



Biogeography
of the Carpathians

Biogeography of the Carpathians
Evolution of Biodiversity in a Spatiotemporal Context
The First Interdisciplinary Symposium
26-28 September 2013, Kraków, POLAND

Diversity and distribution of the micro endemic *Pedicia straryi* group (Insecta, Diptera) reveal complex evolutionary history in the Carpathian Area

Lujza Keresztes^{1,2}, Dénes Avar-Lehel^{1,3}, Levente-Péter Kolcsár^{1,4}

1 Hungarian Department of Biology and Ecology, Faculty of Biology and Geology, Babes-Bolyai University, Clinicilor 5-7, Cluj, Romania

2 e-mail: keresztes2012@gmail.com

3 e-mail: avar_lehel@yahoo.com

4 e-mail: kolcsar.peter@gmail.com

The Carpathian Area is recognized as one of the most important hotspots for aquatic biodiversity in Europe. In the present study linear morphometry and mitochondrial sequence data (COI) were used to study morphological variability and phylogeographic patterns of a range-restricted endemic dipteran group in the Carpathians. Morphometry based on DA analyses are highly congruent with molecular data and confirm the taxon status of *P. apusenica*, *P. straryi* and *P. lobifera* with limited distribution in small enclaves the Carpathian Area. However in the case of the most wide spread *Pedicia straryi* both morphometry and molecular data revealed further divergent structures between allopatric populations from Rodnei and Bucegi Mountains. This pattern is most likely the result of long term isolation in multiple microrefugia in the South-Eastern Carpathians, probably dating back to Miocene-Pliocene periods. Contrastingly, the genetic and morphological divergences between the two allopatric populations of *P. straryi* show more recent speciation events and should be related with the presence of important micro refugia in the Carpathians during the Pleistocene climate change. The present study brings important new evidences on the complex autochthonous evolution of springs habitats in the Carpathians leading finally to a high genetic complexity of these particular aquatic ecosystems from here.

ACKNOWLEDGMENTS: The work was financed partly by IDEI grant nr. PN-2-ID-PCE-2012-4-0595 of the Romanian Government and by P 23687-B17, PI: J. Waringer founded by the Austrian Science Found (FWF).

REFERENCES

- BÁLINT, M., UJVÁROSI L., THEISSINGER, K., LEHRMAN, S., MÉSZÁROS N., PAULS, S.U. (2011): The Carpathians as a Major Diversity Hotspot in Europe. – In: Zachos F.E., Habel J.C. (eds.) Biodiversity Hotspots, *Part 2*. Springer, pp. 189-205.
- UJVÁROSI L., BÁLINT M., SCHMITT, T., MÉSZÁROS N., UJVÁROSI T., POPESCU, O. (2010) Divergence and speciation in the Carpathians area: patterns of morphological and genetic diversity of the crane fly *Pedicia occulta* (Diptera: Pediciidae). *Journal of the North American Benthological Society*: September 2010, Vol. 29, No. 3, pp. 1075-1088.