

증숙횟수에 따른 인삼 에탄올 추출물의 폴리페놀 함량과 활성 변화
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Changes of Polyphenol Contents and Activities of Ethanol Extracts of Ginseng Dependant on The Steam Processing Times

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Objectives

Ginseng, the root of *Panax ginseng* (Araliaceae) is a traditional medicinal herb, which is considered to be an adaptogen that improves physiological function. In Asia, there are a variety of commercial ginseng products including white, red, and black ginseng. Black ginseng is produced from red ginseng by 9 cycles of steam treatment, at which point it becomes black in color. The pharmacological and biological activities of steam-processed ginseng are greater than non-steamed ginseng. During the steaming processes, the ratio of major bio-active components (ginsenosides, saponin) is altered as newly produced components. It has been suggested that the contents of total polyphenol compounds, the dry weight, extract yields, total polyphenol compounds, xanthine oxidase (XO) inhibition, electron donating abilities (EDA) and SOD-like activities on the ethanol extracts of ginseng according to steaming times.

Materials and Methods

○ Preparation of steamed ginseng

The fresh ginseng root aged 4 years were obtained from a JungMun Co. The fresh ginseng was rinsed with water and steamed in an autoclave at the temperature of 95°C for 150 min until 3rd steam processing. And 4th to 9th steam processing were 85°C for 150 min. The unsteamed (control) and steamed ginseng were dried at 60°C air drier. The dried unsteamed ginseng and steamed ginseng (1st, 3rd, 5th, 7th, and 9th) were then ground powder for analyses.

○ Extraction and experimental methods

The 100 g of unsteamed ginseng and steamed ginseng were extracted with 1 L of 70% ethyl alcohol in a reflux extractor for 3 hours at 60°C and which is repeated two times. The extracts were filtered, concentrated, freeze dried and made into a powder. It used the experimental sample.

The content of total polyphenols was measured by Folin-Denis method (AOAC, 2005), XO inhibition was conducted according to the Stirpe and Corte method (1969).

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EDA was evaluated using the Blois (1958) method and SOD-like activity were Marklund and Marklund(1975) method.

Results

The dry weight of first steamed ginseng was 83.89% compared with that of unsteamed one. The dry weight of 3rd one to 7th one were 51.92%~50.17%, and 9th was 46.54% of unsteamed ginseng. The 5th steamed ginseng showed the highest extract yield of 29.26%. The content of total polyphenol compounds was the highest as 71.65 mg% of 9th steamed ginseng. It was increased as an addition of steaming processes, especially, the extracts of over 7 times steaming contain 4 times more polyphenols compared with 5 steamed ginseng. The XO inhibition was increased along with the steaming process times, which was 49.30%~98.96% when ethanol extracts were assayed at 2.0 mg/mL. The EDA of 5th steamed ginseng extract showed the highest value of 94.46% and 7th steamed ginseng was 93.19%. The SOD-like activity was highest as 21.59% in the 1st steamed ginseng extract at 2.0 mg/mL.

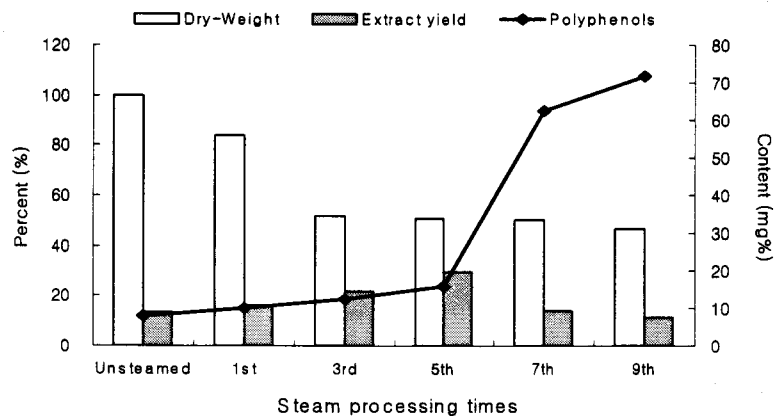


Fig. 1. The change of dry weights, ethanol extract yields and the contents of total polyphenol compounds of ginseng along with the steam processing times.

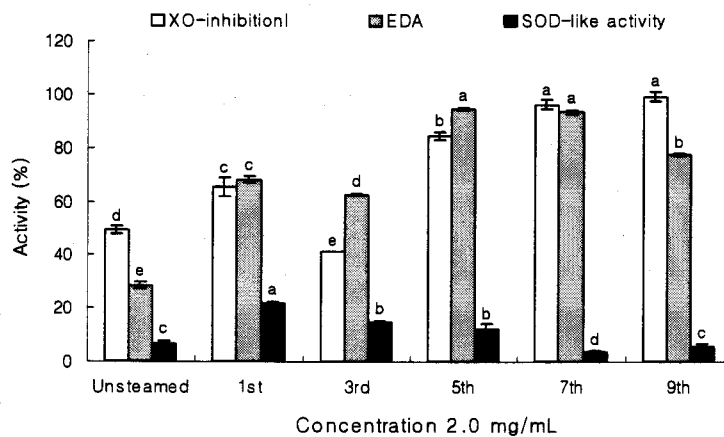


Fig. 2. The change of xanthine oxidase (XO) inhibition, electron donating ability (EDA), and SOD-like of ginseng along with the steam processing times.