Buggy” Westmoreland 4-H Entomology Club. Alex has been fascinated by insects since an early age. He tends a garden to attract butterflies and to study their life cycle from adult to egg to caterpillar to chrysalis to adult once again. Alex has built an insect collection of impressive size and quality that has received recognition in competition. But perhaps his efforts to share with others the fun of insect study and discovery are his most admirable accomplishments.

The Student Award went to Virginia Tilden for excellence in her master’s degree program at Hood College. Virginia provided a well organized and informative presentation on her ambitious research project. Her presentation was titled “Habitat identification, restoration, and repatriation plan for the regal fritillary butterfly, *Speyeria idalia* (Drury).



A special Honorary Award was presented to Dr. K.C. Kim on the occasion of his retirement from Penn State University where he is a Professor of Entomology, Curator of the Frost Entomological Museum, and Director of the Center for BioDiversity Research. K.C. has been a member of the Entomological Society of Pennsylvania since 1970. His dedication and productivity in endeavors related to entomology, education, biodiversity, and conservation both at home and abroad are remarkable. In retirement K.C. will continue to press forward on those conservation and education endeavors most important to him.

THANKS

Many thanks to....

- ♦ All the speakers who contributed generously of their time and expertise to develop the excellent presentations we enjoyed at this meeting.

- ♦ The ESP executive committee and all who lent a hand to help the meeting run smoothly. Kevin Kelly took all the great pictures found in this article, Jane Earle and Andy Kyle ordered the handsome awards, Karen Bernhard and Sandy Gardosik ran the registration table, Mike Hutchinson managed the ESP clothing sales and brought interesting ESP historical documents, Sally Ray brought a dissecting scope for use by the group.
- ♦ All the King's Gap staff who helped orchestrate the meeting, provided the fine food and service, and put everything back in order after we left.
- ♦ The Saw-whet Owl banders.... even though they couldn't deliver an owl on demand, we appreciate the time they took to explain their project. We had fun just hanging out with the crew!
- ♦ The folks who stepped up to the plate and accepted leadership positions in the ESP executive committee for the coming year.



Karen B. helping ESP at the registration table



"Meeting of the Minds"; K.C., Joe Fitz and Greg P.



Mike H. hamming it up for the camera

The OUTSTANDING STUDENT AWARD for 2008

Presented by Harry Katz and the Entomological Society of Pennsylvania

Submitted by Jane Earle

The 2008 outstanding student award was presented to Virginia Tilden of Carlisle, Cumberland County, PA. Virginia is a Masters of Science Degree Candidate at Hood College, MD. Virginia was nominated by Mark Swartz, Monitoring Biologist, Fort Indiantown Gap and Dr. April Boulton, Master's Program advisor, Hood College.

The Outstanding Student Award is presented by the Entomological Society of Pennsylvania to recognize the accomplishment and contributions of a student from Pennsylvania or enrolled at a Pennsylvania College or University who is pursuing a degree in the field of entomology or biology.

Virginia Tilden is a Master's degree student in high academic standing at Hood College in Maryland. She has extensive field and research experience through her undergraduate tenure at Shippensburg University and via her current employment with Regal Fritillary Project at Fort Indiantown Gap (FIG) and the Eastern Native Grassland Restoration and Regal Fritillary Repatriation Project, mainly at Gettysburg National Military Park. She has been a key

contributor in creating protocols, performing field work, and writing restoration management plans for the project, which has the goal of reintroducing Regals back to formerly occupied sites throughout PA and, hopefully, other parts of the Northeastern United States. She has also been instrumental in collecting and cataloguing insects and other invertebrates at FIG as well conducting surveys that monitor not just Regals at FIG but all PNDI species of concern as well as vertebrate taxa on the post.

Dr. Boulton presented the following comments in support of Virginia's nomination for this award. Virginia has successfully completed projects well beyond other students at her level, from fire restoration to insect ecology. She successfully juggles full-time employment and her class work, completing her thesis work in a timely and effective manner. She has a refreshing level of commitment and motivation and eagerly shares her successes in the field by leaving phone and email messages. Virginia was in Dr. Boulton's graduate level Insect Ecology course this past semester, where she was in the top 1% in a class of 13 graduate students. She is one of those prepared, organized, ambitious students that all professors value in class. She always has command of the peer-reviewed literature that is being discussed and eagerly participates in class discussions. She has performed superiorly on all projects and exams.

