



# Bohart Museum Society

Winter 2004-2005

## Newsletter

Editor: Dani DuCharme

Send articles and news items to the editor, Dept. of Entomology, University of California, One Shields Ave., Davis, CA 95616  
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### Editor's Note by Dani DuCharme

The excitement of the fall has come and gone, and the winter is almost complete! The new graduate students are easing into their projects, new undergraduate employees are getting settled into their tasks, and the rest of the staff is working steadily on winter work. With the weather outside being cool and rainy, the winter allows plenty of time for organization of past collections, and beginning preparation for the spring excursions. Also, with fewer tour groups now than in either the fall or the spring, projects can be continued uninterrupted. In addition, as Picnic Day is approaching quickly, displays are being changed, and a kid's corner is in the works! We look forward to all of the changes the New Year is bringing. Thank you for your continued support, and we anticipate sharing with you all of the exciting developments occurring in 2005.

### Peru Excursion by Lynn Kimsey

#### Adventures in Peru

In 2001 four of us, me, Carlos Quiros, Harry Kaya, and Steve Brush, at UC Davis began an unusual study in the high Andes of Peru. We received a grant from the McKnight Foundation, with four scientists from the University of Cusco, to study indigenous tuber crops in small villages in the mountains around the Sacred Valley of Peru.

Cusco is located high in the Andes, an hour's flight southeast from. Working at these altitudes is difficult, requiring several days to acclimate, particularly since you fly directly from Lima (at sea level) to Cusco. Cusco is an exquisite city, built in Spanish-style architecture, with white-washed adobe and tile roofs, on the foundations of Inca ruins. The remarkable stonework of the Inca is still visible along many of the city streets. Major Inca ruins are scattered throughout our study areas.

From Cusco, at about 10,000 ft elevation, we drive higher and further east to the field sites of Sacred Valley. Our four study villages are located in the mountains above the Sacred Valley. The highest of these has fields at over 14,000 ft in elevation. At the far northern end of the valley is Machu Pichu. One of the leading causes of injury in these villages is falling off your field. Crops are grown in family held terraces on the steep mountain slopes. It's misleading to call these terraces as they are simply roughly rectangular areas marked out on the slopes, with no attempt to make them level.

There are apparently no native trees in this part of Peru, except *Polylepis* and *Buddleya* (butterfly bush). Western Peru is extremely arid, with about 10 in. of rain annually there are some large forests on the mountain slopes, but these are all planted *Eucalyptus*. Much of the countryside is covered by a low growing, dense grass, which is introduced; from South Africa.

We are studying four different tuber crops, oca (*Oxalis tuberosa*), mashua (*Tropaeolum tuberosum*), olluco (*Ullucus tuberoses*) and yacon (*Smallantus sonchifolium*); none which are available in US markets. The study focuses on the management, culture and economics of these tubers. My role is to tell them what pest species attack the tubers, what parasites they have, and to offer ideas about how to control them. The primary pests of all of these tubers are flightless weevils. The taxonomy of weevils is very difficult, and in these Andean weevils it's worse. So it's been an adventure trying to determine the genus, not to mention the species, and it turns out that each type of tuber has its own species of weevil(s).

Oca flowers



Oca weevil, *Adioristidius tuberculatus*

## Volunteer Staff Profile

### High School Volunteer!

Students of all ages come to visit the Bohart, whether it is with their school, after-school groups, or camps. It is a rare student, however, who visits the museum and just can't get enough. Rachel Stapp is one of those students. After visiting the Bohart with her brother's home school group over a year ago, she and her sister Julia decided to become regular volunteers at the museum.

Rachel is now sixteen, and has been a volunteer at the Bohart since January 2004. Her duties in the museum are mainly to care for the insect zoo, and incorporate donated specimens into the museum collection. She works three hours a week, and has been here almost every week since she began when it doesn't interfere with her schoolwork.

