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symposium summary

Conservation biogeography

A contributed session at the 5th International Biogeography Society Conference – Heraklion, Greece, 7–11 January 2011

Theory and analyses developed in biogeography can provide new and valuable insights into how to conserve diversity, especially in an era of increased human degradation of both terrestrial and aquatic ecosystems, coincident with climate change (Whittaker et al. 2005). Inspired by increasing research in the field, and by Richard Ladle and Rob Whittaker's new edited book 'Conservation Biogeography' (2011), the *International Biogeography Society* devoted a contributed session to conservation biogeography at its fifth biennial conference. The session covered six related themes: biotic homogenization, invasive species, agricultural ecology, disease ecology, reserve design and communicating conservation biogeography to the general public. Climate change, also an important theme in conservation biogeography, was discussed in its own contributed paper session.

In the first talk, Martin Winter and colleagues evaluated the extent to which invasive species lead to homogenization of species, traits and phylogenetic composition of vascular plants and vertebrates in North America and Europe. Their analyses considerably extend current work which has mostly been conducted at the species level and has not evaluated all three levels of diversity simultaneously. They found that all three levels of diversity were influenced by non-native species, and communities within and among the two regions are becoming increasingly similar. Nonetheless, climatic differences and geographic distance between North America and Europe still seem to limit homogenization. Also on the theme of invasions, Alejandro Ordonez (and co-author Olf Han) evaluated how patterns of species and functional trait distribution of co-occurring native plants varied across a nested series of spatial scales. Their analyses revealed the importance of both trait-based environmental filtering and local-scale factors on the distribution of invasive species.

George Roderick and colleagues contributed a different perspective on the topic of community assembly. They used a series of case studies of crops and their herbivorous pests and natural enemies to uncover patterns of assembly of co-occurring species in the Mediterranean. They found that some herbivores and their natural enemies were already present in the region before crop domestication, while others were associated with subsequent movements of domesticated crops into the region, both early and more recent. The variety of mechanisms by which pests of crop plants moved into the Mediterranean highlights the complexity of the origins of these multispecies interactions, and the challenges associated with conserving—the earliest known—native diversity. Harris Nyeema (with co-author Robert Dunn) also evaluated multispecies interactions and the diversity of co-occurring species, in their study of carnivores and their parasites. They modeled host-parasite associations to explore the consequences of loss of carnivore diversity (29 species) in North America on zoonoses (i.e., diseases transmitted between humans and wildlife) and the implications for parasite diversity and conservation. They showed that the loss of carnivores was a potential human and wildlife health risk, and a concern for parasite conservation because it increased the overall proportion of zoonotic parasites (relative to non-zoonotic parasites) and parasite homogeneity.

Lira-Noriega, Villalobos and colleagues presented a method to simultaneously analyze species richness and range size to identify distinctive assemblages of species. Distinctive assemblages are both species rich and harbour small-ranged species, the combination of which is not always included in conservation assessments. They found that distinct assemblages are poorly represented within the Mexican national reserve system, and thus these tools have clear conservation value.

The final talk in the session, presented by Leticia Ochoa-Ochoa, used the golden toad story (*Bufo periglenes*) as a case study to evaluate how some science stories influence the media, and peoples' resulting perception of biodiversity loss. She and her colleagues explored the emergence of the words "biodiversity crisis," in the media from the 1987 to 1992, and suggest that the toad was instrumental in shifting society's perception of biodiversity loss. More broadly, they emphasized that conservation biogeographers (and conservation biologists in general) know little about how the media perceives their work and the impact it could have on societal views towards the conservation of biological diversity.

In summary, these talks touched on many of the themes and challenges to conservation biogeography outlined by Ladle and Whittaker (2011). A critical challenge is to implement and

disseminate the new knowledge and tools to conservation practitioners and the public.

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symposium summary

Hot topics in biogeography and ecology

A contributed session at the 5th International Biogeography Society Conference – Heraklion, Greece, 7–11 January 2011

The "hot topics" session of the Meeting of the International Biogeography Society (IBS) aimed to highlight new developments and ideas in the field of biogeography. While there was no pre-determined theme linking the presentations, several topics were raised by several presentations during the session. For example, it was apparent that molecular data have become increasingly instrumental to furthering our understanding of biogeography, including distribution patterns, dispersal routes, historic events, ecological trait variation and community assembly. In addition, multidisciplinary studies (e.g. drawing data from ecology, morphology, climatology, geology, species distributions and molecular phylogenies) employing recent methodological advances were shown to provide a deeper understanding of several long-standing questions in biogeography and macroecology. Here, we summarize the presentations that made up the session and attempt to highlight their significance.

In recent years it has become increasingly apparent that long-distance dispersal events are responsible for the disjunct distributions of many organismal groups (de Queiroz 2005). What have been less explored are the factors that facilitate such dispersal—and subsequent colonization—events. Peter Linder and colleagues used a dated phylogeny of danthonioid grasses to infer their long-distance dispersal routes. This allowed them to explore the effects of factors such as dispersal distance, prevailing wind direction, the nature of dispersal routes and the age of source areas on the probability of long-distance colonization events, of which the age was the main explanatory factor.

The field of community phylogenetics (Webb et al. 2002) has provided novel tools to recover patterns in ecology and species distribution. Employing such tools, Catherine Graham and colleagues presented their work on patterns of morphological variation in hummingbirds across