Thesis Research: Restoring habitat for the threatened regal fritillary butterfly (*Speyeria idalia*) at a site in Gettysburg National Park.

Presentations on her research: Grassland Restoration and Management for the Reintroduction of the Regal Fritillary to Historic Landholdings in the NE US, at Entomological Society of America, the Lepidoptera Society, WABC, TWS, and The Entomological Society of Pennsylvania.

Awards: DoD Team Award for Environmental Excellence



Virginia Tilden receives Outstanding Student Award from Jane Earle



Virginia Tilden, ESP's 2008 Outstanding Student Award Recipient

2008 Young Entomologist Award Recipient

Submitted by Jane Earle, Awards Chairman, Entomological of Pennsylvania

Alex Busato from Scottdale, Pennsylvania, was honored as the young entomologist award winner for 2008 by the Entomological Society of Pennsylvania (ESP) at their annual meeting held at Kings Gap Environmental Education and Training Center on November 14 and 15, 2008.

At 9 years old, Alex is the youngest to be honored as young entomologist by ESP. He is the son of Michael and Jennifer Busato, the grandson of Anthony and MaryAnn Tyska, and is a student at Southmoreland Elementary School. Alex was nominated for the award by his 4H Entomology Club leader Debbie Schmider.

The Young Entomologist Award is presented annually by the Entomological Society of Pennsylvania to recognize the contributions of students or young persons who have shown a great interest in entomology through activities such as maintaining an insect collection, conducting a 4-H or scout project in entomology, assisting a park, school, or science fair with entomological displays, or has led other insect related activities such as building or maintaining butterfly gardens.

Alex fits the criteria for the Young Entomologist award well. Alex's interest in insects blossomed when he was in Kindergarten after his teacher, Mrs. Sylvia Jeffers, did a unit on insects. Alex joined the Entomology 4H club "Just Buggy" as a first grader. He has entered a display box in the Westmoreland County Fair for the past 3 years. Alex's collection of insects is close to 400 counting those in display boxes, in preparation for display, and those purchased to aid in his presentations. Alex has also participated in presentations and displays with his Entomology Club at local parks and at the Great Insect Fair held at Penn State University. He enjoys sharing his passion for insects with others and has led many of his peers at school and church as well as their parents to pursue entomology as a hobby.

When Alex was 5 years old he did his first Entomology presentation to his kindergarten class. This year he gave four presentations in one day to all of the 3rd and 4th grade students at his school. Alex has also given presentations to his peers and their parents at the Scottdale and Mount Pleasant Public Libraries. He has instructed other children on making crafts based on insects at the Scottdale Public Library; once they created the life cycle of a Monarch out of pasta and later they made pipe cleaner walking sticks. Following his presentations, members of the community would drop insects off at the Library for Alex to identify. The librarian advertised his presentation by calling him the "Local Entomologist". Alex planted a garden in his backyard to attract butterflies in the hopes that he and his sister would be able to watch them go through their life cycle. He researched different plants, picked them out at a local nursery, and planted them. This year the milkweed in his garden attracted butterflies and later fed several monarch caterpillars. The Black Knight Buddleia that he planted fed many different species throughout the summer.



**Left-
Alex Busato
2008 Young
Entomologist
Award
Recipient**

Below- Alex Busato's Insect Collection



MEMBERSHIP NEWS

ED SIMONS

ESP's honorary member Ed Simons has a new change of address. For those wishing to contact Ed, his new address is now:

Box 123
Burlington, PA 18814

MEMBERS INVITED

Members are invited to participate in the ESP Executive Committee meeting on February 6, 2009 from 10:00 am to 12:00 pm. The meeting will be held in Room 309 at the following address:

Department of Agriculture Building
2301 North Cameron Street
Harrisburg PA 17110

ENTOMOLOGY AND THE PRINT MEDIA

A LITTLE HELP

Butterfly has odd migration

York Dispatch

October 26, 2008

The Associated Press

LAKE LUZERENE, N.Y.

-A monarch butterfly has a chance at completing its species' famed migration to central Mexico thanks to some tiny cardboard splints, a bit of contact cement and a trucker from Alabama.

The insect's broken wing was painstakingly splinted by upstate New York couple Jeannette Brandt and Mike Parwana, after Brandt found the butterfly about three weeks ago.

