

Phytochemical Screening of Korean Medicinal Plants. I.

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Abstract—Phytochemical screening results of ninety-two plants grown in Korea were tabulated in Table I.

In previous communications¹⁻⁶⁾, the results of the preliminary phytochemical examinations of 261 plant samples which have been used in medicine in Korea were reported. In continuation of this program we now present in Table I the results of chemical examination of another 92 species, belonging to 80 genera and 48 families, which were screened for the presence of alkaloids, saponins, terpenoids, and flavonoids. The list of folk medicines described by Lee⁷⁾ was used as a guide in the selection of plants to be tested.

EXPERIMENTAL

Preparation of crude extracts—The various parts of plants were air dried, and extracted with 90% methanol, and the extracts were concentrated *in vacuo* to dryness.

Alkaloid test—The extract (50 mg) was placed in a 30 ml beaker and 3 ml 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% NH₄OH and extracted twice with 5 ml portions of chloroform. These solutions were combined and the chloroform evaporated on a water bath. To the residue was added 2.5 ml of 2 N-HCl, the mixture was stirred briefly, and filtered. To one-half of the filtrate was added a few drops of Mayer's reagent, and to the other half was added a few drops of Wagner's reagent. If a positive result was obtained with this test, we considered that alkaloids having nitrogen function were present.

Saponin test—A solution of the extract (20 mg) in water was vigorously shaken. Presence of saponins was indicated if a characteristic honey-comb froth, which persisted for 30 min was produced.

Terpenoid and steroid test—About 10 mg of the extract was dissolved into 1 ml of acetic anhydride. The presence of terpenoid or steroid was indicated if red-green color was

observed on the bonding surface when a few drops of conc-H₂SO₄ was added.

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

Table I—Phytochemical screening of Korean medicinal plants

Plant name (Family)	Used part	Collected date	Alkaloid		Sapo-nin	Ter-penoid	Flavo-noid	Components previously reported	Serial No.
			Wagner	Mayer					
Agaricaceae									
<i>Omphalia lapidscens</i>	wp	m	—	—	—	—	—		C-68
Amarantaceae									
<i>Celosia cristata</i>	hb	Oct. '69	—	—	+	—	—		A-10
Apocynaceae									
<i>Nerium indicum</i>	lf	Aug. '74	—	—	—	+	—	oleandrin ⁹⁾ 16-Desacetyl-anhydro oleandrin	C-10
Araceae									
<i>Arisaema robustum</i>	hb	Aug. '69	—	—	+	—	+		A-50
Araliaceae									
<i>Tetrapanax papyriferum</i>	wd	m	—	—	+	—	+		A-38
Aristolochiaceae									
<i>Aristolochia manshuriensis</i>	wd	m	—	—	—	—	—		B-54
Asclepiadaceae									
<i>Cynanchum atratum</i>	rt	m	—	—	—	—	—		B-69
Balsaminaceae									
<i>Impatiens textori</i>	hb	July '69	—	—	+	—	+		A-60
Caryophyllaceae									
<i>Gypsophyla aldhamista</i>	rt	May '72	—	—	+	—	+	Gypsogenin ¹⁰⁾	C-45
Commelinaceae									
<i>Commelia communis</i>	hb	Sept. '69	+*	—	+	±	+	Comelinin ¹¹⁾ Flavocommelin ¹²⁾	A-17
Compositae									
<i>Artemisia iwayomogi</i>	hb	Aug. '72	—	—	—	+	—		C-39
<i>Artemisia monophylla</i>	lf	Oct. '69	—	—	+	—	—		A-1
<i>Carthamus tinctorius</i>	fl	m	—	—	+	—	+	Kaempferol ¹³⁾ glycoside Carthamin ¹⁴⁾ Carthamone	A-36
<i>Cephalonoplos segetum</i>	rt	m	—	—	—	—	—		B-68
<i>Chrysanthemum lavandulaefolium</i>	hb.	Oct. '69	—	—	+	—	—		A-9
<i>Echinops latifolius</i>	rt	m	—	—	+	—	—		C-17
<i>Echinops setifer</i>	hb	July '70	—	—	+	—	+		A-92
<i>Helianthus annus</i>	lf	Aug. '74	—	—	—	—	—		C-23

