Ontogeny of individual activity level under different climates in the common lizard Zootoca vivipara

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Résumé

Ongoing climate change has drastic and diverse effects on organisms. In particular, warmer temperatures are assumed to accelerate the pace of life of individuals, and therefore developmental and senescence rates. Because behavioural traits and their among-individual variability are involved in eco-evolutionary dynamics, a better understanding of how climate is susceptible to alter their ontogeny is required. Here we focus on the effect of a warmer climate on the ontogeny in individual activity level in the common lizard Zootoca vivipara. Activity is more susceptible to changes in climate given its link with pace of life syndrome and metabolic rates and such changes may have strong consequences on population and community dynamics. For the last 10 years, common lizards are maintained in semi-natural mesocosms experiencing either current or _˜2∘C warmer climatic conditions and individually monitored for activity level and life history traits over their lifetime. Using this database, we explored how warmer climates impact age-related changes in the mean and the within and between individuals variability of activity levels as well as the mechanisms potentially involved in such changes (differential survival and plasticity). We found activity to be partly heritable and repeatable only on parts of the lifetime resulting from contrasting patterns of between and within individuals variability across ages and climates. Overall there was a change in activity level with age, induced by both within-individual changes and a selective disappearance with limited effects of climatic treatment. Considering its close links with physiology and pace of life syndromes, observed changes of the ontogeny and plasticity of activity with climate may change predator-prey interactions with potential cascading effects on community dynamics and ecosystem functioning.

Mots-Clés: climate change, activity, common lizards, ectotherms, between, individual variability, repeatability, heritability, animal personality

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