XXXV CONVEGNO NAZIONALE "La ricerca in Chimica Agraria: integrazione dello studio dei sistemi suolo, pianta e ambiente"
Udine 11-13 settembre 2017

Distribution of REY in Soil-Citrus limon system (L.) Osbeck

Ioppolo, A., Castrianni, A.G., Saiano, F., Palazzolo, E.

Department of Agricultural, Food and Forestry Sciences, University of Palermo, Palermo, Italy

Introduction

The consumers have an increasing interest about food traceability. It is an important tool for identification of the geographical origin of agrifood products is the most important fruit tree crop in the world and the detection of potential fraud could improve by using tools linking the chemistry composition of its production to its typical growing area.

Objectives:

The aim of this work was to know the chemistry relationship between the soil and the agricultural products "Citrus Limon" in a specifically area of Sicily "Acireale (CT)" analyzing the REY distribution. We carried out experimental trials in different cultivars of "Citrus limon" grafted onto equal rootstock "Citrus aurantium L." on the same soil.

Materials and methods

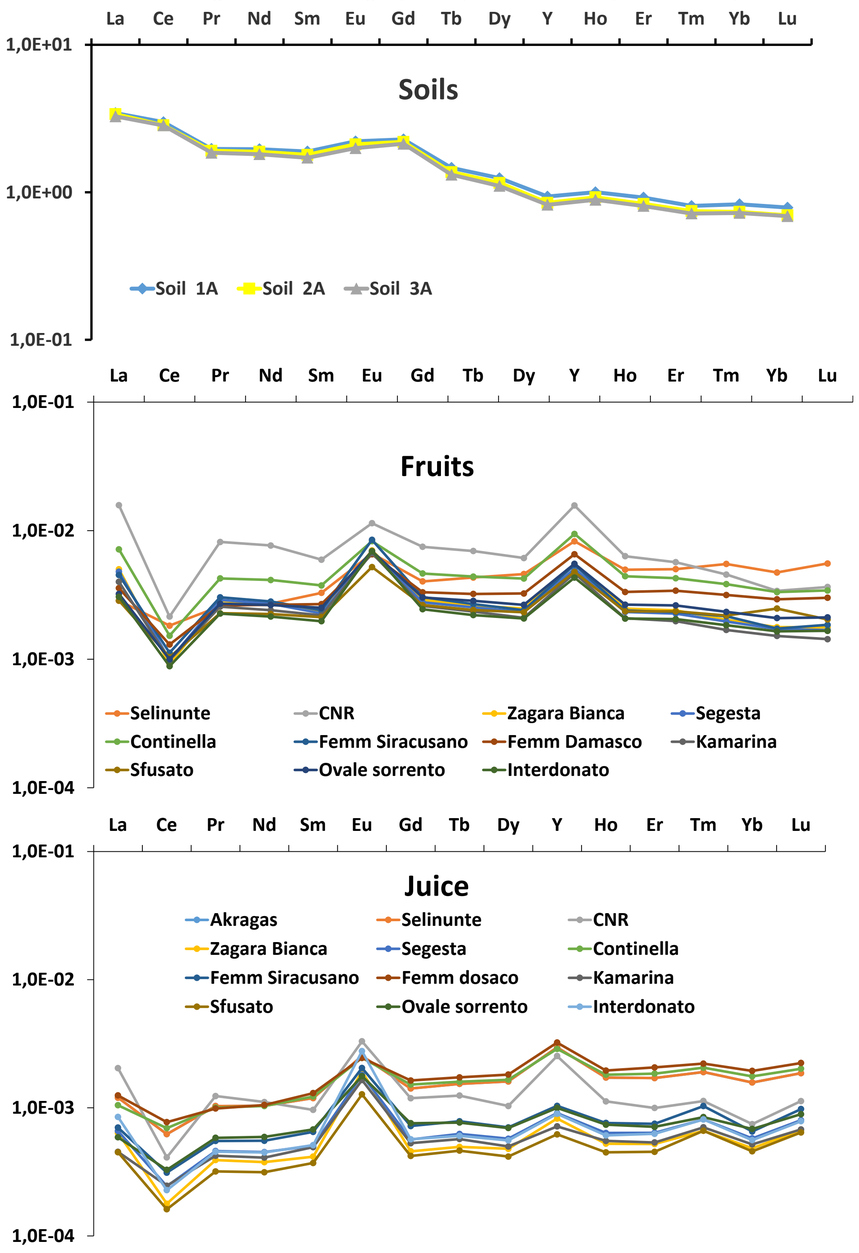
In the CREA experimental farm located in Acireale (CT, Sicily) are collected several Citrus limon varieties cultivated in Sicily. We have studied the following cultivars presented in the table.

