NITRATE- AND NITRITE-REDUCTASE ACTIVITIES IN *MYCOBACTERIUM AVIUM* A5

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(ABSTRACT)

Mycobacterium avium is human and animal opportunistic pathogen responsible for disseminated disease in immunocompromised patients. Mycobacteria have a capacity to adapt to the environmental conditions by inducing enzyme activities and altering their metabolism. *M. avium* A5 cells were grown in a defined minimal medium (Nitrogen Test Medium) with glutamine, nitrite, nitrate, or ammonia as sole nitrogen source at a concentration of 2 mM at 37^0C aerobically. The strain grew well on all the nitrogen sources except nitrite. It grew slowly on nitrite with a generation time of 6 days and cultures were not viable after 4 weeks of storage. These data confirm that *M. avium* can utilize a single nitrogen source in a defined minimal medium as documented by McCarthy (1987).

M. avium genome has been sequenced and contains genes sharing sequence similarities to respiratory nitrate reductase and dissimilatory nitrite reductases. Because, *M. avium* can use nitrate or nitrite as sole nitrogen source for growth (McCarthy, 1987), it must have assimilatory nitrate- and nitrite-reductases. Nitrate- and nitrite-reductase activities of *M. avium* cells growing aerobically or undergoing anaerobic shift in the presence of ammonia, nitrate or ammonia and nitrate in combination were measured. *M.*

avium produced nitrate- as well as nitrite-reductase activity. Nitrite- and nitrate- reductases used either NADH or NADPH as an electron donor. Nitrite reductase activity was greater than nitrate reductase activity. This observation supports the rapid reduction of nitrite and slow reduction of nitrate in *M. avium* as documented by McCarthy (1987) and explained why *M. avium* gives a negative result by the standard nitrate reductase test. In addition to assimilatory enzyme activity, *M. avium* A5 also produced dissimilatory nitrate- and nitrite-reductase activities.

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