Hungry Bears

UC Berkeley, Urban Pest Management Center

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The UPMC Team (from left to right): Sara Moore, Lynette Yang, Robin Tabuchi, Gail Getty, Vernard Lewis, Shawn Leighton, Mike Haverty, and Lori Nelson.

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"With a little luck, we will have a better financial outlook to report in the next few months. Your support has kept us afloat through many storms and we are hopeful it will continue to keep us from sinking."

Update: The UPMC Fights the Financial Storm

Many of you have invested in the *Urban Pest Management Center* and the Lewis Laboratory at UC Berkeley. As you know, we have been dedicated to collaborating and assisting both the public and industry in bridging communication and knowledge of structural pests. We want to thank you. Many of the PCOC Districts, manufacturers and distributors, Pest Management Professionals, as well as private citizens, recognizing the important service the Center provides, have made donations. Like most of America, we are living month to month and are hoping to weather this current financial storm…a little tattered and worn, but still here.

We recently applied for a State grant and expect to hear in May whether or not it will be funded. SPCB Research Funds might be allocated this year and we are anxious to hear new information about funding opportunities at the next Board meeting held in Sacramento on April 22nd. Remember, attending the meetings listed on their website (www.pestboard.ca.gov) provides you with a voice in the industry.

In addition, there is continued interest for the UPMC to provide outreach to children in the State. The outreach focuses on insects, our communities and the balance between them needed to make decisions regarding pest control. We have been contacted by *Scholastic Magazine* in New York. Many in our industry already use this forum to teach the public about our environment and the role many products play in successful pest management. Unfortunately, it is currently cost prohibitive for us to move forward in our current financial state. Hopefully, this will soon change.

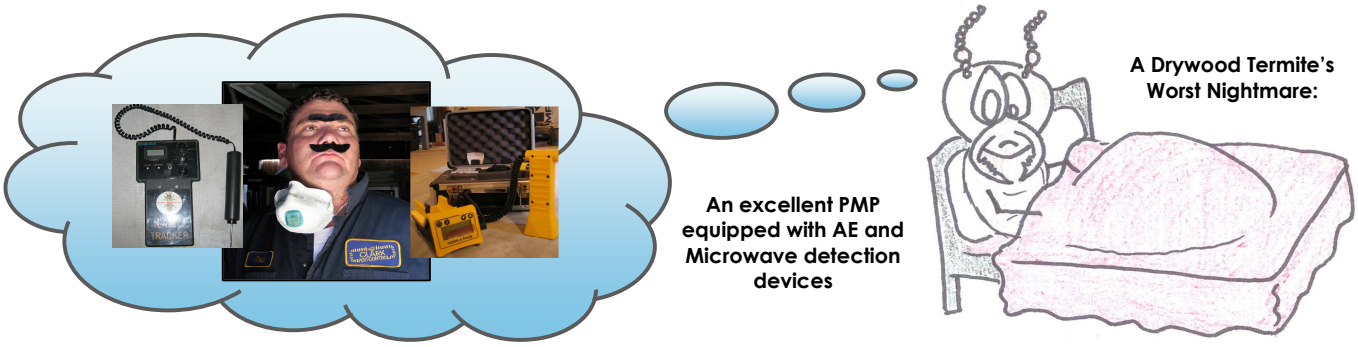
There is little to report regarding the progress of H.R. 2248 *Don't Let the Bed Bugs Bite*; the bill that would allocate $50M to the bed bug problem throughout our nation. This bill is in the first step of the legislative process. Introduced bills and resolutions first go to the committees that deliberate, investigate, and revise them before they go to general debate. The majority of bills and resolutions never make it out of committee. The last action taken on this bill was May 5, 2009 when it was referred to House Financial Services. Many of us have forgotten, or never knew about H.R. 6068: *Don't Let the Bed Bugs Bite Act of 2008*. Same sponsor. But since all proposed bills and resolutions that haven't been passed at the end of a Congressional session (2 years) are automatically cleared from the books, George Butterfield (D-NC) reintroduced the bill under H.R. 2248, which appears to be languishing in committee. No action has been taken since May 5, 2009, almost a year ago.

With a little luck, we will have a better financial outlook to report in the next few months. Your support has kept us afloat through many storms and we are hopeful it will continue to keep us from sinking.

Gail M. Getty
Director, UPMC

Both SPCB Funded Projects are Finalized!

Good news! Pest Management Professionals (PMPs) will not be out of a job any time soon. We found that a PMP is the best detection tool for drywood termite inspections, but strongly recommend that their inspection diagnosis be backed up with use of a portable Acoustic Emissions (AE) device, followed by a microwave device. The use of AE technology is key to assessing if a board is active, and if any adjacent boards are also active. The microwave device can be used to identify termite-travelled tunnels or galleries for a pinpointed local treatment. If a post-treatment inspection is necessary, the AE device can then be used to document treatment efficacy by showing a lack of termite activity. The other devices (borascope, X-ray, and infrared camera) were found to be lacking for inspection.



