A biogeographic perspective for the conservation of Mexican Cactaceae

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In this presentation the results of several research projects aimed at understanding biogeographic parameters of Mexican Cactaceae are described and the repercussions of this information on their conservation are discussed. Our efforts have been focussed in the Chihuahuan Desert Region (CDR), the Mexican eco-region containing the highest diversity of cacti globally. We have demonstrated that the CDR is the most important centre of diversity in the world and that most of this species diversity is regionally or narrowly endemic.

In a recent study we estimated the geographical range size of a selection of species (n = 142). The results showed an enormous variation in range size, from extremely small areas (<1 km^2) to larger ones corresponding to extensive portions of the CDR. The great majority of the species are restricted to areas smaller than 10,000 km^2. From the biogeographic and conservation perspectives the most exceptional group comprises the narrow endemics (42 spp.), whose range is restricted to areas smaller than 10 km^2. These results reinforce the reputation of the Cactaceae as exceptionally rare geographically.

We are in the process of evaluating several Mexican cactus species towards the IUCN Red List criteria. Preliminary results show that 53% of the species considered (n = 142) are categorized as Least Concern, whereas the remaining 47% fall into any of the three categories of threat. These figures probably reflect the extent of endangerment of the Cactaceae in Mexico, and confirm the critical conservation status of the entire family.

In order to assess the effectiveness of the CDR protected area network (PAN) in terms of the conservation of cacti, we are currently studying the geographic distribution of 121 species in relation to the spatial configuration of the PAN. Of the total number of species considered, 76 (63%) are present in at least one protected area; the remaining 45 species are unprotected. After studying these fascinating plants for almost 20 years, we have come to the conclusion that only a combination of actions involving many individuals and organizations from different countries would guarantee their conservation.