The Eighth Annual Darwinian Student Symposium

April 10, 2011, The Chicago Botanic Garden

The Committee on Evolutionary Biology (CEB) and the Department of Ecology and Evolution (EE) co-sponsored their eighth annual student symposium, held again this year at the Chicago Botanic Garden. Students from four different graduate programs discussed their research on topics ranging from extinct plankton phylogenies, rocky intertidal ecology, mammal behavior and gene expression in *Arabidopsis* plants.

The morning session featured graduate students in their third year or later. Matt Heintz opened the session up with a discussion on the possible adaptive significance of play behavior in chimpanzees (*Pan troglodytes*). Rebecca Dikow discussed patterns of phylogenetic signal in bacterial genomic data. Ben Krinsky showed how a gene duplication in fruit flies (*Drosophila*) has lead to the evolution of a new gene regulation in some species, and the possible targets of this novel network. Aaron Savit took participants on a tour of South America by explaining the role of abiotic variables, such as precipitation, in the distribution of closely related birds (the genus *Tangara*). Natasha Bloch continued the bird theme, but shifted focus to the role of color-receptive proteins (opsins) in the evolution of intraspecific color signaling. Will Tyburczy brought us to the world of snails and barnacles as he talked about experiments he had conducted in the Pacific Northwest in his attempts to understand how predator-prey interactions contribute to population size and density.

The second half of the morning session featured students from Geophysical Sciences, Integrative Biology, Evolutionary Biology, and Ecology and Evolution. Dave Bapst pondered how understanding diversity can be skewed by looking only at one time period (such as only current taxa), while Kacy Gordon discussed the role of histone-suppressing sequences upstream of promoters in controlling rates of sequence divergence. Nick Block startled the crowd with his revelation of a cryptic species of bird he discovered in Madagascar that is highly divergent molecularly, but with no obvious phenotypic differences, and Bin He wrapped the morning up with a talk on how background genetic differences can influence the expression of genetic diseases.

After the science-packed morning seminar, the session broke for a brief lunch, followed by informal, but productive, break-out sessions with faculty on topics such as being a successful graduate student, getting

postdoctoral positions, working in a liberal-arts college, and non-university careers. A guided trolley tour of the botanic gardens was then provided, as well as some free time for students and faculty alike to take in the sights. Then, the symposium resumed, with the participants rejuvenated and ready to engage. The afternoon saw two concurrent sessions, one titled "Behavior & Evolutionary Ecology" and the other "Evolution: History & Genetic Mechanisms".

"Behavior & Evolutionary Ecology" started off with Chris Schell's investigation of the role of non-genetic (induced) parental behavior in coyote pup behavioral development. Colin Kyle discussed mechanistic models for predicting the prevalence of fungal pathogens in the invasive gypsy moth. Si Tang talked about the theoretical implications of predator-prey interactions, and what ecologists mean when they say "random ecosystem". Katie Brooks guided us through the benefits of group living in Belding's ground squirrels (*Urocitellus beldingi*), and Liz Scordato told us about her recent work on how targets of sexual selection can shift. Aaron Kandur then brought data to bear on a long-standing theoretical debate about whether gene flow can inhibit local adaptation, and found that it did not in his rocky intertidal system. Kristen Jenkins followed up by taking a longer view of rocky intertidal community dynamics, and asked what we could learn about human impacts on ecosystems by examining ancient examples. Ben Rubin ripped us away from the coast-line and into the jungle, as he described his past fieldwork and proposed research on the evolution of ant-plant mutualism. Traci Viinanen finished this seminar off with a fascinating talk on how intraorganismal seed competition explains why perennials such as wheatgrass (*Thinopyrum intermedium*) produce few seeds relative to the total possible.

The "Evolutionary History and Genetic Mechanisms" session began as Ben Winger introduced us to his research on phenotypic differentiation, using bird taxa on either side of an Andean valley. Alice McQueen discussed hypotheses to explain pathogen resistance gene retention despite fitness costs in Arabidopsis, and Laura Merwin described research plans to discern adaptations to life on the beach among *Arabidopsis* populations in Sweden. Deren Eaton introduced us to the endemic Chinese members of the flowering plant genus Pedicularis, in which he is studying reticulate evolution. Matt Nelson focused on the natural history and phylogenetics of dothidiomycete lichenized fungi, and Nate Upham discussed the fossil-informed phylogenetics of Octodontoid rodents in South America. Paul Grabowski described research on spatial patterns of gene flow and genetic variation using high-throughput sequencing of switchgrass DNA (*Panicum virgatum*). Sophie McCoy's presented her work

detecting ocean acidification using coralline algae as indicators. Finally, Chris Meyer spoke about methods for identifying epistatic interaction using the considerable genetic resources available for *Arabidopsis*.

It is sometimes difficult for the graduate students to keep up with each other's research. The most-overheard comment from fellow students was "I'm so glad I got to see what {graduate student} does." The retreat provides a much-appreciated chance for graduate students to get an in-depth introduction to the range of research their colleagues are working on, and for presenters to gain more input on their projects from interested peers. Our thanks to the Chicago Botanic Garden for hosting the event, and the students, faculty and staff who helped organize the symposium.

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