

Grape Marc is a Functional Substrate for Probiotic Bacteria

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This study aimed at using grape marc for the growth of probiotics with the perspective of producing a functional ingredient having antioxidant activity. *Lactobacillus plantarum* 12A and PU1, *Lactobacillus paracasei* 14A, and *Bifido bacteriumbreve* 15A showed the ability to grow on grapemarc (GM) based media. The highest bacterial cell density (>9.0 CFU/g) was found in GM added of 1% of glucose (GMG). Compared to un-inoculated and incubated control fermented GMG showed a decrease of carbohydrates and citric acid together with an increase of lactic acid. The content of several free aminoacids and phenol compounds differed between samples. Based on the survival under simulated gastrointestinal conditions, GMG was a suitable carrier of lactic acid bacteria and bifidobacteria strains. Compared to the control, cell-free supernatant (CFS) of fermented GMG exhibited a marked antioxidant activity *in vitro*. The increased antioxidant activity was confirmed using Caco-2 cell line after inducing oxidative stress, and determining cell viability and radical scavenging activity through MTT and DCFH-DA assays, respectively. Supporting these findings, the SOD-2 gene expression of Caco-2 cells also showed lowest pro-oxidant effect induced by the four CFS of GMG fermented by probiotic strains.