P91

Effect of Garlic Hot-Water Extracts on the Lipid Metabolism in Rats Fed Hyperlipidemic Diet

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This study was designed to investigate the effect on treatments of garlic and the improvement of the lipids in the dietary hyperlipidemic rats. Rats were administrated 1% cholesterol to induce hyperlipidemia and were fed diets containing FG-ex (hot water extract of fresh garlic), SG-ex (hot water extract of steamed garlic) and BG-ex. (hot water extract of black garlic) by 0.3% (w/w) for 4 weeks. Body weight gain and food efficiency was not significantly different between control and garlic extract fed groups. Blood glucose was decreased in FG-ex and BG-ex fed groups than control group. The contents of total lipids, total cholesterol and triglyceride in serum were significantly lower in all garlic extract fed groups than control group. Especially, triglyceride content was the lowest in BG-ex fed group. HDL-cholesterol was significantly increased in the FG-ex and BG-ex fed groups. Total hepatic lipid, cholesterol and triglyceride concentration were significantly decreased in all fed of garlic extract compared with the control group. BG-ex fed group showed more remarkably decreasing effect than FG-ex and SG-ex fed groups. TBARS concentration of liver was significant different for the added FG-ex and BG-ex administration. DPPH scavenging activity of liver was the highest in BG-ex fed group compared with other groups. From the above result, we suggest black garlic extract may accelerate the improvement of the lipid composition in dietary hyperlipidemic rats than fresh and steamed garlic extract.

Key words: Garlic, Hyperlipidemic, Lipid metabolism

P92

Fur Directly Regulates Expression of QS- and T3SS-Related Genes in *Pseudomonas syringae* pv. *tabaci*

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In a phytopathogen *Pseudomonas syringae* pv. *tabaci*, several virulence traits including swarming motility and production of siderophore, tabtoxin, and QS (quorum-sensing) autoinducers are controlled by Fur (ferric uptake regulator). Although the mechanism of Fur action is unclear, we showed previously that this global regulator affects positively on the expression of two QS-related genes, *psyR* and *psyI*. Here, to determine whether two T3SS (type III secretion system)-associated genes, *hrpR* and *hrpA* belong to Fur regulon, differential expression for these genes was evaluated by RT-qPCR (reverse transcription-quantitative PCR). The results revealed that Fur increases expression of the T3SS genes. In addition, the upstream regions of these four genes were screened for putative Fur boxes, and the interaction of Fur with the predicted Fur-binding sites was also investigated by electrophoretic mobility shift assay (EMSA). Taken together, our data illustrate that the extensive Fur regulon includes T3SS and they provide novel insights into the mechanism how Fur regulates virulence genes in *P. syringae* pv. *tabaci*.

Key words: Phytopathogen; Ferric uptake regulator (Fur); Quorum-sensing (QS); Type III secretion system (T3SS); Virulence