Determination of Total Phenolics Contents, Antioxidant Capacity of *Thymus vulgaris* Extracts using Electrochemical and Spectrophotometric methods

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The present study aims to investigate the antioxidant activity of *Thymus vulgaris* extracts evaluated by DPPH, ABTS, chelating activity on ferrous ions tests, and evaluation of antioxidant capacity by electrochemical techniques (Cyclic Voltammetry Techniques CVT). Total polyphenols and flavonoids contents were quantified by spectrophotometric using Folin-Ciocalteu and FeCl₃ reagents, respectively. The results showed that the total polyphenols contents and flavonoids contents were in the order MetE > EAE > ChE > BoIE > AqE > PEE. The DPPH activity showed that IC₅₀ values were ordered as follows: MetE (8.49 ± 0.02 µg/ml), BoIE (16.98 ± 0.05 µg/ml), EAE (21.61 ± 0.22 µg/ml), ChE (26.01 ± 0.08 µg/ml), AqE (42.21 ± 0.68 µg/ml and PEE (149.1 ± 0.52 µg/ml). The ABTS⁺ assay revealed an important antioxidant activity of the extracts. The capacity of the metal chelating of MetE = 17 ± 2 µg/ml, EAE = 124 ± 1 µg/ml, ChE = 142 ± 1 µg/ml, BoIE = 185 ± 1 µg/ml, AqE = 250 ± 4 µg/ml and PEE = 527 ± 1 µg/ml. Antioxidant activity measured by cyclic voltammetry method present important activity were in the order MetE > EAE > ChE > BoIE > AqE > PEE. All methods showed a correlation between antioxidant activity and phenolics and/or flavonoids content. Finally these results clearly show that *Thymus vulgaris* possesses important antioxidant activity and can serve as potential source of bioactive healthy compounds that consumption could be useful in the prevention and/or treatment of diseases where reactive oxygen species and free radicals are involved.

Keywords: Cyclic voltammetry techniques, spectrophotometric methods, polyphenols, *Thymus vulgaris*, antioxidant capacity.

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