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Consumption of an acid protease derived from *Aspergillus oryzae* elevates colon *Bifidobacterium* in rats

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Traditionally, *Aspergillus* species have been widely used for the production of Japanese fermentation foods such as miso, soy sauce, etc. However, there is limited study on the application of *Aspergillus* for the functional foods production. Previously, we found the marked elevation in colon *Bifidobacterium* by feeding of *Aspergillus* fermented burdock when compared with burdock powder. Recently, our study has found a marked elevation in colon *Bifidobacterium* of rats fed a high-fat (HF) diet supplemented with an Amano protease preparation (Protease A “Amano” SD, derived from *Aspergillus oryzae*, Amano Enzyme Inc.). The current study was conducted to examine if dietary supplementation with an acid protease (AcP) purified from *A. oryzae* also leads to the elevation of *Bifidobacterium* levels in the colon. Rats were fed a HF diet containing the AcP purified from the Amano protease preparation for 2 weeks. The abundance of *Bifidobacterium* in the cecum and feces of rats fed with a HF diet with the addition of the 0.1% Amano protease preparation was markedly elevated by the addition of 0.1% Amano protease. However, the *Bifidobacterium* levels were unaffected by the addition of the purified AcP (0.0096%) at a level equivalent to the amount of AcP found in the 0.1% Amano protease. In contrast, the *Bifidobacterium* levels significantly elevated ($P < 0.05$) when rats were fed a HF diet containing 0.0384% AcP (a four-fold higher content of AcP in the diet containing 0.1% Amano protease). The effect on cecum *Bifidobacterium* was not observed in the inactivated 0.0384% AcP group. These results suggest that the consumption of the *Aspergillus*-derived active AcP elevates the *Bifidobacterium* levels in the colon.

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, 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 Japan Society of Nutrition and Food Science (2012).

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