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GENOMSKA DIVERGENCIJA BRZO EVOLUIRAJUĆIH POPULACIJA PRIMORSKE GUŠTERICE

A. Štambuk¹, I. Sabolić¹, R. Bakarić¹, Ó. Mira¹, D. Lisičić¹, D. Y. C. Brandt², M. Baltazar-Soares³, S. Dennis⁴, M. Novosolov⁵, M. Allentoft⁵, J. Stapley⁶, R. Nielsen², A. Herrel⁷

¹Department of Biology, Faculty of Science, University of Zagreb, Croatia, (astambuk@biol.pmf.hr), ²Department of Integrative Biology, University of Berkley, USA, ³Bournemouth University, UK, ⁴Department of Aquatic Ecology, Eawag, Switzerland, ⁵Centre for GeoGenetics, Natural History Museum, University of Copenhagen, Denmark, ⁶ETH Zurich, Switzerland, ⁷UMR 7179 C.N.R.S/M.N.H.N., Département d'Ecologie et de Gestion de la Biodiversité, France

Razumijevanje mikroevolucijskih procesa kao osnove brze adaptivne evolucije te načina na koji selekcija modulira fenotipsku divergenciju jedni su od glavnih ciljeva evolucijske biologije. 1971. g

proveden je transplant eksperiment u kojem je pet parova primorske gušterice *Podarcis siculus* introducirano s otočića Pod Kopište na obližnji otočić Pod Mrčaru (Jadransko more). Kasnija istraživanja pokazala su da je tijekom samo 35 godina došlo do izraženih promjena u ekologiji i morfologiji introducirane populacije, vjerojatno uzrokovanih prijelazom na omnivorni način prehrane. No, još uvijek je nepoznata relativna uloga genetičkih promjena i fenotipske plastičnosti u toj brznoj fenotipskoj evoluciji. U tu svrhu, u našim istraživanjima kombiniramo procjenu nasljednosti u eksperimentima križanja i asocijacije genotip-okoliš-fenotip istražujući te dvije eksperimentalne, i još 18 nativnih populacija *P. siculus* i *P. melisellensis*. Ovdje predstavljamo rezultate genomske diferencijacije tih 20 populacija koje nastanjuju otoke duž okolišnog gradijenta u regiji. 374 jedinke genotipizirane su metodom genotipiziranja putem sekvenciranja (genotype-by-sequencing approach). Populacijske genomske analize omogućuju nam procjenu genomske divergencije na razini cijelog genoma, kao i specifičnih lokusa među populacijama duž ekološkog gradijenta, te kvantifikaciju varijacije genotipa uzrokovane geografskim i okolišnim varijablama.

Ključne riječi: brza evolucija, *Podarcis siculus*, evolucijska ekologija

GENOMIC DIVERGENCE OF RAPIDLY EVOLVING POPULATIONS OF ITALIAN WALL LIZARDS

A. Štambuk¹, I. Sabolić¹, R. Bakarić¹, Ó. Mira¹, D. Lisičić¹, D. Y. C. Brandt², M. Baltazar-Soares³, S. Dennis⁴, M. Novosolov⁵, M. Allentoft⁵, J. Stapley⁶, R. Nielsen², A. Herrel⁷

¹Department of Biology, Faculty of Science, University of Zagreb, Croatia, (astambuk@biol.pmf.hr), ²Department of Integrative Biology, University of Berkeley, USA, ³Bournemouth University, UK, ⁴Department of Aquatic Ecology, Eawag, Switzerland, ⁵Centre for GeoGenetics, Natural History Museum, University of Copenhagen, Denmark, ⁶ETH Zurich, Switzerland, ⁷UMR 7179 C.N.R.S/M.N.H.N., Département d'Ecologie et de Gestion de la Biodiversité, France

Understanding the microevolutionary processes underlying rapid adaptive evolution and the way selection shapes phenotypic divergence in natural populations remains one of the major goals of evolutionary biology. In a transplant experiment in 1971, five pairs of Italian wall lizards *Podarcis siculus* from the islet of Pod Kopište were introduced on the nearby islet Pod Mrčaru (Adriatic Sea). Follow up study on these populations has revealed that in only 35 years distinctive changes in ecology and morphology have occurred in the transplanted population, probably linked to dietary change towards omnivory. However, the relative the role of genetic changes vs. plasticity in this rapid phenotypic evolution remains unknown. To address this question, we will combine estimates of heritability from crossing experiments with genotype-environment-phenotype associations using two experimental and 18 native populations of *P. siculus* and *P. melisellensis*. Here, we present the results on genomic differentiation among these 20 populations inhabiting islands along environmental gradient in the region. We genotyped 374 individuals using a genotype-by-sequencing approach. Population genomic analyses allows us to estimate genome-wide and loci-specific genomic divergence among populations distributed along the ecological gradient and to quantify the amount of variation in genotype that is explained by geographic and environmental variables.

Keywords: rapid evolution, *Podarcis siculus*, evolutionary ecology