



## Phycoremediation potential of brown macroalgae species *Saccharina latissimi* and *Laminaria digitata* towards inorganic arsenic in a multitrophic pilot-scale experiment

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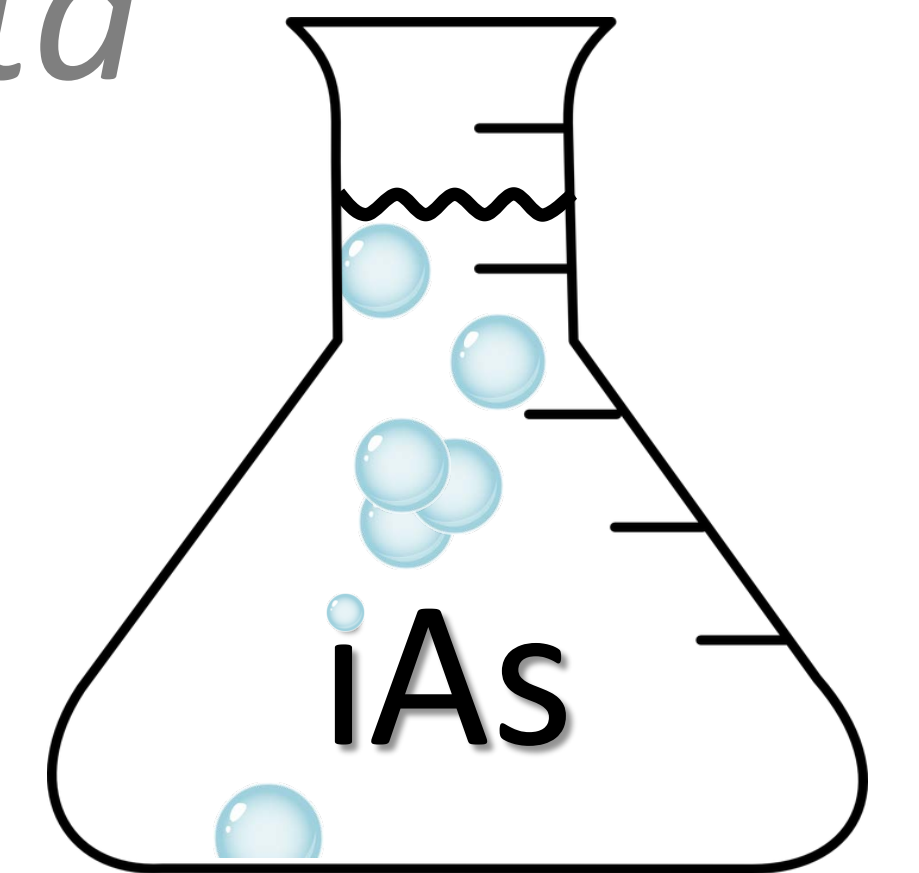
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# Phycoremediation potential of brown macroalgae

