Molybdenum reductase in Enterobacter cloacae

ABSTRACT

Under anaerobic conditions in glucoseï yeast extract medium with phosphate, Enterobacter cloacae strain 48 grew well and reduced Mo6+, to Mo5+. The activity of Mo6+-reductase was measured by the formation of molybdenum blue (complexation between Mo5+ and phosphate ion). Models based on logistic and Luedekingï Piret equations were found adequate to describe the growth of E. cloacae and Mo6+-reductase production. Mo6+-reductase production was found to be a growth-associated process. Washed intact cells, membrane fraction (after disruption using a sonicator) and fluid supernatant (after cell disruption) were able to reduce Mo6+. However, Mo6+-reductase activity was much lower in the supernatant fluid. The (NH4)2SO4-precipitated Mo6+-reductase extract from fluid supernatant was assayed for its properties. The optimum pH and temperature for Mo6+-reductase activity were 8 and 30°C, respectively. The apparent Michaelisï Menten constant (Km) and a maximum velocity (Vmax) were 16.5mm and 0.0192ε mol/ml.h, respectively.

Keyword: Enterobacter cloacae; Metal reduction; Molybdenum reductase