Journal of Hazardous Materials 340 (2017) 272-280



Contents lists available at ScienceDirect

## Journal of Hazardous Materials





## Polyamines may influence phytochelatin synthesis during Cd stress in rice



Magda Pál<sup>a,\*</sup>, Gabriella Csávás<sup>b</sup>, Gabriella Szalai<sup>a</sup>, Tímea Oláh<sup>a</sup>, Radwan Khalil<sup>c</sup>, Rusina Yordanova<sup>d</sup>, Gyöngyvér Gell<sup>a</sup>, Zsófia Birinyi<sup>a</sup>, Edit Németh<sup>a</sup>, Tibor Janda<sup>a</sup>

- <sup>a</sup> Agricultural Institute, Centre for Agricultural Research, Hungarian Academy of Sciences, H-2462 Martonvásár, POB 19, Hungary
- b Faculty of Horticultural Science, Szent István University, H-1118 Budapest, Hungary
- c Botany Department, Faculty of Science, Benha University, Benha, Egypt
- d Institute of Plant Physiology and Genetics, Bulgarian Academy of Science, Bulgaria

## HIGHLIGHTS

- · Putrescine pre-treatment increased cadmium toxicity in rice.
- In contrast, putrescine synthesis inhibition alleviated cadmium stress.
- The synthesis of higher polyamines and phytochelatins is antagonistically related.
- Putrescine may decrease phytochelatin synthesis at enzymatic and gene expression levels.