

## The edible medicinal plants with antitumor activity used in Korea

Sang-Rae Lee<sup>1)</sup>, Harunori Ooda<sup>2)</sup> and Sook-Young Lee<sup>3)</sup>

<sup>1)</sup>Institute of Oriental Botanical Resource, Korea

<sup>2)</sup>Ooda Clinic, Tokyo, Japan

<sup>3)</sup>The Institute for Basic Sciences, Dongshin University, Korea

### Abstract

The present study has been undertaken to detect edible medicinal plants with antineoplastic property on the basis of a number of traditional Korean medical literatures, besides studies on development of anti-cancer medical wild plants growing in Korea and to prove experimentally their efficacy by *in vitro* and *in vivo* tests. 235 species from 45 family 79 genus were screened primarily as edible sources of antitumor effect. Among those the crude extracts of 40 spp. showed considerable cytotoxicity *in vitro* and especially Pegankuen(*Patrinia scabiosaefolia*), Deodeog(*Codonopsis lanceolata*), Okssusu(*Zea mays*), and Geureong(*Eragrostis ferruginea*) exhibited significant antitumor activity against sarcoma 180 sites mice. However, additional researches should be made for the confirmation of their availability as antitumor plants.

The protection and propagation of medicinal plants and their planned collection and supply for the health of human being are the principal factor in the construction of the welfare state.

There are traditional literatures about one thousand kinds of medicinal and edible plants that has been used in Korea for about five hundred and seventy years from 1430 to the present. This research investigated 235 species of antitumor plants on the basis of the above literatures. And then, this research screened their effects through *in vivo*, *in vitro*, bioassay and the analysis of components. The result is that 140 species among them are classified into the edible and antitumor plants. That is to say, the edible and antitumor plants are regarded as decreasing the cancer-genic factor and raising immunity, and preventing side effect of chemical therapy efficiently, if cooked edible part as a nutrient source take ingest continuously.

The main purpose of this research is that we do scientific research about the improvement of breed and quality, the increase of cultivation, the preparation of medicine, the processing and the usages of antitumor plants. Hyangyakgibung(1431), Donguibogam(1596), Bangyakhabyun(1855) wrote the medical food and wild edible greens and played the role as a base of chinese medicine in Korea. Especially, Donguibogam(1596) wrote the followings specifically ① five tastes sokum, ② care of health, ③ the five viscera and food ④ women, children, old people and food, and so on. Besides, there are records about medical food, wild edible greens in the Book of Odes, Book of History, Yegi, the scriptures which are called chinese classical literature. In this literature, the plants which belongs to divisions and subdivisions such as removal of fever, Hwallhuelsanu, tumor reduction, Yeunguensanguel, Hwadam, Pau, Pajuk are classified into the category of antitumor plants. And these literature also introduce their mixture and application. And so, we researched the scientific name, drug name, family name, plant name, characteristic tastes, efficacy, the kinds of target cancer, edible parts, botanical properties, propagation techniques, usages etc about 108 species(45 family 79 genus 104 species) through the analysis of many literature.

We screened cytotoxicities against sarcoma 180 sites mice, V79 and P388 using some of them as sample. In addition, we analyzed the components and did the various tests for the researchable. Especially, *Codonopsis lanceolata* Benth et Hook fill. has been used as medicine and health food in Korea for a long time. It has been used medically as detoxification of Sojong, bruise removal, consumption, pustule exhaust, depression of the blood pressure, energy strengthening, muscle solidification etc. Its space of cultivation and demand increase to 1,000ha. Its significance was confirmed through the test of cultivation, the test of temperature, the analysis of components, the tests of activity.

In addition, there are Baekhasu-o, Pejangkuen, Dongpungcho, Baekpyundu etc. that are worthy of notice in Korea. Baekhasu-o is used for care of health, robustness, nourishing drug of the blood in Korea. Pejangkuen is used for fever cleaning, detoxification, pustule exhaust, stomach cancer, urine cancer etc. Dongpungcho is used for the protection of energy reinforcement, blood cleanup, pain suppression, prevention of various cancers. Also Baekpyundu is used for Chungsuwasub, spleen strengthening, Hwajung, food in summer. And so, we need the development of these plants as Korean traditional food.

However, we need the supplemental experiments in the future in order to prove their effects. Therefore, we need joint research among the institutes and universities. And we

expect that the results of this research are useful for the development and protection, increase of antitumor plants and the health food as a basic data.

