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## Diversity, Uses, and Distributional Patterns of Legume Species in the Major Community Types of Northeastern Mexico

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### Abstract

From the 259 species of legumes recorded, the distribution of 242 wild species of legumes over 224 locations within 12 plant communities was examined in northeastern Mexico. Objectives were: (1) to determine diversity of legumes in the mountains and plains of northeastern Mexico, (2) to elucidate distributional patterns of legumes in this region, and (3) to know what are the main legume species and their main uses in northeastern Mexico. The subfamily *Papilionoideae* had the largest number of wild genera (47) and species (167), followed by *Mimosoideae* (13 and 44) and *Caesalpinioideae* (10 and 31). Genera with the largest number of native species were *Dalea* (28), *Desmodium* (16), *Astragalus* (13), *Senna* (13), *Acacia* (11), *Phaseolus* (10), *Crotalaria* (9), and *Lupinus* (8). Of wild legumes, 24 genera had  $\geq 3$  species each and 21 species were endemic to this area; most were *Lupinus* (5 species), *Astragalus* (4), and *Dalea* (4). Almost all of the 21 endemic species were  $>1500$  m in elevation in oak-pine forests (7), oak forests (5), and cool-temperate forests (5). Only one endemic species occurred  $<1400$  m in elevation. Of the endemic species, 90.5% were in the subfamily *Papilionoideae*. There were 17 cultivated legumes, most of them in *Caesalpinioideae*. Similarity and dissimilarity matrixes using the Sørensen coefficient were assessed using minimum-variance clustering. Using diversity of legumes, three assemblages of plant communities were recognised. Oak, oak-pine, mesic-conifer, and cool-temperate forests harbored the highest diversity of legumes, while rosetophyllous and xeric scrublands and halophytic communities contained the lowest diversity. Species of the subfamily *Mimosoideae* were the most used, main uses includes, forage, fuel, charcoal, handcrafts, furniture, the main genera are *Prosopis*, *Acacia*, *Havardia*, *Leucaena*, and *Ebenopsis*. *Caesalpinioideae* includes 17 species used as ornamentals. All toxic legumes recorded belong to the subfamily *Papilionoideae*, and includes mainly species of the genera *Astragalus* and *Lupinus*. Some species of *Papilionoideae* are used as medicine (*Eysenhardtia texana*, *Indigofera suffruticosa*) and several of them are used as food (*Phaseolus vulgaris*, *Cicer arietinum*, *Pisum sativum*, *Vicia faba*, and *Lens culinaris*).

**Keywords:** Distribution, diversity, legumes, Mexico