

**THIRTEENTH INTERNATIONAL CONFERENCE ON  
MODERN TRENDS IN ACTIVATION ANALYSIS  
MTAA-13**

**PROGRAM AND ABSTRACTS**



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**Center for Chemical Characterization and Analysis,  
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## LOG 230

### Concentrations of Trace Elements in Livers of the Great Egret (*Ardea alba*) from the Metropolitan Region of São Paulo, SP, Brazil

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The determinations of trace elements in tissues of herons are of great interest in order to evaluate environmental contamination. As the herons are at the top of the food webs they tend to accumulate high concentrations of contaminants in their tissues. Besides the effects of pollution are also severe for this species, putting at risk the survival and reproduction of bird populations. In the present study, concentrations of the trace elements Br, Co, Cs, Fe, Rb, Se and Zn were determined in livers from Great Egret (*Ardea alba*) species. The liver samples were obtained from the adult specimens found dead in the Metropolitan Region of São Paulo, SP, Brazil. The liver samples were ground, freeze-dried and the elements were determined by method of neutron activation analysis (NAA). The liver elemental concentration obtained showed wide variations depending on the element. Comparisons made between our results with literature data indicated that element concentrations obtained for herons from Metropolitan Region of São Paulo are higher or at the same magnitude of those obtained for specimens from polluted areas. Comparisons were made between the results obtained for different gender of herons by applying nonparametric Mann-Whitney *U* test at the significance level of 0.05 indicated that female herons present Co and Se concentrations lower than those from males.

## LOG 231

### *In-Vivo* Bone Lead Measurement using $^{109}\text{Cd}$ Excited K-XRF: System Performance and the Relationship between Cumulative Blood Lead and Bone Lead

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497 smelter employees from New Brunswick participated in a bone lead survey conducted by McMaster University in 2008, using the four element "clover-leaf" geometry germanium detector system. The employees were measured at two different bone sites, the tibia and calcaneus, each measurement lasting 30 minutes. Scattered photons, including Pb x-rays, were collected by the germanium detector located behind the  $^{109}\text{Cd}$  source. After developing the clover-leaf geometry system in 2006, this provided the first opportunity to test its performance in terms of consistency and minimum detection limit (MDL) in a large group of subjects. Nearly 42% of the subjects had participated in both of the previous surveys performed in 1994 and 1999. The MDL by the clover leaf geometry system was improved on average for tibia and calcaneus by a factor of 3.1 compared to the 1999 and 1994 surveys in which a conventional system (one detector) was used. A strong positive correlation was observed between tibia and calcaneus lead concentrations. Having been provided by blood lead levels, cumulative blood lead index (CBLI) was generated. The employees were classified into four groups based on their hired date, and their CBLI levels were compared to their tibia and calcaneus lead concentrations in the different groups. The slopes of bone Pb versus CBLI varied between groups, with those hired earliest showing the steepest slopes. This could be taken to imply a non-linearity in the uptake of Pb by bone from blood.