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Rapid lizard radiation lacking niche conservatism: ecological diversification within a complex landscape

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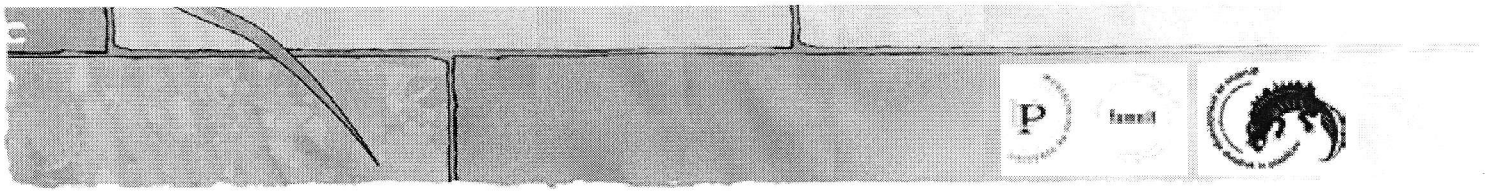
Diversification and rapid radiation are well documented in lacertid lizards. Niche conservatism is frequently observed among related taxa, whereby ecological niches remain mostly stable during speciation events. Here, we investigate the relationship between environmental niche divergence and phylogenetic relatedness in a widespread group of green lizards, the *Lacerta trilineata* group. A dated phylogeny based on three mitochondrial genes was contextualized using species distribution models of all genetically identified lineages in the *Lacerta trilineata* group. Based on this analysis, ancestral climatic niche occupancy was reconstructed using niche occupancy profiles. Niche divergence among lineages was quantified by computing multivariate niche overlaps. All taxa are associated with humid areas, but there is extensive variation in their climatic niche breadths and positions, which accord with the main phylogenetic split in the group. Our results suggest divergent niche evolution within subclades and convergent evolution among clades, which implies only a limited degree of niche conservatism regarding annual variations in temperature and precipitation. In contrast, niche axes – mainly reflecting precipitation patterns of the



coldest quarter – show a greater difference among clades than within clades, and therefore a higher degree of niche conservatism. Based on estimated divergence times between taxa and geological events in Anatolia, our results can be explained by fragmentation of the range of a hypothetical ancestral species, resulting in different adaptations of subclades either to humid continental climates or to more Mediterranean climates. Our study highlights deviations from classical niche conservatism theory due to significant niche shifts among sister taxa.

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