Rachel and her siblings are home-schooled by her mother and a group of other parents in Woodland, California. She gets exposure to science here at the Bohart, as well as by taking a biology (and a Spanish) class at a local community college. Rachel has always had a fascination with insects, and collected and played with them as a small child. She is interested in research conducted by the entomologists in the museum. Rachel especially enjoys seeing the many different types of insects that she comes across in the collection. Although not an insect, Rachel has a pet Rose hair tarantula that she loves. Even though she enjoys insects, after college, she would like to pursue a career in writing, not science. When she is not here at the museum, Rachel enjoys reading, using the computer, and hanging out with her friends.



### New Design Intern!

This quarter, the Bohart Museum recruited a UCD student design intern, Rosanna Yau, to help update our entrance exhibit for this year's Picnic Day. Rosanna is a third-year art student majoring in design with a visual communications emphasis. Her specialties are spatial arrangements, typography and graphic design. Rosanna initially sought out this position because she has always been interested in insects, but never had the opportunity to learn more while specializing in design.

She is currently working on changing our "Form and Function" exhibit to "Medical Entomology—Bugs, Bites, and Bodies." She is using her background to make this display especially visually appealing, while getting across interesting information about the insects involved with human disease. She is also designing a Kids Corner, which will be ready for the eager young children attending Picnic Day. Rosanna is an excellent addition to the Bohart Museum volunteers, and we can't wait to see her visions turn into reality. Come see Rosanna's hard work at Picnic Day 2005!



Volunteers Rachel Stapp (Left) and Rosanna Yau (Right)

## School Visit

### Robbin Thorp Visits Twin Oak Elementary!

Professor Emeritus Robbin Thorp, based in the Bohart Museum, gave a talk January 20<sup>th</sup> to Ms. Shawna Grinnell's third grade class at Twin Oak Elementary School, in Rocklin, CA. Armed with a few of our best "Oh My" drawers of dried specimens (such as beautiful butterflies, giant beetles, and incredible walking sticks), and some live insects from our insect zoo, Dr. Thorp gave a fun presentation. He discussed what makes insects unique, and showed the incredible diversity within orders such as Coleoptera (the beetles). Also, because Dr. Thorp's life's work centered on bees, he discussed the social system in honeybees, how they gather nectar and make honey, and the waggle and round dances. With some interesting anecdotes and plenty of bug facts, he really made an incredible addition to the insect unit in Ms. Grinnell's class. Twin Oaks thanked him for a wonderful visit! Pictures from Dr. Thorp's visit are posted on our website at <http://bohart.ucdavis.edu>; take a look!

In addition to having your children come to visit the museum on a field trip, it is also possible to have an on-site presentation tailored to your children's needs. In order to set this up, please call Dani DuCharme at (530) 752-9555.



Above: Dr. Thorpe showing students live insects during his visit to Twin Oaks Elementary School.

Below: Honey bee stamp from Russia, circa 1989 showing the queen and worker bees.



### Pollinator Postage Stamps!

In January 4<sup>th</sup> 2005 a proposal was submitted to the United States Postal Service to create a commemorative stamp series on "Pollinating Partners." This endeavor was started by a task force of the North American Pollinator Protection Campaign, based in San Francisco, California. The purpose of this campaign is to "raise the awareness of millions of Americans about the crucial role that insects, birds, and bats play in providing pollination services." Another goal is to inspire America's population to become actively involved in preventing the decline of pollinator populations. They feel that postage stamps are just the way to raise that awareness.

If you would like to get involved in the campaign, there are two ways you can help: You can either write a personal letter of support to the USPS, or you can encourage members of your organization to write letters individually. Letters of support are encouraged through March 2005. Sample letters and more details, including addresses and phone numbers are available at [www.nappc.org](http://www.nappc.org). Campaign-specific information is available at: <http://www.organicgardening.com/feature/0,7518,s1-5-20-975,00.html>.

For more information on the history of insects represented in stamp collections, see the incredible collection at:

<http://www.asahi-net.or.jp/~CH2M-NITU/stampe.htm>. Click on the common name or family name of the insect you are interested in, and the geographical region on the world map, and the associated stamps will appear!

