Ⅱ-98

Antioxidant and antimicrobial activity of thermal water treated in vitro *Rehmannia glutonisa*

Ji Hye Yoo[a], Bimal Kumar Ghimire[a], Eun Soo Seong[a], Nam jun Kim[a], Soon-Sung Kwon[b], [1]Jung-Duk Kim[b], Na Young Kim[c], Myong Jo Kim[a], Ju Sung Kim[a], Kweon Heo[a] and
Chang Yeon Yu[a]*
[a]Bioherb Research Institute, Kangwon National University, 200-701, South Korea
[b]Geumjin Life Sciences Co., Ltd.
[c]Food Service Cuisine, Songho College, Hoingsung 25-704, Korea

Objectives

The objective of the present study is to evaluate and compare 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity, reducing power, antimicrobial activity of extract from thermal water treated *Rehmannia glutonisa*.

Materials and Methods

Plant material was washed, dried, and powdered at room temperature. The powdered samples (2 g each) were suspended and extracted in 1 ml 80% methanol (v/v) and kept for 1 day on a shaker at room temperature. The extraction of the residue was repeated twice under the same conditions.
The radical scavenging activity was measured using the stable radical DPPH. The antioxidant activity was calculated as the percent inhibition caused by the hydrogen donor activity of each sample according to the following:

Inhibition (%) = (1 − absorbance of the sample/absorbance of the blank) × 100.

The determination of the reducing power was conducted according to the method outlined by Oyaizu, (1986). Higher absorbance of the reaction mixture indicated greater reducing power. The assays were carried out in triplicate and the results are expressed as means ± standard deviation.
Antimicrobial activity (Two fold dilution assay)
The minimum inhibitory concentration (MIC) of each compound was defined as the lowest concentration that inhibited microorganism growth. Bacterial growth was evaluated visually based on the degree of turbidity.

Results and Discussions

0.5% thermal water treated sample extract demonstrated the enhanced total antioxidant activity (RC_{50} = 9.88 ± 0.06) than other treated and control explants. The reducing power of all the extracts gradually increased with increased concentration of the extracts. All treated *Rehmannia glutonisa* explants showed increased reducing power. 0.1% thermal water teated explant showed the higher reducing power than other treated explants and control plant. None of extract inhibited the growth of yeast strain and *Bacillus subtilis*.

Corresponding author : 유창연 E-mail : cyyu@kangwon.ac.kr Tel : 033-250-6411

Table 1. Free radical scavenging activity of extract from thermal water treated in vitro *Rehmannia glutonisa*.

Treatment (%)	RC_{50}
Control	12.00 ± 0.11
0.01	11.92 ± 0.03
0.05	11.14 ± 0.01
0.10	10.36 ± 0.01
0.50	9.88 ± 0.06
1.00	11.95 ± 0.11

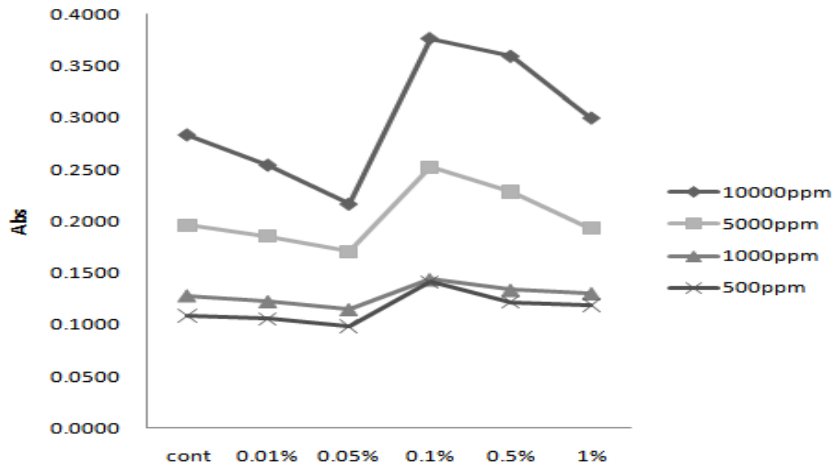

Fig. 1. Reducing power of extract from thermal water treated in vitro *Rehmannia glutonisa*.

Table 2. Minimal inhibitory concentration (MIC) of the methanol extracts from thermal water treated in vitro *Rehmannia glutonisa*.

Explant type	MIC (μg/ml)[1]						
	Bacterial strain (+)		Bacterial strain (−)			Yeast strain	
	B.s*	S.a*	S.t*	K.p*	E.c*	C.a*	P.j*
Control	<1000	1000	1000	1000	1000	<1000	<1000
0.01	<1000	1000	1000	1000	1000	<1000	<1000
0.05	<1000	1000	1000	1000	1000	<1000	<1000
0.1	<1000	1000	1000	1000	1000	<1000	<1000
0.5	<1000	1000	1000	1000	1000	<1000	<1000
1	<1000	1000	1000	1000	1000	<1000	<1000

*B.s.: , S.a.: *Staphylococus aureus*, b S.t.: *Salmonella typhimurium*, *Klebsiella pneumonia*, E.c.*Escherichia coli*, C.a.: *Candida albicans*, P.j.: *Pichia jadinii*.