Seed banks play a central role in vegetation dynamics of many wetlands. Therefore, knowledge of seed reservoirs in the soils of aquatic communities should provide useful tools for conservation and restoration efforts. This study was conducted in the Lerma marshes, one of the last remnants of the vast wetlands that were once in the Mexican Central Plateau. The main objective was to determine the composition and abundance of seed bank and its relationship with established vegetation of the three Lerma marshes. In each marsh, we systematically selected 18 to 40 sampling sites. In each site, the composition of vascular plant vegetation was evaluated in two 10m lines perpendicular to the shore. Every 0.5m, we determined the coverage of species by measuring the intercepted length for each plant or group of plants. At each sampling site where we had evaluated the established vegetation, we collected a sample of the top 10cm of sediment; the soil cores were divided into an upper layer (0-5cm) and a lower layer (5-10cm). These samples were used to evaluate the seed bank by the seedling emergence method. All samples were placed in a greenhouse at 20-25ºC and remained flooded for 15 weeks. Forty-nine species were recorded in the vegetation. Chiconahuapan had the richest and most diverse flora and the greatest number of perennial species. A life-forms analysis showed that perennial herbs, especially rooted-emergent hydrophytes, dominated in the three wetlands. Sixty-one species were identified in the total seed bank; Chimaliapan had the most diverse total seed bank, whereas the mean seedling density was higher in Chignahuapan. Only two species of the total seed bank of each marsh had a density greater than 10% of the total, and more than half were uncommon. The upper layer of sediment (0-5cm) contained two times more seeds/m 2 and species per sample than the lower layer (5-10cm), and there was a significant decrease of seed density with depth. The detrended correspondence analysis produced a clear separation between the composition of the seed banks and established vegetation. In general, in each marsh there was less species diversity in the established vegetation than in the seed bank. Dominance by a few species in the seed bank, the presence of opportunistic species, and the low representation of established species in the seed bank suggest wetland degradation and a low probability of regenerating the natural communities from the seed bank. To ensure the permanence of these marshes, their biodiversity, and therefore the environmental services they provide, up to date planning is a must, and efforts to control and monitor hydrology, water quality, and the influence of human activities are suggested. Rev. Biol. Trop. 62 (2): 455-472. Epub 2014 June 01.
Keywords
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