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Soil properties in urban parks and city population in Tel Aviv-Jaffa: Mutual effects

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Urban parks are man-made open spaces, located in the city area and having two major functions: conservation of natural resources and optimization of the physical and social environment.
This study aimed to investigate the relations between the soil properties and the socioeconomic profile of the populations in the parks in Tel Aviv.
The city of Tel Aviv was divided into three geographical regions: South, Central and North. This division reflects the course of development of the city from south to north, and encompasses differing socio-economic levels of residents. In each geographical region 15 parks were randomly chosen, and were divided into three groups by size (2-10, 10-20 and 20-50 acres).
In each park soil was sampled in two microenvironments (lawn and path), from three points and from three depth layers (0-2, 5-10 and 10-20 cm) in July–August 2011. Before the sampling, penetration depth was determined at all the points.
Each of the soil samples was analyzed for organic matter content, pH, electrical conductivity, and sodium and chlorine contents.
For each type of microenvironment, the results were analyzed with respect to three factors: size of park, region of city, and soil depth.
It was found that the urban park soil properties varied widely: sodium and chlorine contents from 1.8 to 12 and from 1.9 to 7.8 meq/kg, respectively; and electrical conductivity from 0.40 to 1.47 dS/m.
In the lawn microenvironment, electrical conductivity, chlorine and sodium increased in all depths with park size. This trend was significant only in the upper layer. In the path microenvironment no such trend was seen.
In the center of the city lower values of soil properties than in the other regions were found at all depths.
Soil properties decreased with depth in all three geographical regions, in all three sizes of park, and in both microenvironments.
For all sizes of park, in all geographical regions, and in both microenvironments, penetration depths were found be similar.
We suggest that the above results can be attributed to variations in the intensity of park use by visitors, and to the type of anthropogenic activity, both of which depend on the socioeconomic status of the park area.