Succinoxidase System in Aerobacter aerogenes[1]

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Previous studies conducted in this laboratory indicated that diethylstilbestrol inhibits the succinoxidase system of *Aerobacter aerogenes* (Durham and Perry, 1957). Results obtained from manometric experiments showed that stilbestrol inhibited the rate of succinate oxidation by intact cells of *A. aerogenes*. Dehydrogenase assays employing cell-free extracts were performed by conventional Thunberg procedures. Results from these experiments indicated that stilbestrol inhibited the rate of reduction of both methylene blue and brilliant cresyl blue when succinate was employed as the substrate.

To determine whether stilbestrol inhibited succinic dehydrogenase or other components of the succinoxidase system, the dehydrogenase was moderately purified according to a method described by Singer, Massey, and Kearney (1957). Alcohol dehydrogenase was quite closely associated with succinic dehydrogenase, and fractionation procedures yielded both enzymes in a relatively pure condition.

Since diphosphopyridine nucleotide, riboflavin-5-phosphate, cytochrome c, ferricyanide, methylene blue, and brilliant cresyl blue would not serve effectively as electron acceptors for manometric assay of succinic dehydrogenase, the activity was measured employing the phenazine methosulfate technique of Singer and Kearney (1957). Alcohol dehydrogenase activity could be measured immediately following the addition of the substrate, and did not require the incorporation of electron acceptors or hydrogen peroxide inhibitors.

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The addition of stilbestrol to the test systems had no effect on the rate of either alcohol or succinic dehydrogenase activity. However, the total oxygen consumed was decreased when stilbestrol was present. It is concluded from these experiments that stilbestrol does not function by inhibiting the primary enzymes involved in either alcohol or succinate oxidation, but influences other enzymes that may be associated with these systems.

LITERATURE CITED

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