Ⅱ-10

Investigation on antioxidant and liver protecting effects of *Lythrum salicaria*

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Objectives

The study was conducted to evaluate plant parts of *Lythrum salicaria* on antioxidant or liver protective activities.

Materials and Methods

○ Materials : Plant parts of *L. salicaria* including aerial part, flower and root, were collected in the medicinal crop farm of RDA in 2002 and 2003.

○ Methods

- Preparation of extract was conducted by extraction procedure with methanol for *in vitro* assay and with ethanol for *in vivo* assay. Evaporation of the solvent in extracts was conducted under vacuum atmosphere.
- Antioxidant activities on DPPH, superoxide anion, linoleic acid, and total phenol content were evaluated by the methods of Lee *et al.* (2005), Nishikimi *et al.* (1972), Takao *et al.* (2002), and Kim *et al* (1993), respectively.
- Animal and treatment : Sprague Dawley male rats were intoxicated with carbon tetrachloride (1:1 of CCL4 and olive oil, 2g/Kg body weight) three times for 2 weeks. Experiment groups were composed of Normal (basal diet), carbon tetrachlorde (CCL_4) single treated, 1% silymarin added diet plus CCL_4, 1% *L. salicaria* flower extract (LSF) plus CCL_4 and 1% *L. salicaria* root extract (LSR) plus CCL_4 groups, Hepatic TBARS and GSH content, antioxidant enzyme activity including Mn-SOD, CAT, GSH-px, GST, and liver health parameter serum GOT and GPT activity were evaluated.

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Results

Extracts of *L. salicaria* root, flower and aerial part of showed effective *in vitro* antioxidant activities on DPPH, superoxide and linoleic acid peroxidation, but root and flower parts showed stronger activities than aerial part. Treatment with root extract of *L. salicaria* (LSR) showed significantly effective inhibitory activity on lipid peroxidation product induced by CCL4 and significantly alleviated the increase of GOT activity. From the results, we have a suggestion that three parts of *L. salicaria* have antioxidant and liver protecting activities and root part is the most effective candidate to develop a new functional material.

Table 1. *In vitro* antioxidant effect and total phenol content of *L. salicaria* extracts according to collected parts

	Flower	Aerial part	Root
Scavenging effect on DPPH radical (IC_{50}, ㎍/㎖)	10.0±0.0b	18.3±1.1a	7.7±0.1c
Scavenging effect of superoxide radical (%)[1)]	71.2±0.1b	55.6±0.4c	75.0±1.3a
Inhibition effect on linoleic acid oxidation (%)[2)]	78.4±2.1a	82.7±1.4a	76.2±5.6a
Total phenol content(%)[3)]	19.9±0.6a	18.4±0.4b	20.5±0.3a

Data are mean±SD values (n=3). Values with different superscripts in the same row are significantly different at $P<0.05$

[1), 2)] Final concentration was 50 and 10■g/㎖, respectively

[3)] Content show as tannic acid equivalent

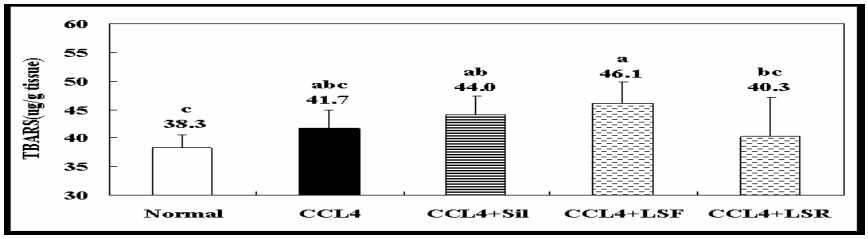

Fig. 1. Effect of flower (LSF) and root extract (LSR) of *L. salicaria* on the content of liver lipid peroxidation product (TEARS) in CCL_4-intoxicated rat.

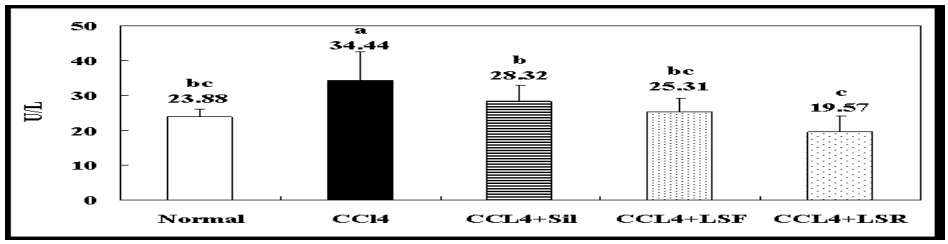

Fig. 2. Effect of flower (LSF) and root extract (LSR) of *L. salicaria* on the activity of serum GPT (U/L) in CCL_4-intoxicated rat.