

bats are poor thermoregulators (McNab, 1969, 1973, 1974; McManus, 1977; Studier and Wilson, 1970). We found torpid individuals of *Dermanura azteca* in several caves inspected in the high site of Pinal de Amoles, suggesting that the reduction in biomass observed can be explained by either individuals entering into torpor, or species avoiding high elevation sites through altitudinal or latitudinal migration.

One of the species which accounted for the changes in density and biomass of insectivorous bats is the molossid *Tadarida brasiliensis*. This species was present in massive numbers in the January and April samples of the wet slope of the mountain. In Querétaro, this species was extremely important in terms of high population density (second to none) and biomass (second only to *Artibeus lituratus*). Seasonality in *Tadarida* from Querétaro very likely is linked to the latitudinal migratory pattern reported for the species (Svoboda et al., 1985).

We did not find evidence for altitudinal migration from bats occupying the habitats in higher elevations during more favorable periods of the year, although this remains a probability. One factor related to environmental constraints is the availability (of roosting sites as suggested by Humphrey, 1975); however, there were apparently enough roosting sites available for bats. The Maguey Verde and Pinal de Amoles are areas rich in caves and abandoned mines which we found empty during our survey.

Habitat Complexity

MacArthur and MacArthur (1961) found that a measure of habitat complexity in the form of foliage height density was a good predictor of bird species density. This result was analyzed by Rotenberry (1978), who found that spatial heterogeneity was a key factor determining bird community structure in unstable environments. Graham (1983) considered the habitat complexity as a factor acting against immigration of tropical bat species into highlands.

We failed to find evidence of habitat complexity as an important factor influencing bat species richness in Querétaro. This statement is based on two observations: i) despite the conspicuous differences in habitat complexity, the number of species in both sides of the mountain range is similar, and ii) the Pinal de Amoles and Santa Inés localities are heterogeneous from a vegetational standpoint; however, species richness was higher in the dry part of the range, where the virtual absence of trees creates a simple landscape. The role of habitat complexity might be important for the determination of bat density and biomass, and additional studies are needed.

In conclusion, The Sierra de Pinal de Amoles constitutes a formidable barrier preventing the homogeneous distribution of bats, using the habitats according to its availability, and imposing strong environmental constraints which are reflected in the observed changes in density and biomass.