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Effect of hydrothermal extract from Codonopsis lanceolata Benth. et Hook on the growth of lactic acid bacteria and harmful bacteria

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The objective of this study is to investigate the effect of *Codonopsis lanceolata* Benth. et Hook on the growth of lactic acid bacteria and some harmful bacteria. Extract of *C. lanceolata* was obtained by hydrothermal extraction method and used intactly without concentration. To investigate the inhibitory effect on the growth of harmful bacteria, we used agar dilution method. On agar plate containing more than 25% extract, they showed decreased number of colonies. Specially gram negative bacteria, like *E.coli, Salmonella paratyphi, Salmonella typhimurium* didn't grow at all on agar plate containing 50% extract. In case of lactic acid bacteria, total viable cell counts in nutrient broth with *C. lanceolata* extract were reached to $\times 10^8$cfu/ml, but the cell viability in nutrient broth without the extract was low, $\times 10^6$cfu/ml. In conclusion, the hydrothermal extract of *C. lanceolata* not only could enhance the growth of lactic acid bacteria which were useful for human, but also had antimicrobial activity for some harmful bacteria like *E. coli, S. paratyphi* etc.

Key words : *Codonopsis lanceolata*, lactic acid bacteria, *E. coli, Salmonella paratyphi, Salmonella typhimurium*