

## Phellinus gilvus 추출물의 생물학적 활성

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### Biological activities of *Phellinus gilvus* extracts

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#### Objectives

*Phellinus gilvus* (PG) is a kind of mushroom that has medicinal activities like anti-inflammation and anti-tumor to some extent. In the present study, we investigated antioxidant, anti-inflammation and wound healing activities of PG.

#### Materials and Methods

Hot water extract of PG (PGW; Fa) was investigated on antioxidant, cell viability, and NO production. PGW was precipitated by ethanol to get polysaccharides (Fb) for further investigation on cell immunity. For dermal wound healing tests, PG was successively extracted by petroleum ether, chloroform, ethyl acetate, butanol and water to get various extracts, respectively.

#### Results and Discussion

PG was found potent DPPH radicals scavenging activities and it is mainly due to the polyphenol components (Table 1); PGW did not show any cytotoxicity on RAW264.7 macrophage until its concentration rose up to 400  $\mu\text{g}/\text{ml}$  (Figure 1, left); and PGW could inhibit LPS-induced NO production in a dose-dependent manner (Figure 1, right). PG has been found more powerful splenocytes proliferation activity than PL and PB (Figure 2, left), but weak activity on mixed splenocytes (Figure 2, right). The stimulating activity of PG on phagocytosis of both peritoneal macrophage and RAW264.7 cells were higher than that of PB or PL (Figure 3). Water extract of PG (PGWE) has been found the best dermal wound healing effects in rat, although there were not significant differences (Figure 4, left). NO plays a key role in normal wound repair, therefore, we investigated the effects of various extracts on NO production too. All five extracts can inhibit LPS induced NO production to the different extent, and CE, EAE and BE from PG exerted the highest inhibitory effects at 200  $\mu\text{g}/\text{ml}$ .

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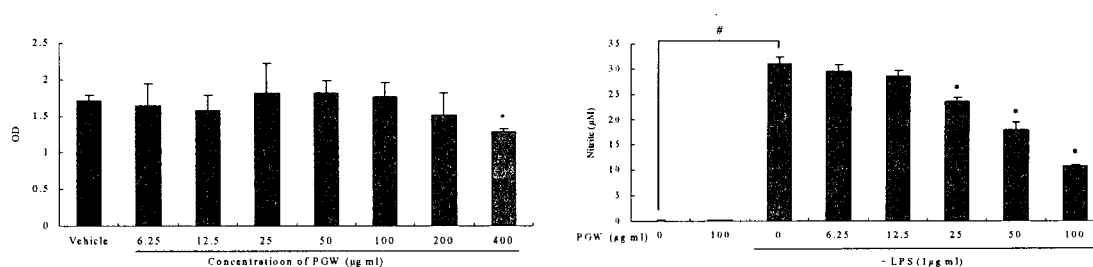
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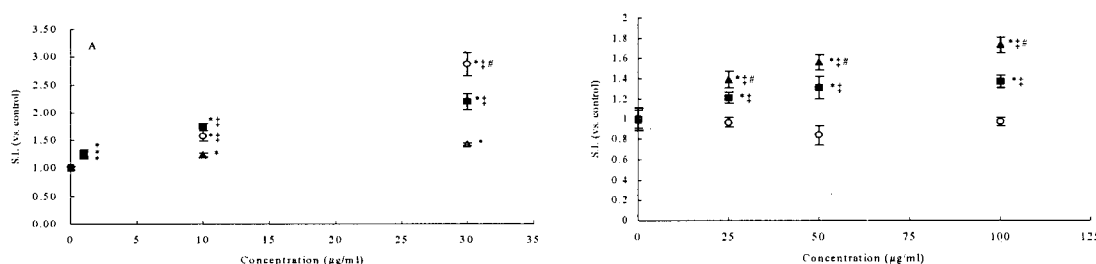
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**Table 1. Comparison of scavenging activities on DPPH free radicals**

