

**TITLE:** Antibiotic activity and antibiofilm of *Lippia grata* in strains of *Pseudomonas aeruginosa* and cytotoxicity in AGS cells

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#### **ABSTRACT:**

Motivated by the search for new therapeutic strategies and considering the increasing bacterial resistance, this work had as objective to evaluate the antibacterial activity and antibiofilm of the extract and essential oil of *Lippia grata* against clinical isolates of *Pseudomonas aeruginosa*. The antibacterial activity of the extract and essential oil was evaluated by the microdilution technique in broth, in which the MIC's were determined using 2,3,5-triphenyltetrazolium chloride as a bacterial metabolism developer and the MBC's by means of growth analysis of the content of the few in Mueller-Hinton agar. The antibiofilm activity of the plant extract of *L. grata* was evaluated in the 25 isolates of *P. aeruginosa* that had a strong or moderate biofilm production. The *L. grata* extract showed antimicrobial activity in 100% of the isolates tested at 50 mg/mL (MIC90 and MBC90). The concentration of 25 mg/mL (MIC50) showed inhibitory activity in 56.8% of the isolates and bactericidal activity in 43.1% of the isolates. The essential oil of *L. grata* presented antimicrobial activity in 100% of the tested isolates in the concentrations between 50 mg/mL and 6,25 mg/mL (MIC90). Concentrations of 3.12 mg/mL (MIC50) and 1.56 mg/mL showed inhibitory activity in 70.4% and 27.2% of the isolates, respectively. Regarding biofilm production, 18 (40.9%) isolates were classified as poor biofilm producers, 18 (40.9%) as moderate producers, 7 (15.9%) as strong producers and only 1 (2.2%) did not produce biofilm. The 25 isolates with moderate or strong biofilm production treated with the *L. grata* plant extract presented reduction in the formation and consolidated biofilm. The AGS line, derived from gastric cancer, after 24h of exposure showed cytotoxic activity of the essential oil inducing cell death in 31.7%, 87.7%, 86.8% and 90.5%, at the concentrations of 250, 500, 750 and 1000 µg/mL, respectively. When exposed to the hydroalcoholic extract, they had cell death in 31.5%, 64.8% and 67.5% (500, 750 and 1000 µg/mL, respectively). These results reveal a sample concentration ratio (oil or extract) directly proportional to cytotoxicity, beyond suggesting its selective cytotoxicity to cells malignant. It is concluded with these results that *L. grata* presented antimicrobial activity, being configured as a promising alternative to combat, particularly, *P. aeruginosa*.

**KEYWORDS:** Biofilm; Cytotoxic activity; Medicinal plants; Products with Antimicrobial Action, *Pseudomonas aeruginosa*.

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