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conference summary

Advances in the biogeography of littoral environments: a multidisciplinary perspective

8th Spanish Congress of Biogeography – Seville, Spain, 23–26 September 2014

A multidisciplinary perspective

The Spanish Congress of Biogeography has convened biennially since 2000 as a spin-off of the Spanish Fieldtrip Workshops in Biogeography—held regularly since 1991—under the scope of Physical Geography. These meetings have brought together geographers dealing with biogeography at scientific, scholarly or professional levels and likewise are open to disciplines related to biogeography. The number of contributions to this eighth congress exceeded those of previous meetings (Table 1). Applied biogeography had the highest number of contributions, followed by structural studies of animal and plant communities, and dynamic biogeography (Table 1). This rank-order appears a persistent trend through years, whereas fluctuating ratios between these areas indicate varying emphases in the research efforts of geographers within the field of biogeography.

Vegetation and faunal systems in littoral environments was the leitmotif of the 8th Congress, which centered on the progress made in their characterization, dynamics and conservation criteria. Littoral environments are especially vulnerable to degradation due to urban sprawl aligned to tourism development (Malavasi et al. 2013). In Spain this situation was denounced in 2009 by the European Parliament on the *Auken* report (Auken 2009) which drew attention to these environments, or at least what remains of them. Key contributions in this congress focused on structural and dynamic studies of vegetation systems, and new conservation proposals[1]. Above all, two aspects were noteworthy: the utility of Geographic Information Systems (GIS) and the application of pioneering methods of inventory and conservation models.

In addition to the main theme, there were contributions on non-littoral environments (including Caatinga and Atlantic Forest), which emphasized the potential for insights from interdisciplinary approaches and paleo studies, and the relevance of disciplines such as Pedoanthracology, Palynology and Paleobiogeography. The main research on fauna (primarily amphibians and birds) discussed modelling techniques for species distribution models (SDMs) and ecological niche models (ENMs), and advanced monitoring systems using high-frequency GPS data-loggers.

Biogeography of littoral environments

The keynote speaker José Ojeda (University of Seville) talked about the principal trends in the access, management and dissemination of spatial information supporting biogeography, highlighting data quality, homogenization and accessibility (Vitolo et al. 2015). Over the last few decades Geographic Information Technologies (GIT) and ultimately GIS have proved to be a key point for studying and monitoring vegetation and fauna of different ecosystems (Guisan et al. 1998, Rodríguez et al. 2012). There are still few studies, however, developed in coastal dune systems. Leví García (University of Las Palmas de Gran Canaria [ULPGC] Spain) presented a comparison of automated versus manual methods for establishing the distribution of vegetation cover in arid sandy systems; the automated method led to a more objective, cost-effective and efficient analysis than the manual approach. The implementation of GIS has proved to be consistent in analysing the mobility of arid sandy systems (Rodríguez et al. 2009) and also the associated survival strategies of their vegetation cover. Antonio Hernández (ULPGC) discussed the strategy of *Tamarix canariensis* to cope with burial by sand: the survival of young seedlings is higher in taller plants and in plants that are further away from the front of dunes.

Advances in methodologies include a combination of phytosociological methods with new

1 See program abstract and 8th Congress' Book for further information: http://congreso.us.es/viiiceb/en/programme.html

Table 1. Review of the size and composition of Spanish Congresses of Biogeography 2000–2014.

	Mean 2000-2012	2014
Contributions	44	66
Contributions per subject area, by proportion:		
Applied Biogeography	0.49	0.44
Structural studies of animals and plants communities	0.20	0.29
Dynamic Biogeography	0.16	0.20
Chorology	0.12	0.06
Methodologies	0.02	0.02

methods for inventorying biotic characteristics related to environmental factors. Traditionally contributions to biogeography from Spanish geographers since the 1970s have been largely restricted to species lists, lacking counts of individuals, which provided only species richness but not evenness for estimating alpha diversity. Nevertheless, in recent congresses and mainly in Seville, inventorying is being refocused on measuring attributes and counting individuals. The Method of Phanerophytes and Chamaephytes Inventory (MIFC; Cámara and Díaz del Olmo 2013) has been developed with the ultimate objective of achieving a deeper understanding of biodiversity and its relationships with environmental factors. From the application of the MIFC combined with the analysis of bioclimatic parameters, Rafael Cámara (University of Seville) explained the importance of the geomorphological position of juniper and shrub formations to the distribution of their heights and coverages in Doñana National Park, presenting a bio-geomorphological map of the area. A fieldtrip to Doñana Natural Space showed progress made using the MIFC (Cámara et al. 2013) as well as complementary research carried out by the Doñana Biological Station (Díaz-Delgado 2010).

Doñana is one of the few remaining spaces in Spain where coastal dunes still survive naturally; elsewhere, many have been transformed into limited spaces of high ecological value within a strongly anthropogenic matrix. In response to this fragmentation, José Gómez (University of Granada) proposed to create a network of flora micro-reserves based on the concept of Plant Micro-Reserves (PMR; Lumbreras 2001), which would be a suitable conservation status for those spaces in southern Spain (Andalusia). On the Mediterranean, micro-reserves have played a major role (Kadis et al. 2013) in conserving threatened floristic taxa of the Habitat Directive 92/43/EEC, which subsequently have been defined as Sites of Community Interest (SICs). According to Emilio Laguna (Centre for Research and Forest Experiments, Valencian Community), passive protection of Valencian networks of PMR complements Natural Protected Areas in eastern Spain, in protecting rare, endemic and threatened species.

In recognition of Ibero-American researchers' participation in these meetings, a special session considered tropical environments. Coral reefs and mangrove forests are two littoral ecosystems seriously damaged by tourism development and overfishing, or the construction of shrimp farms. Management of these situations has much to do with cultural biogeography (Simmons 1979) as emphasized in Yuri Tavares' (University of São Paulo, Brazil) discussion on the role of artisanal fisheries and tourism in Cananéia Estuary. Elsewhere, such as the Atlantic Forest of coastal Brazil, Yuri underlined the need to develop specific biodiversity conservation measures for endangered species that can work despite highly fragmented conditions (Forzza et al. 2012).

Conclusions

The congress emphasized not only the common work among different experts dealing with biogeography but also the contributions made by the more geographical perspective concerning land

management and nature conservation strategies. The potential of multidisciplinary research, new trends in methodological orientations and the evolving support of geographic information technologies are broadening the horizons of biogeography in Spain.

Rafael Cámara and E. Beatriz Rodríguez

Department of Physical Geography and Regional Geographic Analysis, University of Seville, Spain.
rcamara@us.es, http://personal.us.es/rcamara/;
evarodper@alum.us.es

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