Our results from monitoring termite feeding and wood temperature showed that both are highly correlated, throughout the day and seasonally. Even in winter months, there are spikes in activity during heat waves. Considering termites are ectothermic, these results are not surprising. However, if AE or microwave devices are being used during inspection, these results do confirm that inspections should be done between mid-morning and 6 PM when termites are most active. And, if an inspection takes place in winter: crank up the heat for a couple hours prior to using your detection devices!

The Lewis Lab has figured out the scientific way to age pellets. We found 19 chemical hydrocarbons on pellets that change in amounts over time. Soon, this method may be used to assess whether or not an infestation is active, if a treatment was successful, and how long the colony has been active. Activity and age of a colony, and efficacy of a treatment can also be answered by molecular genetics, which can also determine termite breeding structure. The Lewis Lab in conjunction with North Carolina State University took a look at the genetic make-up of drywood populations in urban and agricultural areas, and found that the majority of colonies (45%) have a simple breeding structure whereas only 30% have an extended-family breeding structure and 25% with a mixed-family breeding structure. Breeding structure is related to age of a colony; for instance, a simple-family colony is up to or a little over 5 years old and in comparison, an extended-family colony is at least 10 years old. Thus, breeding structure has significant implications to the extent of structural damage. Depending on breeding structure a least-toxic treatment could be an effective strategy for drywood termite control.

For more juicy drywood termite biology information, please read the SPCB full report. This report can be found online at the UPMC website (http://nature.berkeley.edu/upmc).

Sara Moore
Staff Member, UPMC

A New Addition to Our Lab is on His Way…

For those of you who do not already know, Robin is expecting her first baby any day now! Although she has been on a restricted work schedule for the past few months, she is planning to work right up until the end. She will be gone on maternity leave for May and June to bond with her new baby boy. The rest of the lab team (Vernard, Gail and Sara) will be picking up the slack around the lab to ensure project deadlines are still met.

We wish mom and baby the best of luck and are greatly looking forward to training a future urban entomologist!

Digitally Tracking the Movement of Bed Bugs

Background: Bed bugs are on the rise and could be coming to a hotel near you! In an attempt to control the spread of bed bugs, much work has already been done to explain the behavioral biology of the insect. However, many of these studies apply a before and after approach, measuring the insect's behavior through presence/absence in a trap or harborage. This methodological bias has left a large gap in our present understanding of the insect's movement behavior. Namely, we still don't have a precise understanding as to how the bed bug mediates its surrounding environment.

With the advent and growing affordability of computers and digital cameras, modern methods have allowed the researcher to study animal behavior in ways that are more informative, precise, and reproducible. The reemergence of bed bugs and the lack of knowledge as to how to address this growing problem, justified a closer examination of the insect's behavior, using these digital methods.

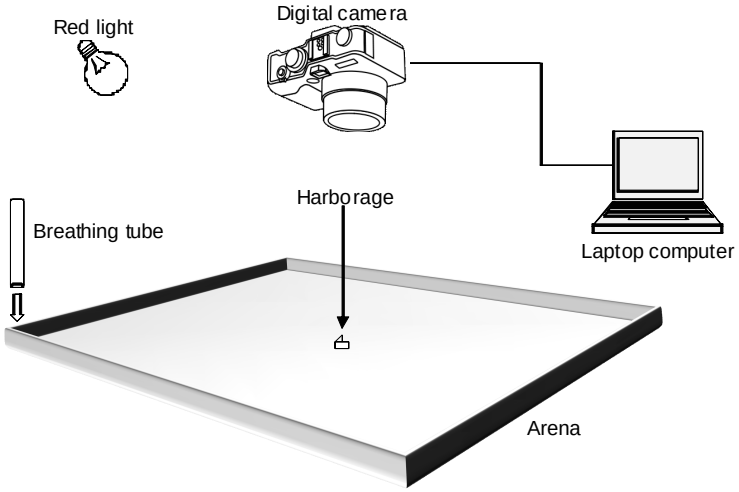


Figure 1. Experimental setup with time-lapse photography equipment and an arena where the bed bugs are photographed