On Sunday, the couple took the healed monarch to a truck stop, where a trucker from Alabama volunteered to let the butterfly ride along to Florida. On Tuesday, the trucker called: The butterfly was loose in Florida with its mended wing.

BUGOFF!

Outdoor activities raise risks of painful insect bites

The Patriot-News

August 19, 2008

Joe Rojas-Burke (of The Portland Oregonian)

They bite. They sting. They suck.

It's high summer, and insect pests are out in force. Count them: quick-to-sting yellow jackets, hard-biting deerflies and horseflies, dangerously venomous spiders and disease-spreading ticks

and mosquitoes. Complications include West Nile virus borne by mosquitoes and Lyme disease from tick bites.

To prevent bites and stings, spray on repellents or stay indoors during peak biting hours. Trying to slaughter insects can backfire. Tests of bug zappers, for instance, suggest that they kill an insignificant fraction of the hordes of insects flying through, and most victims are harmless bugs. At least one study found that zappers increased the number of biting mosquitoes in test backyards. Before you head outdoors, study this field guide to get to know the worst offenders and how to fend off their attacks:

Mosquitoes-

Think little flying hypodermic needles! Most female mosquitoes really do want your blood. Blood-sucking has made mosquitoes dangerous carriers of disease in Africa, Asia and Latin America. In the United States, they are mostly a mere nuisance.

-About the bite: Annoyingly painful-but unlikely to cause a severe reaction. Female mosquitoes hunt for a blood host by detecting carbon dioxide on the skin.

-When you're at risk: Windless evenings. Most mosquitoes rest in cool shade during the heat of the day.

-Avoiding the bite: Window screens help if you're indoors. If you're not; mosquito netting, repellents containing DEET and staying out of wet, boggy areas at dusk. Vitamin B and ultrasonic device remain unproven as repellents.

-First aid: Inflammation and itchiness at bite sites come from the body's immune response to irritants in the mosquito's saliva. Many common remedies help relieve the itching: calamine lotion, baking soda, rubbing alcohol and vinegar. Severe cases call for antihistamine or corticosteroid lotion. Scratching works, but not for long, and can inflame the skin further, increasing the risk of infection and scarring.

Ticks-

Like spiders, ticks are arthropods. They don't fly; they lurk in tall grass and shrubs and wait to land on a passing animal or person. Barbed mouthparts enable them to burrow into the skin and feed on blood. Hard ticks attach and feed for hours, even days. Soft ticks feed for less than an hour.

-About the bite: Most ticks are harmless, but the black-legged deer tick, the size of a pinhead, can carry the bacterium that causes Lyme disease.

-Avoiding the bite: Stay away from tall-grass fields. Walk in the center of trails, without brushing vegetation. Wear long pants. Apply DEET. Check skin after being outside, and promptly remove any ticks.

-First aid: Cleanse the bite area after removing the tick. Over-the-counter antihistamines can relieve itching. Seek immediate medical attention if a red "bull's-eye" rash appears; it can signal Lyme disease.

Ants-

-About the bite: Some ants sting while others bite. The bite of the Formica ant is particularly painful, because it sprays formic acid into the wound after a bite.

-Avoiding the bite: The ants won't seek you out, but be aware of your surroundings and avoid their colonies.

-First aid: See wasps, bees.

Wasps, bees

-About the sting: If you're stung by a honeybee, you have a stinger and a poison sack working its way into your skin. The honeybee isn't doing so hot either. With those body parts torn away, she will probably die. However, she's sent out an alarm scent to alert the other honeybees to your presence. That scent will lead them right to her stinger-and you.

-Wasps are brightly colored for a reason: They're letting everyone know their stinger packs a punch. Velvet ants, which are actually wingless wasps, have potent venom in their stingers that causes a painful sting.

-Avoiding the sting: Wasps and bees don't look for people to sting, but they won't hesitate to do so if they feel threatened. Be aware of your surroundings and avoid their colonies. Leave them alone and they'll leave you be.

-First aid: Most people can tolerate 10 stings for each pound of body weight, but a few folks have more severe reactions. If a sting becomes more than just a pain in the arm, seek medical treatment immediately. If the stinger is lodged in your skin, remove it with a gentle scraping motion. Avoid tweezing-that can force more venom into the wound. Ice reduces pain; hydrocortisone cream can help as well.

Hobo and black widow spiders

Female widows are jet black with red markings on the underside; males and immatures are striped white or yellow. Hobos look identical to several common harmless spiders, with long, hairy legs and chevron-shaped abdominal markings.

