

## Accepted Manuscript

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PII: S0375-6742(17)30733-1  
DOI: doi:[10.1016/j.gexplo.2017.10.014](https://doi.org/10.1016/j.gexplo.2017.10.014)  
Reference: GEXPLO 6015

To appear in: *Journal of Geochemical Exploration*

Received date: 29 December 2016  
Revised date: 19 October 2017  
Accepted date: 19 October 2017

Please cite this article as: Maria João Batista, Lídia Quental, Ruben Dias, Elsa Ramalho, Judite Fernandes, Dino Milisse, Vicente Manhiça, Ussene Ussene, Grácio Rosário Cune, Elias Xavier Daudi, José Tomás Oliveira , Geochemical characterisation of soil of Beira city, Mozambique: Geogenic origin and relation with land cover. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Gexplo*(2017), doi:[10.1016/j.gexplo.2017.10.014](https://doi.org/10.1016/j.gexplo.2017.10.014)

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## Geochemical characterisation of soil of Beira city, Mozambique: Geogenic origin and relation with land cover

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### Abstract

Beira city and Dondo district in Mozambique were studied with the purpose of evaluating the environmental quality of soil and to relate its quality with land cover and geology. This study revealed, by means of statistical tools, such as principal component analysis and multidimensional scaling, geochemical signatures of geogenic and anthropogenic origin in top- and sub-soil samples. Elements present in detrital minerals, deposited in recent geological formations of sedimentary origin (Ba, Cr, Hf, Ti, Th, U and REE), are related with the erosion products of mafic and orthogneissic formations derived from the upstream reaches of Pungwe River. Shallow coastal areas, where tropical climate (mean annual temperature of 24.5°C) facilitate oxidation and deposition of iron oxides on the surface of particles in soil/sediment, have a characteristic element association, comprising Al, Br, Co, Fe, K, Mg, Mn, Na, Ni, Rb and Sc. Anthropogenic influence in overpopulated areas, identified with *discontinuous urban fabric*, is characterised by Cu, Pb, P and Zn, and is problematic because of unpaved roads, an unprotected urban waste dump, and inexistent sewage network,

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