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## **Trace elements in fingernails and toenails of an adult population living in São Paulo city, Brazil**

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Analyses of human nails for their trace element contents have been studied for several decades to assess nutritional status, estimate environmental or occupational exposure to contaminants and for clinical investigations. However, published data of nails analyses of a group within a healthy population to be used as reference values are limited. This is due to wide variability of nails element concentrations within a relatively homogeneous population. This makes difficult to use nails as biomonitor for trace element status. In this scope, the objective of this study was to determine trace element concentrations in fingernails and toenails of a group of adult individuals living in São Paulo city in order to examine factors that can affect human nail elemental concentrations. Nail samples were collected from 27 individuals of both genders aged between 19 and 75 years. The nail samples were first cleaned using a solution of diluted ethanol, Triton X100, acetone and purified water for neutron activation analysis. Nail samples along with the synthetic standard elements were irradiated in the IEA-R1 nuclear research reactor and the induced gamma activities were measured by gamma ray spectrometry. Concentrations of As, Br, Ca, Co, Cr, Fe, K, La, Na, Sb, Se and Zn were determined in these samples. Results obtained indicated that concentrations of Br, Ca, Co, Fe, Sb, Se and Zn obtained in fingernails are higher than those found in toenails. Elements As and Cr of nails are distributed more homogeneously among individuals than other elements. In relation to the gender of the individuals, only Sb, Se and Zn showed higher concentrations in female fingernails than those presented in males. No appreciable variability in element concentrations with age was observed for this group of population and in the case of body mass index (BMI) only Br and Se concentrations from fingernails increased with the BMI. Comparison of our results with literature reported values was not so easy since elemental concentrations obtained for finger and toenails vary considerably due to nutritional, geographical differences and method of cleaning samples. The quality control of the analytical results was evaluated by analyzing reference materials NIST 1577b Bovine Liver and NIST 1566b Oyster Tissue.