A BIOGEOGAPHICAL ANALYSIS OF THE CHIHUAHUAN DESERT THROUGH ITS HERPETOFAUNA

by

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DR. W. JUNK B.V., PUBLISHERS, THE HAGUE 1977
mesquite-grassland fauna as an ecotone may be summarized. This assemblage has
gerhigher simple species diversity than any other, by thirty percent minimally. It is
devoid of ecological endemics, except for a single hybrid clonal form, tending to
affirm its unstable composition. Furthermore, its affinities, as measured by C.C.,
indicate almost fifty percent species shared when combined with either adjacent
association. Refer to the Vegetation account for additional purely botanical
documentation.

A fourth general observation, based on this last table, is that no set of
association based faunas share more than thirty-six percent of their species,
excepting only the mesquite-grassland ecotone.

S.C. values indicate a simpler dendrogram of relationships, Figure 4, with arid
adapted chaparral, desert, and grassland in one cluster and mesic woodland and
forest in the other. In this arrangement riparian woodland is somewhat intermedi-
ate, but linked more closely to the arid group.

Habitat Displacement or Restriction

This section of the ecological account attempts to organize non-desert relict
species of amphibians and reptiles into major units. Each unit provides a
hypothetical model based on the distribution and ecology of the relict species.
These models, Figure 5, attempt to assign geographical origins outside of the desert
and link them to currently utilized refugia within the desert.

The purpose of this complex categorization is to develop a systematic picture of
relict distribution patterns. Hopefully, a clarification of relict patterns will help
resolve the characteristic desert herpetofauna from the remaining species. It will
also provide a defined foundation for subsequent biogeographical discussions.

1. From Great Plain Grassland and Austro-Riparian Woodland to Chihuahuan
Desert Lowlands: (Silaceous and Gypsum) Dune and Ephemeral Mesic Edaphic
Associations (see Figure 5):

COMMENT: In some cases (i.e., Ambystoma tigrinum, Heterodon nasicus, and
Sistrurus catenatus) there may simply be an "in situ" restriction of pluvial and
riparian forms in the desiccating barrials of the desert valleys.

In other cases active displacement by competitive exclusion with better adapted
desert scrubland forms is probably in effect. Holbrookia maculata may be
displaced (to dunes and grassland) from open scrub desert by Cophosaurus texana.
Also grassland species may be superior in locomotion in the soft shifting substrates
of dunes and grassland, and thus survive there.

Examples:

Amphibia:
   Caudata:
   Salientia:

   1. Ambystoma tigrinum
   1. Scaphiopus bombifrons
   2. Bufo valliceps
   3. Bufo woodhousei
   4. Gastrophyre olivacea
COMMENT: Many of these forms (i.e., *Syrrhophus marnocki* and *Xantusia arizonae*) are obligatory saxicolous forms that simply survive "in situ" in rocky outcroppings which have been claimed geographically be expanding post-pluvial desert. Other component species, such as *Urosaurus ornatus* may have shifted (in part) to rocky perches and refuges in the absence of woodland.

Examples:

**Amphibia:**
- *Salientia:*
  1. *Eleutherodactylus augusti*
  2. *Syrrhophus marnocki*

**Reptilia:**
- *Squamata:*
  - *Lacertilia:*
    1. *Eumeces brevilineatus*
    2. *Sceloporus jarrovi*
    3. *Urosaurus ornatus*
    4. *Lampropeltis mexicana*
    5. *Tantilla rubra*
    6. *Tantilla wilcoxi*
    7. *Crotalus lepidus*
    8. *Crotalus molossus*

4. From Tamaulipan Mesquite-Grassland to Riparian Woodland and Marsh:

COMMENT: This category overlaps with Group 3b. Subjective decisions made here consider total distribution of the species and its general habitat associations. In borderline cases highly aquatic forms (i.e., *Thamnophis proximus*) have been assigned to Austro-riparian woodland.

Examples:

**Amphibia:**
- *Salientia:*
  1. *Eleutherodactylus augusti* (saxicolous-Sierra Madre foothill)
  2. *Bufo marinus*

**Reptilia:**
- *Testudinata:*
- *Squamata:*
  - *Lacertilia:*
    1. *Crotaphytus reticulatus*
    2. *Sceloporus couchi (?)*
    3. *Sceloporus olivaceus*
    4. *Eumeces tetragrammus*
    5. *Leiobolopsia silvicolum*
    6. *Drymarchon corais*
    7. *Drymobius marginiferus*
    8. *Lampropeltis triangulum*
    9. *Micrurus fulvius*

5. From Neotropical Woodland to Saxicolous (Karst and Basaltic) Edaphic Associations:

COMMENT: This category overlaps with 3c and b. Only a very few tropical woodland species actually occur as relict faunas in the Chihuahuan Desert proper, though a more considerable number inhabit southern relict pockets (for Quezterero, see DIXON, KETSCHERSID & LIEB, 1972). However, the amphibian genera *Eleutherodactylus*, *Syrrhophus*, and the reptilian *Coleonyx* and *Leptotyphlops*