

Floristic Analysis of Heterogeneous Landscape Patches in a Biological Corridor in the El Rodeo-Básora Area near Moctezuma, Sonora, Mexico

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Abstract—A floristic study was conducted in a heterogeneous landscape near Moctezuma, Sonora. From August to December 2011, Ranchos El Rodeo and El Básora were visited three times. The vegetation at about 900 m elevation is foothills thornscrub, oak woodland, and induced buffelgrass grassland. A total of 120 plant taxa in 95 genera and 41 families were documented. Taxa were identified using regional literature, consulting with experts, and comparison with specimens in the Universidad de Sonora Herbarium. The families with more taxa are Asteraceae, Convolvulaceae, Fabaceae, and Solanaceae. The study area is a transitional zone between thornscrub oak woodland, making it an important biological corridor in central Sonora. Loss of flora is due to land use practices, especially clearing to introduce grass like buffelgrass (*Pennisetum ciliare*). Non-native plants could displace native taxa like *Zinnia zinnioides*, *Ipomoea cristulata*, and *I. hederacea*.

Introduction

The floristic richness of east-central Sonora is due to its location in the transition between the New World tropics and the northern temperate zone at about 29°N, which enhances the diversity of flora, fauna, vegetation types, and habitats. Large geographic areas with difficult access have not been explored botanically. This paper documents the flora and characterizes plant community patches in a heterogeneous landscape in this area (Wiens 1995), which could be used as biological corridors between foothills thornscrub, desert grassland, and oak woodland. Our floristic inventory in Ranchos El Rodeo-Básora area in the Municipio de Moctezuma is an important contribution to the flora of Sonora.

Study Area

The Ranchos El Rodeo-Básora area is a corridor that connects the mountains of central Sonora with the Sierra La Madera, a Sky Island mountain range in the Madrean Archipelago. The study area is along the Hermosillo-Moctezuma highway about 30 km (by air) southwest of Moctezuma (between 29°36'39" to 29°39'06"N and 109°52'50" to 109°56'18"W). The climate of the area is dry tropical with mean maximum temperature of 29.8 °C during June and July, mean minimum of 12 °C in December and January, and mean annual temperature is

of 21.1 °C. Frost only occurs occasionally, and hard freezes like that of February 2-3, 2011, are very rare. Annual average rainfall is 460 mm (Instituto Nacional de Estadística y Geografía 2010). Subtropical dry forest, grassland, and open low forest are the vegetation types in the area (Instituto Nacional de Estadística y Geografía 2010). Subtropical dry forest corresponds to foothills thornscrub of Felger and others (2001) and Sinaloan thornscrub of Brown (1994). Open low forest is also called oak woodland or encinal. Trees and shrubs such as *Acacia constricta*, *A. occidentalis*, *Ceiba acuminata*, *Bursera* spp., *Havardia mexicana*, *Lysiloma* spp., *Ipomoea arborescens*, and *Prosopis velutina* characterize vegetation in the study area (fig. 1).

Methods

The study sites were selected by field trips to the area and using Google Earth satellite image (Image© 2010 Geo Eye. ©2010 Google. ©2010 INEGI). Selection criteria were the presence of well-differentiation vegetation patches in a landscape mosaic, and connectivity between them. Six sampling sites were visited in August, September, and October 2011. A floristic list was constructed using the *relevé* method (Müller-Dombois and Ellenberg 1974). Plants were collected for identification using regional floristic literature, consultation with experts, and comparison with specimens in the University of Sonora Herbarium (USON). Voucher specimens were deposited into USON. Collections, observations, and images from the El Rodeo-Básora flora are available online in the Madrean Archipelago Biodiversity (MABA) database (Madrean.org).

