

## Endemic plant species to the rock-outcrops of the serranías of Roboré and



## Concepción: implications for conservation

Pozo Paola

<sup>1</sup>Herbario Nacional de Bolivia, Instituto de Ecología, Universidad Mayor de San Andrés, casilla 10077, Correo Central,  
[paolasarela@yahoo.es](mailto:paolasarela@yahoo.es)

Studies in the Bolivian Cerrado Biome have identified rock outcrops as hotspots of plant endemism, including new species to science. Different modes of sculpturing of the rock surface produce a great variety of microhabitats with very specific microclimatic conditions that afford opportunities for the establishment of a highly specialized, often endemic flora. Between 2007 and 2011 numerous expeditions and botanical surveys were carried out on rock outcrops in the Bolivian Cerrado Biome aiming to contribute to the botanical knowledge of this ecosystem. Four habitats of rock outcrops were studied including rock towers, rock platforms, campos rupestres and granite domes.

Species identification was undertaken with the help of different specialists using literature and herbarium collections held at the Herbario Nacional de Bolivia (LPB), Herbario del Oriente Boliviano (USZ) and Kew Herbarium (K). In the serranías of Concepción six endemic species were recorded including *Chamaecrista chiquitana*, *Vigna subhastata* (Leguminosae) and *Eugenia cydoniifolia* (Myrtaceae). In the serranías of Roboré 28 endemic species were recorded including *Frailea chiquitana* (Cactaceae), *Justicia adhaerens* (Acanthaceae), *Mimosa auriculata* (Leguminosae) and a new species of *Tibouchina* (Melastomataceae). In the present study we have recorded 34 endemic plant species in the rock-outcrops of the serranías of Roboré and Concepcion. Taking into consideration that local endemism and rarity of species are important criteria in determining potential areas for conservation, is a priority to enhance our knowledge about the vegetation and the species that grow on the rock-outcrops in the Cerrado Biome in Bolivia.



*Frailea chiquitana* (Cactaceae)



*Justicia adhaerens* (Acanthaceae)



*Mimosa auriculata*

## POPULATION CHARACTERISTICS OF ENDEMIC AND/OR RESTRICTED PLANT SPECIES TO ROCK- OUTCROPS IN THE BOLIVIAN CERRADO BIOME

Paola Pozo

<sup>1</sup>Herbario Nacional de Bolivia, Instituto de Ecología, Universidad Mayor de San Andrés, casilla 10077, Correo Central, [paolasarela@yahoo.es](mailto:paolasarela@yahoo.es)

Previous studies in the Bolivian Cerrado Biome have identified rockoutcrops as the most important habitat for conservation of biodiversity, specifically those of Roboré, where 72% of the Bolivian Cerrado endemic flora grows, including new plant species for science. In a general context, in terms of distribution, It has been determined that most of the species are narrow endemics; they grow only in the studied mountains. For example, species such as *Mimosa auriculata*, *Blepharodon philibertioides*, *Pitcairnia chiquitana*, *Bidens herzogii* grow only in the mountains of Roboré and nowhere else worldwide. Even, species like *Justicia adhaerens*, *Praxelis chiquitensis* and *Manihot* sp. nov. 2 are confined to a single rockoutcrop in Santiago de Chiquitos in the mountains of Roboré, showing a considerable specificity and suggesting that these species require extremely specific conditions for their survival.

In general, these species have very isolated populations with a clumped spatial pattern. Some species are either frequent or rare to very small areas in their habitat. According to UICN categories and criteria most of the narrow endemics to the rock-outcrops studied are threatened due to their small area of occupation, in most of the cases they are confined to a single locality and with few, small and isolated populations. Thus, it is a key to understand more about the population, ecology and biology of these species in order to determine the factors causing their rarity as well as to predict their survival capacity and propose a sound conservation strategy.

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*Bidens herzogii* (Cactaceae)



*Cleistocactus samaipatanus* (Cactaceae)



*Calea dalvi* (Compositae)



*Hibiscus conceptionis* (Malvaceae)



*Praxelis chiquitensis* (Compositae)



*Blepharodon philibertioides* (Apocynaceae)