Effects of frying oil and Houttuynia cordata thunb on xenobiotic-metabolizing enzyme system of rodents

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Abstract
AIM: To evaluate the effects of frying oil and Houttuynia cordata Thunb (H. cordata), a vegetable traditionally consumed in Taiwan, on the xenobiotic-metabolizing enzyme system of rodents.

METHODS: Forty-eight Sprague-Dawley rats were fed with a diet containing 0%, 2% or 5% H. cordata powder and 15% fresh soybean oil or 24-h oxidized frying oil (OFO) for 28 d respectively. The level of microsomal protein, total cytochrome 450 content (CYP450) and enzyme activities including NADPH reductase, ethoxyresorufin O-deethylase (EROD), pentoxyresorufin O-dealkylase (PROD), aniline hydroxylase (ANH), aminopyrine demethylase (AMD), and quinone reductase (QR) were determined. QR represented phase II enzymes, the rest of the enzymes tested represented phase I enzymes.

RESULTS: The oxidized frying oil feeding produced a significant increase in phase I and II enzyme systems, including the content of CYP450 and microsomal protein, and the activities of NADPH reductase, EROD, PROD, ANH, AMD and QR in rats (P < 0.05). In addition, the activities of EROD, ANH and AMD decreased and QR increased after feeding with H. cordata in OFO-fed group (P < 0.05). The feeding with 2% H. cordata diet showed the most significant effect.

CONCLUSION: The OFO diet induces phases I and II enzyme activity, and the 2% H. cordata diet resulted in a better regulation of the xenobiotic-metabolizing enzyme system.