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 gopher 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

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

• Geomys knoxjonesi
• Northern G. arenarius
• Southern G. arenarius
• Geomys bursarius

Colonization route hypotheses

• Previous studies on the topic have been inconclusive and based on limited data sets

Literature


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