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Obtaining the Wild bergamot essential oil with high content of thymoquinone

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Abstract

Background: The Wild bergamot (*Monarda fistulosa* L.) is mentioned among plants with high content of thymol and carvacrol in the composition of essential oil. At the same time, it also produces significant amounts of thymoquinone – a substance with antimycotic, anticancerous and antituberculous activity. The objective of this study was to evaluate the factors which affect the thymoquinone formation during the processing of plant material, and to create a technological procedure for obtaining the Wild bergamot essential oil with maximum content of this active compound.
Material and methods: Aerial parts of the Wild bergamot have been harvested in the budding-flowering phase from the collection of the Scientific Centre for Medicinal Plants Cultivation of *Nicolae Testemitanu* State Uiversity of Medicine and Pharmacy. Essential oil isolation has been performed by hydrodistillation. Analysis of plant material and the obtained samples of essential oil have been performed by high performance liquid chromatography method with diode-array UV detection.
Results: The content of thymoquinone increases considerably during the process of fermentation of humidified plant material in the air stream prior to the essential oil distillation. Additionally, the content of thymoquinone in the essential oil can be increased by performing the distillation with a mixture of steam and air.
Conclusions: A technological procedure was created, which allowed obtaining the Wild bergamot essential oil, that contains 20-32% of thymoquinone and 23-32% of thymol and carvacrol, with a yield of 12.5-14.5 g from 1 kg of dried plant material.
Key words: *Monarda fistulosa* L., essential oil, thymoquinone, hydrodistillation.

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