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Effect of Rehydration Media, Freezing Temperature and Combination of Cryoprotectants on Survival Rate of Freeze-dried Lactic Acid Bacteria

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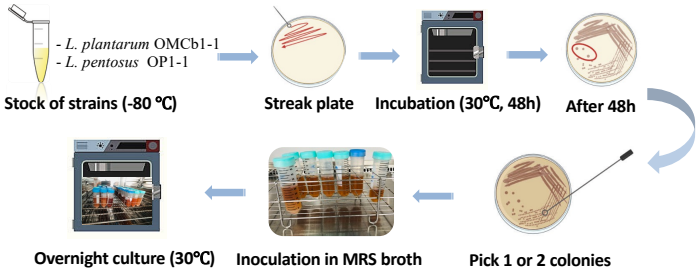
INTRODUCTION & AIM

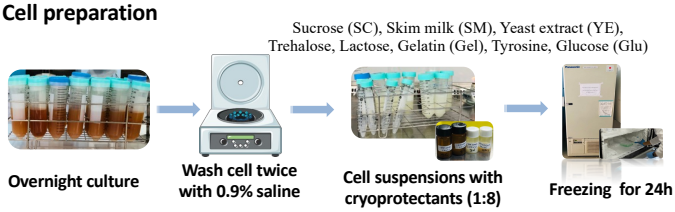
In Cambodia, spontaneous fermentation is used to produce fermented vegetables. Inoculation of lactic acid bacteria (LAB) should be replaced this traditional fermentation method for large-scale production. And freeze-drying method is one of the best way to preserve LAB. Therefore, this study aimed to investigate the effect of rehydration media, freezing temperature, and combination of cryoprotectants on survival rate of freeze-dried LAB.

METHOD

❑ Bacteria culture preparation



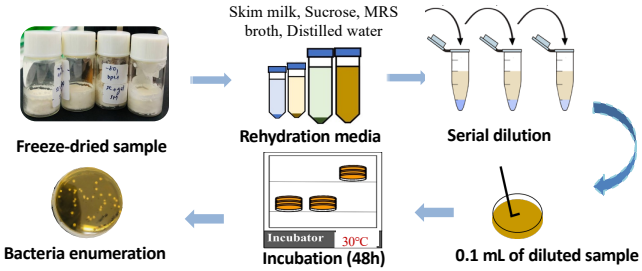
❑ Cell preparation



❑ Freeze-drying process

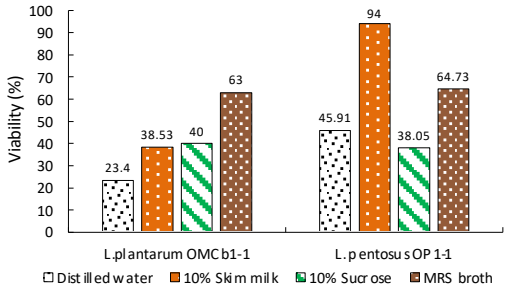
- Pre-freezing (frozen material) (-20℃ & -80℃)
- Primary drying (sublimation ice) (-36℃, 0.2 mbar) for 24h
- Secondary drying (desorption water) (-42℃, 0.1 mbar) for 2h

❑ Rehydration process

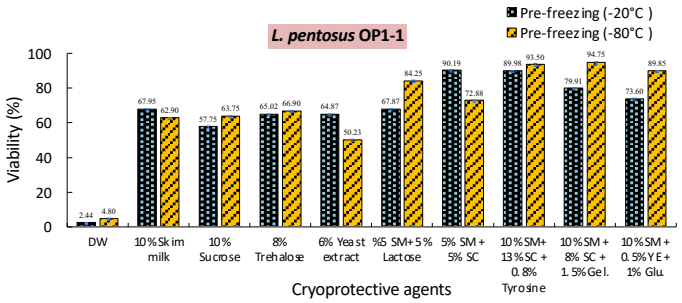


RESULTS & DISCUSSION

❑ Effect of rehydration media on survival rate of freeze-dried LAB



❑ Effect of pre-freezing temperatures and cryoprotectants



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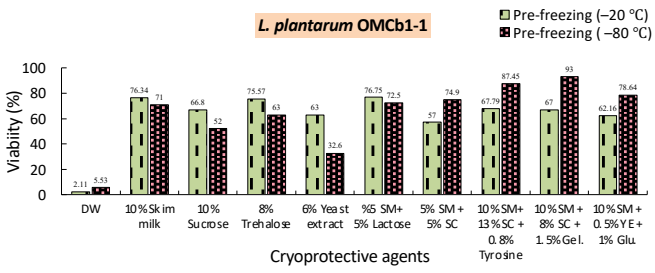

CONCLUSION

- ❑ Skim milk performed most effectively as a rehydration medium for *L. pentosus* OP1-1, and MRS broth was most effective for *L. plantarum* OMCb1-1.
- ❑ The combination of cryoprotectants (skim milk, sucrose, and gelatin) with pre-freezing at -80 °C gave the highest survival rate of both *L. plantarum* OMCb1-1 and *L. pentosus* OP1-1.

ACKNOWLEDGEMENT

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