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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 predetermined 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

an elevational gradient from tropical lowlands to the high Andes. Building on their previous work (Graham et al. 2009), they combined phylogenetic, morphological and ecological data to discover that traits vary with elevation and that environmental filtering is particularly strong at high altitudes. Furthermore, they provided evidence that traits vary evenly across the elevational gradient, pointing to niche differentiation.

Daniel Kissling and co-authors combined phylogenetic with global distribution data of the palm family to assess the degree of phylogenetic clustering (higher relatedness than expected from random) within geographic regions (Webb et al. 2002). At this large spatial scale they observed spatial heterogeneity in phylogenetic clustering and could therefore identify areas where palms have undergone radiations, though they also concluded that clustering was scale dependent.

Carina Hoorn and colleagues also used a multi-disciplinary approach to address one of the most persistent objectives of macroecology: to elucidate the drivers of species richness patterns from a mechanistic perspective. By linking geologic events and their consequences for climatic changes to the patterns of diversification across a range of taxa, Hoorn et al. proposed explanations as to why the Amazon is the most species-rich area of the world (see Hoorn et al. 2010). Evidence suggests that the uplift of the Andes was responsible for much of the current Amazonian biodiversity, as it shaped the greater region by changing climatic patterns, water courses and local habitat mosaics.

David Storch and colleagues tackled species richness variation from another perspective. Geometric models were employed (Šizling et al. 2009) to test Rapoport's rule (which states that geographic extents of species decline from high to low latitudes) and Stevens' principle (species' environmental tolerances increase with latitude), which attempts to explain Rapoport's rule (Stevens 1989). They tested whether latitudinal clines in range size could be simulated under different biological (Stevens' principle) and geometric (including geographic barriers to ranges) constraints. Simulations indicated that, while

Rapoport's rule could be generated under various conditions, Stevens' principle resulted in a reversed Rapoport's rule. This work provides insights into evaluating the role of species tolerances and dispersal boundaries on diversity patterns.

Finally, Sofia Silva presented an assessment of longitudinal distribution patterns of vertebrates of the Atlantic forest, one of the most species-rich biodiversity hotspots. Compiling distribution data from the literature, she and her team confirmed the presence of a longitudinal distribution pattern in the Atlantic forest, but a more complex one than previously thought. Using a technique that draws tracks linking occurrence data, they found support for currently recognized hotspots of endemism and uncovered previously overlooked hotspots. Their study demonstrates the underlying complexity of the biogeographic history of biomes (Carnaval et al. 2009), which should be taken into account when making decisions about their conservation.

The "hot topics" session illustrated how new methods, simulations, and collation of data from across disciplines continues to advance our understanding of biogeography. It will be interesting to see how the field has advanced when the next IBS meeting happens in Miami in 2013.

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