-About the bite: Bites inflict little pain at first. Widow venom triggers cramping pain, rigid muscles, headache, dizziness, nausea and respiratory distress. Hobo spider bites swell, then blister, and as skin dies leave a slow-to-heal cratered wound. Severe headache, nausea may develop.

-Avoiding the bite: Wear gloves and long sleeves when handling firewood or working in crawl spaces. Screen basement windows.

-First aid: Put a cold pack on the bite and seek immediate medical care. If possible, catch the spider and take it to the doctor.

HOT CLOCK KEY TO FRUIT FLY'S GLOBAL SPREAD

Heat-sensitive genetic molecule may have enabled some species to survive in wider range of climates

Science News Web edition

Wednesday, December 24th, 2008

By Tina Hesman Saey

Sometimes, survival of the fittest means dependence on weak links.

Widely distributed fruit fly species have a temperature-sensitive step in the manufacture of a key part in their biological clocks. The heat-sensitive stumbling block may be the reason *Drosophila melanogaster* and *Drosophila simulans* have been able to spread to temperate zones while their cousins haven't, a new study in the Dec. 26 *Neuron* suggests.

Previously, a research team led by molecular biologist Isaac Edery of Rutgers University in Piscataway, N.J., had discovered that, when the temperature rises, *Drosophila melanogaster's* production of a major gear in the clock that governs its daily rhythms melts down. The gear, a protein known as PERIOD, helps set the circadian clock in fruit flies and many other animals.

Fruit flies are active in the morning, take a siesta during the hottest part of the day, then wake up and move around again in the early evening when it is cooler. The siesta helps keep the flies from over-heating and drying out. PERIOD protein builds up during the siesta period until it reaches high enough levels to set off the flies' inner alarm clocks and rouse them for the evening.

“There is a nice association between the time of day that the activity of the fly peaks and the point at which PERIOD peaks,” says Herman Wijnen of the University of Virginia in Charlottesville. Wijnen was not involved in the new study.

Production of PERIOD follows a multi-step process. First, the information contained in the *period* gene is converted into RNA, which will be read later by the cell's protein-building machinery. Genes in fruit flies, humans and other eukaryotes contain interruptions, called introns. To deal with these, the cell has a molecular version of TiVo that cuts out introns as if they were commercials interrupting a television program. But cells can't just skip over introns. The cells must physically cut the interrupting regions out and splice back together the bits of RNA that contain the actual protein-building instructions (called exons.)

In *Drosophila melanogaster*, and another widely dispersed species of fruit fly called *Drosophila simulans*, one of the exons contains a weak splice site that doesn't hold together well when the mercury rises. The weak splice site prevents PERIOD protein from being made when it is too hot, delaying the flies' evening wake-up call. The heat response allows the two species to vary the length of their midday naps.

That's important in temperate latitudes in which day length varies considerably across seasons. Flies need longer naps in summer to avoid the heat of the day, and shorter snoozes as temperatures grow cooler and daylight hours dwindle.

But in the new study, Edery and his colleagues show that closely related fruit fly species, *Drosophila yakuba* and *Drosophila santomea*, don't have heat-sensitive splice sites in *period*. Instead, the two species, found only in Africa, have strong splice sites that hold together even in hot weather, making the schedule of PERIOD production more regular than in the species that are widely dispersed. The equatorial flies also have regimented daily schedules, waking, napping and rousing again about the same time every day. That makes biological sense for species living along the equator where day length and temperatures don't vary much with seasons, says Edery, who is also a member of the Center for Advanced Biotechnology and Medicine in Piscataway, N.J.

Replacing the weak *D. melanogaster* splice site with one from the African species also puts *D. melanogaster* on a regimented schedule, the researchers find. But a strong splice site that's insensitive to temperature could spell disaster for a fruit fly that finds itself in northern climates in the middle of summer. The flies might wake from their siesta while it is still hot, and become desiccated as they move about in the heat. The weak, heat-sensitive splice site makes *D. melanogaster* and *D. simulans* more flexible and better able to adapt to diverse climates than their cousins, Edery says.

“The proposition that we're making is that the weak splice sites in *melanogaster* and *simulans* species may have facilitated their ability to colonize other parts of the world,” Edery says. Edery and his colleagues make the argument in “nice” molecular detail, Wijnen says. “It's a very nice illustration that these mutations seem to be associated with populations [of fruit flies] in temperate zones.”

