



## **The Relationship between TOC and pH with Exchangeable Heavy Metal Levels in Lithuanian Podzols**

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Heavy metals can have a negative impact on public and environmental health. The objective of this study was to investigate the relationship between total organic carbon (TOC) and pH with exchangeable heavy metals (Pb, Cd, Cu and Zn) in order to predict exchangeable heavy metal content in soils sampled near Panevėžys and Kaunas, Lithuania. Principal component regression (PCR) and nonlinear regression methods were tested to find the statistical relationship between TOC and pH with heavy metals. The results of PCR [ $R^2 = 0.68$ ,  $RMSE = 0.07$ ] and non-linear regression [ $R^2 = 0.74$ ,  $RMSE = 0.065$ ] (pH with TOC and exchangeable parameters) were statistically significant. However, this was not observed in the relationships of pH and TOC separately with exchangeable heavy metals. The results indicated that pH had a higher correlation with exchangeable heavy metals (non-linear regression [ $R^2 = 0.72$ ,  $RMSE = 0.066$ ]) than TOC with heavy metals [ $R^2 = 0.30$ ,  $RMSE = 0.004$ ]. It can be concluded that even though there was a strong relationship between TOC and pH with exchangeable metals, the metal mobility (exchangeable metals) can be explained by pH better than TOC in this study. Finally, manipulating soil pH could likely be productive to assess and control heavy metals when financial and time limitations exist (Khaledian et al. 2016).

### Reference(s)

Khaledian Y, Pereira P, Brevik E.C, Pundyte N, Paliulis D. 2016. The Influence of Organic Carbon and pH on Heavy Metals, Potassium, and Magnesium Levels in Lithuanian Podzols. *Land Degradation and Development*. DOI: 10.1002/ldr.2638