

Productivity and quality of volatile oil extracted from *Mentha spicata* and *M. arvensis* var. *piperascens* grown by a hydroponic system using the deep flow technique

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Abstract:

The purpose of this study was to determine the differences between spearmint (*Mentha spicata* L.) and Japanese mint (*M. arvensis* L. var. *piperascens* Malinv.) cultivated in either soil or nutrient solution using the deep flow technique (DFT). The differences were measured in terms of harvest period (full bloom period) and quantity and chemical components of volatile oils. The spearmint and Japanese mint were cultivated in four different nutrient formulas: plant standard nutrient, plant standard nutrient with an amino acid mixture, plant standard nutrient with a sulphur compound, and a combination of plant standard nutrient with an amino acid mixture and a sulphur compound. We observed that cultivation of spearmint and Japanese mint in nutrient solution using DFT is an effective method to provide high production of volatile oil, since it results in an earlier harvest period and higher quantity of volatile oil. We determined that for spearmint an amino acid mixture is an appropriate nutrient supplement to enhance production of volatile oil with optimum carvone content. Finally, we observed high menthol content in Japanese mint grown in all four nutrient formulas; however, supplementation with a combination of sulphur fertilisation and amino acid mixture yields the highest quantity of volatile oil.

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