Monday 18/06/18 11:15-11:30

Do wall lizard colour morphs differ in ecology? From realised to fundamental niche

Miguel A. Carretero[1], Verónica Gomes[1,2], Neftalí Sillero[3], Guillem Pérez i de Lanuza[1]

[1] CIBIO Research Centre in Biodiversity and Genetic Resources, InBIO, Universidade do Porto, Campus de Vairão, Rua Padre Armando Quintas, N° 7. 4485-661 Vairão, Vila do Conde, Portugal.
[2] Departamento de Biologia da Faculdade de Ciências da Universidade do Porto, Porto, Portugal
[3] CICGE: Centro de Investigação em Ciências Geo-Espaciais, Faculdade de Ciências da Universidade do Porto, Observatório Astronómico Prof. Manuel de Barros, Alameda do Monte da Virgem, 4430-146 Vila Nova de Gaia, Portugal

Recent studies with lacertids are improving our understanding of the maintenance of alternative phenotypes in polymorphic species. While ventral colour polymorphisms are frequently interpreted in the light of sexual selection, the contribution of natural selection has often been neglected. *Podarcis muralis* encompasses up to three pure (white -W-, yellow -Y-, orange -O-) plus intermediate morphs whose frequencies vary across populations. Ecological models performed with >100 populations from E Pyrenees suggest morph divergence in realized niche associated to climate. The Y, YO morphs occupy a narrow niche space within the other morphs while O and WO show higher local frequencies in the most humid habitats. Indeed, such geographic patterns could derive from the spatial variation in the environmental context of sexual selection. However, an analysis of microhabitat in representative localities based on >1000 observations indicated that O morph is partially segregated relative to the others, tending to occupy more humid (vegetated, close to water) sites, suggesting divergence in fundamental niche. Here, we tested this hypothesis by analysing two ecophysiological traits, preferred body temperature (Tp) and evaporative water loss (EWL). Adult males from the three pure morphs (W,Y,O) underwent tests for Tp in a photothermal gradient (10 h) and EWL in sealed chambers (12 h). We detected diel variation in Tp but failed to find differences in mean Tp between morphs. However, when controlling for size, accumulated EWL was higher in O lizards. This suggests that geographical abundance and microhabitat use of O morph are at least partially constrained by its water ecophysiology. However, W and Y morphs did not differ in ecophysiology as they did not in microhabitat, suggesting an indirect relationship between climate and demographic parameters (sex-ratio, density). Overall, these findings depict a complex scenario of interaction between sexual and natural selection shaping colour polymorphism in space and time.