Recovery of Saline Soils with Bacterial Exopolysaccharides of EM

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Abstract *: During 3 months of 1999, the influence of incorporating organic matter and EE into a sandy saline soil was measured. The treatments tested were E50 = saline soil + farmyard manure (FYM) 50 ton/ha; E50EM = E50 + effective microorganisms (EM); CR30 = green crops residues 30 ton/ha; CR30EM = CR30 + EM; C = saline soil with no OM. One month before soil treatments and 3 months after incubation soil samples were characterized for FC, pH, EC, CEC texture, exopolysaccharide, alkaline phosphatase and exteerase enxymatic activities. The results indicate that the saline soils had low level of OM, microbial activity (measures by phosphatase and exterase enzymes) due to low energy balance, alkaline pH, excess of cations (Ca, Mg, Na) low phosphorus solubility and the unavailable micronutrients for micro-organisms and plants. When microorganisms (E50EM) were added to the pre-digested FYM, its microbial activity was increased in the saline soil causing a much faster humificfation of OM than when only FYM was used. The addition of OM to the soil provide energy for micro-organisms which when developing, excrete organic compounds with different functional groups that may immobilize the various cations existing in the soil, thus making the nutrients accessible to micro-organisms and plants. In this way, the pH is corrected to neutrality releasing organic (phenolic, fatty acids), polysaccharide enzymes such as esterases, alkaline phosphatases and dehydrogenases. This results in changes in physical-chemical soil properties such as EC, FC, CEC, and OM decomposition. The higher humification of OM verified mainly in treatment E50EM reflected on FC and CEC integrated to higher polysaccharide production and enzyme activities, as corroborated by the higher correlation indices. This correlation indicates that some biochemical parameters may by early sensitive indicators of desalinization and improvements in soil structure. It is concluded that the methodology was efficient and the micro-biological indicators detected, in an exact an early form, the physical- chemical changes in the saline soils requires OM as source of energy and stimulation from micro-organisms to accelerate soil recovery and economic cultivation.*