

## Evaluation of Microbial Community, Biochemical and Physiological Properties of Korean Black Raspberry (*Rubus coreanus* Miquel) Vinegar Manufacturing Process

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**Abstract :** Fermentation characteristics of black raspberry vinegar by using static cultures without any additives were has been investigated to establish of vinegar manufacturing conditions and improve the quality of vinegar by optimization the vinegar manufacturing process. The two vinegar manufacturing conditions were prepared; one-step fermentation condition only using mother vinegar that prepared naturally occurring black raspberry vinegar without starter yeast for alcohol fermentation (traditional method) and two-step fermentation condition using commercial wine yeast and mother vinegar for acetic acid fermentation. Approximately 12% ethanol was produced after 35 days fermentation with log 7.6 CFU/mL of yeast population in one-step fermentation, resulting sugar reduction from 14 to 6oBrix whereas in two-step fermentation, ethanol concentration was reached up to 8% after 27 days with continuous increasing yeast until log 7.0 CFU/mL. In addition, yeast and ethanol were decreased after day 60 accompanied with proliferation of acetic acid bacteria (log 5.8 CFU/mL) and titratable acidity; 4.4% in traditional method and 6% in two-step fermentation method. DGGE analysis showed that *S. cerevisiae* was detected until 77 days of traditional fermentation and gradually changed to AAB, *Acetobacter pasteurianus*, as dominant species and *Komagataeibacter xylinus* at the end of the fermentation. However, *S. cerevisiae* and *A. pasteurianus* was dominant in two-step fermentation process. The prepared two-step fermentation showed enhanced total polyphenol and flavonoid content significantly resulting in higher radical scavenging activity. Our studies firstly revealed the microbial community change with chemical change and demonstrated a suitable fermentation system for black raspberry vinegar by the static surface method.

**Keywords :** bacteria, black raspberry, vinegar fermentation, yeast

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