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Phylogenomics and morphometrics reveal new species and signals of an adaptive radiation in Vanuatuan *Strumigenys* trap-jaw ants (Hymenoptera: Formicidae)

The South Pacific region harbors thousands of tropical islands and endemic species, making it one of the most geologically complex and biologically unique regions on Earth. Although islands comprise only 6.7% of global land area, they support approximately 20% of global biodiversity, ~50% of all endangered species, and 75% of documented extinctions. In light of the current global biodiversity crisis, documenting island biodiversity is essential for conservation and for understanding evolutionary processes in these fragile ecosystems. Due to their isolation, discrete boundaries, and distinctive geomorphological signatures, islands serve as “natural laboratories” for studying evolutionary processes such as speciation, adaptive radiation, and extinction. In particular, steep elevational gradients and isolated high-elevation habitats can promote ecological divergence by creating distinct niches and opportunities for population isolation.

Ants (Hymenoptera: Formicidae) are abundant, diverse, and ecologically dominant insects that serve as important biodiversity indicators and model systems. Due to its central location in the South Pacific, the Vanuatuan archipelago has long been hypothesized to harbor a unique fauna and function as a biogeographic steppingstone, yet its biodiversity remains poorly studied. Systematic sampling of Vanuatuan ant communities revealed the archipelago as a novel ant biodiversity hotspot, with numerous undescribed species, particularly within the genus *Strumigenys* SMITH, 1860. *Strumigenys* ants are one of the most diverse and abundant ant genera worldwide but have not yet been systematically studied in Vanuatu, which hinders a comprehensive understanding of the biogeographic and evolutionary history of *Strumigenys* ants in the South Pacific.

In this master’s thesis, I use an integrative taxonomic framework combining UCE phylogenomics, biogeography, morphology and morphometrics to delimit species, infer the evolutionary history, and explore the morphological diversity of *Strumigenys* trap-jaw ants in Vanuatu. This integrative approach revealed the presence of seventeen *Strumigenys* species, ten of which are hypothesized to be endemic to Vanuatu, making *Strumigenys* the most species-rich ant genus in the archipelago. Moreover, the UCE phylogeny revealed a clade of high elevation endemics that exhibit substantial morphological variation and whose evolutionary history indicates the first potential case of an adaptive radiation in Vanuatuan ants.