



Use of biominerals as indicators and records of environmental pollution

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The mineralization of tissues has been widely studied (Lowestan & Weiner, 1989). These tissues also constitute a record of exposition to toxicants in the environment by organisms. Formation, composition and microstructure of mineralized tissues should be directly affected by different physiological factors of the organism (age, sex, diet) or indirectly by the presence of pollutant altering the normal metabolism of calcium regulation involved on mineral formation. Several studies have demonstrated how toxicity, in particular related with heavy metals and organochlorate products, can negatively affect normal calcification (Berglund et al. 2000). Toxicological studies in laboratory models and wild animals can give insights in how toxicants may affect animals metabolism regulation and its reflect in the formation of mineralized tissues. For this purpose we have studied various samples of bone tissue (Sprague-Dawley rats and Clapper rails) and avian eggshell (*Gallus gallus*) exposed to different kind of toxicants. Our studies using FTIR and X-ray diffraction demonstrated how the exposure to PCBs and mercury compounds in bone tissue affects negatively the grade of mineralization in a population of *Rallus longirostris*. In the same way, toxicity treatment with TCDD significantly altered bone chemical composition in Sprague-Dawley rats. Avian eggshell of farm chickens exposed to high arsenic concentrations show varia-

tions on calcite crystal forming eggshell structure.

References:

Berglund, M., Akesson, A., Bjellerup, P., Vahter, M. (2000) Metal-bone interactions. *Toxicology Letters* 112-113: 219-225.

Lowestan, H.A., Weiner, S. (1989) *On biomineralization*. Oxford University Press, New York.