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Structure and Composition of Forest Species in Four Sites, Sierra Madre Occidental Mountain Range, Mexico

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Abstract

This research was carried out with the objective of evaluating the structure and composition of forest species in the Sierra Madre Occidental, in the area of El Salto, Pueblo Nuevo, state of Durango, Mexico. The database was obtained from four study sites in an area of 2500 m². Site 1 was (“Ejido” Banderas), site 2 (“Ejido” Adolfo Ruiz Cortines), site 3 (Santa Bárbara) and site 4 (“Ejido” El Brillante). At each site, 10 plots of 10m × 10m were randomly chosen. At each plot, the following plant traits were registered for each species and plant individual: height (m), diameter at chest height (cm) and projected crown area (m²). For each species, its dominance was quantitated according to its basal area, density according to the number of individuals, and its frequency according to its presence at each plot. Thereafter, a weighted value was generated for each species, called the importance value index (IVI). Diversity and species richness were estimated using the Shannon-Wiener diversity index (H') and the Margalef index (DMg), respectively, and to obtain similarity among sites, the Jaccard index was employed. The results shown that there were 18 tree species comprised in 9 genera. The site with greatest species diversity was Santa Bárbara with 9 species and the site with lowest diversity was “Ejido” Adolfo Ruiz Cortines with 6 species. At the “Ejido” Ruiz Cortines and “Ejido” El Brillante the species with greatest ecological importance value was *Quercus sideroxylla*, in “Ejido Banderas was *Quercus duri-foia* and in Santa Bárbara it was *Pinus cooperi*. For the studied sites, the higher (1.51) and lower (0.93) Shannon-Wiener index found was for Santa Bárbara and “Ejido” Banderas, respectively. With respect to the Margalef index, higher (1.79) and lower (0.97) values were registered for Santa Bárbara and “Ejido” El Brillante, respectively. These values indicate a tendency to the heterogeneity among sites. For the Jaccard index, it was obtained that the “Ejido” Adolfo Ruiz Cortines and “Ejido El Brillante sites, shared more species, showing that they are more similar to each other, with a value of 0.40.

Keywords: Bray-Curtis ordenation, Importance Value Index, margalef index, Shannon-Wiener index, Species richness