## Functional analysis of *Oryza sativa* monooxygenase genes involved in Coenzyme Q biosynthesis

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Coenzyme Q (CoQ) is a lipid-soluble electron carrier required for the respiratory chain in the many organisms. In eukayote, its preferable localization in cells is mitochondrial inner membrane. It's the main function of CoQ is to accept electrons from the NADH- and succinate-coenzyme Q reductases and to donate them to the $bc_1$ complex. It is known that CoQ content in human tissues peaks at the age of 20 and decreases thereafter, which is especially prominent the case in heart cells, and CoQ is therefore used clinically for the treatment of certain heart diseases. Several new biological activities has been discovered and further potential uses of CoQ for improving human health have recently been reported, i.e. CoQ confers mild symptomatic benefits for patients with Alzheimer's, Parkinson's and Huntington's diseases. Recently, CoQ has also been used in cosmetics and food supplements to prevent the accumulation of active oxygen species utilizing its strong antioxidative activity, and which caused a dramatic increase in demand and consequently a severe worldwide shortage of CoQ.

The biosynthetic rout of CoQ have been mostly investigated using various mutants of *Saccharomyces cerevisiae* and *Escherichia coli* that are deficient in production of CoQ. The benzoquinone ring of coenzyme Q6 of yeast a polyprenyl side chain six isoprenoid units. At least nine yeast genes (*COQ1–9*) were defined by complementation studies bored on the growth defect on glycerol media. However, in higher plants the synthesis of CoQ have not been well characterized.

This study suggests that a bifunctional enzyme exists in the rice genome involved biosynthesis of CoQ. We clarified its biochemical properties by use of yeast mutants, and the subcellular localization of this enzyme in plant cells.