VEGETARIAN SPIDER

Small jumping species steals lunch from ants

Science News; Vol. 174 #5

August 30th, 2008

By Susan Milius



LUNCH, SANS WEBThis spider is one in what may be the first-known population of vegetarian spiders. The herbivores live on acacia trees in Mexico and steal leafy snacks, such as the tree nubbin this spider holds, from their ant neighbors.

A little eight-legged pickpocket that darts around acacia trees could be the first known vegetarian spider. *Bagheera kiplingi* belongs among the big-eyed, athletic predators in the family of jumping spiders and gets its name from a panther in a Rudyard Kipling story. Yet a population of these spiders in Mexico mostly eats bits of the acacia trees, says Christopher Meehan of Villanova University in Pennsylvania.

A few other spider species do taste vegetable matter now and then, says Yael Lubin of Ben-Gurion University in Sede Boqer, Israel. Male crab spiders that spend their brief mating-oriented adult lives sitting on flowers will sip nectar for a little energy boost. And some baby spiders eat spores that have stuck to a web. But on hearing about spiders specializing in stealing vegetarian food, “I was absolutely floored,” Lubin says.

These arachnid herbivores are no wimps. “The tree is full of biting, vicious ant guards,” Meehan said during the [12th International Behavioral Ecology Congress](#) meeting August 9 through 15 at Cornell University. The little spider spends its life dodging patrols of ants and stealing their (vegetarian) lunches.

Acacia trees and their resident ants have become a textbook example of a mutually beneficial partnership. Tree thorns grow swollen bases the right size to shelter ants. Glands at the base of the leaves ooze nectar, far from flowers but just at the spot to offer refreshment for ants. Acacia leaflet tips sprout nubbins of protein and fat suitable for ant snacks.

Certain ant species take full advantage of these comforts and defend their home trees against all comers. In the course of their vigilance, the ants get rid of caterpillars and other invaders that might chew on the tree. Meehan says the spiders manage to dodge the ants, perching on leaf tips and nesting in mature leaves, which aren’t as heavily patrolled as other tree parts.

Ecologists have studied the partnership for years, but “people who look at ant acacias — they look at the ants,” Lubin says. “It took the eyes of a student naturalist to see this.”

That fresh observer was Meehan, who, along with his Villanova colleague Robert Curry, noticed the spiders dining on the leafy snacks of acacias in Mexico. In videos of 140 spider meals, the researchers counted 136 acacia protein-fat snacks with a few nectar sips. On four occasions the

spiders did turn to meat as they tugged away ant larvae from a passing nursemaid and ate the youngsters.

In Costa Rica, the spiders also steal ant food, though to a lesser extent, according to observations from Eric Olson of Brandeis University. He independently discovered the spiders eating tree snacks in Costa Rica in 2001 and is working with the Villanova team on a report on the species.

Those meat moments don't happen often, according to studies done in collaboration with Matt Reudink of Queen's University in Kingston, Canada. The team checked spider tissue for the heavier form of nitrogen, N15, which becomes more concentrated as animals eat animals that have eaten other animals.

That carnivore signal does not show up in the acacia-tree spiders, which carry a relatively light concentration of N15, one that is typical of plant-eaters, according to the team's data. The researchers also found that the concentration of the heavier form of carbon, C13, also looks typical for a vegetarian.

SLAVE ANTS REBEL

Kidnapped worker ants do a little quiet sabotage

Science News; Vol.174 #6

September 13th, 2008

By Susan Milius



NANNY SABOTAGE - Members of a species of ants captured to work as slaves rebel against their captors by destroying the pupae they were enslaved to nurture.
Alexandra Achenbach/ Ludwig-Maximilians University

Tiny ants enslaved inside acorns across the northeastern United States could be resisting their captors with a covert army of killer nannies. About the size of newspaper commas, ants in the genus *Temnothorax* fall prey to a marginally larger ant species that doesn't do its own housework.

Instead the do-little ants, *Protomognathus americanus*, raid smaller species' nests and steal babies in the larval and pupal stages. The youngsters grow up inside the acorn home of the slave-makers' queen, doing her housework and nursemaiding her young.

Biologists have seen that the species vulnerable to enslavement evolve ways to try to fight off raids. But ways for the kidnapped youngsters to resist captivity haven't shown up. Theorists have even argued that post-enslavement resistance couldn't evolve. But observers are giving up on the slaves too fast, says Susanne Foitzik of Ludwig-Maximilians University in Munich.

