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PHENOLIC COMPOUNDS IN DECOCTION, INFUSION AND HYDROALCOHOLIC EXTRACT OF CULTIVATED THYME (*THYMUS VULGARIS* L.) WITH BIOACTIVE PROPERTIES

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The use of medicinal plants as prevention or treatment of various conditions has, recently, sparked an increasing interest for scientific researchers that have been studying their biological properties [1]. *Thymus vulgaris* L. can provide a wide source of biomolecules, such phenolic compounds that have been referred to as antioxidants [2] and antimicrobials [3]. Several studies report chemical composition and antioxidant properties of thyme, but mostly of essential oils [4,5].

In the present work, the bioactive properties of decoction, infusion and hydroalcoholic extracts of cultivated thyme were evaluated, and further characterized in terms of phenolic composition. The antioxidant activity was assessed by four *in vitro* assays: reducing power, free radicals scavenging activity, beta-carotene bleaching inhibition and lipid peroxidation inhibition in brain cell homogenates. Antimicrobial activity was assessed against gram-positive (*Staphylococcus aureus* and *Staphylococcus epidermidis*) and gram-negative (*Escherichia coli*, *Klebsiella* spp., *Pseudomonas aeruginosa*, *Enterococcus aerogenes*, *Proteus vulgaris* and *Enterobacter sakazakii*) bacteria was also evaluated. Phenolic compounds characterization was performed by HPLC–DAD–ESI/MS.

The decoction showed the highest concentration in phenolic compounds (either phenolic acids or flavonoids), followed by infusion and hydroalcoholic extract. In general, the samples were effective against gram-positive and gram-negative bacteria, although decoction presented the most pronounced effect. This sample also gave the highest radical scavenging activity and reducing power. Rosmarinic acid (in all the preparations), luteolin 7-O-glucoside (in the hydroalcoholic extract) and luteolin 7-O-glucuronide (in the infusion and decoction) were the main phenolic acid and flavonoid, respectively. The results obtained support the idea that compounds with strong antioxidant and antibacterial activities are also water-soluble. Furthermore, the use of infusion and decoction of thyme, by both internal and external use, at recommended doses, is safe and no adverse reactions have been described.

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