Toxicity screening of sediments from Lake Geneva using the freshwater ostracod *Heterocypris incongruens* (ISO 14371)

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**Introduction**

- **Context of the study:** In 2015 the International Commission for the Protection of Lake Geneva (CIPEL) financed a specific project to study the presence of micropollutants in surficial sediments from Lake Geneva and evaluate the risks of transfer to the zoobenthos. Project components include:
  - Physico-chemistry: ancillary parameters, metals, organic micropollutants prioritized according to substance properties and previously attested presence in Lake Geneva.
  - Macrozoobenthos: qualitative (composition of oligochaetes, insects and mollusks) and quantitative (density, biomass) indicators.
  - Paleolimnological indicators: chironomids, diatoms, microcrustaceans in sediment cores.

- **This study:**
  - screening of toxicity of sediments from 30 sites subject to extended physico-chemical characterization (blue squares in Fig. 1 below).
  - Test the effect of sample storage conditions (freezing) on the toxicity test endpoints.

**Material and Methods**

**STUDY AREA AND SAMPLING SITES**

- **Endpoints:** mortality and growth.

**RESULTS AND DISCUSSION**

- **TOXICITY SCREENING**
  - **Mortality (Fig. 2):**
    - Seven out of 30 samples has mortality statistically different from controls. Statistically homogeneous samples are defined by a continuous line.
    - Increasing mortality
    - 29 15 4 71 54 8 79

- **Growth inhibition (Fig. 3):**
  - Higher incidence of toxicity than for mortality endpoint, including samples with increased control-normalized mortality: 11, 22, 26, 30, 32, 33, 38, 49.
  - Low impact of toxicity threshold used for toxicity classification of samples.

- **Clustering of sites (Fig. 4) and visual representation of toxicity (visual abstract).**

- **Spatial trends in toxicity (visual abstract):**
  - Hot spots: the Haut Lac, an area closed to the Rhone mouth.
  - the Grand Lac, the deepest area, and two areas with urban influence.
  - the south-eastern part of the Petit Lac.

**EFFECT OF SAMPLE STORAGE CONDITIONS**

- **Direct sensitivity comparison (Fig. 5):**
  - Both mortality and growth inhibition decreased to low levels of toxicity for all samples stored frozen for approximately 6 months.
  - The exception was sample n°3, from the area impacted by the Lausanne WWTP at Vidy bay. Chemical analyses are ongoing.

![Visual abstract](image)

**REFERENCES**


Gent, Belgium.

(ISO 14371)