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BOOK OF ABSTRACTS

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Phytoremediation approach to a mercury and arsenic polluted site: a novel strategy for enhanced phytoextraction

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ABSTRACT

Arsenic and mercury are non essential elements for plants, they are considered the most toxic heavy metals and their contamination is a very serious global problem.This study was undertaken to evaluate the possibility of using assisted phytoextraction for the simultaneous removal of mercury and arsenic from a multi-contaminated industrial soil located in northern Italy. The species selected were *Brassica juncea* and *Lupinus albus* and the addition of thiosulfate to the soil greatly promoted the uptake and translocation of both contaminants in the shoots. Mercury concentration in the aerial parts reached in *B. juncea* 120 mg/kg (approximately 40 times the value of the control) and the concentration of arsenic also increased significantly in the shoots of *B. juncea* (14.3 mg/kg), where the value in the control was negligible. The simultaneous increase of both contaminants uptake by plants, using a single additive, will provide new insights into the phytoextraction technology in terms of cost and time reduction.
With the aim to further supporting and promoting plant growth, a series of bacterial strains isolated from this polluted soil were assayed for i) their ability to tolerate arsenate (AsV), arsenite (AsIII) and mercury chloride and for ii) showing peculiar plant growth promoting traits (PGPR).
The best performing isolates, basing upon *in vitro* experiments, have been tested for growth promotion in planta. The results of phytoextraction experiments on a laboratory scale, the characterization of these native bacterial strains and some data of in vivo trials with isolated PGPR will be shown and discussed.

Keywords: *assisted phytoremediation, metal mobilization, plant uptake, plant growth promoting bacteria.*