Kidnapped workers of two *Temnothorax* species kill off a good portion of their charges in the nurseries of slave-maker colonies, Foitzik said at the 12th International Behavioral Ecology Congress held August 9 through 15 at Cornell University.

Yet, in their birth colonies, *Temnothorax* ants readily nurture their baby sisters and half-sisters to adulthood.

Killing sprees by slave nannies could be an overlooked form of resistance, Foitzik suggests. The baby-killing offers any kin in nearby colonies some protection from slave-makers, since the kidnapper queen's offspring make up the raiding parties. Paring back their number cuts back the raiding power. Foitzik proposes that this benefit to kin could drive the evolution of the trait.

"This is evolution to be a bad nanny," says Peter Nonacs of the University of California, Los Angeles. He compares the ant dynamics to other resistance puzzles that have intrigued evolutionary biologists. A wide variety of bird species, for example, seem able to evolve the urge to kill the eggs of parasitic cowbirds, but hardly any species kills cowbird hatchlings.

Foitzik began to wonder about baby-killing among ants, she says, because the slave-maker colonies contain surprisingly few workers of their own species. The kidnapper queens do lay plenty of eggs. If tended properly, they grow into workers that don't do a lot of work, depending on slaves for food even as adults. These slave-makers attack other colonies to refresh the supply of household help.

At a West Virginia study site, slave-maker nests averaged only two worker adults of the queen's species, and several dozen slaves. "That's not a raiding party — that's a raiding duet," Foitzik says. New York colonies averaged only five slave-maker adult workers. The slave-maker ants have large, fierce jaws and use chemical weaponry during attacks, but these reduced numbers can still make raids iffy.

When Foitzik brought colonies into her lab, the slave-maker queen's young failed to thrive. She discovered that slave nursemaids care for the eggs and young larvae but turn into horror nannies once slave-maker young reach the pupal stage. "They take pupae and dump them in some corner. Mold grows on them and they die," Foitzik says. Or the slaves rip apart other pupae and eat the chunks.

Overall, slave nursemaids kill some 80 percent of their captors' young queens and some 60 percent of the young workers, Foitzik reports. To see if lab life, rather than enslavement, was driving the ants to such extremes, Foitzik also kept in the lab colonies of the slave species that hadn't been raided. There, more than 90 percent of the young survived to adulthood.

BUZZING BEES PROTECT PLANT LEAVES

Pest caterpillars don't eat as much if distracting pollinators zoom by

Science News; Vol.175 #2

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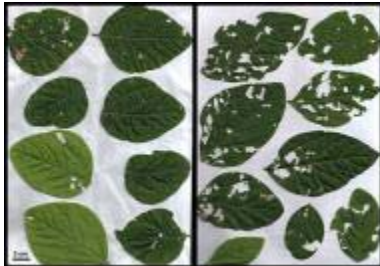
By Susan Milius



BZZZZY AIR TRAFFIC - Honeybees going about their business of pollinating flowers may create such a buzz that caterpillars munching on leaves along the bees' flight paths can't get a quiet meal and thus do less damage to foliage. IMAGE CREDIT: Helga R.Heilmann, BEEgroup Würzburg

Traffic noise, honeybee traffic that is, can be a bane for caterpillars and a boon for plants. The *buzz buzz buzz* of honeybees zipping overhead as they forage can keep caterpillars below from getting enough peace and quiet for a full meal, says Jürgen Tautz of the University of Würzburg in Germany.

In tests, bee flight-path distractions took such a toll on dining that caterpillars ate only about a third of the leaf area they consume in a bee-free zone, Tautz and Würzburg colleague Michael



GOOD BUZZ - Soybeans left for 18 days in tents with caterpillars suffered more damage from the pests' munching when bees were excluded (random selection of leaves, right) than when the pollinators zipped back and forth over the plants (left). IMAGE CREDIT: Helga R.Heilmann, BEEgroup, Current Biology

Bee traffic-noise as a pest deterrent is “a very cool and novel idea,” says Jeff Conner of Michigan State University’s Kellogg Biological Station in Hickory Corners. Earlier work, including his, showed that pests eating plants makes the plants less attractive to pollinators, but “this new study turns that idea on its head,” he says. The pollinators are making plants less attractive to pests.

