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Biogeography of Southwestern Pocket Gophers in the Genus Geomys

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Background

- The southwest United States is home to several closely related pocket gophers species (Geomys).
- This project investigates 3 colonization route hypotheses for G. arenarius across the arid region between the Pecos River and Rio Grande Valley.
- Complex morphological and genetic relationships between the species has resulted in unclear taxonomic classifications. A second goal of the project was to reassess and further define the evolutionary relationships of the species.
- Previous studies on the topic have been inconclusive and based on limited data sets.

Colonization route hypotheses

Mitochondrial Gene Sequences

- Mitochondrial gene sequences provide insight into more recent evolutionary splits than nuclear genes.
- The COX1 mitochondrial gene was sequenced using Iowa State University genetic sequencing services from tissue samples of gophers from 4 subspecies: G. bursarius (outgroup), northern G. arenarius, southern G. arenarius, and G. knoxjonesi.
- 69 samples were used in the final assessment, samples that were missing information, such as geographic coordinates, or were misidentified as belonging to Geomys were excluded from analysis.
- Trees were generated using Geneious, MEGA7, and FigTree.

Route and Species Status Results

- Sequences from the COX1 mitochondrial gene support the trans-Pecos colonization route for G. arenarius.
- Current species statuses are supported.

COX1 Phylogenetic Tree

Mitochondrial Gene Sequences

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Literature