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Subcellular localization of isocitrate lyase in the wood-destroying basidiomycete *Fomitopsis palustris*

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Introduction

Oxalate biosynthesis in wood-destroying fungi, including *Fomitopsis palustris*, has been receiving much attention, because the acid is closely associated with wood decay processes and inactivation of copper-containing wood preservatives [1,2]. Recently, Erman *et al.* have reported a new physiological role of oxalate biosynthesis that is metabolically linked to both the glyoxylate (GLOX) and TCA cycles in *F. palustris*; this fungus acquires biochemical energy by use of this bi-cycles system coordinating with the oxalate biosynthesis during glucose oxidation [3,4]. Especially, isocitrate lyase (ICL), the key enzyme of GLOX cycle, has been revealed to be a pivotal enzyme in the metabolic system for the fungal vegetative growth [3].

This study aims to clarify the subcellular localization of the key enzyme for the oxalate biosynthesis of *F. palustris*. This investigation will contribute to elucidation of the carbon flux and its transportation system related to the oxalate biosynthesis in wood-destroying fungi.

Results and Discussion

We conducted subcellular fractionation of mycelial homogenate of *F. palustris* by sucrose density gradient centrifugation. Both activities of ICL and malate synthase (MS), the key enzymes of GLOX cycle, were detected in the fraction containing the peroxisomal marker enzyme catalase, but not in the mitochondrial fraction identified by the mitochondrial marker enzyme succinate dehydrogenase. Furthermore, immunoelectron microscopy showed that gold particles with antigenic sites of ICL were present mainly in the peroxisomes.

These results clearly indicate that both ICL and MS are peroxisomal enzymes in *F. palustris* mycelia.

References

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