

## 홍삼농축액에서 *Saccharomyces cerevisiae*와 *Saccharomyces carlsbergensis*에 의한 Ginsenosides의 bioconversion

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### Bioconversion of Ginsenosides in Red Ginseng Extract by *Saccharomyces cerevisiae* and *Saccharomyces carlsbergensis*

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Ginseng (*Panax ginseng* C.A. Meyer) is reported to have many pharmaceutical activities. The minor ginsenosides (Rd, Rg3, Rh2 and compound K) display pharmaceutical properties superior to those of the major ginsenosides. These minor ginsenosides, which contribute a very small percentage, are produced by hydrolysis of the sugar moieties of the major ginsenosides. The pH of red ginseng extracts fermented with *S. cerevisiae* and *S. carlsbergensis* decreased rapidly during 3 days of fermentation, with no further significant change thereafter. After 20 days of fermentation, a relatively small difference remained in the acidity of extracts fermented with *S. cerevisiae* (0.54%) and *S. carlsbergensis* (0.58%). Reducing sugar in the *S. cerevisiae* and *S. carlsbergensis* extracts decreased from 25.86 to 4.54 mg/ml and 4.32 mg/ml glucose equivalents, respectively; and ethanol contents increased from 1.5% at day 0 to 16.0 and 15.0%, respectively, at 20 days. Ginsenosides Rb1, Rb2, Rc, Re, Rf, and Rg1 decreased during the fermentation with *S. cerevisiae*, but Rd and Rg3 increased by 12 days. Ginsenosides Rb1, Rb2, Rc, Re and Rg1 decreased gradually in the extract with *S. carlsbergensis*, but Rd and Rg3 were increased at 6 days and 9 days.

**Key word** : bioconversion, red ginseng extract, ginsenoside, *Saccharomyces*