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ANALYSES OF BIOGENIC AMINES IN *CHONGGAK* KIMCHI AND *KKAKDUGI*, KOREAN KIMCHI PRODUCTS MADE OF RADISH

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Kimchi is the name representing various types of Korean traditional fermented vegetables and largely consumed as a side dish and excellent source of beneficial lactic acid bacteria (LAB) in Korea. There are hundreds of different kinds of kimchi depending on raw materials, but in general cabbage or radish have been used as a major ingredient. Hence, *Chonggak* (pony-tail radish) kimchi and *Kkakdugi* (diced radish kimchi) are as popular as Baechu (Chinese cabbage) kimchi, commonly called kimchi, in Korea. Although many researchers have studied health benefits of LAB, there have been several reports in which some LAB species have strong capabilities of producing biogenic amines (BA), resulting in the formation of excessive BA in lactic fermented foods. However, there have been insufficient studies on the BA content and BA-producing LAB in kimchi, particularly radish kimchi. In this study, BA content in two types of radish kimchi were determined to estimate BA-related risks. While most radish kimchi samples contained relatively low levels of BA, some samples had excessive levels of histamine and total BA higher than toxicity limits of respective categories. It is noteworthy that, except for one *Kkakdugi* sample, putrescine content in each type of radish kimchi increased alongside acidity. To understand bacterial contribution to BA content in radish kimchi, BA production by LAB isolated from respective samples was measured. BA production by most LAB was below detection limits; however, some LAB significantly

produced vasoactive amines (tyramine and β -phenylethylamine). Moreover, these amines were produced in greater quantities by LAB from over-ripened kimchi than those from either less ripened or optimally ripened kimchi. Based on 16s rRNA sequences, BA-producing LAB were all identified as *Lactobacillus brevis*. This study suggests that most kimchi products are safe for consumption; however, the use of starter culture is required to further reduce BA content in kimchi.

Biography

Jae-Hyung Mah completed his PhD from Korea University, South Korea and Postdoctoral studies from University of Wisconsin-Madison and Washington State University, USA. He is a Professor of Food and Biotechnology at Korea University, South Korea. He published about 50 papers in reputed journals and has been serving as an Editor-In-Chief, Editorial Board Member and Referee for several peer-reviewed journals in Food Science and Technology. His researches focus on the analyses of hazardous chemicals and microorganisms in fermented foods, development of novel protective and preservative strategies such as application of genetically designed starter culture to food fermentation and mathematical model studies on inactivation kinetics of food borne pathogenic and spoilage microorganisms exposed to chemical, physical and biological intervention treatments.

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