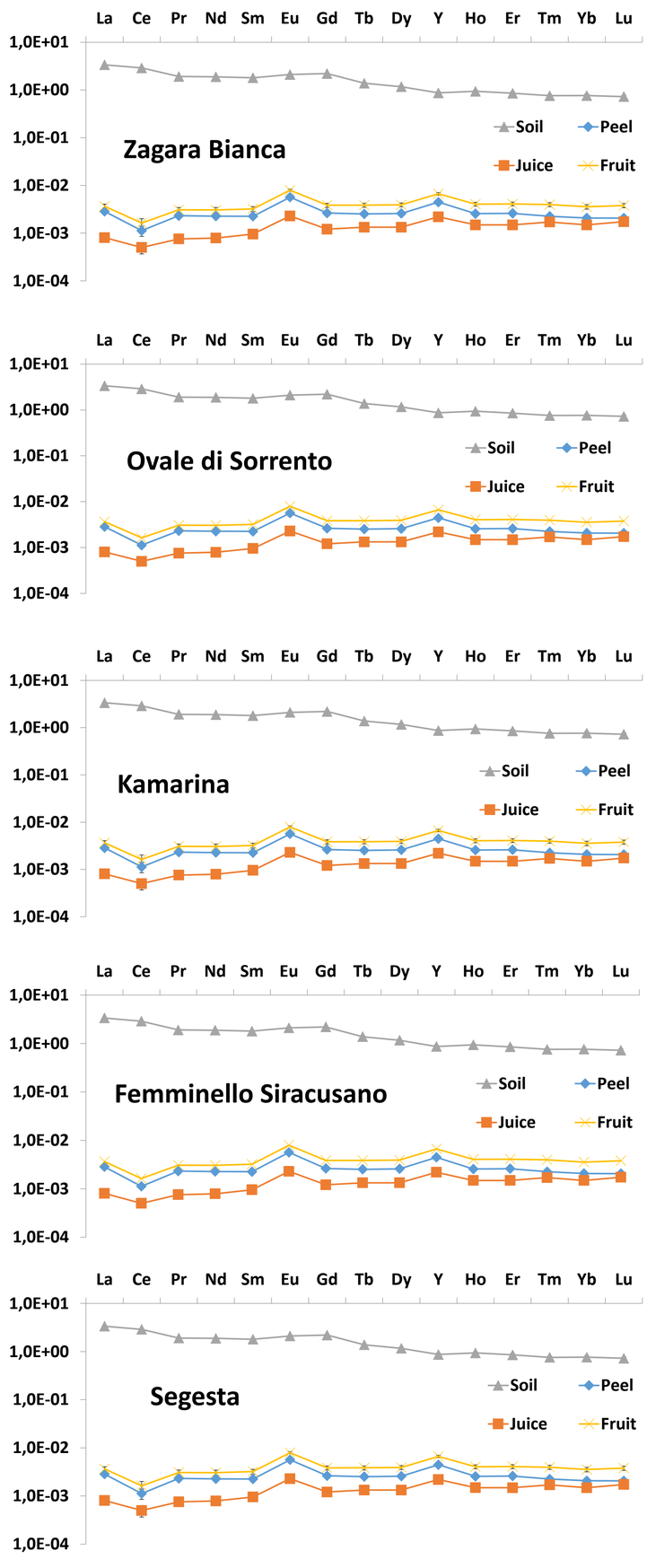
Segesta	Akragas	Interdonato	Femminello Dosaco
Continella	Selinunte	Kamarina	Zagara Bianca
Femminello Siracusano	CNR	Sfusato	Ovale di Sorrento