species *Saccharina latissima* and *Laminaria digitata*

## towards inorganic arsenic in a multitrophic pilot-scale experiment



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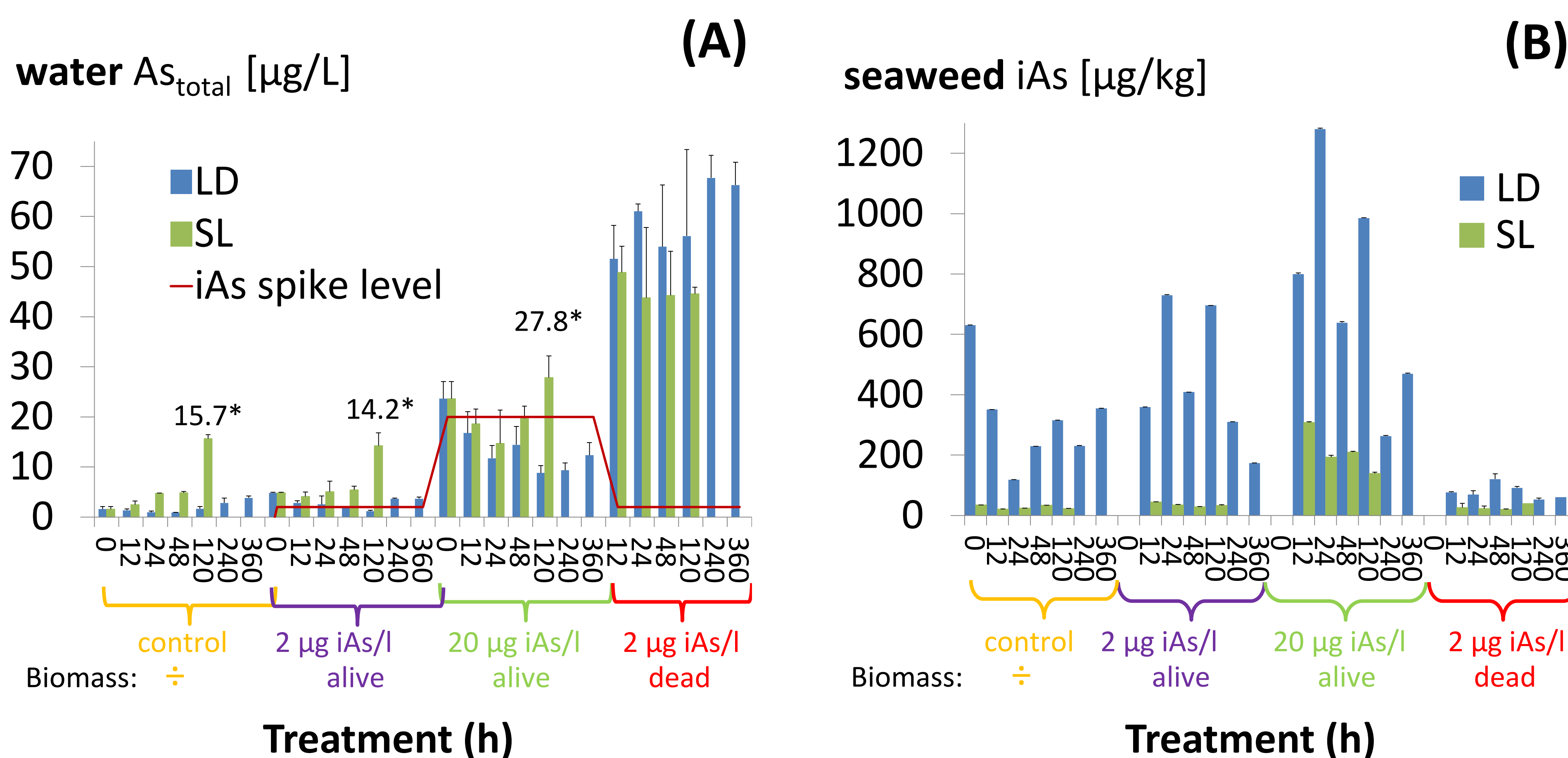
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**Intro.** Phycoremediation has emerged as one of the most promising and cost-effective technologies, which uses the macroalgae capacity to remove, degrade or render harmful contaminants in aquatic systems. Arsenic (As) is a ubiquitous metalloid which is bioaccumulated in the marine food chain and inorganic arsenic (iAs) is considered to be the most toxic form of arsenic.

**Aim.** To evaluate the phycoremediation capacity of the two brown seaweed species Sugar kelp (*Saccharina latissima*, SL) and Oarweed (*Laminaria digitata*, LD) in a controlled multitrophic (water, algae, mussels) pilot experiment with 0, 6, 12 h, ... up to 15 days (360 h) exposure to iAs.

