



## Book review

### Mapping the cacti of Mexico. Part II: *Mammillaria*, H.M. Hernández, C. Gómez-Hinostrosa. DH Books (2015). 189 pp.

In the collective thought of Mexico, cacti are an important part of the landscape. They are reflected in such literary works as “*Dos Crímenes*”, by Jorge Ibarguengoitia, “*Fantasia en Desierto*”, by Alfredo Gutiérrez y Falcón, and “*Sotto Il Sole Giaguaro*” by Ítalo Calvino, and in movies such as “*¡Qué viva México!*” (Dir. Eisenstein, 1932) and “*La Ley de Herodes*” (Dir. Luis Estrada, 1999), the latter filmed in Zapotitlán de las Salinas, Puebla, a place known for its endemic cacti.

Cacti such as “garambullos”, “cardones”, “nopales”, “saguaros”, and “biznagas” have often been used to describe the Mexican, and North American, environments. “*Biznaga*” is the common Mexican word for the species of *Mammillaria* and other globe-shaped cacti, like *Coryphantha*, *Mammilloidia*, and *Ferocactus*.

If the word “cactus” evokes images of Mexican vistas, mention of “mamilarias” should do so even more, since *Mammillaria* is “the largest genus in the cactus family, and one of the largest and most emblematic in the Mexican flora”, according to Héctor M. Hernández and Carlos Gómez-Hinostrosa, in their new book, “*Mapping the Cacti of Mexico, Part II: Mammillaria*”, published in 2015 by DH Books with support from the National Commission for Knowledge and Use of Biodiversity (Conabio) of Mexico.

In 2011 the authors demonstrated the geographical distribution of 34 genera in “*Part I, Mapping the Cacti of Mexico*”. With the publication of Part II, we now have a series that is likely to continue because of the absence of maps for the genera *Opuntia*, *Coryphantha*, *Ferocactus*, *Echinocereus*, and *Pachycereus*.

With the publication of these works on Mexican cacti, it is important to remember that this is not the first work of this type. Those who have studied cacti, especially from the perspective of systematics, will remember the “*Catálogo de Cactáceas Mexicanas*” by Guzmán, Arias, and Dávila (2003), published more than a decade ago. That catalogue, also prepared with support from Conabio, was a significant contribution to the field that included species synonymies and their distribution throughout Mexico. Some years later, that catalogue was updated in Guzmán’s thesis. Both the catalogue and the thesis synthesise

the nomenclature history of the accepted taxa. Their checklist is based on the taxonomic usage of Hunt (2006), a practice repeated in both parts of “*Mapping the Cacti of Mexico*”.

*Mapping the Cacti of Mexico, Part II: Mammillaria*—whose cover curiously includes a picture of *M. lasiacantha*, from the USA—is divided into 3 sections. Each contains a biogeographical analysis of the genus (pp. 11–24), geographical distribution maps for the species (pp. 24–138), and 3 appendices (pp. 139–188). In the first part, the authors determine species richness patterns, locate the 6 sites with the highest diversity, and indicate endemic species in these sites and for each Mexican state. The biogeographical pattern of species richness is comparable with that found in the authors’ other works. As one might expect from the title, the second and most important part of the book contains maps of *Mammillaria* species.

What is novel in “*Mapping the Cacti of Mexico*?” The special contribution of this book is its biogeographical outline of cacti, in this case the “mamilarias”. Except for the research of Mourelle and Ezcurrea (1997) and Dávila-Aranda, Arias-Montes, Lira-Saade, Villaseñor, and Valiente-Banuet (2002) on columnar cacti, there are to date no biogeographical studies of either *Mammillaria* or other taxonomic groups in Cactaceae at the country level. Biogeographical research generally focuses on particular areas of Mexico, such as the Chihuahuan Desert (Gómez-Hinostrosa & Hernández, 2000) and the Tehuacán-Cuicatlán Valley (Miguel-Talonia, Téllez-Valdés, & Murguía-Romero, 2014).

The appeal of the book lies in the authors’ demonstration in relief maps of a species distribution more detailed than that of Guzmán et al. (2003). The species maps also include more specific descriptions of geographical distribution, as well as habitat characteristics like soil, altitude, and vegetation.

The publication of this data might well create controversy in its discussion of many threatened cacti species. According to Goettsch et al. (2015), human collectors, along with agriculture, are a risk factor in the extinction of cacti. Some readers might think that this book provides information to feed such “unscrupulous collection” practices. Readers must decide for themselves whether the maps encourage this practice, keeping in mind that Conabio is supporting their publication.

However, in light of the work of Goettsch and his eighty collaborators, “*Mapping the Cacti of Mexico*” may also be an important contribution to conservation, because it shows high richness spots of *Mammillaria* and includes information regarding conservation status. *M. albiflora*, for example, designated as “critically endangered” by the International Union for Conservation of Nature (IUCN), is endemic to Guanajuato, a place of high concentration of species according to the map, but it is not in a Mexican Protected Natural Area (ANP).

The book has several additional assets, such as appendices with the number of records and the list of herbarium specimens used in the description of each species, as well as a list of synonyms in the taxonomic index. The inclusion of errata and the list of herbarium specimens from Part I of the series is likewise a valuable contribution.

In general, this is a book that will appeal to people with different interests, including fans and collectors, students developing an interest in the world of cacti, and scientists focused on the geographical distribution of species in Mexico. It is a significant contribution to the current body of knowledge on Mexican biodiversity. Finally, both parts of “*Mapping the Cacti of Mexico*” may motivate researchers to address other aspects of biogeography, not only of cacti but also of other emblematic and characteristic plants of the Mexican landscape.

## References

- Dávila-Aranda, P., Arias-Montes, S., Lira-Saade, R., Villaseñor, J. L., & Valiente-Banuet, A. (2002). *Phytogeography of the columnar cacti (Tribe Pachycereeae) in Mexico: a cladistic approach*. In T. H. Fleming, & A. Valiente-Banuet (Eds.), *Columnar cacti and their mutualists. Evolution, ecology and conservation* (pp. 25–41). Tucson: The University of Arizona Press.
- Goettsch, B., Hilton-Taylor, C., Cruz-Piñón, G., Duffy, J. P., Frances, A., Hernández, H. M., et al. (2015). High proportion of cactus species threatened with extinction. *Nature Plants*, *15142*, 1–7.
- Gómez-Hinostrosa, C., & Hernández, H. M. (2000). Diversity, geographical distribution, and conservation of Cactaceae in the Mier y Noriega region, Mexico. *Biodiversity and Conservation*, *9*, 403–418.
- Guzmán, U., Arias, S., & Dávila, P. (2003). *Catálogo de cactáceas mexicanas*. Ciudad de México: Universidad Nacional Autónoma de México, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad.
- Hunt, D. (2006). *The new cactus lexicon*. Milborne Port, Somerset: DH Books.
- Miguel-Talonia, C., Téllez-Valdés, O., & Murguía-Romero, M. (2014). Las cactáceas del valle de Tehuacán-Cuicatlán, México: estimación de la calidad del muestreo. *Revista Mexicana de Biodiversidad*, *85*, 436–444.
- Mourelle, C., & Ezcurra, E. (1997). Rapoport's rule: a comparative analysis between South and North American columnar cacti. *The American Naturalist*, *150*, 131–142.

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