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Study on nitrification process in two calcareous and non-calcareous contaminated soils

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Heavy metals are well known to be toxic to most microorganisms when present in high concentration in the soil. They are a serious threat to soil quality due to their persistence after entering the soil. It has been demonstrated repeatedly that heavy metals adversely affect biological functions in soil. While calcareous soils are widespread in Iran, there is lack of information on the behavior of microbial activity in the presence of heavy metals in these soils. Therefore, the aim of this study was to investigate the effect of Cd and Zn as pollutant on nitrification process in two calcareous and non-calcareous soils. After additions of 0, 10 and 100 μg Cd g-1 and 0, 100 and 500 μg Zn g-1 to the soils, nitrification in the presence and absence of ammonium was measured after 45 days incubation. Nitrification results showed that nitrate decreased in both treated soils. Toxic effect of Cd and Zn intensified with increase of metal concentration. The difference of nitrate in samples without ammonium was more pronounced than ammonium treated ones. Nitrification led to decrease in soil pH which was intensified especially in non-calcareous soil. The results of this study indicated that toxic effect of Cd and Zn on measured nitrification was more evident in non- calcareous soil.

Keywords: Nitrification, Cadmium, Zinc, Calcareous and non-calcareous soil.