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Morgan L. Pierce, Nathan Upham, Sharon J. Hall. Rodent Diversity And Gene Flow In An Arid Metropolitan Area.

IRT: Adapting to City Life

Arid ecosystems are rapidly urbanizing across the globe, changing the structural and functional connectivity of the landscape and in many cases resulting in native biodiversity loss. Prior studies on wild rodents have found that urbanization is an inconsistent predictor of species richness or genetic health. Urbanization in arid regions has been largely unstudied, raising questions of how desert-adapted rodents, which are critical for seed dispersal and ecosystem function, are impacted by city life. Here I investigate how urbanization has impacted rodent species diversity and genetic connectivity across desert remnants of metropolitan Phoenix, Arizona, USA. I sampled six sites from May 2024-May 2025 consisting of two desert fragments (Hayden Butte, Desert Botanical Garden), three parts of the Rio Salado corridor (7th Ave., 35th Ave., McClintock Dr.) and one intact desert site (Lost Dutchman State Park). Genomic analyses of the two most-captured native species— the Desert Pocket Mouse (*Chaetodipus penicillatus*) and the Cactus Mouse (*Peromyscus eremicus*) — and one non-native species, the Roof Rat (*Rattus rattus*), donated by Blue Sky Pest Control, reveal connectivity of the region. My results provide insights regarding species diversity, population-genetic structure, nucleotide diversity, and gene flow directionality, and how those measurements compare to urbanization and greenness. No previous studies within this region investigated community composition using genetic techniques, but we compare these results to related studies in New York City. Results from this project will be valuable for city planners and health agents interested in understanding the impacts of urban planning decisions on desert ecosystems.