

Biological soil crusts in the Negev – small, yet hugely important for the ecosystem

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The biological soil crusts (BSCs) that are naturally occurring on the sand dunes of the NW Negev desert, Israel fulfill many important ecosystem services. In 1982, the dunes were declared a military area and land use of any kind was excluded. This exclusion of land use enabled BSCs to grow and stabilize the formerly mobile dunes, enabling soil-forming processes and a succession of higher vegetation. We studied the structural characteristics of the BSCs in order to better understand the role they play in altering matter fluxes in general, and water redistribution in particular in this arid ecosystem. Further, their chemical and physical characteristics after mechanical disturbance were analyzed in order to characterize their ability to recover from trampling and we found that while some parameters (such as crust stability) didn't change significantly 4 years after the mechanical disturbance, the content of available plant nutrients was significantly reduced due to increased water infiltration and leaching processes. We conclude that crust disturbance that is caused by land use such as agriculture or grazing should be avoided to keep the dunes stable and the soils more fertile.

5ª feira, 14 de Janeiro de 2016

FCUL (Edif. C6) – 12.00h-13.00h – Sala 6.2.51

