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# *A*ntioxidant and anti-fibrotic properties of *Lythrum salicaria* root in $CCL_4$-induced liver fibrosis rat model

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## Objectives

The study was conducted to investigate antioxidant and liver fibrosis protecting activities of *Lythrum salicaria* root

## Materials and Methods

○ Materials : Root of *L. salicaria* (LSR) was collected in the medicinal crop farm of RDA in 2004.

○ Methods

- Preparation of extract was conducted by extraction procedure with 50% ethanol at 85℃, for 2 hours for the study. Evaporation of the solvent in extracts filtered was conducted under vacuum atmosphere.
- In vitro antioxidant activity against ROS and peroxynitrite in chemical environment and on cells such as YPEN1 and BV2 were analyzed.
- Animal and treatment : SD male rats were composed of normal group, $CCL_4$ single treated group (negative control), CCL4 plus LSR-treated groups (0.5, 0.25g, 0.5g of LSR extract/Kg), CCL4 plus silymarin-treated groups (0.5, 0.25g, 0.5g of LSR extract/Kg) and induced liver fibrosis with carbon tetrachloride three times for 6 weeks. Liver fibrosis of rats was induced by intra-peritoneal injection of 40% $CCL_4$ (1.0㎖/kg body weight) dissolved in 0.5㎖ of corn oil twice per week, TBARS production and ratio of GSH/GSSG (reduced glutathione/oxidized glutathione) as antioxidant parameters, hydroxyproline content and microscopic analysis as collagen production indicators were investigated.

## Results

Fifty percent ethanol extracts of *L. salicaria* root showed effective *in vitro* antioxidant activities on ROS and peroxynitrite. Ratio of hepatic GSH/GSSG in CCL4 plus LSR extract (0.125～0.5g/Kg)-treated rats increased from 2.8 to 5.7 fold values compared to that of $CCL_4$-treated rats. Amounts of hydroxyproline in $CCL_4$ plus LSR extract-administrated rat livers were 5～10㎍/㎎ which were

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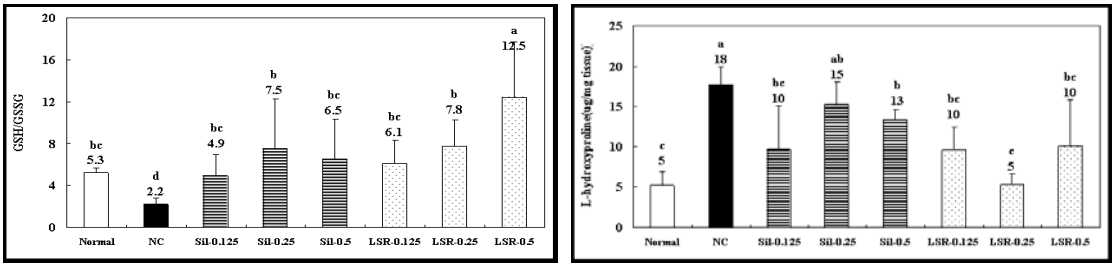
correspond to -44~-72% of the value in $CCL_4$-treated rat livers (18㎍/㎎ tissue). This collagen reducing effect of liver tissue in $CCL_4$ plus LSR-treated rats was supported by immunohistochemical and histological observation. The results showed that the root of *L. salicaria* have efficient antioxidant potential and effective antifibrotic activities in liver fibrosis induced rat.




(a) (b)

Fig. 1. Effect of LSR extracton on the ratio of GSH and GSSH (a) and total collagen content (b) of fibrosis-induced liver of rat

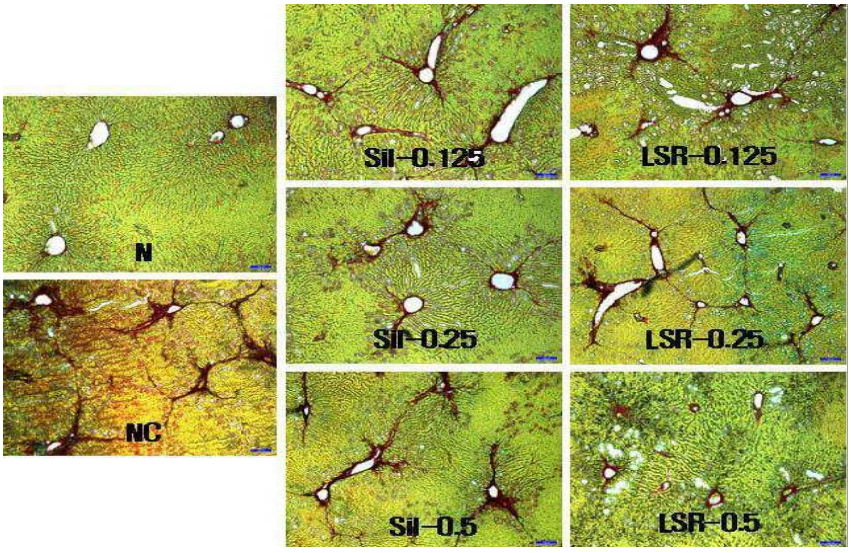



Fig. 2. Histological observation for explaining the effect of LSR extract on collagen production in fibrosis-induced liver of rat (×100). N, vehicle-injected normal group; NC, negative control, $CCL_4$ (1㎖of 40% $CCL_4$ /Kg body weight with 1.5㎖ of corn oil plus 1㎖ of distilled water, 2 times/week for 6 weeks) injected group Sil-0.25, Sil-0.5, 0.25g, 0.5g silymarin/Kg body weight/rat/day-supplemented & $CCL_4$-injected group; LSR-0.25, LSR-0.5, 0.25g, 0.5g of LSR extract/Kg body weight of rat/day-supplemented & $CCL_4$-injected group. Values with alphabet on each bar are significantly different at $P<0.05$.