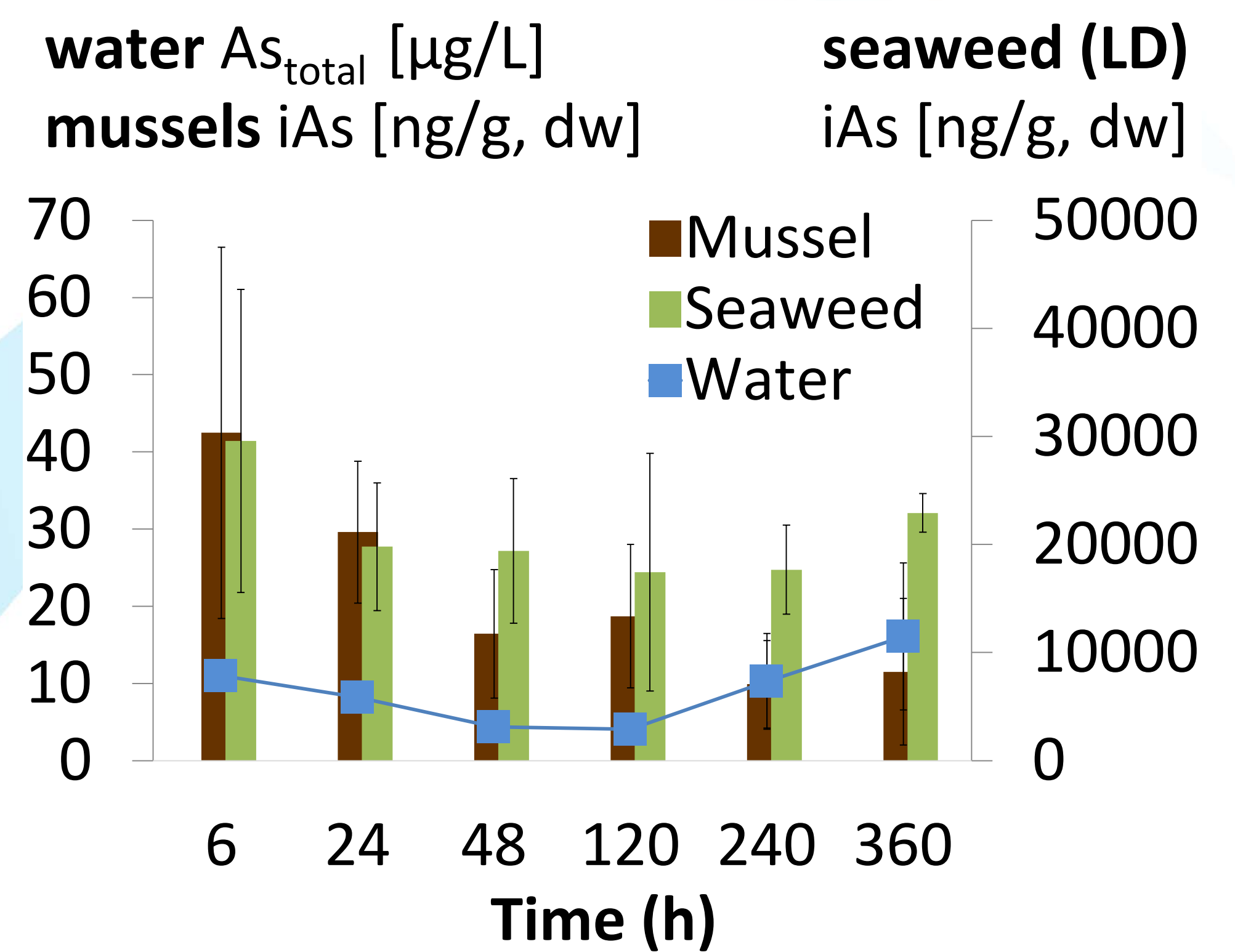
### Results.



**Figure 1.** As conc. (mean±SD) in A) seawater sampled twice and B) seaweed from tanks added iAs with dead or alive LD and SL.

