Antimutagenic Effect of Ikmocho(*Leonurus sibiricus L.*) to Benzo[α]pyrene in Salmonella Mutation Assay

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실험목적 (Objectives)

The Ames test is a very well known and well accepted assay for the detection of mutagens or antimutagens. The advantages of Ames test is relatively inexpensive, rapid and accurate screening test. Meanwhile, Ikmocho(*Leonurus sibiricus L.*) belonging to the Labiatae biennial herb has been known to be good medicine for women disease since the ancient times. It is reported about anti-oxidative and anti-inflammatory activity, and hypercholesterolemia of inhibiting action. However, studies on inhibitory effect of mutations rarely been reported. Therefore, this study was to examine the antimutagenic effect of the Ikmocho against the mutagenicity of benzo[α]pyrene in salmonella mutation assay(Ames test).

재료 및 방법 (Materials and Methods)

Mutagenicity and Antimutagenicity experiment of Ikmoch ethanol extract were performed according to the preincubation method of Maron and Ames. *S. typhimurium* TA98 was provided by Korea Research Institute of Bioscience and Biotechnology. This strain was tested for its genetic traits such as ampicillin resistance, sensitivity to crystal violet(rfa), histidine requirement and sensitivity to UV light(uvrB mutation) prior to use. The experimental concentration of Benzo[α]pyrene was selected through a dose response curve. Ikmocho powder(100 g) was extracted with 70% ethanol(1 L) at room temperature for 72 hours and this extract is concentrated by rotary vacuum evaporator. The inhibition rate for mutagenicity was calculated by the following formula:

Inhibition rate(%)=[(A-B)/(A-C)]×100 (A is the number of revertants in the positive control. B is the average number of revertans with Ikmocho 70% EtOH extract and C is the spontaneous revertants.)

실험결과 (Results)

The yield of Ikmocho 70% ethanol extract was 15.8%. The antimutagenic effect of Ikmocho 70% ethanol extract was increased in a dose-dependent manner and the inhibition rate(97%) was observed at the concentation of 5000 ug/plate. In this study, we conclude that 70% EtOH extract of Ikmocho itself is potentially safe for mutagenicity, and this extract has an inhibitory effect against mutagenicity of benzo[α]pyrene.

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Table 1. Yield of 70% extract from Ikmocho

Extract	Yields (g)	Yields (%)†
70% Ethanol	15.08	15.08

† Yield: solid extract (g)/raw material (dry weight) × 100

Figure 2. Dose response curve of B[a]P mutagenicity in *S. typhimurium* TA98

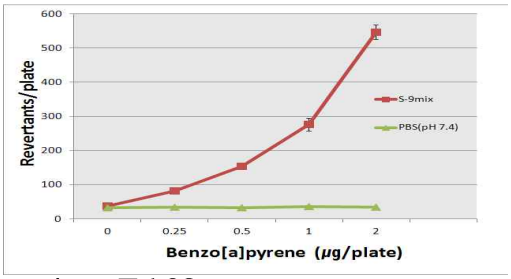
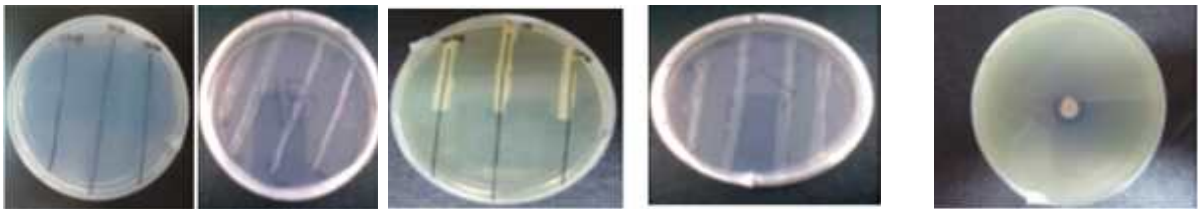


Figure 1. Genetic traits test results of *S. typhimurium* TA98.



histidine requirement | uvrB mutation | ampicillin resistance | rfa(△) mutation

Table 3. Mutagenicity on 70% ethanol extract from Ikmocho(*Leonurus sibiricus L.*)

Treatment (±S9 mix)		Dose (ug/plate)	Revertants/plate without S-9	Revertants/plate With S-9
Positive control	Spontaneous		22 ± 1.15	33 ± 2.16
	4-Nitroquinoline-n-oxide	0.5	425 ± 21.50	
	2-Aminoanthracene	0.5		437 ± 7.36
70% ethanol extract of Ikmocho		156.25	22 ± 0.58	33 ± 1.25
		312.5	21 ± 1.15	29 ± 0.47
		625	23 ± 1.53	30 ± 1.63
		1250	21 ± 1.00	33 ± 2.83
		2500	21 ± 2.08	28 ± 1.25
		5000	23 ± 2.08	28 ± 3.56

Table 4. Antimutagenicity of Ikmocho ethanol extract against benzo[a]pyrene

Treatment (+S9 mix)	Dose (ug/plate)	Revertants/plate	Inhibitionrate(%)
Spontaneous		34±0.58	
Positive control (2-Aminoanthracene)	0.5	419±26.96	
Mutagen(B[a]P)	2	549±12.86	
70% ethanol extract of Ikmocho	156.25	436±10.02	21.97
	312.5	260±9.39	47.76
	625	201±15.18	64.81
	1250	106±2.08	84.19
	2500	64±6.43	92.74
	5000	37±4.16	97.67