Syn-copalyl Diphosphate Synthase

APPLICATION AREAS
Metabolic Engineering, Biocatalytic Agent

ABSTRACT
Plants produce a large number of low molecular weight organic compounds that, while not essential for growth, play an important role in plant defense and allelopathy. These secondary metabolites have represented an important source of chemotherapeutic agents in the past, but since they are often made naturally in very small quantities, their availability often limits their use or even investigation as promising lead compounds.

As part of a long term goal of understanding plant natural product biosynthesis, ISU researchers have identified a novel enzymatic activity, syn-copalyl diphosphate synthase from rice, and shown that this enzyme initiates biosynthesis of a number of compounds that might have commercial uses. For example, in rice the resulting natural products have been demonstrated to act as antibiotics and suppress the growth of neighboring plants. The gene for the enzyme that produces syn-copalyl diphosphate, a precursor for many natural products that have potential industrial (including pharmaceutical) uses, may also have some utility as a biocatalytic agent.

BENEFITS
Syn-copalyl diphosphate synthase produces a precursor for natural products with antibiotic and herbicidal activity. Isolation of the structural gene and its overexpression may facilitate production of sufficient quantities of these natural products for investigation and use.

REFERENCE(S)

INVENTOR(S)
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