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Integrative taxonomy of Vanuatuan doryline ants reveals four new endemic species in the South Pacific

Island ecosystems harbor many endemic species that are increasingly threatened by biodiversity loss due to climate change and habitat destruction. The South Pacific consists of thousands of islands and while this region has been of much scientific interest, many archipelagos and their biota remain understudied. Recent advances have begun to address this knowledge gap, identifying the Vanuatu archipelago as a previously unrecognized ant biodiversity hotspot. Ants are among the most ubiquitous, diverse, and ecologically dominant insects on the planet and therefore serve as important biodiversity indicators. Our study builds on these initial results by using an integrative approach to delimit the Vanuatuan members of the ant subfamily Dorylinae, combining ultraconserved elements (UCEs) as phylogenomic markers, morphometrics and comparative morphology. Furthermore, we combined our UCE dataset with molecular data from regional doryline species to place the Vanuatuan species in a broader phylogenetic context. Based on these results, we describe four new endemic Dorylinae species and show that the Vanuatuan endemics arose via at least three independent dispersal events from various neighboring archipelagos as well as via in situ speciation within Vanuatu. This study also highlights the need for a comprehensive dataset to better understand the biogeographical history of Dorylinae ants in the South Pacific, which in turn can shed light on general evolutionary and dispersal patterns for ants in this region.