



***In vitro* antioxidant activity of essential oil of *Mentha piperita* L. leaves grown under hydric stress.**

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Keywords: *Mentha*, moisture levels, total antioxidant activity, chelating power.

Water deficit is a strategy to increase phytochemicals in plants, however to avoid the negative effects of excessive ROS production, such as cell damage and death, this must be carefully managed (1). The aim of this study was to compare the influence of different levels of soil moisture in antioxidant activity of the essential oil of *Mentha piperita* L. Plants were grown in 5 L pots filled with 4 kg of soil and cattle manure mixture 3:1. In the first 30 days plants were irrigated by drip at 100 % of field capacity (FC) every 72 h. FC was determined by gravimetric method after 72 h draining. Irrigation system design consisted of four levels of moisture: (T1) 100 % FC; (T2) 80 % FC; (T3) 60 % FC; (T4) 40 % FC. Experimental design was laid out in randomized block with 4 treatments in 5 blocks with 5 pots containing 1 plant/pot. After 70 days, leaves were harvest and oven dried at 40 ± 2 °C. The essential oil obtained by the leaves hydrodistillation was analyzed by GC and GC/MS techniques and evaluated on its antioxidant capacity. Total antioxidant capacity was measured based on the reduction of ammonium molybdate method described by (2). Degree of chelating ferrous ions by samples was evaluated according to the method described by (3) and DPPH free radical scavenging activity was accomplished by (4). Data were analyzed by one-way analysis of variation (ANOVA), and differences among treatments were determined by a comparison of means using Tukey's test (p < 0.05). There was statistical difference in the menthol content between soil moisture levels. The lowest value was observed with 40 % of field capacity (25.98 %), the other treatments showed an average of 29.11 %. Menthone and menthofuran did not differ statistically among treatments. However, highest limonene content was observed in plants grown in 40 % of FC. Plants grown in 60 % and 40 % of the FC had higher total antioxidant activity. Total antioxidant activity in this treatment increased about 55 % compared to control (100 % FC). DPPH free radical scavenging activity had no significant differences between treatments, but low values of IC₅₀ (3.32 to 4.73 mg mL⁻¹) denoted high activity. The essential oil extracted from plants grown in 80 % of FC showed the highest power of chelating iron ions (IC₅₀ = 0.18 mg mL⁻¹). The results of this study suggest that hydric stress has effect on menthol and limonene content in the peppermint essential oil, which influenced total antioxidant activity and chelating power.

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Acknowledgements: FAPEMIG, CNPq, CAPES.