Results and Discussion

A total of 120 taxa in 95 genera, and 41 families were documented in the El Rodeo-Básora area. The families with more taxa are Asteraceae (22), Fabaceae (16), Convolvulaceae (9), Cactaceae (7), and Solanaceae (5) (fig. 2). Asteraceae, Fabaceae, and Poaceae

In: Gottfried, Gerald J.; Ffolliott, Peter F.; Gebow, Brooke S.; Eskew, Lane G.; Collins, Loa C., comps. 2013. Merging science and management in a rapidly changing world: Biodiversity and management of the Madrean Archipelago III; 2012 May 1-5; Tucson, AZ. Proceedings. RMRS-P-67. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

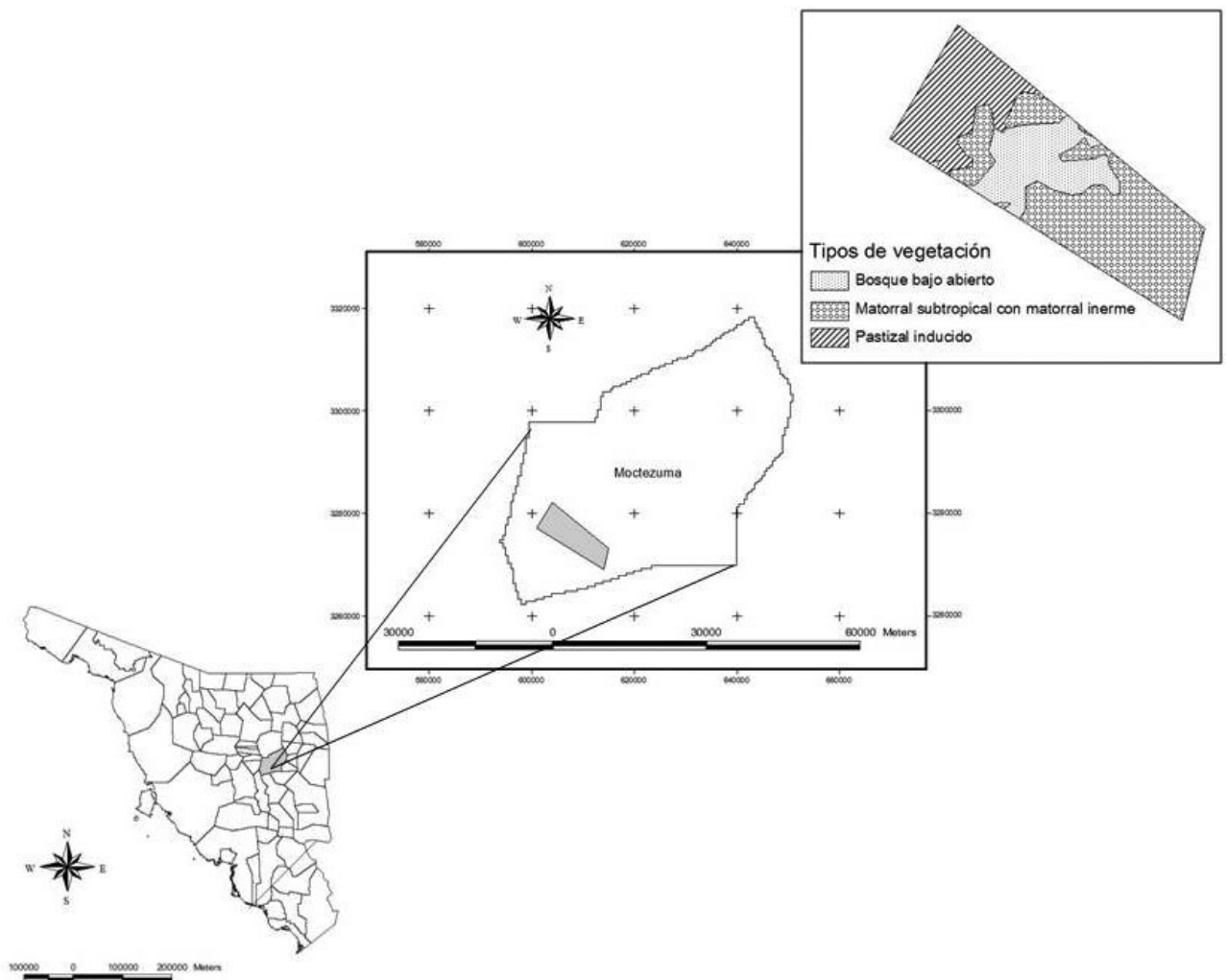


Figure 1—Study area and vegetation.

