Geophysical Research Abstracts
Vol. 16, EGU2014-9720-1, 2014
EGU General Assembly 2014

Transport and Fate of Organic and Inorganic Nitrogen from Biosolids leachates

Talli Ilani, Pavel Trifonov, and Gilboa Arye

French Associates Institute for Agriculture and Biotechnology of Drylands, The Jacob Blaustein Institutes for Desert Research, Ben Gurion University of the Negev, Midreshet Ben Gurion, Israel (talli.ilani@gmail.com)

The use of biosolids as a means to ameliorate soil becomes prevalent in the last few years. In agricultural fields, the application of biosolids will be followed by irrigation; resulting in excessive leaching of the dissolved fraction of the organic matter. The dissolved organic matter (DOM) is one of the major players in the chemical, physical and biological processes in soils. The DOM mainly composed of dissolved organic carbon (DOC) and lower proportions of dissolved organic nitrogen (DON) and phosphate (DOP). The DON is considered to be the primary source of mineralisable nitrogen in the soil and can be used as an estimate of the nitrogen supplying capacity of the organic matter. Most of the researches which are dealing with nitrogen fate in terrestrial environments focused on its inorganic fractions (mainly nitrate and ammonium) and their transport toward the dipper soil layers. Since DON can be the source of the inorganic nitrogen (by providing nutrients and energy to nitrifying microbes, which in turn increases the nitrogen source for plants as nitrate), knowledge about the nature of its transport characteristics in the soil is important in the case of biosolids amendment. In addition, irrigation water quality (e.g. fresh water, wastewater or desalinized water) may significantly affect the transport and fate of the various nitrogen forms. The main objective of this study is to examine the fate and co-transport of organic and inorganics nitrogen, originating from biosolids leachates in the subsoil. The effect of water quality and flow rate under saturated steady-state flow is examined by a series of flow-through soil column experiments. The established breakthrough curves of the co-transport of total nitrogen, organic nitrogen (will be calculated from the differences between the total nitrogen measurements and the inorganic nitrogen measurements), nitrate, ammonium, dissolved organic carbon and chloride is presented and discussed.