

Abstract

Studies of respiration on glucose in procyclic *Trypanosoma congolense* in the presence of rotenone, antimycin, cyanide, salicylhydroxamic acid and malonate have indicated the presence of NADH dehydrogenase, cytochrome b-c1, cytochrome aa3, trypanosome alternate oxidase and NADH fumarate reductase/succinate dehydrogenase pathway that contributes electrons to coenzyme Q of the respiratory chain. The rotenone sensitive NADH dehydrogenase, the trypanosome alternate oxidase, and cytochrome aa3 accounted for 24.5 +/- 6.5, 36.2 +/- 4.2 and 54.1 +/- 5.5% respectively of the total respiration. Activities of lactate dehydrogenase, NAD(+)-linked malic enzyme and pyruvate kinase were less than 6 nanomoles/min/mg protein suggesting that they play a minor role in energy metabolism of the parasite. Phosphoenolpyruvate carboxykinase, pyruvate dehydrogenase, succinate dehydrogenase, NADP(+)-linked malic enzyme, NADH fumarate reductase, malate dehydrogenase, and alpha-ketoglutarate dehydrogenase and glycerol kinase on the other hand had specific activities greater than 60 nanomoles/min/mg protein. These enzyme activities could account for the production of pyruvate, acetate, succinate and glycerol. The results further show that the amount of glycerol produced was 35-48% of the combined total of pyruvate, acetate and succinate produced. It is apparent that some of the glycerol 3-phosphate produced in glycolysis in the presence of salicylhydroxamic acid is dephosphorylated to form glycerol while the rest is oxidised via cytochrome aa3 to form acetate, succinate and pyruvate.