Trace-elements speciation in agricultural soil and microscopical analysis of plant tissues. Interdisciplinary study of trace-elements distribution and their uptake by flax plants.

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Flax are widely used in animal food because of their high content in Omega 3 . A number of trace-elements (TEs) are essential as micronutrients; however they become highly toxic at supraoptimal concentrations. In field conditions, they can accumulate in the plants at high quantities incompatible with their introduction in the food chain. In order to control this risk and evaluate the uptake of TEs, it is necessary to assess the contents of various chemical species of TEs in the soil and in the plants (total content and the contents of each organ).

We were mainly interested in evaluating the presence of the following elements, Cu, Ni, Pb and Zn in soils on which flax plants were grown. Two situations have been compared: the first one corresponds to fields into which some sludge of water-treatment were brought in agronomic doses, similar to reasoned cultural practices (Normandy) and the second corresponds to plots of land irrigated by waste water over a long period which led to an accumulation of TEs in the soil (Paris Region).

We are currently performing TEs extraction from both soil types and plants using different methods: sequential and total extraction (notably assisted by microwaves) methods. The data will be compared and presented. In addition, the content, localization of TEs in flax plants as well as their possible effects on the tissue organization will be presented..