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“Bridging the gap between increasing knowledge and decreasing resources”

## Morphological and Physiological Leaf Traits in Ten Native Shrubs, Northeastern Mexico

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### Abstract

Leaf morphological and physiological traits have key implications in the growth and development of plants in specific habitats. In this regard, the aim of this study was to assess the morphological and physiological leaf traits of ten native shrubs growing in the shrubland plant community known as Tamaulipan thornscrub, northeastern Mexico. Studied plant species were *Leucophyllum frutescens* (Scrophulariaceae), *Acacia rigidula* (Fabaceae), *Bumelia celastrina* (Sapotaceae), *Acacia berlandieri* (Fabaceae), *Cordia boissieri* (Boraginaceae), *Celtis pallida* (Ulmaceae), *Forestiera angustifolia* (Oleaceae), *Amyris texana* (Rutaceae), *Bernardia myricaefolia* (Euphorbiaceae), and *Lantana macropoda* (Verbenaceae). Morphological leaf traits such as leaf length (mm), leaf width (mm), leaf area (cm<sup>2</sup>), leaf dry mass (g), and specific leaf area (cm<sup>2</sup>/g) were measured. In each plant species, 5 randomly shrubs were selected and from each shrub 10 leaves were sampled. Physiological leaf traits such as predawn (Ypd) and midday (Ymd) leaf water potential (MPa) were measured in five different shrubs per species. Data were analysed using the Kruskal-Wallis non parametric test since they did not show a normal distribution and the assumptions of equal variance. Leaf trait differences among shrub species were validated using the Mann-Whitney U test with the Bonferroni correction method. The results of this study have shown that the morphological and physiological leaf trait values in this study are in agreement with documented figures. Besides, results have revealed that there were highly significant differences among shrub species for studied traits. Highly significant and positive relationships were detected among leaf traits according to the Spearman's rank correlation analysis. Studied leaf traits play important roles in plant productivity and functioning responses to changes in soil resource availability and adaptation to abiotic stresses such as drought, heat and nutrient limitation.

**Keywords:** Environment, functional traits, leaf area, specific leaf area, Tamaulipan thornscrub, water potential