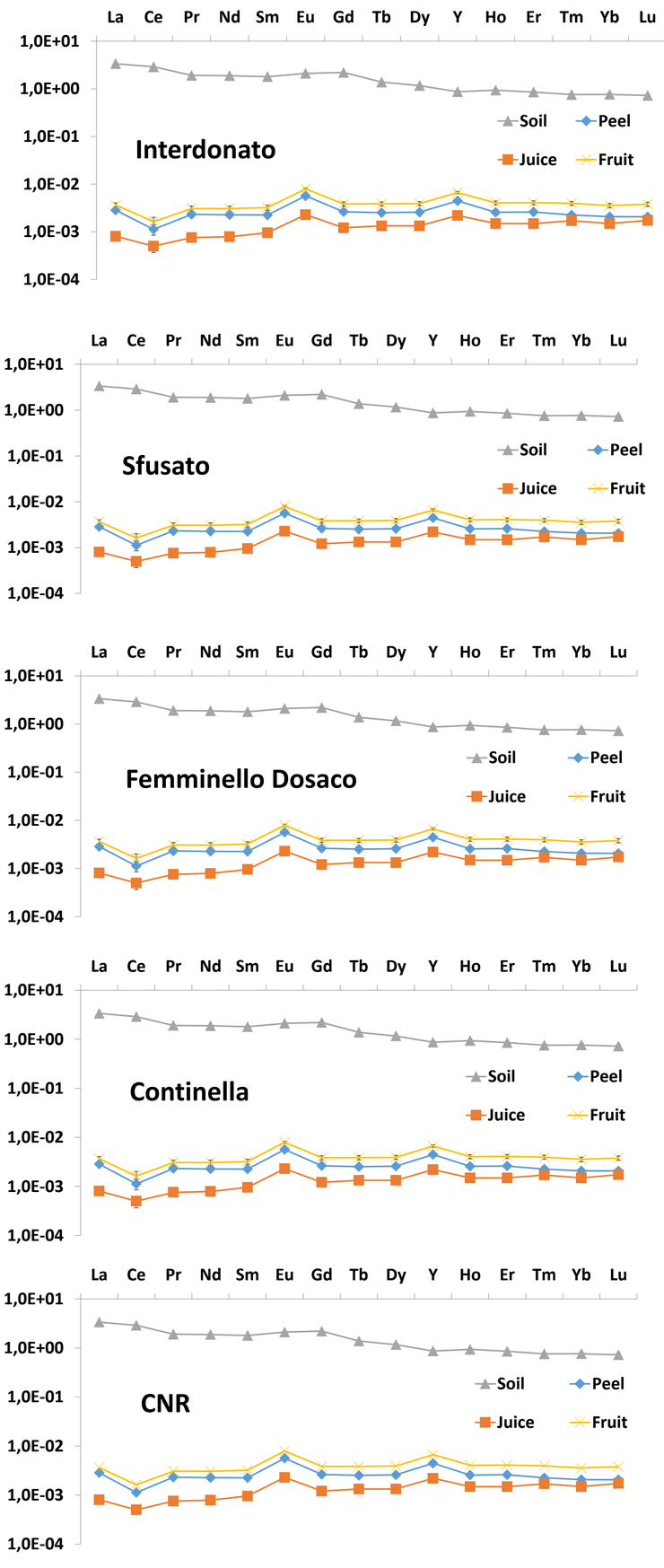
Aliquots of sample (soil, fruit, juice and peel) dried at 105 ° C and ground, were mineralized in Teflon containers with HNO_3 and H_2O_2 concentrated in a microwave oven. Quantitative analysis of REY (Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu) was performed with an Agilent ICP-MS 7500ce, operating in mode quantitative with external calibration and internal standard on line (^{187}Re 1mg L^{-1}).

Results

The good spatial homogeneity of the studied area is given by the standard deviations values found among the soil samples reflecting the hypothesis of the "similar soil", in the REY pattern. The REY pattern for the different cultivars show a strong similarities of all REY distributions confirming the identical behaviour of every cultivar in the uptake of REY. The different cultivars were not able to induce significant differences in REY uptake from the soil maintaining the same fingerprint (with the exception of Eu).







Conclusions

For the first time, results were obtained on the transfer of REY from soil to lemon plants. So the transfer did not get any splitting by soil distribution. The obtained results demonstrate that the lemon of different cultivar, growth on the soil with similar REY pattern, have the similar REY one.

Hence, the REY patterns could be a versatile tool to link soil and lemon, for a geographical characterization.

References

A.Pisciotta, L.Tutone, F.Saiano Food Chemistry. 2017, 221, 1214–1220

P. Censi, F. Saiano, A. Pisciotta, N. Tuzzolino Sci. Total Environ. 2014, 597–608