

**INHIBITION OF *SELENASTRUM CAPRICORNUTUM* ACID PHOSPHATASE BY  
SEWAGE SLUDGE CONTAMINANTS AND *IN VIVO* KINETIC STUDIES WITH  
MERCURY AND LAS**

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Sewage sludge applied to agricultural soils as a fertilizer often contains Al, Cd, Hg, Pb, Se and linear alkylbenzene sulphonate (LAS) as contaminants. These pollutants once transported to the aquatic environment can alter enzyme activities in living organisms. In this context, algae acid phosphatase, enzyme that play important roles in the metabolism decomposing organic phosphate into free phosphate and in autophagic digestive process recycling cellular materials, can be a potential candidate. In this work we described *in vitro* inhibitory effect of selected sewage sludge contaminants and kinetic parameters of inhibition of Hg and LAS on acid phosphatase extracted from the green algae *Selenastrum capricornutum*. The order of inhibition at the highest concentration tested was: LAS>Hg=Al>Se=Pb>Cd, with IC<sub>50</sub> (concentration of compound that promotes 50 per cent inhibition) values of 0.085 and 0.289 mM for Hg and LAS, respectively. The enzyme inhibition by Hg was of non-competitive type (K<sub>i</sub> = 0.0365 mM), while LAS was a competitive inhibitor (K<sub>i</sub> = 0.010 mM). *In vivo* studies with treated algae cultures for 24 hours showed that enzyme activity and protein content diminished after Hg treatments, whereas increased in LAS exposure. In contrast to short term treatments, a decrease in specific enzyme activity was observed by exposing algae during 7 days with IC<sub>50</sub> values of 0.0126 mM and >2 mM, for Hg and LAS respectively.

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