

Notes from the Field

December 2004

Volume 1 Number 12

Ecology and Applied Taxonomy



Imagine yourself walking through the woods. You stumble upon a lovely little mushroom and your stomach starts growling. You've just run out of trail mix and wouldn't mind an additional snack. You consider eating the

mushroom. But should you? Is this fungus deadly poisonous or an edible delicacy? How would you find out?

The quickest and easiest way would be to carefully observe the specimen, consult a field guide and put a name on the toadstool. But if your mycology training is limited, how can you be confident that your observational skills are sharp enough to prevent an untimely death? Herein lies the essence of applied taxonomy: using the knowledge of naming and classifying organisms for application to real-world issues.

Dr. K.C. Kim and I are developing the concept of applied taxonomy as a way to help reinvigorate the waning field of taxonomy and integrate it with ecology. At the 2004 meeting of the Entomological Society of America (Nov. 14-17, Salt Lake City, UT), we co-organized a symposium entitled "Biodiversity and Applied Taxonomy: Assessment of Natural and Agricultural Ecosystems" to begin discussing how taxonomic knowledge is used by ecologists. With the growing recognition that species are important to ecosystem function, invasion ecology and other issues, ecologists are increasingly dependent upon taxonomic information to accurately and efficiently identify species. However, the number of scientists trained to name, describe and identify organisms has been—and remains—in continual decline. Because taxonomic knowledge is essential for ecological research, ecologists have a vested interest in the future of taxonomy. How might we contribute to ensuring that this foundation of all biology will remain an active area of study?

The primary way is for ecologists to collaborate with taxonomists, become well-versed about the taxonomic issues surrounding our research and discuss these in our papers. To assess whether ecologists are already doing this, I conducted a literature review of five major ecology

journals from the past ten years and compiled data about taxonomic issues included in 353 relevant papers. The results were stunning. On average, only 37% of the authors reported collaboration with taxonomists. Only 28% of the authors discussed issues surrounding specimen identification. On a more positive note, ecologists are largely attempting to identify organisms to the species level (~65%). (For more details about this review, feel free to contact me: lbb130@psu.edu.)

Applied taxonomy presents a philosophical shift that highlights the need for taxonomists and ecologists to work together more closely for the benefit of both. Although most applied taxonomy issues will not be matters of life and death, increased understanding and discussion of taxonomy among ecologists will surely improve the rigor of our science and create demand for the continued description and naming of biodiversity.

~Loren Byrne, PhD Student

Congratulations, Tiffany!

Tiffany Bogich, a junior in the Intergraduate Undergrad/Graduate Program at Penn State University was selected as the October (one of 8 during the year) winner of the William W. Asbury Award for Student Organization leadership. Over the past four years, a \$500 award is made to a returning student who has excelled in one or more areas such as Dedication to Community Service, Academic Excellence, Promotion of Diversity, Responsible Citizenship or Creative Programming. Tiffany is combining her last year as a Mathematics Undergraduate with an Ecology Masters to finish both these degrees in 5 years through the Schreyer Honors College. She is the first in this type of program that the Ecology IGDP has been lucky to attract. Tiffany is the president of Phi Eta Sigma National Honor Society, has served as the Vice President and Treasurer of the Penn State Sailing club, and is member of Golden Key, the Penn State University Choir, Rugby Team, Women's Chorale and the Blue & White Society. In addition to her involvement on campus, Tiffany has been a dancer for Dance Marathon, a tutor for the Pennsylvania Literacy Core and a participant in Fresh Start. She has actively promoted diversity on campus through planning discussion panels with staff members representing minority student service areas. Recently, Tiffany planned and led a session for student organization training entitled "Conference Planning and Regional Networking Workshop" and has created other programming opportunities for her fellow students.

Notes From Carolyn Mahan PSU Altoona Campus



Carolyn G. Mahan is an Associate Professor of Biology and Environmental Studies with a primary scholarship interest in the preservation of biodiversity and threatened ecosystems. She joined Penn State Altoona in 1998 and the graduate program in ecology in 2003.

Dr. Mahan's research has been funded primarily from federal and

private agencies, but she also has collaborated on wildlife consulting research for private industry. Her on-going research includes studying the effects of an external, non-indigenous stressor, the hemlock woolly adelgid and resulting hemlock decline on biodiversity at Shenandoah National Park and Delaware Water Gap National Recreation Area. Through this research at Shenandoah National Park, several species of insects currently unknown to science have been discovered. Dr. Mahan also is studying another hemlock-associated species, the threatened northern flying squirrel. The northern flying squirrel's range has been shrinking throughout Pennsylvania and her research is attempting to better understand the ecology of this nocturnal mammal. Dr. Mahan has expanded her research in biodiversity to urban and suburban settings. She has completed a study to examine biodiversity in parklands and greenbelts that exist in more developed areas. Biodiversity information may help local and regional planners in designing development projects in areas of rapid growth. In addition to her work on the effects of urban development on biodiversity, Dr. Mahan has initiated undergraduate research projects at Penn State Altoona to examine how animal behavior and parasite loads may be affected by increasing landscape development, habitat loss, and fragmentation. Her work has documented new host records for parasites of eastern chipmunks. Dr. Mahan's work has resulted in 20 peer-reviewed articles published in the scientific literature. In addition, Dr. Mahan has presented over 30 technical presentations and invited seminars on her research at national and state conferences and workshops.

In complement to this publication and research record, Dr. Mahan has been active in several professional organizations related to her research and scholarly interests. These organizations include the American Society of Mammalogists (ASM), The Wildlife Society (TWS), and the

Pennsylvania Biological Survey (PABS). She has served as a committee member for ASM, is on the board of directors and is the newsletter editor for the Pennsylvania Chapter of TWS, and is the co-chair of the Mammal Technical Committee for PABS. In November 1998, she co-chaired the Pennsylvania Conference on Biodiversity that was sponsored by PABS. At the community level, Dr. Mahan serves on the board of directors of the ClearWater Conservancy, a non-profit, community-based watershed organization that strives to balance growth with natural resource conservation throughout central Pennsylvania.



Dr. Mahan's teaching assignments reflect her interest in biological diversity and environmental issues. Annually she teaches BI SC 3H (Environmental Science for honors students), BIOL 110 (Basic Concepts and Biodiversity), and BIOL 427 (Evolution). In addition, Dr. Mahan helped develop and taught ENVST 100 (Visions of Nature) and ENVST 400W (Senior seminar in Environmental Studies). In 2004, ENVST 400W focused on watersheds and our place in the Chesapeake Bay watershed. In addition to other service commitments, Dr. Mahan helped design, develop, and now co-coordinates the Inter-disciplinary Program in Environmental Studies at Penn State Altoona. The Environmental Studies program provides students with an opportunity to examine and understand the complexity of environmental issues well into the 21st Century. This program is the first of its kind at The Pennsylvania State University and currently only exists at Penn State Altoona.

Notes from the Office

As the holidays grow near, the Fall 2005 application season begins. Mary and I are rapidly adding new applications to the burgeoning files in 308 Kern. I may be contacting you in the coming months about visiting with prospective students. When considering graduate schools, I am sure you remember how important it is to hear student perspectives on a prospective program. Your participation in the process is important to us.

As always, farewells are in order again this semester. Graduates this December are: Hugo Castillo, Songlin Fei, and Po-Ching Wang.

It was good to see so many of you at the Minisymposium a few weeks ago. Thank you for the Ecology shirt and happy holidays to each of you.

PS: Don't forget to file your Intent to Graduate on eLion before January 24, 2005, if you are planning to graduate in May, 2005.

~Rosemarie Hibbler