## Museum Scientist Visits Puerto Rico

Tom Zavortink, senior museum scientist, recently traveled to Puerto Rico in search of a variety of bromeliad-dwelling mosquito species. This trip, which was Tom's first to Puerto Rico, lasted two weeks, and took him all over the small island. He spent most of his time on the Eastern end at El Verde Field Station on El Yunque Mountain. Dr. Zavortink collected in three different El Yunque montane forest types: Tabanuco, Palo Colorado and Dwarf forest. He also sampled the Carite Forest and Toro Negro Forest Reserves. In the latter reserve, Cerro de Punta, the highest mountain in Puerto Rico, found at an elevation of 1330m is in the Toro Negro Forest Reserves.

Tom teamed up with Scottish scientists Barbara and Michael Richardson, on this collecting trip. Barbara, an ecologist, and Michael, a mycologist, have spent twelve years studying bromeliad communities in Puerto Rico through the Long Term Ecological Research Program. Although we think of Puerto Rico as hot and sunny, Tom spent most of his time in the cloud forest, where it was cold and rainy, with daily temperatures topping out in the 60's.

Tom hoped to get three or four undescribed mosquito species that only inhabit the water trapped in bromeliad plants, primarily in the leaf axils. In the Puerto Rican collecting sites at least six different types of bromeliads were sampled. Many of these bromeliads were out of arms reach, and he was forced to climb trees to sample in these environments. In fact, Tom collected mosquitoes out of the second highest bromeliad in Puerto Rico—yet the highest still eludes him! He also sampled out of *Heliconia* bracts and leaf axils, as well as from bamboo.

The bromeliad leaf axil environment is an interesting and unique ecosystem, because some bromeliads are insectivorous (insect-eating). Organisms that live in the water stored in the plant are adapted to the acidic environment produced by the plant, and can physiologically resist being digested. Animals found in this ecosystem are not only mosquitoes; but are also chironomid (non-biting midge) larvae, adult frogs, beetles and their larvae and psychodid (moth fly) larvae. The limited space available in the plant, as well as the limits as to what can enter the water in the plant (depending on its height from the ground), plus the

resiliency of the species inside make this environment fascinating to study.

Tom collected hundreds of specimens (larvae only) from this interesting ecosystem, and brought most of them back alive in order to rear them and make larval, pupal and adult associations. Once these specimens are reared and associated Tom hopes to describe the undescribed species. From what he has reared out so far, he has three of the previously undescribed species. To see if the fourth species is present, he will need to look further at the larvae, pupal skins, and male genitalia.

As a senior museum scientist, Tom Zavortink is no stranger to travel. He has traveled to Africa, Malaysia, Costa Rica, Mexico, Guatemala and Venezuela—many of these places, in search of mosquitoes. In his lifetime, he has described over 20 new mosquito species. Tom received his Bachelor's degree at Kent State University in Ohio, and his Doctorate from UCLA. He spent most of his life as a teacher at the University of San Francisco. His favorite part of traveling is having a good time, and collecting plenty of mosquitoes. In the future, Tom hopes to return to Puerto Rico, and collaborate with other scientists working on bromeliads and the Long Term Ecological Research Program. Good luck to Dr. Zavortink in rearing out his mosquitoes and finding the undescribed species he is looking for!



Dr. Zavortink prepared to slide mount his newly collected mosquito larvae and pupal skins, and eventually adult genitalia.

## Updates

### Nicaragua update!

The planning for the museum Nicaragua trip is well underway! With only a few months to go, the participants are eagerly awaiting departure. So far, 10 people will be traveling to Boca de Sabalo, Rio San Juan Province, Nicaragua, from May 2<sup>nd</sup> to May 12<sup>th</sup> 2005. The list of participants is as follows: Steve Heydon, Bohart Museum, Terry Sears, Silvaard Institute, Jeff Smith, Rocklin, CA, Norm Smith, Clovis, CA, Eddie Thomsen, graduate student, UC Davis, Richard Brown, retired, from Stockton, CA, Marius Wasbauer, retired from Cdfa, Brookings, Oregon, Ken Lorenzen, Bohart Museum, and Tom Zavortink, Bohart Museum.