Plant name (Family)	Used part	Collected date	Alkaloid		Sap- nin	Ter- penoid	Flavo- noid	Components previously reported	Serial No.
			Wagner	Mayer					
<i>Inula lineariaefolia</i>	hb	Aug. '72	—	—	—	—	—		C-38
<i>Petasites japonicus</i>	lf	Aug. '70	—	—	+	—	—		A-93
<i>Siegesbeckia pubescens</i>	lf	Oct. '69	+	—	+	+	—	Kaurane diter- penoids ^{14,15)}	A-31
<i>Syneilesis palmata</i>	hb	June '69	—	—	—	—	+		A-49
<i>Synurus deltoides</i>	hb	July '72	—	—	—	—	—		C-31
Convolvulaceae									
<i>Cuscuta chinensis</i>	sd	m	—	—	+	—	—		B-56
Crassulaceae									
<i>Sedum japonica</i>	wp	Oct. '72	—	—	+	—	+		B-73
Cupressaceae									
<i>Biota orientalis</i>	sd	m	—	—	—	+	—	α - & β -Cupare- none ¹⁶⁾	C-90
Cyatheaceae									
<i>Cibotium Barometz</i>	rz	m	—	—	+	+	—		C-67
Elaeagnaceae									
<i>Elaeagnus crispa</i>	wd	Oct. '69	+*	—	+	—	—		A-22
Equisetaceae									
<i>Equisetum arvense</i>	hb	June '72	—	—	—	—	—		C-48
Euphorbiaceae									
<i>Securinega suffruticosa</i>	lf	June '70	+	+	+	+	+	Securinine ¹⁷⁾ Securinol ¹⁸⁾ Allosecurinine ¹⁹⁾	A-90
Flacourtiaceae									
<i>Hydnocarpus sp.</i>	sd	m	—	—	—	—	—		C-85
Gramineae									
<i>Coix lachryma-jobi</i> var. <i>frumentaceae</i>	sd	m	—	—	—	—	—		C-58
Hyperaceae									
<i>Hypericum Ascyon</i> var. <i>genuium</i>	hb	Oct. '69	—	—	+	—	+		A-24
Juglandaceae									
<i>Platycarpa strobilacea</i>	lf	July '70	—	—	+	—	+		A-55
Labiatae									
<i>Elscholtzia patrini</i>	hb	July '73	+	—	—	—	—		C-20
<i>Elscholtzia splendens</i>	hb	Sept. '74	—	—	—	—	—		C-19
<i>Leonurus sibiricus</i>	hb	Sept. '74	—	—	—	—	—		C-21
<i>Lycopus coreanus</i>	hb	Sept. '74	—	—	—	—	—		C-44
<i>Nepeta cataria</i>	hb	June '71	—	—	+	—	—		A-62
<i>Perilla frutescens</i> var. <i>japonica</i>	hb	Oct. '74	—	—	—	—	—		C-12

Plant name (Family)	Used part	Collected date	Alkaloid		Sapo- nin	Ter- penoid	Flavo- noid	Components previously reputed	Serial No.
			Wagner	Mayer					
Lardizabalaceae									
<i>Akebia quinata</i>	lf	Oct. '69	—	—	+	—	—		A-14
Leguminosae									
<i>Dolichos lablab</i>	sd	m	—	—	—	—	—		C-79
<i>Glycyrrhiza sp</i>	rd	Oct. '74	—	—	+	—	—	Glycyrrhizic acid glycoside ²⁰⁾	C-5
<i>Lepedeza crytobotrya</i>	lf	July '70	—	—	+	+	+	Kaempferol ²¹⁾	A-84
<i>Lepedeza maximowiczii</i>	hb	July '70	+	—	—	—	±		A-79
<i>Pueraria thunbergii</i>	rt	Sept. '69	—	—	+	—	+	Daizein ²²⁾ Daizin	A-18
Leliaceae									
<i>Convallaria keiskei</i>	hb	Sept. '69	+	—	+	—	±	Convalla saponin ²³⁾ Rhodea saponin ²⁴⁾ Isorhodea saponin	A-25
Magnoliaceae									
<i>Magnolia liliflora</i>	lf	Aug. '73	—	—	+	+	—		C-24
Malvaceae									
<i>Malva alitoria</i>	sd	m	—	—	—	—	—		B-57
Menispermaceae									
<i>Cocculus trilobus</i>	hb	July '71	+	+	+	±	—	Coclobine ²⁵⁾ Cocculolidine ²⁶⁾ Trilobine ²⁷⁾ Magnoflorine ²⁸⁾	A-76
Nyctaginaceae									
<i>Mirabilis jalapa</i>	hb	Oct. '69	—	—	+	—	+	Quercetin ²⁹⁾	A-19
Oleaceae									
<i>Forsythia viridissima</i>	fr	Sept. '74	—	—	—	—	—		C-9
Piperaceae									
<i>Piper longum</i>	fr	m	—	—	+	+	—		C-89
Polygonaceae									
<i>Amblygonon pilosum</i>	hb	Oct. '69	—	—	—	—	—		C-51
<i>Persicaria nepalensis</i>	hb	July '72	—	—	—	±	—		C-50
<i>Persicaria Thunbergii var. coreana</i>	hb	Sept. '69	—	—	+	—	+		A-26
Polypodiaceae									
<i>Pteridium aquilinum</i>	hb	Sept. '69	—	—	+	—	+	Astragalinal ³⁰⁾ Isoquercitrin	A-23
<i>Pyrrhosia lingua</i>	hb	Sept. '74	—	—	—	—	—		C-49
Primulaceae									
<i>Lysimachia barystachys</i>	hb	Sept. '70	+	—	+	—	±		A-69