So far Tautz has just tested the idea in a strictly controlled setup. He and his colleagues put up a pair of tents housing arrays of plants. In the various runs of the test, researchers used bell pepper plants, once with and once without fruits, as well as soybean plants. A beehive opened into one tent and some 50 bees at a time buzzed over the plants on the way to collecting sugar water from feeders in the corners.

As a sample pest, Tautz chose the beet armyworm (*Spodoptera exigua*), a caterpillar that feeds on some 50 plant species. Armyworms are relentless munching machines, but they stop moving, and sometimes drop off their perches, if a wasp flies by. Plenty of wasps eat caterpillars, and Tautz says that he’s found sensory hairs on caterpillars, including beet armyworms, that detect the wasps’ wing beats.



EATING MACHINE - A beet armyworm just keeps on chewing unless something really scary disturbs it, like the buzz of an incoming insect. Helga R.Heilmann, BEEgroup Würzburg

Honeybees don't hunt caterpillars, but Tautz says he was out walking his dog one day, listening to the buzz of bees, when it occurred to him that, to a caterpillar, bees’ wing beats might sound similar to wasps’. That seemed to be the case in his experiments. In tents with bees flying over plants without fruit, caterpillars did less damage to leaves than in quiet tents, the researchers report.

In the tent without bee traffic and with peppers already forming on plants, the quiet didn't make as much of a difference in leaf damage. But that's because caterpillars took advantage of the bee-free peace to move off the leaves and start eating the peppers themselves, Tautz says.

Conner says that protection from traffic noise doesn't necessarily indicate any plant evolution that promotes this phenomenon. It could just be a happy side effect of pollination. Whatever the history, it makes a good example of hard-to-spot indirect relationships between species in ecosystems, Tautz says.

Also, he says he can imagine that gardeners might someday take advantage of this effect. "Alternating rows of vegetables and flowers not only look beautiful, they may reduce the use of pesticides," he says.

LOVE SONG OF THE DENGUE VECTOR MOSQUITO **Male and female mosquitoes match pitch when in the mood**

Science News Web edition
Thursday, January 8th, 2009
By Laura Sanders

Mosquitoes use their own kind of eHarmony to find a compatible mate. New research shows that male and female mosquitoes sing duets of matching love songs by vibrating their wings. The annoying recordings of mosquito duets aren't likely to go platinum, but they give researchers some interesting new ways to think about courtship behavior in insects.

The study, published online January 8 in *Science*, finds that male and female *Aedes aegypti* — carriers of dengue and yellow fever — change the pitch of their buzzing to match each other's harmonics. The results go "way beyond the accepted dogma on hearing in mosquitoes and perhaps indeed in other organisms," comments Daniel Robert, an expert on insect hearing at the University of Bristol in England.

A female mosquito's come-hither buzz, produced by vibrating her wings at a certain rate, is irresistible to males. Scientists have long thought that male mosquitoes could hear just enough sound to locate and home in on a female, says coauthor of the new study Ronald Hoy, of Cornell University.

What's more, females were thought to be totally deaf. The importance of female behavior in animals has been overlooked until the last few decades, says Hoy. "The assumption was that it's all about the guys," he says. Understanding how mosquitoes really woo one another may lead to new ways to stop their reproduction, which in turn could halt the spread of diseases mosquitoes carry.

A single female mosquito flying through the air produces a complex sound made up of a fundamental tone — which hovers around 400 hertz — and a stack of harmonics. Sometimes called overtones, harmonics are multiples of the fundamental tone. A female mosquito therefore can produce tones of around 400, 800 and 1200 hertz, says Hoy.

In the new experiments, researchers delicately tethered live mosquitoes to the ends of flexible wires, and recorded the tones made by the wings as a male and female mosquito came within a few centimeters of each other. Although the fundamental tones for each mosquito didn't change very much during a "fly by"— females still produced a fundamental 400-hertz tone and males a

600-hertz tone — each mosquito produced a faint harmonic note, right around 1200 hertz, that was closely in sync.

That these sweet nothings are matched means that the female hears and responds to the presence of the male, and vice versa, shattering the notion that female mosquitoes are inactive bystanders in courtship behavior, the team suggests. At the same time, 1200 hertz far exceeds the accepted range of male mosquito hearing.

“You’re not going to hear the harmonic until you’re really close. It’s like whispering sweet nothings,” says Hoy. Picking out these loving murmurs is an acoustic feat. “I doubt that humans — except for a few musicians with great, and trained, ears — could do that,” he says.

