ECOTOXICITY ELEMENTS
TOXICITY TO SEDIMENT ORGANISMS
Freshwater benthic organisms, laboratory ecotoxicity study

PAPER REVIEWED

Casellato, S., Aiello, R., Negrisolo, P.A., Seno, M. 1992. Long-term experiment on *Branchiura sowerbyi* Beddard (Oligochaeta, Tubificidae) using sediment treated with LAS (Linear Alkylbenzene Sulphonate). Hydrobiologia, 232, 169-173.

TEST SUBSTANCE

- LAS: structure, supplier, molecular weight not mentioned.

✏ Remarks: It is not clear whether data are expressed in mg LAS / kg dry weight or wet weight.

METHOD

• Laboratory	Dipartimento di Biologia, Università di Padova, Italy
• Objectives	To assess possible effects of LAS sorbed to sediment on the reproductive cycle of *Branchiura sowerbyi* during a 220 days exposure using concentrations 2-5 times higher than those calculated for the LC_{50} values of LAS dissolved in water.
• Method/guideline followed	Guideline not available. Method not fully described in reviewed paper. 20 specimens of *B. sowerbyi* in duplicate were used both for treated and control sediments.
• Test substrate/application	A natural pond sediment was washed, dried and characterized in terms of grain size, carbonate and organic carbon contents. 1 liter of a LAS solution (1 g/kg) was mixed with a sample of 200 g dried sediment. The mixture was allowed to equilibrate for 6 h on a rotary shaker and allowed to settle for 48 h. The mixture was then washed 28 times with deionised water, until the sediment did not release any methylene blue (= marker) material to the overlying water (i.e., until the irreversibly adsorbed quantity of LAS in sediment was reached). Water content of resulting sediment is not mentioned.
• GLP	Likely not.

- Year (study performed) — ≤ 1989
- Species/strain/supplier — The specimens of *B. sowerbyi* used in this study were derived from a population living in a pond of a Botanical garden. Worms were collected together with sediment and maintained in the dark at 15°C in a glass container with natural sediment, for at least 2 weeks prior to experimentation.
- Analytical monitoring — LAS concentrations in treated sediment were measured with HPLC.
- Exposure period — 220 days
- Endpoints — Number of cocoons, number of oocytes per cocoon, total number of oocytes, period of embryonic development, % of degenerated cocoons and % of hatching worms.
- Statistical methods — No statistics used in the reviewed paper.

✏ Remarks: /

RESULTS

- Nominal concentrations — Not mentioned.
- Measured concentrations — The initial concentration of LAS in treated sediments was 25.87 mg/kg and 3.99 mg/kg in control. After 45 days, a reduction of 62-63 % of the nominal concentration was measured. After 220 days, the reduction reached 72 %.
- NOEC, LOEC, EC_{50} — N.A. Results for each endpoint are briefly qualitatively described in Table 1.

Table 1: Results for the different endpoints considered during 220 days exposure of *B. sowerbyi* to LAS adsorbed to sediment.

Parameter	Result
Number of cocoons	Higher in treated worms than in controls (not significant?).
Number of oocytes / cocoon	Similar in both series.
Total number of oocytes	Higher in treated worms than in controls (not significant?).
Period of embryonic development	Similar in both series.
% degenerated cocoons	Similar in both series.
% hatching worms	Similar in both series.

✏ Remarks:
- The result for the different endpoints is shown in the figures of the reviewed paper. However, for most parameters, no standard deviations are shown. It is not mentioned in the text whether the observed differences were significant.
- The nature and the grain size of the sediment used did not allow to obtain a higher concentration of adsorbed LAS.
- No transparent explanation is given for the phenomenon of progressive reduction of LAS concentration in the sediment during the long-term test.

CONCLUSIONS

The LAS concentration in sediment used did not produce any effect on *B. sowerbyi* during the 220 days exposure. LAS sorbed to sediment has much lower effect on the studied organisms than when LAS is dissolved in water.

RELIABILITY

Klimisch score	3b (documentation insufficient for assessment): no GLP, methods insufficiently described, no statistics used