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減圧マイクロ波乾燥法で得られたエゴマ葉粉末の機能性の検証

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Beneficial functions of perilla leaf powder dried by microwave under reduced pressure

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Abstract

The leaf of *Perilla frutescens* var. *frutescens* (perilla leaf) contains rosmarinic acid and α-linoleinic acid; these compounds have antioxidative properties and reduce the risk of cardiovascular diseases. However, the beneficial effects of perilla leaf on metabolic syndrome have not been explored. In this study, we investigated whether perilla leaf powder, dried by microwave under reduced pressure, can reduce the risk of metabolic syndrome using SHR.*Cg-Lepr^{cp}*/NDmer (SHR-cp), a rat model of metabolic syndrome. The SHR-cp rats were divided into 3 groups: (1) the control group, which was given only sterile distilled water only, (2) the MH group, which was given 5 g/kg body weight/day of perilla leaf powder, (3) the ML group, which was given 1 g/kg body weight/day of perilla leaf powder. Perilla leaf powder was dissolved in sterile distilled water for administration. Body weight and food intake were measured every week and blood pressure was determined every 2 weeks. After 14 weeks of perilla leaf powder administration, rat plasma was collected and subjected to biochemical analysis, and fatty acid compositions and lipid peroxide levels were measured.

Body weight and food intake were not significantly different among the groups. The changes in blood pressure from baseline to week 14 decreased significantly in the MH group compared with the other groups. Plasma triglyceride and total cholesterol levels also decreased significantly in the MH group compared with the levels in the other groups. Plasma levels of α-linoleinic acid, docosapentaenoic acid, and total n-3 fatty acids increased significantly in the MH group compared with the levels in the other groups. Lipid peroxide (LPO) levels in plasma were also decreased significantly in the MH group. Regression analysis revealed a significant positive correlation between plasma LPO levels and changes in the mean blood pressure and diastolic blood pressure from baseline to week 14 and a significant negative correlation between plasma LPO and α-linolenic acid levels and between plasma α-linolenic acid and plasma triglyceride levels.

These results suggest that the administration of the perilla leaf powder, dried by microwave under reduced pressure, can potentiate anti-oxidative, anti-hypertensive, and antihyperlipidemic effects, leading to preventive effects on cardiovascular diseases.

Keywords : エゴマ葉粉末、ロスマリン酸、α- リノレン酸、血漿脂質、血圧
perilla leaf powder, rosmarinic acid, α-linoleinic acid, plasma lipids, blood pressure

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