EuroSciCon

6th Edition of International Conference on

Pharmacognosy and Medicinal Plants

April 16-17, 2018
Amsterdam, Netherlands

Am J Ethnomed 2018, Volume 5
DOI: 10.21767/2348-9502-C1-006

SOIL PARAMETERS FROM DIFFERENT GEOGRAPHICAL AREAS IN SOUTH AFRICA: A HINT FOR A PREEMINENT ANTIOXIDANT COLLECTION SITES OF HYPOXIS HEMEROCALLIDEA

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Statement of the Problem: Hypoxis hemerocallidea is a commonly used African herbal medicine that is wild harvested, due to its strong antioxidant activity. Its anti-oxidant activity is linked to plant stressors like soil, heavy metals concentrations, organic matter content and pH. Although, minerals are known to increase antioxidant capacity, the use of this plant from a wild source may pose a safety concern to the person consuming the said plant or its naturally harvested corm may not be completely safe.

Objective: The purpose of this study is to determine the relationship between the concentration of selected soil metal concentrations, the H. hemerocallidea corm metal concentrations and corm antioxidant activity.

Methodology & Theoretical Orientation: H. hemerocallidea corms were collected from five different geographical regions of South Africa. Qualitative and quantitative evaluation of anti-oxidant activity of the corms was done. Heavy metal, organic matter content and pH analysis were also evaluated.

Findings: The soil and corm metal concentrations varied by site. In general, the highest corm and soil metal concentrations for any sites were Fe, Mn, and Cr. Among the trace metals investigated, Fe was the highest, particularly for the corm collected from Ga-Rankuwa 83.7±0.03 µg g-1. The soil and corm crude samples from Ga-Rankuwa with high levels of metals (e.g. Fe, Cr, Ni, Pb) yielded greater antioxidant activity (EC50 of 1.68±0.49 µg/ml). We were, however, unable to link the corm's antioxidant activity to environmental conditions.

Conclusion & Significance: The results from this study however highlight the dangers of using naturally harvested bulbs in undefined soils as the dangers of naturally harvested medicines and indicate that the plant has the ability to bio accumulate heavy metals.

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