Plant name (Family)	Used part	Collected date	Alkaloid		Sapo- nin	Ter- penoid	Flavo- noid	Components previously reported	Serial No.
			Wagner	Mayer					
<i>Lysimachia davurica</i> Ranunculaceae	hb	July '70	—	—	+	—	+		A-75
<i>Actaea asiatica</i>	rd	Sept. '69	—	—	+	—	—		A-37
<i>Clematis apiifolia</i>	hb	Sept. '69	—	—	+	—	+		A-13
<i>Clematis tubulosa</i>	lf	Sept. '70	—	—	+	—	—		A-73
<i>Hepatica maxima</i>	hb	Aug. '72	—	—	+	+	—		C-27
<i>Lycotconum longicassi- datum</i>	hb	July '70	+	+	—	—	—		A-74
<i>Paeonia suffurticosa</i> Rhamnaceae	rtb	m	—	—	—	—	—		C-96
<i>Rhamnus daburica</i> Rosaceae	lf	Sept. '70	—	—	+	—	—	Bornesitol ³¹⁾	A-71
<i>Agrimonia pilosa var. japonica</i>	hb	Oct. '69	—	—	+	—	—		A-33
<i>Chaenomeles sinensis</i>	fr	m	—	—	—	—	+		C-80
<i>Potentilla frugarioides var. sprengliana</i> Rubiaceae	hb	May '72	—	—	—	—	—		C-43
<i>Rubia akane</i> Rutaceae	rt	m	—	—	—	—	—		C-15
<i>Evodia rutaecarpa</i>	fl	m	+	+	—	—	—	Evodianine ³²⁾	C-73
<i>Poncirus trifoliata</i>	fr	m	—	—	—	—	—		C-6
<i>Zanthoxylum piperitum</i>	fr	m	±	—	+	—	±		A-29
<i>Zanthoxylum schinifolium</i> Sargassaceae	fr	m	+	+	—	+	—	Skimmianine ³³⁾ Esculetin	C-98
<i>Sargasum enerve</i> Scrophulariaceae	wp	Aug. '73	—	—	—	—	—		C-0
<i>Melampyrum roseum var. typica</i>	hb	July '70	—	—	+	+	+		A-100
<i>Melampyrum setaceum var. genuinum</i> Solanaceae	hb	Oct. '71	—	—	+	—	—		A-72
<i>Lycium chinense</i>	lf	Oct. '69	—	—	+	—	+	β -Sitosterol β -glucoside ³⁴⁾	A-21
<i>Lycium chinense</i>	rtb	m	—	—	—	+	—	Sitosterol ³⁵⁾	B-37
<i>Physalis francheti</i> Styracaceae	fr	m	—	—	—	—	—		C-92
<i>Styrax japonica</i> Umbelliferae	fr	Oct. '70	—	—	+	—	+	Jegosapogenol ³⁶⁾	A-68
<i>Angelica gigas</i>	rt	m	—	—	+	—	—	Nodakenetin ³⁷⁾ Umbelliferone Nodakenin	B-46

Plant name (Family)	Used part	Collected date	Alkaloid		Sap- nin	Ter- penoid	Flavo- noid	Components previously reported	Serial No.
			Wagner	Mayer					
<i>Angelica koreana</i>	rt	m	—	—	—	—	—		C-8
<i>Angelica miqueliana</i>	hb	July '72	—	—	—	—	—		C-32
<i>Anthriscus sylvestris</i>	rt	m	—	—	—	—	—		B-62
<i>Conicelium sp.</i>	rz	m	—	—	—	—	—		
<i>Peucedanum japonicum</i>	rt	m	—	—	+	—	—		A-108
<i>Seseli coreana</i>	rt	m	—	—	+	—	—		C-71
Urticaceae									
<i>Boehmeria paraspicata</i>	hb	July '72	—	—	—	+	—		C-29
Valerianaceae									
<i>Patrinia scabiosifolia</i>	rz	m	—	—	+	±	—	Scabioside ³⁸⁾ Patrinosides ³⁹⁾	B-33
Verbenaceae									
<i>Clerodendron trichotomum</i>	lf	July '71	—	—	+	+	—	Acacetin-7- glucurono glucuronide ^{40,41)} Friedelin ⁴²⁾	A-52

bk; bark, fl; flower, fr; fruit, hb; herb, lf; leaf, lf,br; leaf and branch, rt; root, rtb; root bark, rz; rhizome, pc; pericarp, sd; seed, wd; wood, wp; whole plant, m; crude drug in market.

* The presence of alkaloids was checked^{43,44)}.

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