

**Anticancer Activities of *Acer mono* bark
according to Different Extraction Processes**

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Objectives

Acer mono has been widely spread out through Korea, China and Japan. And most studies were converged such as analyzing their saps components, growth and development of free. Like this previous study, there have not been enough studies on their biological activities for *Acer mono* extracts.

Therefore, this study was to screening the possibility of biological activities of *Acer mono* extracted by different extraction process.

Materials and Methods

Experimental studies was performed to measure extraction yields and biological activities, such as immune activity and anticancer activity of *Acer mono* bark extracts according to different extraction processes. *Acer mono* bark were extracted with water extraction at 100°C for 24 hours(WE), 70% ethanol extraction at 80°C for 24 hours(EE) and high pressure extraction at 40°C for 20 min(HPE). The each extracts were freeze-dried at -4°C before use.

Results

Extraction yields of *Acer mono* extracts were increased about 4-6% by HPE, compared to those from conventional extraction processes, such as WE, EE. Extracts of *Acer mono* bark by HPE process have low cytotoxicity as 21% on human normal lung cell (HEL299). HPE extracts showed increased up to 2~2.5 times compared with water extracts about human immune B & T cell growth. The secretion of IL-6 and TNF- α from those cells were also greatly enhanced by adding *Acer mono* bark extracts under HPE condition than conventional water and 70% ethanol extraction. On human stomach and lung cancer cell lins, the extracts from HPE was showed the highest inhibition activity was 60~68% and its selectivity was 3-4.5 in adding 0.6 mg/

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mℓ concentration, which values were 15~20% higher than those from conventional process. And compare with the extracts of different extraction processes by scanning electron microphotographs (SEM) and HPLC. The surface of HPE extracts showed more destroy than WE and EE extracts. By comparison of HPLC peak of *Acer mono* bark extracts, HPE extracts showed the highest height peak and various peak. It was found that *Acer mono* bark extract treated under HPE process were more effective on the anticancer active than conventional extraction and other extraction processes, which concede effectively extract biologically active compounds from *Acer mono* bark.

* 시험성적

Table 1. Extraction yields of *Acer mono* bark treated different extraction process.

Samples	Extraction Process	Yields (% , w/w)
<i>Acer mono</i> bark	WE (Water extraction)	6.49
	EE (EtOH extraction)	6.31
	HPE (High pressure extraction)	10.42

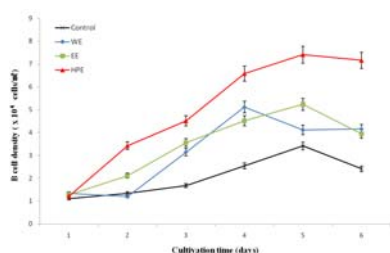


Fig. 2. The cell growth of B cell from *Acer mono* bark extracts from different extracts process in adding 0.5 mg/ml concentration.

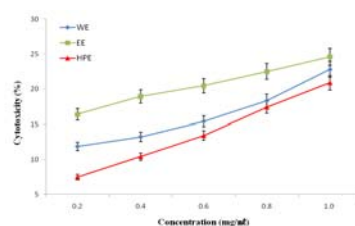


Fig. 1. Cytotoxicity of the extracts from *Acer mono* bark on normal cell line, HEL299 according to different extraction processes.

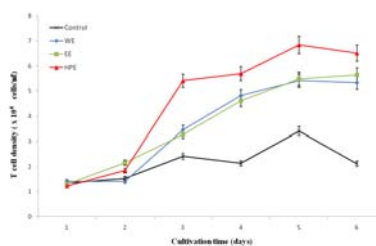


Fig. 3. The cell growth of T cell from *Acer mono* bark extracts from different extracts process in adding 0.5 mg/ml concentration.

Table 2. The secretion of IL-6, TNF-α from Human B cell (Raji) and T cell (jurkat) in adding the extracts of *Acer mono* bark from different extracts process.

Sample	Cultivation time (days)	Cell line			
		B cell (10-4pg/ml)		T cell (10-4pg/ml)	
		IL-6	TNF-α	IL-6	TNF-α
WE	1	0.23	0.32	0.42	0.63
	2	1.53	1.97	2.63	2.21
	3	2.52	2.12	3.26	2.85
	4	3.65	2.32	4.76	4.32
	5	4.92	4.65	4.89	5.16
	6	5.11	4.89	5.22	5.75
EE	1	0.68	0.76	1.34	0.95
	2	1.93	1.43	2.63	2.20
	3	2.62	2.43	3.95	3.02
	4	3.99	3.45	5.23	4.87
	5	5.21	4.88	5.72	5.78
	6	5.38	5.02	6.27	6.10
HPE	1	1.23	1.23	0.66	1.27
	2	2.32	2.43	3.52	3.07
	3	3.53	2.97	4.09	3.23
	4	4.87	3.21	5.74	5.51
	5	5.96	5.32	6.04	5.89
	6	6.25	5.99	6.87	6.38

Table 3. Inhibition ratio of human stomach adenocarcinoma cell and lung adenocarcinoma cell growth and their selectivity in adding sample.

Concentration (mg/ml)	Sample	Human cancer cell lines			
		AGS		A549	
		Inhibition ratio (%)	Selectivity	Inhibition ratio (%)	Selectivity
0.2	WE	14.84	1.25	12.82	1.08
	EE	20.13	1.23	19.24	1.17
	HPE	20.53	2.74	19.52	2.61
0.4	WE	28.64	2.17	25.41	1.92
	EE	30.21	1.60	28.45	1.50
	HPE	32.16	3.09	29.72	2.85
0.6	WE	37.14	2.41	35.75	2.32
	EE	54.26	2.65	40.83	2.00
	HPE	60.23	4.49	41.62	3.10
0.8	WE	40.56	2.21	48.35	2.63
	EE	58.11	2.58	59.83	2.66
	HPE	63.41	3.64	60.42	3.47
1.0	WE	45.61	2.00	55.01	2.41
	EE	63.15	2.57	63.54	2.58
	HPE	65.88	3.15	66.62	3.19