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***Desulfovibrio* strain PCS, a novel metal reducing pleomorphic sulfate reducing bacterium**

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Background:

A sulfate reducing bacterium was isolated from the Paleta Creek site in San Diego Bay with 60mM lactate as the sole carbon source and electron donor, and 50mM sulfate as the electron acceptor. The novel isolate, strain PCS is an anaerobic, non-sporulating, gramnegative organism that is highly motile. The optimum temperature for growth of strain PCS was determined to be 37°C. Preliminary 16S rDNA analysis revealed that the closest relative to strain PCS is *Desulfovibrio africanus* (98 % similar). Light microscopy and SEM images of individual cells reveal sigmoid morphology. Cells of strain PCS appear like slender curved rods during the early log phase and spiral in exponential /stationery phase to approx 5-10µm in length and 0.3µm in width. In this regard, strain PCS is less than half the width of its closest known relative *D.africanus*. The images also reveal the presence of lemon shaped/spherical structures approx 1µm in diameter especially in early log and stationary phases of growth. Detailed investigations are underway to determine the nature and function of these structures. When grown on LS4D minimal media, strain PCS incompletely oxidizes lactate, accumulating acetate as an end product. Sulfate is reduced to hydrogen sulfide. Apart from lactate, strain PCS also utilizes alternative electron donors like pyruvate, benzoate and dihydroxyacetone. Propionate, butyrate and formate were not utilized. Alternative electron acceptors utilized includes Fe-NTA and thiosulfate. Nitrate and chlorate were not reduced. When tested for reduction of toxic metal like Cr(VI), a washed cell suspension of strain PCS could remove almost 150 µM of Cr(VI) supplied as potassium chromate with lactate as the electron donor. This high chromium reducing capability of strain PCS is of great significance for the potential utilization of this microbe towards the treatment of Cr(VI) contaminated environments.

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