

## Mo (VI) reduction to molybdenum blue by *Serratia marcescens* strain Dr. Y9.

### ABSTRACT

In this work we report on the isolation of a local molybdenum-reducing bacterium. The bacterium reduced molybdate or Mo(6+) to molybdenum blue (oxidation states between 5+ to 6+). Electron donors that supported cellular growth were sucrose, maltose, mannitol, fructose, glucose and starch (in decreasing order) with sucrose supporting formation of the highest amount of molybdenum blue at 10 g/l after 24 hours of static incubation. The optimum molybdate and phosphate concentrations that supported molybdate reduction were 20 and 5 mM, respectively. Molybdate reduction was optimal at 37°C. The molybdenum blue produced from cellular reduction exhibited a unique absorption spectrum with a maximum peak at 865 nm and a shoulder at 700 nm. The isolate was tentatively identified as *S. marcescens* strain Dr.Y9 based on carbon utilization profiles using Biolog GN plates and partial 16S rDNA molecular phylogeny. No inhibition of molybdenum-reducing activity was seen using electron transport system (ETS) inhibitors such as antimycin A, 1 HQNO (Hydroxyquinoline-N-Oxide), sodium azide and cyanide suggesting that the ETS of this bacterium is not the site of molybdate reduction.

**Keyword:** *Serratia marcescens*; Molybdate-reduction; Molybdenum blue.