Yerba Mate (*Ilex paraguariensis*) a Potential Food Antibacterial Agent and Combination Assays with different classes of Antibiotics

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Yerba Mate, *Ilex paraguariensis*, is used in the preparation of infusions in South America and in some areas within the Middle East. In the present work, the antibacterial activity of the aqueous extract of commercial leaves of Mate were tested against Gram negative and Gram-negative bacteria. Antibacterial activity was observed against all tested strains, with a greater activity against Gram-positive bacteria.

Further studies were performed on reference strains and clinical isolates of *Staphylococcus aureus*. The MIC of the aqueous extract ranged between 1.25 and 2.5 mg/ml. Checkerboard synergy tests were done to study the synergism/antagonism between Yerba Mate and different antibiotics. Mate extract showed no synergy with Cefotaxime and Ciprofloxacin for most of the tested strains, with a few showing an additive effect. Gentamicin showed antagonism with a number of strains; as for Clarithromicin, almost all the strains showed an additive effect between the Mate extract and the antibiotic. A more in-depth analysis to identify the active molecule responsible for this activity is important for a better understanding of the potential role of Yerba Mate in developing new antibacterial agents and in elucidating its interactions with antimicrobial agents used in the clinical setting.