A special issue on phylogeography and ecological niche modelling, edited by Utku PERKTAŞ from Hacettepe University, TURKEY and Hakan GÜR from Ahi Evran University, TURKEY, was published by Folia Zoologica, International Journal of Vertebrate Zoology (Publisher: Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic). This special issue consists of 2 reviews, 6 research articles, and 2 book reviews, including contributions from 25 scientists from 16 universities/institutes/laboratories in Europe, North America, and South America. The phylogeography review was written by Scott V. EDWARDS et al. from Harvard University, U.S.A., and the ecological niche modelling review by A. Towsend PETERSON et al. from the University of Kansas, U.S.A. Editors’ introduction to and content of the special issue can be found below.
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Preface

Guest editors’ introduction to the special issue: integrating phylegeography and ecological niche modelling

In this special issue of the Folia Zoologica, we did not focus on a specific problem or a taxon, but on two key disciplines that have been widely used together in recent biogeographic studies: “Phylegeography and Ecological Niche Modelling”. Phylegeography itself deals with the spatial arrangements of genetic variation and diversity especially within and among closely related species. In late 1980s, John Avise developed its theoretical framework based on the principals of population genetics and phylogenetics (Avise et al. 1987). At the beginning, mitochondrial DNA (mtDNA) studies became more common especially in animal phylegeography. Hence, astounding numbers of phylegeographic studies based on mtDNA data have been published for last 20 years (see Knowles 2009, Gutiérrez-Garcia & Vázquez-Domínguez 2011). The rising interest in phylegeography together with recent advancement in DNA technology and statistical processes make this field a fast-evolving discipline. Perhaps the most significant development in phylegeography in the past ten years has been the introduction of new sequencing techniques that allow rapid sequencing from large amount of gene loci and the advances in coalescent theory.

Phylegeography is a synthetic discipline that integrates with different disciplines within ecology and evolutionary biology to provide a comprehensive understanding of the spatial arrangements of genetic variation and diversity in the past and present. Ecological niche modelling, for instance, is an important methodological development designed to predict the past, present and future geographic distribution of organisms. The integration of phylegeography and ecological niche modelling provides incorporating the patterns of geographic ranges into analyses of genetic variation and diversity (Carstens & Richards 2007, Alvarado-Serrano & Knowles 2014). In a nutshell, phylegeography together with ecological niche modelling certainly provides valuable insights that can improve our understanding of the spatial patterns of biodiversity in the past and present.

This issue aims to consider the advances in both phylegeography and ecological niche modelling. There are eight articles that are set in the two sections, and two book reviews. The first section includes two studious and comprehensive reviews. In the phylegeography review, Edwards, Shultz & Campbell-Staton focused on next generation sequencing and its contribution to phylegeography. On the other hand, in the ecological niche modelling review, Peterson & Anamza focused on species-level distributional ecology with a brief historical review and methodological considerations and advances. The second section includes a nice set of six research articles. Galbreath & Hoberg focused on phylegeography of host-parasite co-speciation in the North American pika-parasite assemblage. Smyth, Patten & Pruett examined ring species formation in song sparrow complex that surrounds Sierra Nevada in North America. Ornelas and his colleagues focused on genetic diversity of eight hummingbird species in Mesoamerica and its relationship with past climatic fluctuations. Fahey, Ricklefs & DeWoody examined historical demography of 16 bird species in Hispaniola based on nuclear DNA (mtDNA) data and discussed the concordance between mtDNA and nDNA. Savit & Bates focused on phylegeography of the crimson-collared tanager in South America. At the end, in our research article, we examined historical demography of the Eurasian green woodpecker to discuss glacial refugia hypothesis in Europe. The third section includes two book reviews. Thus, this issue closes with up-to-date reviews of recently published books in the field of statistical phylegeography and climate change ecology.

It is certainly inevitable that phylegeography as a fast-evolving discipline will continue to grow. We believe that this set of articles, written by well experienced experts of phylegeography and ecological niche modelling, reflects its fast-evolving nature and may be a valuable resource.

Finally, we would like to give our sincere thanks to all contributing authors and to all reviewers, who helped to improve all contributions in this issue in terms of both contents and readability. We also extend our warmest thanks to the chief editor, Prof. Jan Zima, and the managing editor, Lenka Glišová, for making this special issue possible in the Folia Zoologica.

Literature


Utku Perktas & Hakan Gür