A 2006 study first suggested that females may have an active role in courtship. That study showed that females of the nonblood feeding mosquito *Toxorhynchites brevipalpis* match fundamental notes with males, a feat that would be impossible if females were deaf. This “acoustical interactivity,” as Hoy and colleagues call it, may be an important step for mosquito reproduction.

WEBSITE ADDRESSES FOR ENTOMOLOGICAL ARTICLES OF INTEREST

(These are articles that require a fee to reprint. A title, publication source, date, author and website address are included in this section for those interested in viewing the documents.)

Growing more corn for ethanol makes pest control harder

The New York Times

December 22, 2008

Henry Fountain

http://www.nytimes.com/2008/12/23/science/23obfuel.html?_r=2&ref=earth

Bug from Borneo is the world’s longest insect is nearly the length of a human arm, British scientists say

MSNBC

October 16, 2008

Raphal G. Satter

<http://www.msnbc.msn.com/id/27228564/?GT1=43001>

Fatal caterpillar-induced bleeding syndrome in returning traveler

Canadian Medical Association Journal

July 15, 2008

<http://www.cmaj.ca/cgi/content/full/179/2/158>

ENTOMOLOGICAL MEETINGS/PROGRAMS

February 6, 2009 (10:00 am-12:00 pm)

ESP Executive Committee Meeting

PA Department of Agriculture; Room 309

March 20-23, 2009

Eastern Branch of Entomological Society of America 80th Annual Meeting
Hilton Harrisburg; Harrisburg, PA

Contact: http://www.ebesa.ento.vt.edu/EB_MeetingInfo.html

April 5-9, 2009

American Mosquito Control Association 75th Annual Meeting
Hilton Riverside; New Orleans, LA

Contact: <http://www.mosquito.org/meetings/index-new.aspx>

May 17-22, 2009

North American Benthological Society 57th Annual Meeting
Grand Rapids, MI

Contact: <http://www.benthos.org/Meeting/>

Spring of 2009

American Entomological Society Field Day

Contact: <http://www.ansp.org/hotsted/aes/CurrentFieldDay.htm>

Summer of 2009

ESP Annual Collecting/Photography Trip

Site, Date and Contact to be announced in the next issue

ESP WELCOMES NEW MEMBERS FOR 2008

Charles Bier (R)- Arachnids Araneae inventory, biodiversity study and conservation, museum collections, general interest in invertebrates and their conservation

Brian Dougherty (R)- Aquatics, Mayflies, Stoneflies and Caddisflies

Jerry McWilliams (R)- Collecting and Photography; Lepidoptera, Odonata, Cicindelidae

David Schmit (R)- Forest pests, pest control

Virginia Tilden (S)- Lepidoptera conservation and restoration

Laura Wheatall (S)- Lepidoptera

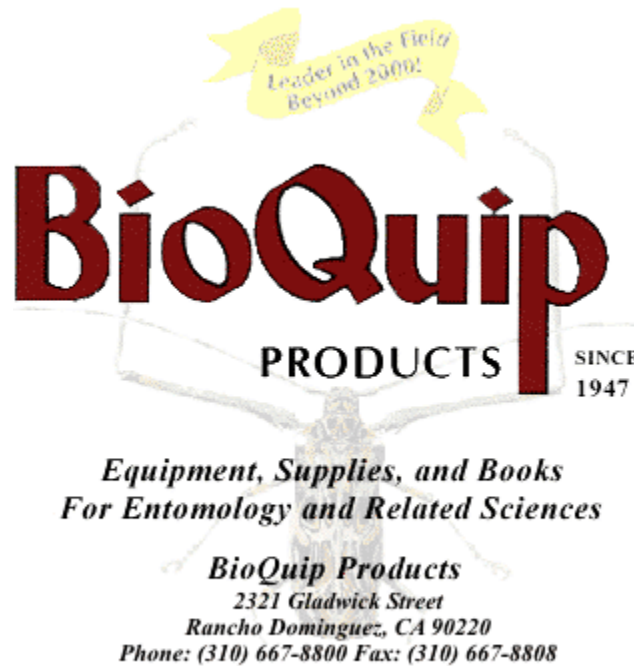
S = Student Membership

R= Regular Membership

SPECIAL THANKS

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Andy



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- quality of life through informed stewardship of the environment

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