The Rio San Juan has been selected for an expedition because runs through large extant tract of Caribbean rain forest. Wise use of the Rio San Juan basin and an understanding of its value to Nicaragua depend on a thorough knowledge of the biological riches it contains. The Center for Biosystematics on the UC Davis campus is in the planning stages for a survey of the birds and mammals of the Rio San Juan basin. An insect survey is needed to complement the surveys of vertebrates. A complete survey of the insects is nearly impossible, so we plan to initiate a survey of the Lepidoptera, particularly the butterflies and the sphinx moths, as indicators of faunistic richness. The 10 participants of this expedition will collect using nets, traps and black light collecting. We can't wait to see what they bring back!

### Graduate Student Corner!

Here's an update on what the graduate students of the Bohart Museum are up to! We will focus on two graduate students in each issue, keeping you updated on their progress towards an advanced degree!

#### Eddie Thomsen

Eddie will be participating in the trip to Nicaragua in May with fellow Bohart Museum staff members and Bohart Museum Society members. He is on the lookout for bioluminescent click beetles and orchid bees, and will help in the collection of Lepidoptera. He is also looking forward to learning new general field collecting techniques by working black lights and malaise traps. Eddie is focusing in on a doctoral thesis project that may include orchid bee physiology and mating behavior.

#### Fran Keller

Fran will be heading to the Mojave Desert and Western Arizona with her kids for spring break to look for *Stenomorpha* (Coleoptera: Tenebrionidae) species and to photograph the explosive desert flower blooms. She had a successful collecting trip in Fresno County finding *Stenomorpha lecontella* and is now observing live specimens and hoping for some beetle larvae to rear out and describe. Fran is also working on a poster presentation regarding the revision of *Stenomorpha* for the upcoming "Coleoptera Tenebrionoidea: Taxonomy, Biogeography and Faunistics Workshop and Symposium" in Lyon, France in October 2005.



Dr. Thorpe speaks with visitors at Picnic Day 2003

### Picnic Day 2005!

This year's theme for Picnic Day is: Live On One Shields Avenue. Well, the Bohart Museum has taken a whole different meaning to this year's theme. From 11am-4 pm on April 16<sup>th</sup>, 2005 come visit the Bohart Museum of Entomology! See our insect collection from around the world including the world's largest beetles, butterflies, and other creepy crawlers! Hold **live** insects from our petting zoo. Also, our new Medical Entomology exhibit will be on display, in addition to the Kid's Corner, which is also new to the Bohart. Every child who comes on Picnic Day will be able to contribute to our banner, color their own insect stickers, and even make a butterfly metamorphosis craft. Can't wait to see you on Picnic Day!



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### Developing Bug Zone: Partnership between the Sacramento Zoo and the Bohart Museum

This year, the Sacramento Zoo is bringing back their “Bug Zone” exhibit. This temporary exhibit will run from the first of April through the twenty-sixth of June. They will show over 30 species of live insects and non-insect arachnids, as well as preserved specimens in an outdoor display. Insect pictures and fun insect facts will also be on display in addition to a discovery station, and a docent-staffed “petting zoo.” The zoo staff coordinating the exhibit requested help from the Bohart Museum to secure live specimens, and to supply information for the display. In fact, some of the insects from the Bohart’s insect zoo will be on display, including the Madagascar Hissing Cockroaches, Indian and Vietnamese walking sticks, and termite and ant colonies. The staff of the Sacramento Zoo has requested entomology-savvy volunteers from the museum to interact with the visitors. This partnership is of benefit to both the museum and the zoo, and we look forward to the opening of the exhibit. Also, Dani DuCharme, Coordinator of Education and Outreach at the Museum will be giving a talk at the Sacramento Zoo, entitled “It’s a Bug’s World”. This evening talk, on April 27<sup>th</sup> from 6:30-8pm is open to the public, and geared towards a general audience. We would love to see you there!



