

天然酸化防止剤ローズマリー抽出物中の活性成分と活性寄与率

(2010年6月21日受付)

(2010年8月24日受理)

松藤 寛^{a)}、千野 誠^{a)}、山形一雄^{a)}、山崎 壮^{b)}

a) 日本大学生物資源科学部

b) 国立医薬品食品衛生研究所

Antioxidant compounds and their contribution to total antioxidant capacity
in rosemary extracts, natural antioxidants

(Received June 21, 2010)

(Accepted August 24, 2010)

Hiroshi Matsufuji^{a)}, Makoto Chino^{a)}, Kazuo Yamagata^{a)}, Takeshi Yamazaki^{b)}

a) College of Bioresource Sciences, Nihon University

b) National Institute of Health Sciences

Abstract

The identification and contribution of active components in commercial rosemary extracts as a natural antioxidant using DPPH, which are used as an antioxidative evaluation method, were performed. When two commercial rosemary extracts (manufacture A, powder sample; manufacture B, vegetable oil-liquid sample) were applied to HPLC-DPPH online post-column system, three major peaks (1, 2 and 3) appeared in UV chromatograms at 285 nm, and HPLC-separated components corresponding to peaks 2 and 3 reacted with DPPH, resulting that they were detected as major negative peaks in DPPH scavenging chromatograms at 517 nm. The results suggested that they would be major antioxidative components in rosemary extracts. The LC-MS/MS and co-injection analyses of authentic samples revealed that compound 1, 2 and 3 were rosmarinic acid (RosA), carnosol (Car) and carnosic acid (CarA), respectively. The contents of RosA, Car and CarA were 4.18, 44.0 and 161 mg/g in the rosemary extract A, respectively, and 0.38, 6.30 and 43.3 mg/g in the extract B, respectively. The DPPH radical scavenging activity (TEAC, Trolox equivalent activity) of the rosemary extract A, RosA, Car and CarA were 0.350, 2.26, 0.941 and 1.34, respectively, but the activity of rosemary extract B was not measured because the reaction solution was suspended. Calculated from the contents and antioxidant activity, the contribution of Car and CarA to activity of rosemary extract A was estimated as about 75%. On the other hand, the rosemary extract was mixed with 26 antioxidants, and the effects of antioxidants on DPPH radical scavenging activity of the extract were examined by comparison of activity (I_M) of the mixture with the estimated activity (I_E) from individual antioxidants. The ratios of I_M to I_E (I_M/I_E) of the combinations with vanilic acid or *p*-coumaric acid were almost 0.8, implying that the antioxidants caused antagonistic effects. The ratios of the combinations with caffeic acid or ascorbic acid were more than 1.2, implying synergistic effects.

Keywords : ローズマリー抽出物、DPPH、抗酸化物質

Rosemary extract, DPPH, antioxidants

I 緒言

ローズマリー抽出物は天然酸化防止剤として利用されている食品添加物であり、「マンネンロウの葉又は花から得られた、カルノシン酸、カルノソールおよびロスマノールを主成分とするものである」と既存添加物名簿に定義されている¹⁾。

また、既存添加物名簿収載品目リスト注解書の基原・製法・本質において「シソ科マンネンロウ (*Rosmarinus officinalis* LINNE) の葉又は花より、二酸化炭素、温時～熱時含水エタノール若しくはエタノールで抽出して得られたもの、又は温時～熱時ヘキサン、メタノール若しくは含水メタノールで抽出し、溶媒を除去して得られたものである。有効成分は、フェ