Effects of Patriniae Radix and Melandrii Herba on Enzyme Activities in Mice

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Abstract—Effect of various fractions from the roots of *Patrinia scabiosaefolia* (Valerianaceae) and whole plants of *Melandrium firmum* (Caryophyllaceae) on enzyme activities in mice was investigated. The butanol fractions from both plants caused a significant elevation of serum transaminase activities when administered intraperitoneally, but did not, orally. Prolonged exposure by oral administration of both plants elevated hepatic cytochrome p-450 content, indicating the induction of drug metabolizing enzymes in liver.

Keywords—*Patrinia scabiosaefolia* · Valerianaceae · *Melandrium firmum* · Caryophyllaceae transaminase · alkaline phosphatase · cytochrome p-450

In the previous communications, it has been reported that the methanol extracts of several Chinese drugs caused a significant prolongation of hexobarbital-induced sleeping time and elevation of serum transaminase activities accompanied by severe histopathological changes in the hepatic tissues in mice.1–3) These results strongly suggested that there may exist some hepatotoxic constituents in these plants.

In this study, the effect of various fractions from roots of *Patrinia scabiosaefolia* (Valerianaceae) and whole plants of *Melandrium firmum* (Caryophyllaceae) on hepatic drug metabolizing function as well as on serum transaminase activities was investigated.

† Part 2 in the series: Studies on Hepatotoxic substances in Medicinal Plants. For Part 1, see ref. 3.

Experimental Methods

1. Plant material
The roots of *P. scabiosaefolia* and the whole plants of *M. firmum* were collected in October in the mountain area near Seoul and botanically identified.

The dried plant materials were cut into small pieces and extracted three times with 90% MeOH on a water bath and concentrated to dryness. Each of the methanol extracts was fractionated as illustrated in scheme 1 and 2. Each fraction thus obtained was evaporated to dryness and rendered for the animal experiments.

The sprouts of both plants were also collected in the same area in April and May, air-dried and powdered, which were added to the normal
solution were administered intraperitoneally for three consecutive days or orally for 14 days to the experimental animals. The control animals were given vehicle only. Twenty four hr. after the last treatment, hexobarbital-induced sleeping time, serum enzyme activities and hepatic microsomal cytochrome p-450 content were measured.

In the second experiments, mice were fed lab chows containing powdered sprouts (25%) for 14 days and on the 15th day, the determination of serum enzyme activities and hepatic cytochrome p-450 level were carried out.

4. Measurement of hexobarbital induced sleeping time

Mice were injected i.p. with sod. hexobarbital (50 or 100mg/kg) and observed for sleep as evidenced by loss of the righting reflex. The duration of sleeping time was measured from the time of loss to the time the animals regained the righting reflex.

5. Measurement of serum enzyme activities

For the measurement of serum enzyme activities, mice were killed by cutting carotic artery and blood was collected carefully into a glass centrifuge tube and then allowed to clot in a refrigerator (4°C) for approximately one hr. The serum was separated from the cells by centrifugation at 1000 rpm for 20 min and stored below 4° until the determination of enzyme activities in the same day. The GOT, GPT and alkaline phosphatase activities were estimated by measuring absorbance at 340nm for transaminases and at 415nm for alkaline phosphatase, respectively, after coupling the serum with corresponding reagents dissolved in purified demineralized water at 37° for 5 min using Automated Blood Analyzer (Abbott Laboratories, Model ABA-200).

6. Measurement of hepatic microsomal cytochrome p-450 content

Microsomal cytochrome p-450 content in liver was determined by the procedure of Omura and