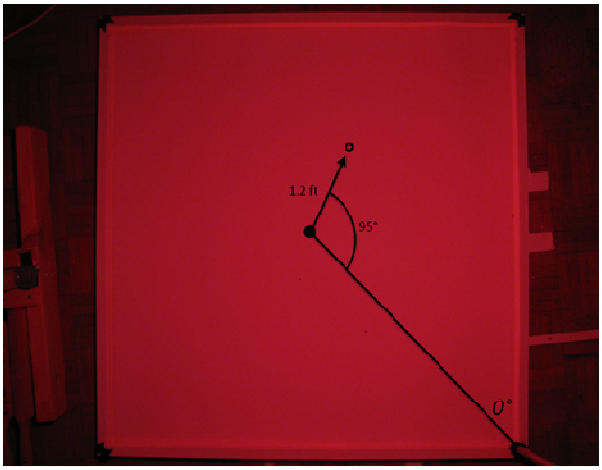


Figure 2. Turning the bed bug's spatial location (empty circle) into an angle and a distance, relative to the center of the container (black circle)

Experimental Setup: A time-lapse photography system was used to track the bed bug's movement within a large, experimental arena (**Figure 1**). As the insect travels throughout the arena, an aerial camera would take a series of still photographs, turning the insect's behavioral movement into a spatial location within each picture. The pictures taken of each insect were then transferred to a laptop computer where the insect's spatial location within each picture was converted into a set of polar coordinates (angle and distance) (**Figure 2**). When all of the insect's points were connected in sequence, a continuous pathway was produced.

This setup provides a cheap and easy way to descriptively and quantifiably measure the movement of bed bugs, or other similarly sized insects. I have already begun to examine the influence of environmental host cues on the behavioral movement of the insect within its environment (**Figure 3** and **4**). By better understanding the interaction between the insect, the host, and the environment, more successful and cost-effective integrative pest management (IPM) strategies, reflecting a comprehension of the insect's behavioral biology, can be devised.

James Suchy
Undergraduate Researcher

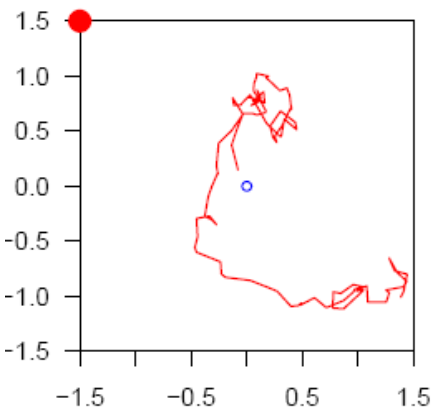


Figure 3 (left). Bed bug path (red line) in the absence of host cues, from central harborage (blue circle)

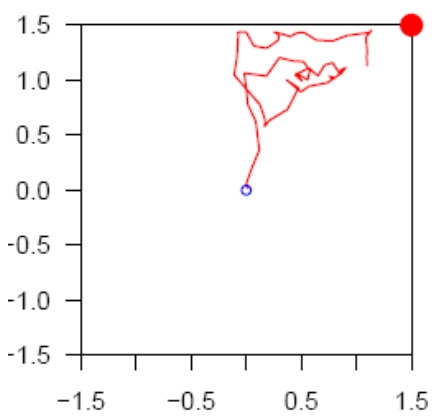


Figure 4 (right). Bed bug path (red line) in the presence of host cues (red circle), from central harborage (blue circle)

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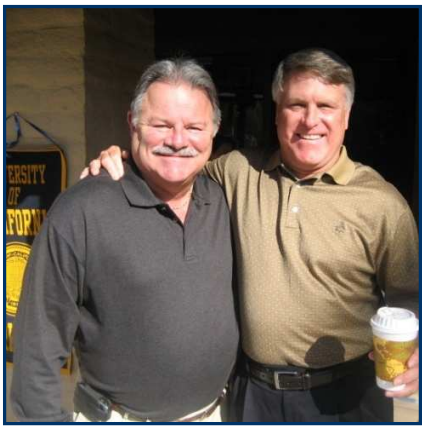
Another Successful Golf Tournament

We all know these are tough financial times. So, we cannot thank you enough for your support at our annual Urban Pest Management Center fundraiser golf tournament! In 2009, we once again held the tournament at the SilverRock Resort in La Quinta, CA. We would like to especially thank Curtis Good and PCOC for helping the UPMC raise money. Through their support, and the money provided from the tournament sponsors and players, we were fortunate to raise over $10,000. Not only does this event raise much needed money for the UPMC, but year after year, it provides members of the industry with a great day of golf and many wonderful raffle items. We have yet to pick a location for the 2010 golf tournament, so keep your ears open for when and where you can join us this year!



Darrell Ennes and Curtis Good showing their support of the UPMC

Gail Getty, Margie Koehler and Vernard Lewis at the 2009 golf tournament

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Enclosed is my unrestricted gift in support of the Dr. Vernard Lewis laboratory and urban pest management research. The check should be made payable to the UC Regents and is tax deductible.

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