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INVESTIGATION SOME PROPERTIES OF SEWAGE SLUDGE FOR LAND APPLICATION IN ESFAHAN.

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INTRODUCTION: Land application of sewage sludge is still one of the most important disposal options in most countries. Although, land application of sludge allows the nutrients of sludge to be used beneficially, but pollutants and pathogenic organisms can raise the health risk. The aim of this study was to investigate the suitability of using dried sewage sludge of Isfahan waste water plans as a fertilizer in agricultural lands. In recent decades, the WWTPs are developing because of increasing wastewater generation [4], so managers have concerned about its environmental risks. Previous studies reported that United States of America, European United Nations, Japan, Taiwan and Korea produced annually 7, 8, 3.5, 0.2 and 2.43 million tons dried biosolids respectively [1; 2; 3].

Methods: Samples were collected from WWTPs(Waste Water Treatment Plans) in 2012, seasonally. Micro-biochemical parameters were measured for each site. Dried sewage samples were collected seasonally (with 3 replications) using sterilized bottles (containers) and then kept in freezer at 4^0C to prevent any change in sludge conditions.

Micro-biochemical parameters were measured including total and fecal coliforms (counts), pH, electrical conductivity (ds/m), total solid (%), moisture (%), organic matters (%), nitrogen (%), phosphor (%), calcium (%), magnesium (%), potassium (%), nitrate, ammonium and organic nitrogen (%) and carbon-nitrogen ratio (%). Data was checked for normality distribution with the Kolmogorov-Smirnov test. Comparison the biochemical data and standard level (EPA) analyzed by using two tailed t-test, assuming a significant level of α=0.05 by SPSS 17 software package.

Results: According to results, total coliforms were not in A and B classes (more than 2000000).Since in the microbial properties showed high value of coliforms counts (more than 2000000), waste water treatment plants should employ selected technical methods to remove pathogens and it is suggested that the sewage sludge should not dispose into any place where has environmental conflicts.

The pH, nitrogen, phosphor, potassium, calcium, total solid, organic matter and moisture were classified in normal ranges except for magnesium. The carbon to nitrogen ratios ranged from 7.41-9.45. It was significantly lower than the normal range. Organic nitrogen composed the highest percentage of the total nitrogen (about 78%) and inorganic nitrogen was in normal ranges. The electrical conductivity ranged from 5-8.8. It may contribute to soil salinization in long term. Seasonal variations showed the maximum nitrogen and phosphor was in winter. Minimum and maximum of potassium, calcium and magnesium were recorded in spring.

Conclusion: In summary, the sewage sludge is a rich source of nutrient matters (nitrogen, phosphor, potassium, calcium, magnesium and organic matters), so its applications could support plant growth, increase organic matters of soil. Also it improves the moisture and nutrients contents of the soil and its air and water infiltrations (physicochemical properties).Therefore, it seems sewage sludge has a good potential for applying them as agricultural fertilizer regardless to their microbial counts. Improving some treatment processes are suggested to eliminate the limitations**.**

Keywords: EPA[2] standards, WWTPs, Dried sewage sludge, Quality, Fertilizer.

References

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