

Immuno-modulatory Activities of Fresh Ginseng according to Extraction Processes

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Objectives

Panax ginseng C.A Meyer has been traditionally used as a precious medicine for more than 5,000 years. Ginseng saponins have been regarded as the main effective components responsible for the biological activities, such as anticancer, antiaging, and immune activities effects. The purpose of this study was to investigate the possibility of enhancement of immuno-modulating activities of fresh Ginseng according to different extraction processes.

Materials and Methods

Experimental studies was performed to measure extraction yields of activity components and biological activities, such as cytotoxicity and immune activity, by extracts of fresh ginseng according to different extraction processes. Fresh ginseng were extracted with HPE(high pressure extraction), MPE(medium pressure extraction), EE(Ethanol extraction) and WE(water extraction). The each extracts were freeze-dried before use.

Results

Estimated conditions for the maximized extraction of activity components including ginsenosides were easily extracted at MPE (121°C, 1.8atm, and 20min) process. On the basis of HPLC results, ginsenosides of fresh ginseng was increased by MPE process, compared to other extraction process. Extracts of fresh ginseng by MPE process have low cytotoxicity on human kidney cell (HEK293). Human immune B & T cell growth was increased about 2 to 7 times compared with water extracts in adding MPE extracts. The secretion of IL-6 and TNF- α from those cells were also greatly enhanced by adding fresh ginseng extracts extracted under this condition than

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conventional water extraction. It was found that fresh ginseng extract treated under MPE process were more effective on the immune active than conventional extraction and other extraction processes, which concede effectively extract biologically active compounds from fresh ginseng.

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Table 1. Extraction yields of fresh ginseng treated different extraction process.

Samples	Extraction Process	Yields (% w/w)
Fresh Ginseng	HPE (High pressure extraction)	23.48
	WE (Water extraction)	22.8
	MPE (Midium pressure extraction)	23.562
	EE (EtOH extraction)	19.08

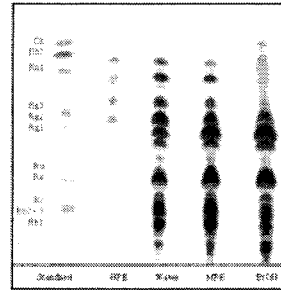


Fig. 1. TLC patterns of saponins in fresh ginseng extracts treated different extraction.

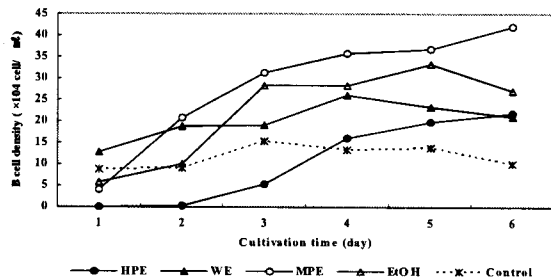


Fig. 2. The cell growth of B cell from Fresh Ginseng extracts from different extracts process in adding 0.5 mg/ml concentration.

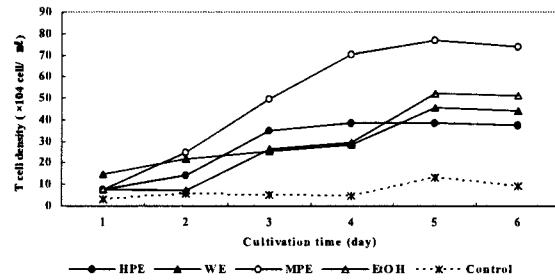


Fig. 3. The cell growth of T cell from Fresh Ginseng extracts from different extracts process in adding 0.5 mg/ml concentration.

Table 2. The secretion of IL-6, TNF- α from Human B cell (Raji) and T cell (jurkat) in adding the extracts of fresh ginseng from differents extracts process.

Sample	Cultivation time (day)	Cell line			
		B cell (10-4pg/ml)		T cell (10-4pg/ml)	
		IL-6	TNF- α	IL-6	TNF- α
HPE	1	2.1	2.6	2.4	3.6
	2	3.2	3.1	3.2	4
	3	3.4	3.8	5	5.5
	4	4.9	4.5	6.1	5.9
	5	5	5.6	7.8	6.1
WE	1	2.5	2.7	2.5	3.8
	2	3.5	3.6	2.7	4.4
	3	4.1	4.6	4.6	5.3
	4	4.1	5.9	5.9	6.7
	5	6.3	6.8	7.9	8.9
MPE	1	2	2.7	2.9	4
	2	2.5	4	4	5.2
	3	4.4	4.8	5.6	6.4
	4	5.4	6.3	7.2	7.8
	5	6.8	6.9	9.2	9
EtOH	1	2.3	2.4	2.5	3.6
	2	3.1	3	3.3	4.2
	3	4	3.6	4.2	5.3
	4	5.1	4.3	5.4	6.3
	5	5.3	5.2	7.5	7.2