Nickel bioaccumulation in marine sponges

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Marine sponges are ubiquitous filtering feeding organisms, particularly exposed to environmental conditions and have been pointed out as potential biomarkers.

A previous study on the content of several metals, performed by energy dispersive x-ray fluorescence (EDXRF), in marine sponges from the Berlengas Natural Reserve, a well recognized site free from anthropogenic influence, showed that the specie *Cliona viridis* accumulate nickel up to 3000 ppm [1] . A similar study, using atomic absorption spectroscopy, determined similar nickel contents for the same specie in the Marseill golf, a location with high human impact [2]. These studies provided evidence that the bioaccumulation of nickel in this species could be regarded as a normal physiological process and not a response to a metal contamination in the environment.

The nature of the molecule responsible for this bioaccumulation is now been investigated and was successfully isolated from the species *Cliona viridis* and *Cliona varians* (which also accumulate nickel) using chromatographic procedures. This molecule prove to be a protein with a high content in sulfur aminoacids provided by polarographic techniques and aminoacid content results. This protein is heat stable, highly glycosilated with a molecular mass of 4 kDa determined by MALDI-TOF.

The UV-Vis spectrum shows that this molecule lack free Ni^{2+} or $[Ni\ (H_2O)_6]^{2+}$ and the nature of nickel moiety and its coordination to the protein is been currently ascertain by SQUID and EPR studies.

1- Araújo, M.F; Conceição, A.; Barbosa, T.; Lopes, M.T., Humanes; M.M.; (2003) *X-Ray Spectrochimica Acta*, 32; 428-433.

2- "Qualité de l´énvironnment marin littoral: étude des spongiaires pour la bioevaluation des peuplements de substrats durs" Thierry Perez, Université de la Mediterranée, 2001.