Induction of Cytochrome P450 1A and 2B by α- and β-ionone in Sprague Dawley Rats

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β-Ionone has been reported to induce the cytochrome P450 (P450) 2B1 in rats. In this study, the effects of β-ionone and an isomer, α-ionone, on liver P450 1A and 2B expression in Sprague Dawley rats were investigated. Subcutaneous administration of α- and β-ionone 72 and 48 hr prior to sacrificing the animals induced the liver microsomal P450 1A and 2B proteins. P450 2B1 induction was associated with the accumulation of its corresponding mRNA. Induction by β-ionone was much higher than that by α-ionone in both the mRNA and protein levels. When the route of administration was compared, P450 2B was induced more strongly after oral administration compared to that after subcutaneous injection. A single oral dose of 100, 300 and 600 mg/kg of α- and β-ionone for 24 hr induced P450 2B1-selective pentoxyresorufin O-depentylase activity comparably in a dose-dependent manner. In addition, α- and β-ionone induced the P450 1A and 2B proteins. These results suggest that α- and β-ionone might be potent P450 2B1 inducers in rats, and that both ionones may be useful for examining the role of metabolic activation in chemical-induced toxicity where metabolic activation is required. (This work was partially supported by the Echotechnopia21 Program (0013), Ministry of Environment, and by the Project from the Center for Biological Modulators (CBM-01-B-8), Ministry of Science and Technology, Republic of Korea.)