

Dust nutritional impact on desert biocrusts

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Atmospheric transport of dust can redistribute nutrients across landscapes regionally and globally. Nutrients in dust can facilitate subsequent biological activity. Although the nutritional impact of dust on marine phytoplankton has been well quantified, its impact on terrestrial desert biocrusts is less certain. Here we tested whether atmospheric dust deposited on the Sonoran Desert of Arizona influences the development of biocrust microorganisms by 'feeding' them with incremental aliquots of dust on sterile media. We tested cyanobacteria from dissimilar environments (Sonoran desert biocrusts and a crater lake) to assess the potential generality of the phenomenon. We found that dust loads significantly enhanced cyanobacteria growth regardless of biocrust native habitat. Our results suggest that dust is currently an important source of nutrients, and may enable a means of dispersion for microbes to colonize and endure in new terrestrial environments over geologic time. More generally, our results highlight potentially important interactions between dust and microbes that have implications for the evolution of the biosphere, and for how we currently manage it