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Enhancement of Whitening Activity on *Lithospermum erythrorhizon* by Several Extraction Processes

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추출 공정에 따른 지치의 미백 활성 증진

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Objectives

This study was investigated to enhance whitening activity on *Lithospermum erythrorhizon* by several different extraction processes.

Materials and Methods

The *Lithospermum erythrorhizon* was extracted by several processes, water extraction for 24 hours at 100°C (WE100), water extraction for 24 hours at 60°C (WE60), 70% ethyl alcohol extraction for 24 hours at 60°C (EE), high pressure extraction for 30 minutes at 500 MPa and 70% ethyl alcohol extraction for 24 hours at 60°C (HPE).

Results

- Extraction yield of HPE showed the highest extraction yield as 23.7%(w/w) which was increased up to 5~10% compared to the conventional extraction process.
- The HPE showed the lowest cytotoxicity against normal human cell, HEL299 as 13.4% and EE showed the highest cytotoxicity as 14.6% in adding 1.0 mg/ml.
- The HPE showed the highest inhibitory effects on tyrosinase as 52% in adding 1.0 mg/ml, and EE showed lowest inhibitory effects as 37%.
- HPE was investigated melanin synthesis from Clone M-3 cells as 79.5%, while presently lower than EE as 8%.
- In general, the HPE had higher whitening activity than the extracts from other processes.

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- From these results, high pressure extraction process could improve the whitening activity of *Lithospermum erythrorhizon* due to release of high amount of useful compound by the destruction of the cell wall.

Table 1. The extraction yields of *Lithospermum erythrorhizon*.

Sample	Extraction condition	Yields (% , w/w)
<i>L. erythrorhizon</i>	WE100 ¹⁾	20.5
	WE60 ²⁾	20.8
	EE ³⁾	19.8
	HPE ⁴⁾	23.7

- ¹⁾WE100: water extraction at 100°C.
²⁾WE60: water extraction at 60°C.
³⁾EE: 70% ethyl alcohol extraction at 60°C.
⁴⁾HPE: high pressure extraction for 30 minutes at 60°C with 70% ethyl alcohol solvent.

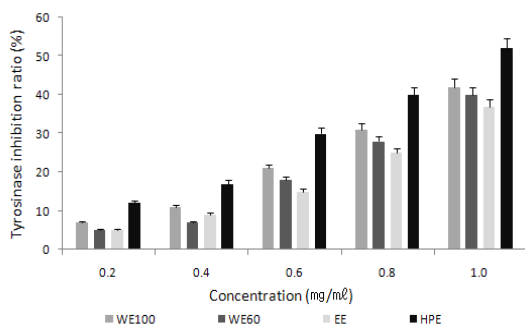


Fig. 2. Tyrosinase inhibitory activity of the extracts of *L. erythrorhizon* by different extraction processes.

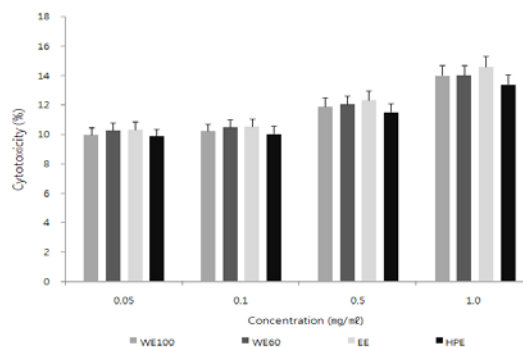


Fig. 1. Cytotoxicity of the extracts of *L. erythrorhizon* by different extraction processes on normal cell line, HEL299.

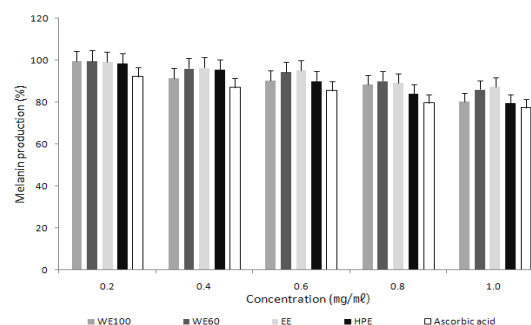


Fig. 3. Melanin production of the extracts of *L. erythrorhizon* by different extraction processes in Clone M-3 cells.

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