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[Lab. of Herbal Garden]

Studies on Genus *Plantago* Growing in Turkey (1). Morphological Comparison of Leaf of the Wild Species.

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Comparative anatomical study was carried out on the leaves of 13 Turkish *Plantago* species. These species were distinguished from each other by the following characteristics: Shapes and numbers of the glandular hair and non-glandular hair, types of the vascular bundles, growth rates of collenchyma cells, epidermal cell wall structures and other microscopically invariable. On the basis of these characteristics, the key for identification was established. These 13 species were classified into two groups, one having bicollateral vascular bundles, and the other collateral vascular bundles. As regards the stomata, these hairy narrower leaves tended to have stomata of dicytic type and scarcely of anisocytic type.

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Studies on Genus *Urtica* in Turkey (2). Discrimination of Commercial Herb Drugs of *Urtica* in the Middle East.

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Commercial herb drugs of "*Urtica*" obtained in Turkey, Egypt and Syria in 1977-1986 were characterized mainly by microscopic studies. *Urtica dioica* L. was sold only in Turkey, and the majority of the drugs derived from *U. dioica* L. were the ground parts of plant, only one sample being presumably underground parts of the species. On the other hand, seeds of *U. pilulifera* L. were commercially available in these 3 countries, and the ground parts in Turkey and Egypt.

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Application of the Steam Explosion Process to Extraction of Constituents from *Phellodendron* Bark (1). Effect of Process on the Extraction Efficiency.

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Steam explosion process was applied to extraction of *Phellodendron* bark. Although *Phellodendron* bark was a fibrous bark crude drug hard to be milled, the steam-exploded *Phellodendron* bark was easily crushed to broken tissues. The extraction yields of the extract and of berberine from the low pressure steam-exploded bark were higher than those from untreated barks. The constituents of the extract, however, varied depending upon the processing steam pressure. The viscosity of the aqueous extract from the steam-exploded bark was lower, which resulted in easier filtration and improvement of extraction of its components. The steam-exploded bark was brown and had a burnt smell, but steam-explosion, in particular of lower steam-pressure, was considered to be useful pretreatment for efficient extraction.

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Studies on Constituents of *Plantaginis Herba* 9 Inhibitory Effects of Flavonoids from *Plantago* Herba on HIV-reverse Transcriptase Activity.

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The inhibitory effects of flavonoids from *Plantago* Herb, apigenin, luteolin, cosmosiin, luteolin 7-glucoside, scutellarein, 6-hydroxyluteolin, plantagin, homoplantagin and 6-hydroxyluteolin 7-glucoside, on the HIV-reverse transcriptase activity were examined and compared with that of baicalein, a known HIV-reverse transcriptase inhibitor. Their structure-inhibitory activity relationships were discussed. Scutellarein and 6-hydroxyluteolin were shown to be strong HIV-reverse transcriptase inhibitors. The order of inhibitory effects of the test compounds was 6-hydroxyluteolin > scutellarein > baicalin > luteolin. Apigenin showed no inhibitory effect. Both O-glucosylation of 7-hydroxy group and O-methylation of 6-hydroxyl group on flavone skeleton caused a decrease in the inhibitory activity, though plantagin and 6-hydroxyluteolin 7-glucoside showed a potent inhibitory effect on HIV-reverse transcriptase, which is almost equivalent to that of baicalein.