Bacillus subtils var. natto及Rhizopus microsporus var. oligosporus混合發酵對去種皮黑豆機能性成分生成之影響

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摘 要

納豆是日本傳統的大豆發酵食品，由蒸煮過的大豆接種納豆 菌(Bacillus subtilis)發酵而成，以獨特黏質及特殊風味為其特徵。 然而天貝為印尼蛋白質飲食來源，以去殼蒸煮過之大豆包裹香蕉 葉利用根黴(Rhizopus oligosporus)發酵而成，棉花狀菌絲的生長使 大豆結合成緻密的糕狀，且具有令人喜愛的香氣。本研究以蒸煮 過的去種皮黑豆為基質，分別接種Bacillus subtilis var. natto (來自 於日本商業菌種) 和Rhizopus microsporus var. oligosporus (來自於 印度尼西亞商業菌種)進行雙菌發酵。以不同菌種、發酵條件與溫 度下所產生的機能性物質。發酵溫度分別為Bsn 在42°C和40°C與 Rmo 在37°C和40°C與雙菌在40°C，經不同時間進行發酵後將產 品進行下列分析：一般化學組成包括水分、粗蛋白、胺基態氮與 水解率；機能性成分包括黃酮類化合物、 γ -聚麩胺酸與輔.-Q10； 抗氧化酵素包括麩胱甘.過氧化.、超氧歧化.活性與DPPH 自 由基清除率；蛋白.和解脂.活性與血管收縮轉化.抑制活性， 且比較各處理間的差異。然後依產生機能性物質、抗氧化活性以 及其他活性物質高低決定最理想的發酵時間，溫度和發酵順序。 其結果顯示： 發酵溫度對不同菌種發酵產物之一般化學組成沒有顯著的影 響，但是胺基態氮與水解率在某些範圍內會隨著發酵時間的延長 而增加。機能性成分-黃酮類化合物、 γ -聚麩胺酸與輔.-Q10，單 菌發酵，受溫度與發酵時間長短有影響。而雙菌發酵的產物，受 到先後發酵順序與發酵時間影響較為明顯。在單菌與雙菌發酵， vi 麩胱甘.過氧化.、超氧歧化.活性隨著發酵時間的延長而增 加。DPPH 自由基清除率也會隨著發酵時間延長而增加。單菌發 酵，蛋白.、解脂.活性會受溫度影響而有所改變。上述與雙菌 發酵加以比較，蛋白.、解脂.活性與血管收縮轉化.抑制活性， 隨著發酵時間的增長而增加。

關鍵詞 : 發酵食品、機能性成分、抗氧化活性、酵素活性 血管收縮素轉化.

目錄

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