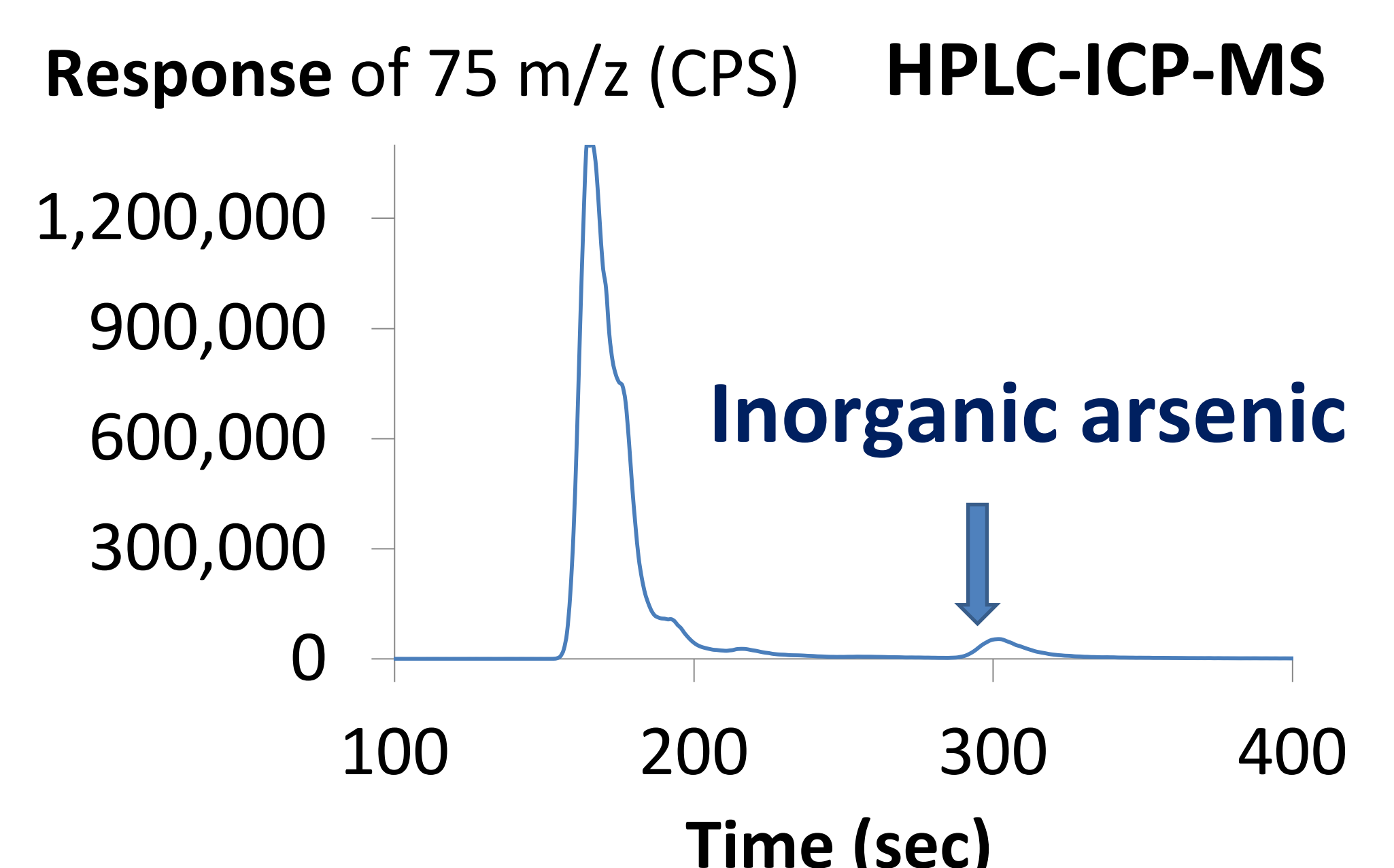
- Water (As<sub>total</sub>) LD < SD. Dead algae releases As. \* (SL) biomass released As.
- Seaweed (iAs) LD > SD in absolute levels. Low iAs in dead biomass.

**Conclusion.** *Laminaria digitata* was most efficient for removal of arsenic from seawater and hence a better choice for phycoremediation practices towards this parameter.



**Figure 2.** As conc. (mean±SD) in water, mussel and LD seaweed cultured in tanks (n=2) added 20 µg iAs/l seawater.

- Temporary drop of As<sub>total</sub> in water.



**Figure 3.** As speciation for LD, 12 h exposure, 20 µg iAs/l. • iAs << As<sub>total</sub>