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Aspergillus derived protease as a novel bifidogenic factor

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Traditionally, *Aspergillus* species have been widely used for the production of a variety of fermented Japanese foods including, miso, soy sauce, sake and sake lees. However, there is limited study on the application of *Aspergillus* species for the production of functional foods beneficial for health. In a recent animal study, we observed a marked elevation in the colon *Bifidobacterium* and organic acids in rats fed *Aspergillus*-fermented burdock compared to burdock powder. Similar observations were made in rats fed with water-soluble fraction from the fermented burdock and other *Aspergillus*-fermented foods such as malted rice and multi-grain malt. Since the water-soluble fraction from the fermented burdock contained substantial amount of extracellular proteases derived from *Aspergillus*, we postulated that bifidogenic effects might be associated with *Aspergillus*-derived proteases. To test hypothesis, rats were fed a diet containing 0.1% protease A 'Amano' SD (*Aspergillus oryza*, Amano Enzyme Inc.) (Amano protease) and number of *Bifidobacterium* in colon was measured. The results showed a marked elevation in colon *Bifidobacterium* population. Since the Amano protease preparation is a mixture of several proteases, we set out to identify the active protease responsible for the bifidogenic effect. Our results show an acid protease derived from *Aspergillus oryzae* to exhibit a potent bifidogenic effect that was lost when protease was inactivated. A dietary addition of 0.0384% acid protease was comparable to 5 to 10% of prebiotics (e.g., oligosaccharides and dietary fibers) in raising colon *Bifidobacterium* population. In conclusion, our findings provide an insight into novel applications of an acid protease derived from *Aspergillus* as a functional food supplement for colon health.

Biography

Norihisa Kato has completed his PhD (1980) from Nagoya University, Japan. Currently, he is a Professor in Laboratory of Molecular Nutrition, Graduate School of Biosphere Science of Hiroshima University. His research interests are in elucidation of anti-disease food factors and the molecular mechanisms. He is an expert Editor of *Journal of Nutritional Science and Vitaminology* and has published more than 200 papers. He was given the Award for Excellence in Research by Japan Society of Nutrition and Food Science (2012).

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