

Does space *always* matter in the origin of biological species

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ABSTRACT

For the last 40 years one of the most contentious issues in evolutionary biology has been determining the role that spatial separation of populations plays in the generation of new species. Most early formulations of this process, called speciation, did not require geographical isolation of populations. However, the new understanding of evolution that arose in the early 20th century as a result of the synthesis of Mendelian genetics and Darwinian principles posed serious theoretical problems for such ‘space-neutral’ models of speciation. As a result of these problems, and of strong advocacy from leading thinkers in evolutionary biology, it became orthodox to presume that species almost universally arise following the geographical isolation of populations. More recently a handful of field studies and mathematical models have purported to show that speciation without geographical isolation is possible. We work on a remarkable land snail radiation from Rarotonga in the Cook Islands. Here we present the evidence that makes us believe this radiation may have arisen without a period of geographical isolation and set out some of the approaches we will take to rigorously test this possibility.

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