Journal Homepage: -www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI:10.21474/IJAR01/7929
DOI URL: http://dx.doi.org/10.21474/IJAR01/7929

RESEARCH ARTICLE

ANTI-OXIDATIVE AND ANTI-INFLAMMATORYEFFECTS OF ANGELICA DAHURICA EXTRACT.

Dong Woo Kang[1], Yeon Jo Ha[1], Pan Gil Kim[2] and Sang Wan Gal[1].

1. Department of Pharmaceutical Engineering, Gyeongnam National University of Science and Technology, South Korea.
2. 198, Saman-ro 112, Gimhae-siGyeongnam,50811, Gimhae College, South Korea.

Manuscript Info

Manuscript History
Received: 15 August 2018
Final Accepted: 17 September 2018
Published: October 2018

Keywords:-
Angelica dahurica, antiinflammation, antioxidative activity, DPPH, low-temperature extraction, nitrite scavenging activity.

Abstract

Angelica dahurica has been well-known to have excellent ability for relieving in flammation. This study was done to evaluate the anti-oxidative and anti-inflammatory activities of A. dahurica extract performed by High Speed Vacuum Low Temperature Extractor. DPPH radical scavenging activity was measured by adjusting the concentration of A. dahurica extract to 10 ~ 60%. This activity was increased in a concentration dependent manner until 40%, but decreased in 60%. The nitrite scavenging activity was measured by adjusting the concentration to 20 and 50%, and pH to 1.2, 3, and 6. As a result, the activity showed better value at 50% than 20%, but presented a trend to increase as the pH value was lower. Therefore, we suggest that anti-oxidant and anti-inflammatory activities of the A. dahurica extract are evaluated to increase in dose dependent manner.

Introduction:-

Baizhi is a biennial or perennial herb that grows in the wet mountain valley of the whole region of Korea, which the scientific name is *Angelica dahurica*. The young leaves of Baizhi are possible to eat, but the thick and large roots are herb medicine. The ground part of Baizhi maintains essential oils, butthe roots havebyak-angelicin, byak-angelicol, oxypeucedanin, imperatorin, isoimperatorin and phellopterin. In addition, the root maintains angelicotoxin, which causes a kind of seizure similar to angelic acid, and its pharmacological properties are different according to harvesting time (Liang, et al., 2018). Baizhi inhibits growth against *Escherichia coli*, *Shigella*, Typhoid, Paratyphoid, *Pseudomonas* and Cholera, as well as has antifungal activity against some pathogenic fungi. Since Baizhi is effective for relieving pain, it has been used for treatments of headache and toothache. Furthermore, since it plays a role of relieving inflammation, it has been used for encephalitis, vaginitis and cystitis of women and also for various skin diseases and skin pruritus.

Baizhi applied in this study was purchased from a traditional market in Jinju city, South Korea. The purchased Baizhi was cut into 10~20 cm in length and the threated Baizhi was applied for extraction. The extraction of the treated Baizhi was done with High Speed Vacuum Low Temperature Extractor (Daehanmedian Co., LTD, South Korea). The treated Baizhi (1.2 kg) was mixed with 20,000 ml water, and then extracted for 7 hr at 108℃.

The anti-oxidative ability of the Baizhi extract was measured by hydrogen donating effect on DPPH (1,1-diphenyl-2-picrylhydrazyl) by slightly modifying the Blois method (Blois, 1958).The sample and 0.4 mM DPPH solution

Corresponding Author:-Sang Wan Gal.
Address:-Department of Pharmaceutical Engineering, Gyeongnam National University of Science and Technology, South Korea.

were mixed in a 96-well plate at a ratio of 1: 4, reacted at 37℃ for 30 min, and then absorbance was measured at 520 nm using an ELISA reader (Multiscan GO, Thermo Scientific co. ltd., USA). The concentrations of the samples were 10, 20, 40, and 60%, and vitamin C (Vit C) 0.5 mg /ml was used as aninternal standard. As a result, DPPH radical scavenging activity was observed by 67.8, 70.8, 108.3 and 86.4% at the sample concentrations of 10, 20, 40 and 60%, respectively, when Vit C was adjusted into 100% (Fig. 1). The activity of Baizhi extract showed an increasing trend in a dose dependent manner until 40%, but decreased at 60%.

