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## Effects of sporulation and heat-shock conditions on spores of six major *Bacillus* species

Jae-Hyung Mah, Xuezhi Bai and Young Kyoung Park  
Korea University, Korea

This study was performed to evaluate the effects of sporulation conditions including sporulation media, temperature and time on the sporulation ability and heat resistance of spores of six different species belonging to the genus *Bacillus* including *B. subtilis*, *B. coagulans*, *B. licheniformis*, *B. pumilus*, *B. brevis* and *B. cereus*. From the comparison of sporulation rates of each species on/in the reported sporulation media, an insignificant difference in numbers of *Bacillus* spores produced except for *B. coagulans* spores was found between NA sporulation medium (nutrient agar supplemented with 1 ppm Mn<sup>2+</sup>) and solidified SG medium (a glucose nutrient broth-based moderately rich medium), the most frequently used sporulation media whereas a significant decrease in numbers of spores produced was observed in liquid media of the same composition as used for two sporulation media when compared to the corresponding solid media. The sporulation temperature (30-50°C) and time (1-7 days) had a significant impact on the sporulation ability and heat resistance of spores of each species. The greatest yield of spores was achieved with the sporulation conditions at 37-44°C for 2 days and heat resistance of spores increased significantly as sporulation temperature increased. Meanwhile, heat-shock conditions with different combinations of temperature (60-80°C) and time (10-30 min) was examined for the enumeration of spores of each species and their efficiency was compared by determining the number of viable spores after each heat-shock treatment. Consequently, an accurate and rapid enumeration of the viable spores could be conducted under a heat-shock condition of 60-65°C for 10 min.

### Biography

Jae-Hyung Mah has completed his PhD from Korea University and Postdoctoral studies from University of Wisconsin-Madison and Washington State University. He is the Professor of Food and Biotechnology at Korea University (Sejong Campus). He has published more than 40 papers in reputed journals and has been serving as an Editorial Board Member of several peer-reviewed journals. His researches focus on the analyses of hazardous chemicals and microorganisms in fermented foods and development of novel protective and preservative strategies such as application of genetically designed starter culture to food fermentation and inactivation kinetics of pathogenic microorganisms exposed to intervention treatments.

[nextbio@korea.ac.kr](mailto:nextbio@korea.ac.kr)

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