
Soil type influences crop mineral composition in Kilimanjaro, Tanzania

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Abstract

Food supply and composition data can be used to estimate dietary intake of micronutrients essential to health and identify risks of deficiency. Local composition data for crops can capture local environmental influences and provide spatially resolved crop composition data, where information is currently limited.

One hundred and seventy-three plant samples, representing 26 edible food items, were sampled from 50 sites in the vicinity of Mount Kilimanjaro in 2015, representing various topography, land-use, elevation and differences in local climate. Both soil and crop samples were analysed for 58 elements, including the essential minerals, calcium (Ca), copper (Cu), iron (Fe), magnesium (Mg), selenium (Se), zinc (Zn) and iodine (I).

In general, iodine concentrations were low in staple crops despite relatively elevated levels of soil-I (median 21 mg/kg), with virtually no contribution to dietary intake, with the exception of leafy vegetables 0.26 mg/kg in calcareous soils and 0.17 mg/kg in non-calcareous soils. Selenium concentrations were 38% and 52% higher in maize and pulses, respectively, in calcareous versus non-calcareous soils. These patterns were in broad agreement to previous reports^{1,2,3,4} for Malawi.

The data from these measurements will be presented as an estimation of dietary mineral supplies for the Kilimanjaro region, with estimates of likely deficiency risks on each soil type.

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