高膽固醇飲食添加紅麴粉末對倉鼠體內脂質代謝之影響
Effects of Monascus Rice Powder on Lipid Metabolism in Hamsters

謝孟志(Meng-Jyh Shieh);黃士懿(Shih-Yi Huang);錢信(Hsin Chein);楊惠婷(Hui-Ting Yang);劉佩姎(Pei-Yang Liu);謝明哲(Ming-Jer Shieh)

摘要

本實驗在於評估紅麴粉末（Monascus rice powder）對倉鼠降血膽固醇及總抗氧化狀態影響。四週大雄性倉鼠（Syrian hamsters）72 隻，先以老鼠飼料餵養四週，使其適應環境並使體重達 120 g 之後，隨機犧牲 8 隻當基準組（B 組），再依體重分為 C（32 隻）、H（16 隻）、L（16 隻）3 組，分別給予高膽固醇飼料（0.1%cholesterol）、高膽固醇飼料加 0.4%紅麴粉末或高膽固醇飼料加 1.6%紅麴粉末。飼養四週後，各組隨機犧牲 8 隻倉鼠，C 組剩餘 24 隻倉鼠再隨機分成 CC、CH、CL 3 組，CC 組繼續給予高膽固醇飼料、CL 組改給予高膽固醇飼料加 0.4%紅麴粉末、CH 組改給予高膽固醇飼料加 1.6%紅麴粉末；而原先 H、L 兩組各剩餘 8 隻倉鼠則改給予高膽固醇飼料，並分別改稱為 HC、LC 組，再飼養四週後犧牲。犧牲之倉鼠，分析其血漿膽固醇、血漿三酸甘油酯、血漿磷脂質及血漿總抗氧化力；肝臟膽固醇、肝臟三酸甘油酯，肝臟 monacolin K 含量及糞便中性固醇。結果顯示：在血脂肪方面，紅麴粉末能有效預防倉鼠因高油脂飲食所引起的高脂血症及使患高脂血症倉鼠血脂肪下降。在肝臟脂肪濃度方面，紅麴粉末能有效預防倉鼠肝臟中因高油脂飲食所引起的三酸甘油酯堆積，但對患高血脂症倉鼠肝臟脂肪濃度沒有影響；而在肝臟總膽固醇三酸甘油酯方面，紅麴粉末能有效預防倉鼠肝臟中三酸甘油酯因高脂肪飲食所引起的膽固醇及三酸甘油酯的堆積。本實驗結果發現，以低劑量紅麴粉末（26 mg/day）和高劑量紅麴粉末（104 mg/day）添加在高膽固醇飼料，可預防倉鼠血脂肪升高，高劑量組（1.6% in diet）效果明顯優於低劑量組。但對已患高血脂症倉鼠，在不改變飲食型態下，添加紅麴粉末對降血脂作用則不顯著。另外，紅麴粉末可略為提升膽固醇病鼠之血漿總抗氧化力，但詳細機制則有待更進一步實驗證明。

Abstract

The proposed study evaluated the cholesterol-lowering effectiveness and the plasma total antioxidative status produced by Monascus rice powder in hamster. Seventy-two weanling male hamsters were housed and divided into three groups and fed a cholesterol diet (1 g/kg diet) to induce hypercholesterolemia for this study. Various doses (4 g/kg diet for low dose and 16 g/kg diet for high dose) of Monascus rice powder were administrated for this study. After treatment with different doses of Monascus rice powder, the blood and liver were taken for lipid profiles including triglycerol (TG), total cholesterol, lipoprotein cholesterol, and phospholipids analysis and plasma total antioxidant status. Results indicated that the plasma TG and cholesterol levels decreased in the Monascus rice powder treated groups. The lipid accumulation in the liver also diminished over the four-week administration.

Monascus rice powder diets presented diminishing effectiveness on hepatic TG and cholesterol accumulation. From the dose viewpoint, high doses of Monascus rice powder presented greater effectiveness lowering plasma cholesterol and hepatic lipid accumulation. Moreover, when the Monascus rice powder was excluded from diets, the plasma and hepatic TG and cholesterol elevated dramatically. Monascus rice powder also enhanced total plasma antioxidative status; however, the mechanism still remains to be elucidated.