Tricarboxylic Acid Cycle Enzymes of the Ectomycorrhizal Basidiomycete, *Suillus bovinus*

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In crude cell extracts of the ectomycorrhizal fungus, *Suillus bovinus*, activities of citrate synthase, aconitase, isocitrate dehydrogenase, succinate dehydrogenase, fumarase, and malate dehydrogenase have been proved and analyzed. Citrate synthase exhibited high affinities for both its substrates: oxaloacetate (K_m = 0.018 mM) and acetyl-CoA (K_m = 0.014 mM). Aconitase showed better affinity for isocitrate (K_m = 0.62 mM) than for citrate (K_m = 3.20 mM). Analysis of isocitrate dehydrogenase revealed only small maximum activity (60 nmol × mg protein^{-1} × min^{-1}), the enzyme being exclusively NADP$^+$-dependent. Using the artificial electron acceptor dichlorophenol indophenol, activity and substrate affinity of succinate dehydrogenase were rather poor. Fumarase proved Fe^{2+}-independent. Its affinity for malate was found higher (K_m = 1.19 mM) than that for fumarate (K_m = 2.09 mM). High total activity of malate dehydrogenase could be separated by native PAGE into a slowly running species of (mainly) cytosolic (about 80%) and a faster running species of (mainly) mitochondrial origin. Affinities for oxaloacetate of the two enzyme species were found identical within limits of significance (K_m = 0.24 mM and 0.22 mM). The assumed cytosolic enzyme exhibited affinity for malate (K_m = 5.77 mM) more than one order of magnitude lower than that for oxaloacetate. FPLC on superose 12 revealed only one activity band at a molecular mass of 100 ± 15 kDa. Activities of 2-oxoglutarate dehydrogenase and of succinyl-CoA synthetase could not be found. Technical problems in their detection, but also existence of an incomplete tricarboxylic acid cycle are considered. Metabolite affinities, maximum activities and pH-dependences of fumarase and of malate dehydrogenase allow the assumption of a reductive instead of oxidative function of these enzymes *in vivo*.