In order to measure NO scavenging activity, mouse macrophage RAW 264.7 cells were added by1.0×10^5 cells/ml in a culture plate and incubated for 24 hr under LPS (lipopolysaccharide) stimulation. NO production in the culture supernatant was measured by the amount of nitrite accumulated in the cell supernatant by Griess reaction (Garrat, 1964). Vit C (1 mg/ml) was applied as an internal standard. After incubation, an aliquot (100 μl) of the supernatant was mixed with the same amount of Griess reagent [1% sulfanilamide (30% acetic acid) and 0.1% N-(1-naphthyl) ethylenediaminedihydrochloride (60% acetic acid), reacted for 20 min at room temperature, and then the absorbance at 540 nm was measured using an ELISA reader (Multiscan GO, Thermo Scientific co. ltd., USA) to evaluate the NO scavenging ability. The used concentrations of Baizhi extract were 20% and 50%, respectively, and pH was adjusted into 1.2, 3 and 6. As a result, when compared to Vit C, the NO scavenging activity was 102.3% at pH 1.2 with 20% of the Baizhi extract, but 85.3 and 57.6% at pH 3 and 6, respectively (Fig. 2A). On the other hand, the activity was 119.3 and 124.1% at pH 1.2 and 3, respectively, with 50% of the Baizhi extract, but 47.6% at pH 6.0 (Fig. 2B). From these results, we suggest that the NO scavenging ability of Baizhi extract is regulated by concentration-dependent manner and is affected by pH.

Taken together, we suggest that the Baizhi extract has anti-oxidant and anti-inflammatory activities in a concentration-dependent manner.

Acknowledgements:-

This work was supported by Gyeongnam National University of Science and Technology Grant 2017.

Figure legends

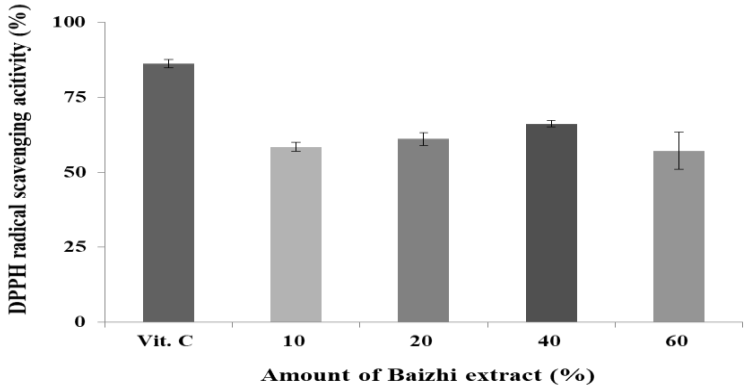

Fig. 1:-DPPH radical scavenging activity of Angelica dahurica extract. The Angelica dahurica extract was applied by the indicated volumes. The extraction was done by a low temperature extractor. Vit. C (0.5 mg/ml) was used as a positive control.

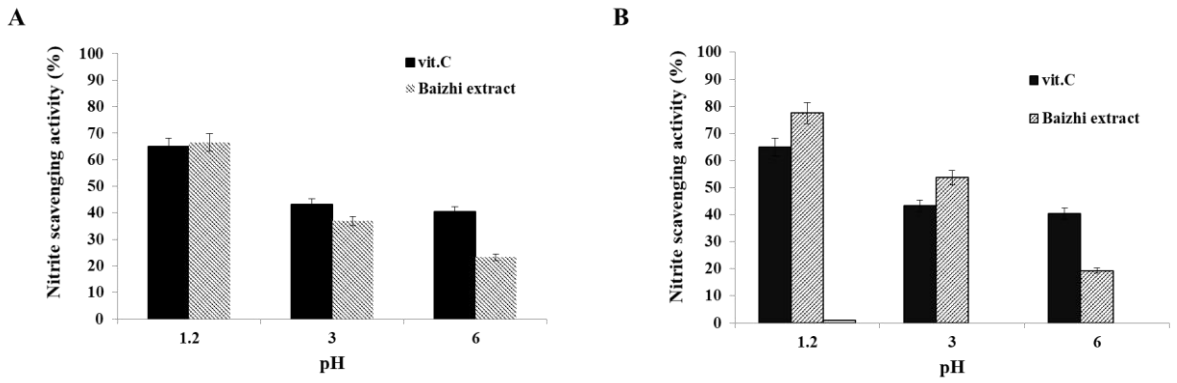

Fig. 2:-Nitrite scavenging activity of *Angelica dahurica* extract. The *Angelica dahurica* extract was applied by 20 (A) and 50% (B) amounts and pH was adjusted into the indicated values. The extraction was done by a low temperature extractor. Vit. C (1 mg/ml) was used as a positive control.

References:-

1. Blois, M. S. 1958. Antioxidant Determinations by the Use of a Stable Free Radical. Nature, 181, 1199-1200.
2. Garrat, D. C. 1964. The Quantitative analysis of Drugs. Chapman and Hall Ltd., Japan, 3: 456-458.
3. Liang, W. H., Chang, T. W., and Charng, Y. C. 2018. Influence of harvest stage on the pharmacological effect of Angelica dahurica. Bot Stud. 59 (1): 14.