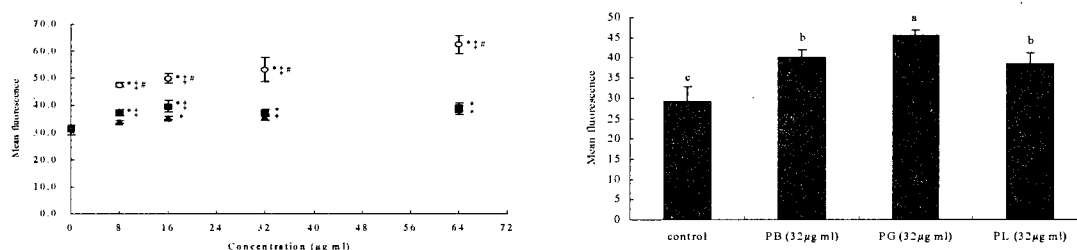
	Fb	Fc	Fd	Ascorbic acid
IC <sub>50</sub> ( $\mu\text{g/ml}$ )	Not detected	1525.49 $\pm$ 247.43 <sup>a</sup>	80.26 $\pm$ 1.11 <sup>b</sup>	51.77 $\pm$ 3.59 <sup>c</sup>



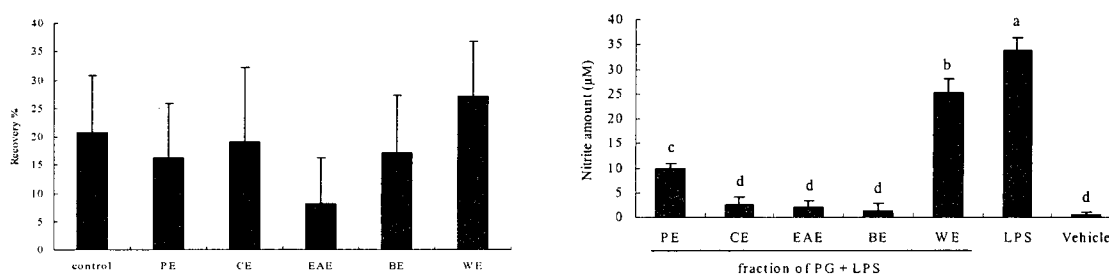
**Figure 1.** Effects of hot water extract from *Phellinus gilvus* (PGW) on cell viability (left) and Nitric oxide (NO) production of RAW264.7 macrophage cells stimulated by LPS (1  $\mu\text{g/ml}$ ) (right). \* represents  $p < 0.05$  compared with the LPS alone treated group, and # represents  $p < 0.05$  compared with the media alone treated group.



**Figure 2.** Effects of polysaccharides isolated from various *Phellinus* spp., PG( $\circ$ ), PB( $\blacksquare$ ) and PL( $\blacktriangle$ ), respectively on *in vitro* splenocyte proliferation (left) and one way mixed splenocytes reaction (right). Values were expressed as Means $\pm$ S.D.; \*:  $p < 0.05$  vs. control; †:  $p < 0.05$  vs. PL; #:  $p < 0.05$  vs. PB.



**Figure 3.** Effects of polysaccharides isolated from various *Phellinus* spp., PG( $\circ$ ), PB( $\blacksquare$ ) and PL( $\blacktriangle$ ), respectively on *in vitro* phagocytosis response in peritoneal macrophage (left) and RAW264.7 cell lines (right). Values were expressed as Means $\pm$ S.D.; \*:  $p < 0.05$  vs. control; †:  $p < 0.05$  vs. PL; #:  $p < 0.05$  vs. PB. Bars with different character mean significantly different ( $p < 0.05$ ).



**Figure 4.** Effects of various extracts from PG on dermal wound healing in normal rat (left) and on Nitric Oxide (NO) production in RAW264.7 macrophage cells stimulated by LPS (1 $\mu\text{g/ml}$ ) (right) at dose of 1mg/d and concentration of 200 $\mu\text{g/ml}$ , respectively. Bars with different character mean significantly different ( $p < 0.05$ ).