

Heavy Metal Stress and Its Consequences on Exopolysaccharide (EPS)-Producing *Pantoea agglomerans*

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Abstract Currently, the heavy metal pollution is of grave concern, and the part of microorganism for metal bioremediation should take into account as an efficient and economic strategy. On this framework, the heavy metal stress consequences on exopolysaccharide (EPS)-producing agricultural isolate, *Pantoea agglomerans*, were studied. The EPS production is a protective response to stress to survive and grow in the metal-contaminated environment. *P. agglomerans* show tolerance and mucoid growth in the presence of heavy metals, i.e., mercury, copper, silver, arsenic, lead, chromium, and cadmium. EDX first confirmed the metal accumulation and further, FTIR determined the functional groups involved in metal binding. The ICP-AES identified the location of cell-bound and intracellular metal accumulation. Metal deposition on cell surface has released more Ca²⁺. The effect on bacterial morphology investigated with SEM and TEM revealed the sites of metal accumulation, as well as possible structural changes. Each heavy metal caused distinct change and accumulated on cell-bound EPS with some intracellular deposits. The metal stress caused a decrease in total protein content and increased in total carbohydrate with a boost in EPS. Thus, the performance of *P. agglomerans* under metal stress indicated a potential candidate for metal bioremediation.

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