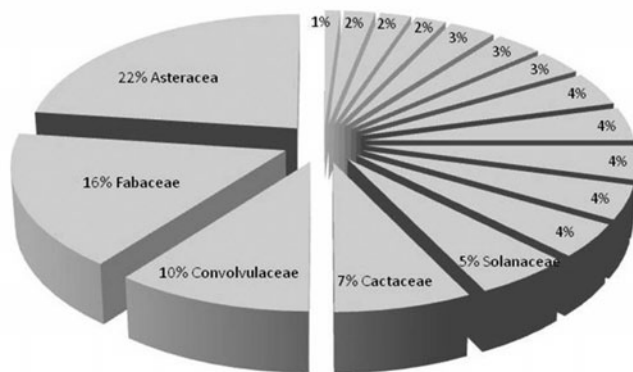


Figure 2—Dominant families in the El Rodeo-Básora area.

are the most speciose families in floras in Sonora (Van Devender and others 2010). Life forms of the taxa were classified according to Whittaker (1975) and (Krebs 1972): (a) trees—woody plants greater than three m tall; (b) shrubs—short, woody plant less than three m tall; (c) herbaceous—not woody plant above ground; (d) vines—woody vines or herbaceous vines; (e) epiphyte—plants that grow on other plants, but are not parasitic. Herbs with 62 taxa are the most common life form (fig. 3). The physical structure of the vegetation is defined by trees, shrubs, and large succulents (especially organpipe cactus [*Stenocereus thurberi*]). Trees with 17 taxa are much more diverse than in desert grassland, but only represent 14.2% of the flora. Some common plants in the transition between foothills thornscrub and oak woodland include *Ceiba acuminata*, *Fouquieria macdougalii*, *F. splendens*, *Ipomoea arborescens*, *Lysiloma divaricatum*, *Parkinsonia praecox*, *Prosopis velutina*, *Quercus chihuahuensis*, *Q. viminea*, and *Sabal uresana*. Floristic richness is threatened by cattle ranching and the introduction of exotic forage plants.

Four species in the El Rodeo-Básora flora have federal protection status in Mexico according to the NOM-059-SEMARNAT-2010 (DOF 2010). *Agave angustifolia* (Agavaceae) has a status of Amenazada (= Threatened), while *Amoreuxia palmatifida* (Bixaceae), *Crusea hispida* (Rubiaceae), and *Sabal uresana* (Areaceae) have special status.

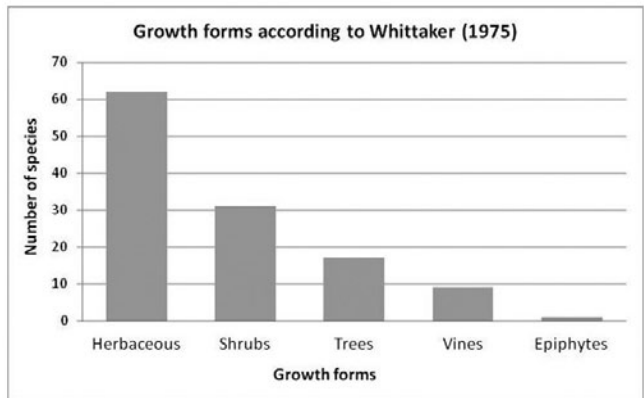


Figure 3—Dominant life forms of taxa in the El Rodeo-Básora area.

We conclude that the El Rodeo-Básora area is of special interest and conservation concern because of its mosaic of foothills thornscrub, desert grassland, and oak woodland, its floristic diversity, its role as a biological corridor connecting central Sonora landscapes to the Sky Island region, and the presence of four federally protected species.

Acknowledgments

We thank J. Jesús Sánchez-Escalante at the Universidad de Sonora for help identifying plants and putting voucher specimens into USON.

We thank Thomas R. Van Devender and Ana Lilia Reina-Guerrero for help in identifying plants and a careful review of the manuscript.

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