

Impact of man on the biological components of desert ecosystems in Israel

A. DANIN, *Department of Botany, The Hebrew University, Givat Ram, Jerusalem 91904, Israel*

Mobile dunes of fine sand south of Beer Sheva, Israel (150 mm mean annual rainfall) became populated with *Stipagrostis scoparia* that germinated in rainy years. They produced adventive roots from buried stems, and thus the elongation of stems led to the development of biogenic mounds around the plants. On the leeward side of the mounds, *Artemisia monosperma* got established. Its seeds need a thin cover of stable sand for germination. The thicker crown of *A. monosperma* decreased local wind velocity; airborne suspended dust settled down and became trapped in and between the biogenic mounds. The addition of fine particles to the sand improved the moisture regime at the surface and favored the development of a microphytic crust with filamentous cyanobacteria as the principal component. This crust diminished sand mobility and promoted sand stabilization. The increase in cohesion of sand grains caused by cyanobacterial filaments nearly terminated the movement of sand by saltation. *A. monosperma* covered 10-15% of the area, and the number of annual and perennial plants increased. Within 10 years, sand movement totally stopped. Intensive grazing of Bedouin herds and the cutting of dry plants for fuel promoted wind erosion of the stable sands. Within 10 years of intensive cutting and grazing, all the biogenic sand mounds disappeared. This implies removal of a layer of about 1 m from the dune sand.

Areas of mobile fine sand under 100-200 mm mean annual rainfall may become stabilized shortly after human interference has ceased; intensive stepping on the microphytic crust and removal of shrubby vegetation leads to reworking of the sand, removal of sand and fine soil components by wind erosion, and dune formation. In coarse sand areas, stabilization takes a much longer time, and destruction as a result of human interference is faster.

Polyamines in plant development and response to stress

ARTHUR W. GALSTON, *Department of Biology, Yale University, New Haven, CT 06511, USA*

The diamine putrescine (Put) and the triamine spermidine (Spd) are present in all cells, while