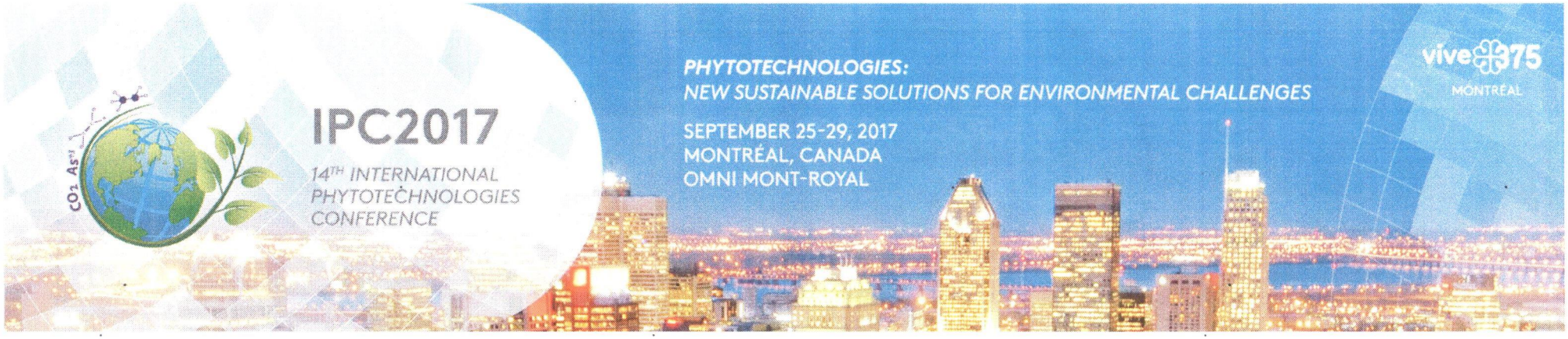

OFFICIAL PARTICIPATION CERTIFICATE

This certificate confirms the participation of:

Maria ALARCON-HERRERA

to IPC 2017 Conference

Signed on behalf of the IPC 2017 Organizing Committee in Montréal on September 27th 2017

Pierre Bolduc
IPC 2017 Secretariat

ARSENIC UPTAKE BY EDIBLE FRUITS GROWN IN CONTAMINATED SOILS

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Arsenic contamination has become a global issue due to ever-increasing contamination of groundwater, soil, and crops in many regions of the world. The use of groundwater with high arsenic (As) content in agricultural irrigation is a regular practice, which results in the accumulation of As in soils to levels that can alter soil physicochemical properties, decrease fertility, and reduce crop yield. Plants absorb many elements from soil and irrigation water. Some of these elements have a biological function but others, such as As, can be toxic to the plants. The presence of As in plants poses a risk due to the possible bioaccumulation of this metalloid through the food chain. Edible fruits like melon and watermelon are mainly grown in warm and arid or semi-arid locations. These crops have a high production and commercialization worldwide. The mechanisms for uptake, biotransformation, and bioaccumulation of As vary substantially between plant species and genotypes.

The aim of this investigation was to determine the bioaccumulation, effects, and distribution of As in melon and watermelon plants irrigated with As-contaminated water. Our results showed that the accumulation of As in the soil over time was clearly established once it was present in the irrigation water. Arsenic uptake and distribution followed the same behavior in both plants. The root was the part of the plant that accumulated the highest amount of As, followed by the leaves and finally the stems (Fig. 1). Outside of the roots, most accumulation occurred in the leaves. The irrigation of plants with As-contaminated water (1.4 mg/L) for a period of 35 weeks resulted in adverse effects on the development of both genotypes. For these As concentrations, watermelon plants showed a clear reduction of root growth . The mechanisms responsible for As resistance and toxicity in plants must be better elucidated. As-resistant plants that do not accumulate As in the edible parts are required for safe agriculture in areas with arsenic groundwater contamination.

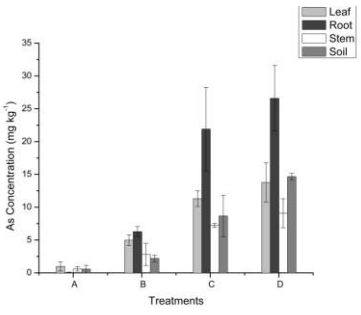

Fig. 1. As distribution in the soil mesocosm. Treatments accord to As concentration in irrigation water: A (control), B (0.7 mg As L-1), C (1.4 mg As L-1) and D (2.8 mg As L-1). Bars represent the mean values ± SD (n = 5).

References

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