The Effect of Glucose on the Utilization of Ethanol by a Strain of *Acetobacter aceti*

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Acetobacter aceti AHA grows on a mineral medium with ethanol or acetate as the only organic substrate but not with glucose. Addition of 50 mg of glucose per liter or more to an exponentially growing culture on ethanol medium inhibits the growth immediately. The time till growth starts again is dependent on the amount of glucose added up to a maximal effect at 200 mg of glucose per liter. During the lag phase, glucose is converted to gluconate and 2-ketogluconate. At the same time, much more acetate is formed from ethanol and accumulated in the medium than by a growing culture without glucose. Addition of glucose to a growing culture on acetate stops the growth and depresses the rate of acetate degradation.

As with other organisms growing on glucose, the addition of growth-inhibiting amounts of glucose to this strain causes a marked diminution in the activity of the key enzymes of the glyoxylate cycle, isocitratase and malatesynthetase.

Addition of cyclic AMP together with glucose abolishes the growth-inhibiting effect of glucose. During the lag phase caused by glucose, mutants are selected which are resistant to glucose.