Table 1. Antitumor activity of crude extracts on Sarcoma 180 asites mice

Scientific name	Dose (mg/Kg/day)	BWC (g)	PVC/TV	GR (%)	Decision
<i>Patrinia scabiosaefolia</i> (Paejangeun)	100	-1.7	0.06	19.6	++
<i>Codonopsis lanceolata</i> (Deodeog)					
Root	100	-4.1	0.32	47.6	+
Stem	100	+4.7	0.38	55.4	+
<i>Rubia akane</i> (Cheon cho)	100	-0.8	0.29	57.4	+
<i>Zea may</i> (Okssusu)	100	-1.7	0.06	7.5	+++
<i>Eragrostis ferruginea</i> (Geureong)	100	-0.7	0.20	27.0	++

Table 2-1. Cytotoxicity of crude drugs against murine P388 leukaemia cell

Scientific name	Crude drug	IC <sub>50</sub> ( $\mu$ g/mL)
<i>Lycium chinense</i>	枸杞葉	15
	地骨皮	13
<i>Melandrium firmum</i>	王不留行	19
<i>Trichosanthes kirilowi</i>	天花粉	14
<i>Cirsium maackii</i>	大蘇	15
<i>Maximowiczia chinensis</i>	五味子	27
<i>Cynachum wifordi</i>	白何首烏	25
<i>Patrinia scabiosaefolia</i>	敗醬根	15
<i>Citrus unshiu</i>	陳皮	1.9
<i>Artemisia asiatica</i>	艾葉	5.8
<i>Dioscorea japonica</i>	山藥	20
<i>Adenophora triphylla</i>	南沙參	36
<i>Aralia continentalis</i>	獨活	7.2
<i>Cassia occidentalis</i>	望江南	11
<i>Dolichos lablab</i>	白扁豆	6.8
<i>Polygonum aviculare</i>	扁蓄	27
<i>Cassia tora</i>	決明子	5.5
<i>Coix agrestis</i>	薏苡仁	40
<i>Arctium lappa</i>	牛蒡子	6.5
<i>Poligonatum involucreatum</i>	玉竹	13
<i>Platycodon glaucum</i>	桔梗	38

Table 2-2. Cytotoxicity of crude drugs against murine P388 leukaemia cell

Scientific name	Crude drug	IC <sub>50</sub> ( $\mu$ g/mL)
<i>Artemisia capillaris</i>	茵陳蒿	8.2
<i>Ulmus japonica</i>	榆根皮	44
<i>Houttuynia cordata</i>	魚腥草	20
<i>Leonurus sibiricus</i>	益母草	35
<i>Carthamus tinctorius</i>	紅花	48
<i>Panax ginseng</i>	韓國人蔘公社製切片紅蔘	13
	紅蔘茶	55
	韓國紅蔘根(良)	17
	韓國白蔘(曲蔘)	17
	開城人蔘	30
	田七人蔘	6.8
	日本紅蔘	17
<i>Euonymus alatus</i>	鬼箭	16
<i>Taraxacum platycarpum</i>	蒲公英	18
<i>Portulaca oleracea</i>	馬齒莧	49
<i>Saururus loureiri</i>	三白草	29
<i>Monochoria vaginalis</i>	鴨舌草	48
<i>Fagopyrum esculentum</i>	蕎麥	15
<i>Solanum nigrum</i>	龍葵	24
<i>Capsicum annum</i>	蕃椒	34

Table 3. 韓國 食用抗癌植物의 栽培現況(1998年)

Crude Drug	Scientific Name	栽培面積 (ha)	生産量 (t)	輸入量 (t)	自生量 (t)	總消費量(t)
沙蔘	<i>Codonopsis lanceolata</i>	1,500	9,000	600	50	9,650
桔梗	<i>Platycodon glaucum</i> (Thunb.) Nakai	1,000	12,000	25,000		3,700
南沙蔘	<i>Adenophora triphylla</i> A. DC. var. <i>tetraphylla</i> M	20	120	40	30	190
山藥	<i>Dioscorea japonica</i> Thunb.	200	2,400	60		2,460
牛蒡	<i>Aster fastigiatus</i> F.	300	7,200	1,000		8,200
蓮根	<i>Nelumbo nucifera</i> GAERT	100	3,000	500		3,600
東風菜	<i>Aster scaber</i> Thunb.	1,000	36,000		2,000	38,000
蒜	<i>Allium monanthum</i> Maxim.	300	4,200			4,200
石山菜	<i>Sedum sarmentosum</i> Bung	100	1,500		50	1,550
苦菜	<i>Ixeris dentata</i> Nakai	10	200		20	220
野芹菜	<i>Pimpinella brachycarpa</i> (kom.) Nakai	200	2,400		200	2,600
艾葉	<i>Artemisia asiatica</i> Nakai	30	360		1,000	1,360
獨活	<i>Aralia continentalis</i> Kitagauwa	100	1,500		50	1,550
莧	<i>Amaranthus mangostanus</i> L.	100	2,000		500	2,500
薺菜	<i>Capsella bursapastoris</i> MEDICUS	50	2,000		1,500	3,500
白何首烏	<i>Cynanchum wilfordi</i> (Maxim.) Hemsl.I	134	128			128
韭	<i>Allium tuberosum</i> ROTH.	1,500	54,000			54,000