Darwinian species formation: adaptive divergence in a salamander ring-species complex.

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Abstract:

Darwin had little to say directly about species concepts or species formation, despite the title of his most famous book. He focused on variation, natural selection and adaptation and the reader was left to infer that adaptive divergence, in a geographic setting, led to species formation. Darwin discussed "doubtful species" and the often difficult distinction between species, subspecies, and varieties, repeatedly making the point that species formation is generally a long, slow process. Ring-species are ideal representations of darwinian species formation. In California a complex of lungless salamanders, *Ensatina*, has a geographical distribution in the form of a ring, with gradual adaptive divergence taking place from a northern stock in two geographic directions, along the coast and along the interior mountains, and in two adaptive directions, leading ultimately to different end-points that overlap in the south, where species formation is completed. I will summarize findings from decades of research, focusing on recent phylogeographic and molecular phylogenetic analyses, and targeted studies of hybrid zones. Despite some complications, *Ensatina* is a ring-species complex that is an appropriate representation of darwinian species formation.

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