GENES CONTRIBUTING TO THE INDUCED MULTICELLULARITY OF *BACILLUS CEREUS* GROWING IN SOIL

L. Weyrich, Y. Luo, J. Sutton, S. Vilain and V. Brözel
Department of Biology and Microbiology
South Dakota State University
Brookings, SD 57007

ABSTRACT

Bacillus, notably *B. cereus*, are readily isolated from a wild range of soils. When growing in soil or liquid extract of soil, *B. cereus* switches to a distinct multicellular phenotype. The ensuing bundles of chains are the basis for translocation of the species through soil by a process termed sliding. We have recently developed an *in terra* model system for studying the growth of bacteria in soil, using soil extractable soluble organic matter (SESOM). The aim of this research was to identify genes contributing to the soil-induced multicellularity of *Bacillus cereus* ATCC 14579. Random mutants were generated using LTV1 (Tn917) and screened for formation of rhizoidal colonies on SESOM agar. Mutated genes were identified by plasmid rescue. A number of mutants forming regular colonies or colonies spreading poorly were obtained, including a mutation in the *purA* gene, encoding adenylosuccinate synthetase. Interestingly some hyper-rhizoidal mutants were also found, including a mutant defective in the *galE* gene, encoding UDP-glucose 4-epimerase which transforms UDP-D-glucose to UDP-galactose, and a few other intriguing genes as well. This mutant yielded chains but no bundles or clumps, indicating a role in lateral adherence between cells.