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# Phytochemical Screening of Korean Medicinal Plants (II)

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# 韓國藥用植物의 化學成分檢索 (Ⅱ)

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Phytochemical screening results of forty nine plants in Korea were tabulated in this paper.

The results of the preliminary phytochemical tests of 353 plant samples were reported in previous papers[1~7]. In continuation of the program, we now present the results of phytochemical examinations of another 48 species, belonging to 30 families in Table I. The presence of alkaloids, saponins, terpenoids and flavonoids were screened with the usual test methods. The selection of plants was made mainly from the plants which have been used in medicine in Korea and the list of folk medicines reported by Lee[8] was served as a guide in the selection of the plants.

## Experimental

The preparation of the plant extracts and the alkaloid, saponin terpenoid and flavonoid testing procedures employed have been previously described in detail[7].

**Preparation of crude extracts**

Plants were air dried and extracted with 90% methanol. The extract was concentrated in vacuo to dryness. The dried extract was treated with n-hexane. The residual extract after removal of the hexane fraction was tested for the alkaloids, saponins, terpenoids and flavonoids.

**Alkaloid test**

The extract (50mg) was placed in a 30ml beaker and 3ml of 2N-HCl was added. The mixture was heated on a water bath, with stirring, for 5-10 minutes. After cooling to room temperature, a small amount of Celite was added. This mixture was briefly shaken and filtered. The filtrate was then made alkaline to litmus paper with 5% $NH_4OH$ and extracted twice with 5ml portions of chloroform. These solutions were combined and the chloroform evaporated on a water bath. To the residue 2.5ml of 2N HCl was added the mixture, was then stirred briefly, and filtered. A few drops of Mayer's reagent was added to one-half of the filtrate and a few drops of Wagner's reagent was added to the other half. If a positive result was obtained with this test, we considered that alkaloids having a nitrogen function were present.

**Saponin test**

A solution of the extract (20mg) in water was vigorously shaken. Presence of saponins was indicated if a characteristic honey-comb

**Table I.** Phytochemical Screening of Korean Medicinal Plants.

| Plant names (Family) | Used part | Collected date | Alkaloid | | Saponin | Ter-penoid | Flavo-noid | Serial No. | Components previously reported |
|---|---|---|---|---|---|---|---|---|---|
| | | | Wanger. | Mayer | | | | | |
| Anacardiaceae | | | | | | | | | |
| *Rhus javanica* | tw | Sep. '77 | − | − | + | + | + | D-55 | |
| Araliaceae | | | | | | | | | |
| *Aralia elata* | tw | Sep. '77 | + | − | − | − | + | D-56 | Araloside[9], Hederagenine[10] |
| *Kalopanax pictum* | tw | Sep. '77 | + | − | + | − | − | D-60 | |
| Berberidaceae | | | | | | | | | |
| *Epimedium koreanum* | lv | Aug. '76 | − | − | + | + | − | D-33 | |
| Betulaceae | | | | | | | | | |
| *Corylus heterophylla* | tw | Sep. '77 | − | − | − | − | + | D-52 | |
| Campanulaceae | | | | | | | | | |
| *Codonopsis philosula* | rt | Aug. '76 | − | − | + | + | − | D-5 | |
| *Platycodon glaucum* | rt | Oct. '76 | + | − | + | + | + | D-26 | |
| Caprifoliaeae | | | | | | | | | |
| *Lonicera japonica* | wp | Sep. '77 | + | − | − | − | + | D-58 | Loganoside (Loganin)[11], Lonicerin[12] |
| Caryophyllaceae | | | | | | | | | |
| *Gypsophila oldhamiana* | wp | Sep. '77 | − | − | + | + | − | D-57 | |
| Compositae | | | | | | | | | |
| *Achillea sibirica* | wp | Sep. '77 | + | − | + | − | − | D-59 | |
| *Syneilesis plamata* | wp | Sep. '77 | + | + | + | + | − | D-51 | |
| Cornaceae | | | | | | | | | |
| *Cornus officinalis* | fr | Oct. '76 | + | − | + | + | − | D-30 | |
| Eucommiaceae | | | | | | | | | |
| *Eucommia ulmoides* | bk | Oct. '76 | + | − | + | − | + | D-42 | Pinoresinol diglucoside[13] |
| Gramineae | | | | | | | | | |
| *Imperata cylindrica var. koenigii* | rt | Sep. '76 | + | + | + | + | + | D-47 | Arundoin, Cylindrin[14,15] |
| Labiatae | | | | | | | | | |
| *Nepeta japonica* | lf | Aug. '76 | + | − | − | + | − | D-45 | |

