



## INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

### **Analysis of Phenolic Compounds, Methylxanthins and Antioxidant Activity of Erva-Mate (*Ilex paraguariensis* A. St. Hil.) Residue: a New Potential Source of Antioxidants**

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#### **Abstract**

The erva-mate (*Ilex paraguariensis* A. St. Hil.) is a plant found in Brazil, Paraguay and Argentina, countries with the only producer worldwide occurrence, which holds significant social and economic importance. Due to the beneficial effects of erva-mate, its consumption is not confined only to producing countries. Among these tasks is their antioxidant properties, which can contribute to protection against oxidative processes in the human body, among these tasks is their, such as phenolic compounds and tannins the chemical compounds responsible for this effect and stimulant properties attributed to its contents of methylxanthins, such as caffeine. The aims of this research were to evaluate the phenolic, methylxanthinic and tannin composition of erva-mate residue (mate powder), to compare the quali/quantitative phenolic composition of extracts obtained from distinct solvent systems and the antioxidant potential of those extracts. Among the extracts prepared with different solvents, the 80% methanol extract showed the highest total polyphenol content (11.51 g/100g) followed by methanol acid, ethanol acid, 80% ethanol, distilled water and water acid. To compare the results of the TPC and antioxidant activity of the extracts is possible to observe that the higher phenolic content of the extracts resulted in increased antioxidant capacity in DPPH<sup>•</sup> e ABTS<sup>•+</sup> methods. HPLC analysis showed 4,5 dicaffeoylquinic acid as the highest component of the phenolic fraction of mate powder followed by chlorogenic acid. The caffeine, teobromina and tannin contents in mate powder were 1.01, 0.10 and 0.29 g/100g respectively. According to the results, this residue can be used as an ingredient in the formulation of functional foods adding value to the waste generated during processing of the erva-mate. Consumption of mate powder would significantly contribute to the antioxidant and stimulants intake, providing high amounts of phenolic acids, tannin and methylxanthins with potentially beneficial biological effects for human health.

*Keywords:* *Ilex paraguariensis*; residues; mate powder; phenolic acid; antioxidant capacity; methylxanthins; tannin

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