

The effect of moisture content on the soil organic matter decomposition in Muthurajawela marsh soil – a preliminary study

G.K.A.H.T. Sandamali¹, N.J. Ubeynarayana², R.C.L.De Silva³

Muthurajwela marsh situated along the west coast of Sri Lanka is being highly exploited by the industries to dump their waste. According to the literature a high organic matter content in the marsh (>30%) is having a linear relationship with the soil cation exchange capacity (CEC), making industries to consider the marsh a potential wasteland with a high capacity to hold heavy metal cations. The high CEC of marsh is capable to act as a buffer preventing the surrounding ground water becoming acidic even though the organic soils are acidic.

With the accelerated development around the area, various anthropogenic activities have been affecting the moisture content of the soil which may alter the quality of the marsh. In an attempt to investigate the effect of the changing moisture content on the soil properties of the marsh, a preliminary study is being conducted at certain areas in the periphery of the Muthurajawela sanctuary. The observed results are as follows; moisture content of 17.64% to 168.71% (by dry weight) and 36.63% to 84.31% (by wet weight), organic matter content of 5.06% to 57.89% (by dry weight), total CEC of 96 to 696 meq/100g soil, soluble soil pH of 2.10 to 7.91 and exchangeable soil pH of 2.08 to 7.26. Samples from the sites that had very high moisture levels showed higher organic matter contents, low pH values and very high CEC. As the soil moisture decreased, the organic matter levels and the total CEC decreased while the soil pH increased according to the study so far.

The study implicates that the moisture content has a significant influence on the organic matter content of the marsh soil and hence is important in monitoring the quality of the marsh. Reduction of the soil moisture due to anthropogenic activities is therefore suggested to be directly affecting the continuity of the organic nature of the soil. Hence the cation exchange capacity and other properties of the soil would be altered making long-term loss of soil moisture putting the wetland system at the risk of losing its ecological performance. Therefore the Muthurajawela marsh needs strict conservation.

Key words: Muthurajawela Marsh, Organic matter, Moisture content, Cation Exchange Capacity, CEC

1 Department of Chemistry, University of Kelaniya, Sri Lanka. hirushi484@gmail.com

2 Department of Chemistry, University of Kelaniya Sri Lanka. nilusha90@gmail.com

3 Department of Chemistry, University of Kelaniya, Sri Lanka. russel@kln.ac.lk