| Plant names (Family) | Used part | Collected date | Alkaloid | | Saponin | Ter-penoid | Flavo-noid | Serial No. | Components previously reported |
|---|---|---|---|---|---|---|---|---|---|
| | | | Wagner. | Mayer | | | | | |
| *Perilla frutescens var. crispa* | lf | Aug. '77 | − | − | − | − | + | D-53 | |
| Lardizabalaceae | | | | | | | | | |
| Akebia quinata | st | Aug. '76 | + | − | + | + | − | D-62 | Arjunolic acid, Norarjundic acid,[16] Hederagenin, Oleanolic acid[17] Kaempferol[18] |
| Leguminosae | | | | | | | | | |
| *Albizzia julibrissim* | fr | Oct. '76 | + | + | + | + | + | D-28 | Albizziine,[19] Quercitrin[20] |
| *Sophora japonica* | fl | May. '76 | − | − | + | + | + | D-44 | Sophorabiose, Neohesperidose[21] 4-glucosido-5, 7-dihydroxyisoflavone[22] Sophoriciside,[23] Anbydropisatin, Biochanin[24] |
| Liliaceae | | | | | | | | | |
| *Fritillaria sp.** | rh | Oct. '76 | + | + | − | − | − | D-41 | |
| *Hemerocallis fulva* | wp | Sep. '77 | − | − | + | − | − | D-50 | |
| Magnoliaceae | | | | | | | | | |
| *Shizandra chinensis* | fr | Aug. '76 | + | + | + | + | − | D-7 | |
| Moraceae | | | | | | | | | |
| *Morus alba* | rt,bk | Sep. '76 | − | − | − | + | + | D-1 | Morin[25] |
| Myristicaceae | | | | | | | | | |
| *Myristica fragrans** | fr | Aug. '76 | − | − | + | + | + | D-31 | Trans-Isolemicin, Methoxyeugenol[26] |
| Nymphaceae | | | | | | | | | |
| *Nelumbo nucifera* | sd | Sep. '76 | + | − | + | − | + | C-6 | Isoliensinine[27] Anonain, Pronuciferine[28] Nuciferine, Armepavine[29] Nornuciferine[30], Neferine[31], Nelumboside[32], Kampferol[33], Nelumboside[50] |
| Oleaceae | | | | | | | | | |
| *Fraxinus rhynchophylla* | tw | Sep. '77 | − | − | + | − | − | D-54 | |
| Plantaginaceae | | | | | | | | | |
| *Plantago asiatica* | sd | June. '76 | + | + | − | + | + | D-9 | |
| Ranunculaceae | | | | | | | | | |
| *Paeonia obovata var. typica* | rt | Sep. '76 | − | − | − | − | − | D-2 | |
| Rhamnaceae | | | | | | | | | |
| *Rhamnus davurica* | bk | Nov. '77 | − | − | − | − | + | D-37 | Bornesitol[34] |

| Plant names (Family) | Used part | Collected date | Alkaloid | | Saponin | Ter-penoid | Flovo-noid | Serial No. | Components previously reported |
|---|---|---|---|---|---|---|---|---|---|
| | | | Wagner | Mayer | | | | | |
| *Zizyphus vulgaris var. spinosus* | sd | Oct. '76 | + | + | + | − | + | D-8 | |
| Rosaceae | | | | | | | | | |
| *Agrimonia coreana* | wp | Aug. '76 | − | − | + | − | + | D-29 | |
| *Eriobotrya japonica* | lf | Aug. '76 | − | − | + | + | − | D-46 | |
| Rutaceae | | | | | | | | | |
| *Evodia danielli* | fr,sd | Oct. '76 | + | + | − | + | − | D-22 | |
| *Phellodendron amurense* | fr | Oct. '76 | + | + | + | + | + | D-27 | Quercetin-3-galactoside[35] Magnoflorine, Phellodendrine Guanidine[36] |
| Scrophulariaceae | | | | | | | | | |
| *Scrophularia oedhomii* | rt | Aug. '76 | + | + | + | − | − | D-43 | |
| *Verbasum phlomoides* | wp | Oct. '76 | + | + | + | − | − | D-25 | |
| *Veronica sibirica* | wp | Sep. '77 | + | − | + | − | − | D-48 | |
| Solanaceae | | | | | | | | | |
| *Lycium chinense* | tw | Aug. '76 | + | + | + | + | − | D-49 | Withanolid[37], Betaine[38], β-Sitosterol glycoside[39] |
| Symplocaceae | | | | | | | | | |
| *Symplocos chinensis* | bk | Oct. '77 | + | + | + | + | − | D-35 | |
| *Symplocos chinensis* | fr | Oct. '77 | − | + | + | + | + | D-36 | |
| Umbelliferae | | | | | | | | | |
| *Anethum graveoleus* | fr | Aug. '76 | + | + | + | + | + | D-11 | |
| *Bupleurum falcatum* | rt | Aug. '76 | − | − | + | + | − | D-3 | Stigmasterol, Spinasterol[40,41] Saikogenin[42,43], Saikoside[44] Saikosaponin[51] |
| *Bupleurum longeradiatum* | rt | Aug. '76 | − | − | + | + | − | D-4 | Spioasterol[45], Saikoside[44] |
| *Toorilis japonica* | fr | Aug. '76 | + | + | − | + | + | D-12 | Torilin[46] |
| Zingiberaceae | | | | | | | | | |
| *Alpinia officinarum** | rh | Aug. '76 | − | − | − | + | + | D-18 | Kaempferol, Galangin, Kaempferide,[47] β-Sitosterol, Stigmasterol[48] |
| *Amomum xanthoides** | sd | Aug. '76 | + | + | + | − | − | D-13 | |
| *Amomum sp.** | fr | Aug. '76 | − | − | − | + | + | D-38 | |
| *Curcuma longa** | rh | Aug. '76 | + | + | + | + | + | D-24 | Curcumin[49] |
| *Curcuma sp.** | rh | Aug. '76 | − | − | − | + | + | D-39 | |

bk; bark, fl; flower, fr; fruit, lf; leaf, rh; rhizome, rt; root, sd; seed, st; steak, tw; twig, wp; whole plant * Imported materials

froth, which persisted for 30min, was produced.

**Terpenoid and steroid test**

About 10mg of the extract was dissolved into 1ml of acetic anhydride, and the appearance of red-green color on the bordering surface when a few drops of conc. sulfuric acid was added was considered a positive test.

**Flavonoid test**

A solution of the extract (200mg) in 95% ethanol (5ml) was treated with a few drops of conc. hydrochloric acid and 0.2g of magnesium powder. The presence of flavonoid was indicated if a pink or magenta red color developed within 3 minutes.

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