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Evaluation of the antioxidant and antibacterial activity of spearmint (*Mentha spicata* L.)

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Aromatic herbs and spices have been used for centuries in gastronomy for seasoning and flavouring purposes. Additionally, several of these herbs are also used in traditional medicine due to their composition in bioactive compounds. In order to control the microbial growth in foods, the food industry often resorts to the use of additives, namely of authorised preservatives. However, recently there has been a growing interest towards the use of alternatives, namely natural additives and extracts from plants, that would allow preventing foodborne diseases and promoting the extension of the shelf life of foods [1]. Due to its potential activity against foodborne pathogens and foodspoilage bacteria and its better acceptability by consumers who are increasingly demanding for more “natural” foods, the use of essential oils can be an interesting alternative to substitute, at least partially, synthetic preservatives [2]. Different types of mints are included among the most widespread perennial aromatic herbs, with different species being also used in folk medicine. Among those, *Mentha spicata* L., commonly called spearmint or garden mint, is widely used in as a flavouring agent in foods, in particular in the European cuisine. This plant is also frequently used in infusions and in folk mainly for its digestive, carminative, antispasmodic and diuretic properties [3].

In this work, the total content of phenolic compounds and of flavonoids, reducing power and antioxidant activity (in vitro measurement of 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging capacity) of spearmint (*Mentha spicata*) methanolic extracts were evaluated using spectrophotometric techniques. Additionally, the antibacterial activity of the essential oil extracted from the plant by hydrodistillation using a Clevenger apparatus, was also evaluated by the agar-diffusion method against different Gram-positive bacteria (*Bacillus cereus*, *Staphylococcus aureus*) and Gram-negative bacteria (*Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa*).

Preliminary results of this study suggest that the inclusion of spearmint as a seasoning/flavouring agent in different dishes or consumed in the form of infusion can offer health benefits due to their antioxidant capacity. Additionally, the essential oil from *Mentha spicata* showed a significant inhibitory capacity against all studied Gram-positive and Gram-negative bacteria, with the exception of *Pseudomonas aeruginosa*, which showed to be resistant. Compared to the antibiotics used as a positive control, for some bacteria, higher inhibition halos were obtained for the essential oil. Therefore, the use of spearmint as a condiment in gastronomy may be beneficial from the point of view of food safety and food shelf-life improvement.

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