Jpn. J. Food Chem, Vol. 5(2), 1998

Essential Oil and Phenolic Production in Mentha piperita Shoot Cultures

(Received September 14, 1998)
(Accepted Octber 6, 1998)

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Key word: *Mentha piperit*a, essential oil, carvone, menthol, phenolic, rosmarinic acid, lithospermic acid, lithospermic acid B, shoot culture.

Abstract

A xenic shoot culture of *Mentha piperita* was established from young shoots of plants cultivated in a field, and essential oil and phenolic production of *M. piperita* shoots cultured on Murashige-Skoog (MS) solid medium was investigated.

The main compound of *M. pipetita* cultivated in a field is normaly menthol, but carvone was detected as a main compound in the shoots cultured on phytohormone-free MS solid medium under 16h/day light for 6 weeks. In contrast menthol was not detected by GC-MS analysis in the shoot culture.

M. piperita shoots cultured on phytohormone-free MS solid medium in the dark for 6 weeks produced only carvone.

M. piperita plantlets obtained by culturing *in vitro* for 3 weeks were transplanted to soil, and essential oil was examined. Carvone was detected as a main compound during cultivation period (until 7 weeks after transplantation), while production of menthol started at week 3 after the transplantation.

Rosmarinic acid (RA), caffeic acid derivative, was detected in *M. piperita* shoots cultured on MS solid medium under 16h/day light and in the dark, but other polyphenols such as lithospermic acid and lithospermic acid B were not detected by HPLC analysis. Potted plants, regenerated from shoot cultures, accumulated RA *(ca.* 4%) at a relatively high level as a main compound after 7 weeks of cultivation.

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