P3-8

Quality Characteristics and anti-inflammatory activity of *Kyungokko*s sold in the market

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Objectives

Kyungokko is a traditional Korean herbal medicine which is called 'Ko', boiling down materials mixed with four main ingredients, such as Ginseng Radix, Rehmanniae Radix, Hoelen and honey, into paste type. The physiological superiority of *Kyungokko* has descended up to this day, but its formula was irregular, recently. Therefore, the quality characteristics and taste of *Kyungokko*s different depending on processing methods and mixing ratio of materials. This study was carried out to investigate quality characteristics and anti-inflammatory activity of 10 types of *Kyungokko*s sold in the market and then develop a better *Kyungokko* products.

Materials

- *Kyungokko* sold in the market 10 kinds

Methods

- General component : AOAC method(1984)
- Color : L(lightness), a(redness) and b(yellowness)value(CM-3600d, Konica Minolta, Japan)
- Viscosity(cP) : Spindle : LV-4, Speed(0.1rpm), Temp : 20℃, Repeat : 5 times (Brookfield DV-III Ultra Rheometer(USA)
- Ginsenosides, Catalpol, free sugar, etc.
- Anti-inflammatory activity : RAW 264.7 macrophages were pre-treated with 10-fold or 30-fold dilutions of each KOG extract for 15 hr, and stimulated by lipopolysaccharide (LPS, 3 mg/ml) for 24 hr.

Results

*Kyungokgo*s purchased in local markets in Korea vary in each materials combination and their mixing riatio on processing. The general component of *Kyungokko*s revealed that the content were moisture(18.62~49.78%), ash(0.198~1.211%), protein(0.89~3.58%), lipid(0.16~1.14%) and carbohydrate(47.95~77.08%). The color were L(26.49~73.87), a(16.51~38.64) and b(45.41~88.94). The characteristics of viscosity were classified with 3 groups, high, medium and non-dilatant type according to increasing of loop execute times. In cytotoxic activity against RAW 264.7 cells, three extracts,

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such as KOG-1, -7 and -8, in 30-fold dilution showed no cytotoxicity. And the extracts of KOG-2, -4, and -5 showed a low cytotoxic effect. In the production of nitric oxide (NO) and tumor necrosis factor-a (TNF-a), the extracts of KOG-1 and -2 with low cytotoxicity markedly inhibited the production of the inflammatory mediators, NO and TNF-a, from LPS-stimulated RAW 264.7 cells. These results indicate that the extracts of KOG-1 and -2 have anti-iflammatory activity in LPS-stimulated RAW 264.7 macrophages.

Table 1. General components and contents of *Kyungokgo*s sold in the market (%)

	Moisture	Ash	Protein	Lipid	Carbohydrate
1	21.51	1.211	3.58	0.16	73.54
2	49.78	0.356	1.41	0.50	47.95
3	43.56	0.680	2.12	0.34	53.30
4	45.28	0.542	1.67	0.66	51.85
5	39.60	0.445	1.29	0.72	57.95
6	32.13	0.274	0.91	0.54	66.15
7	18.62	0.968	2.19	1.14	77.08
8	36.57	0.714	2.54	0.25	59.93
9	40.15	0.372	1.33	0.36	57.79
10	43.43	0.198	0.89	0.34	55.14

Table 2. The colors of *Kyungokgo*s sold in the market

	L*(D65)	a*(D65)	b*(D65)
1	26.49	38.64	45.41
2	57.13	26.99	81.43
3	50.11	34.01	80.8
4	57.38	31.49	88.87
5	51.98	31.27	80.37
6	70.12	20.53	88.94
7	59.34	26.01	83.13
8	49.30	32.96	78.60
9	59.39	27.28	84.48
10	73.87	16.51	85.81

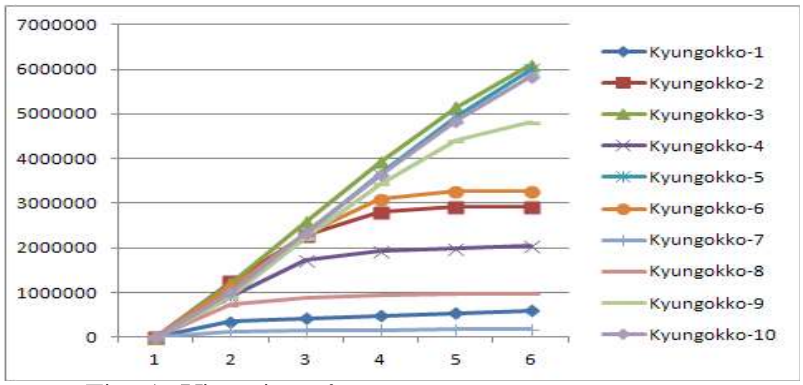

Fig. 1. Viscosity of *Kyungokgo*s sold in the market.

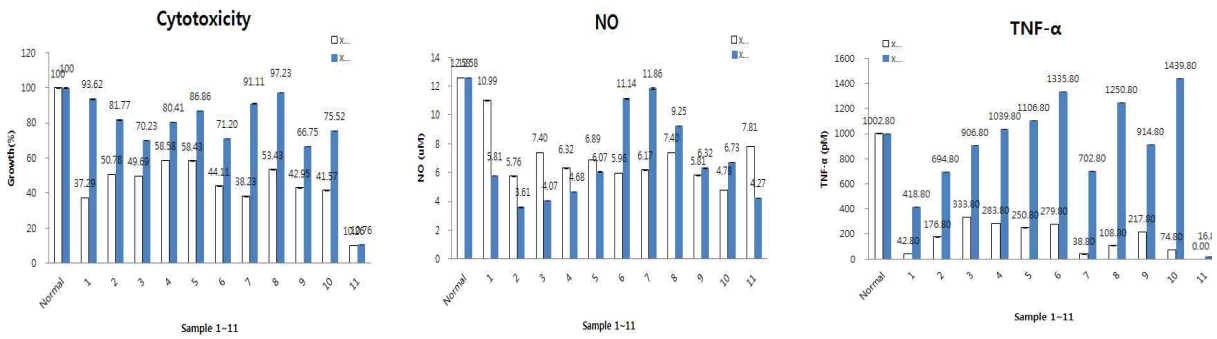

Fig. 2. Effect of of *Kyungokgo*s sold in the market. on cytotoxicity, the production of nitric oxide (NO), the pro-inflammatory cytokines (TNF-α) of on LPS-stimulated RAW 264.7 cells.