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Soil ecosystem services in the Chapultepec Forest

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The Chapultepec Forest, one of the largest urban parks in Latin America (770 ha) in the megalopolis of Mexico City, has sought to maintain a coexistence between cultural spaces and ecosystem services and as a result the forest today presents an architectural palimpsest that has been sealing the soil. Management decisions are generally made without taking the soil into account, perhaps because there is no published information about the soils and each administration, which changes every four years with the government in power, often maintains practices based on custom and traditions, such as sweeping leaf litter from the soil surface under the trees.

The objective of this work was to evaluate soil quality in order to propose management practices that improve soil quality and ecosystem services such as infiltration and carbon sequestration. For this purpose, Homogeneous Landscape Units were identified, in which soil profiles were described and an edapho-ecological evaluation was carried out. In addition, composite samples were taken at a depth of 20 cm for laboratory analysis and simple unaltered samples were taken to measure bulk density. Infiltration measurements were made with a double-ring infiltrometer and the Ks value was obtained using pedotransfer functions. The sealing percentage of the park surface was evaluated.

As a result of the management of the forest throughout its history, currently 30% of its surface has been sealed. There are sections with up to 52% sealing. The three main sections of the forest are dominated by exotic plant species. One section still has natural soils and they are of medium quality for vegetation support (low fertility and moisture retention capacity); the other two sections have Technosols because of the large amount of anthropogenic material they have received and have low quality for plant support. Reforestation with native species and mulching are recommended. The forest has good infiltration capacity (80%).

A first video was made with the results of the research to show the importance of keeping the leaf litter on the surface (https://www.youtube.com/watch?v=1vpdmuhG-8M- hojarasca).