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## Inoculation of bacteria for the amelioration of sandy soil under drought

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Soil degradation represents a pressing worldwide problem that is being accelerated by processes of erosion, depletion of soil organic matter, soil compaction, acidification, salinization, and drought. Soil microorganisms can influence soil aggregation via a range of mechanisms such as the production of exopolysaccharides and other extracellular matrix polymers such those involved in biofilm formation. In this study, we sought to use bacteria harboring specific traits to enhance soil aggregation. To this end, 120 bacterial strains were isolated from an experiment field under drought conditions and tested for their ability to grow under drought, salinity tolerance, rapid growth, biofilm, and exopolysaccharides production. Based upon this trait assessment, 24 strains were further tested at two moisture levels for their ability to impact soil structure after 8 weeks of incubation at 25°C. The mean weight diameter (MWD) of water-stable aggregates and carbohydrates were determined for treated soils. Three strains were shown to impact soil aggregate properties at the higher moisture content: one affiliated with *Bacillus niacini*, one affiliated with *Paenarthrobacter nitroguajacolicus* and one of unclear classification. The first of these strains also affected soil structure at the lower moisture level. This *B. niacini* strain also increased the carbohydrate content of the soil, as did two other strains, related to *B. wiedmannii* and *B. aryabhatai*, respectively. However, no positive correlation was observed between the MWD and the production of carbohydrates in soil. Our results suggest that soil inoculation with specific microbial strains can improve soil structure.