

Moderately halotolerant selenate- and tellurite-reducing bacteria were characterized for wastewater treatment applications. A selenate-reducing strain 9a was isolated from the biofilm of a leachate treatment plant at a sea-based waste disposal site. A tellurite-reducing strain Taa was isolated from an enrichment culture derived from brackish sediment. Both bacterial strains were *Shewanella* species. Strain 9a could anaerobically remove 45–70% of 1.0 mM selenate and selenite from water containing up to 3% NaCl within 4 days, while strain Taa could anaerobically and aerobically remove 70–90% of 0.4 mM tellurite from water containing up to 6% NaCl within 3 days. Globular particles of insoluble selenium were observed both outside and inside the cells of strain 9a. The insoluble tellurium formed by strain Taa was globular under microaerobic conditions but nanorod under aerobic conditions. These bacteria will yield a range of useful selenium and tellurium nanomaterials as well as wastewater treatment applications.

Removal of selenium and tellurium from saline water by moderately halotolerant selenate- and tellurite-reducing bacteria.