

OP11. Inhibitory effects of *Ocimum basilicum* and *Salvia officinalis* essential oils on virulence factors of *Pseudomonas aeruginosa* clinical isolates

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Pseudomonas aeruginosa is a Gram-negative human opportunistic pathogen, responsible for a variety of human health disorders. The virulence of each *P. aeruginosa* strain is strongly related to its capability of biofilm formation, different types of motility, production of toxins and pigments. Essential oils of basil and sage have a wide range of applications in the traditional and/or official medicine. The aim of the present study was to evaluate the activity of basil (*Ocimum basilicum*) and sage (*Salvia officinalis*) commercially available essential oils on *P. aeruginosa* virulence factors (post-adherence biofilm production, resistance of a mature biofilm, motility and production of pyocyanin). Antipseudomonal efficacy was studied using the microdilution method and the obtained minimal inhibitory concentrations (MICs) were further used to explore the anti-virulence potential. The experiments were performed against a panel of *P. aeruginosa* clinical isolates of different origin at 1/2 x MIC, MIC, and 2 x MIC concentrations.

The two essential oils were chemically characterized by GC and GS/MS analyses, where linalool and (*E*)-anethole were found to be the dominant compounds in the basil oil sample, while α -thujone and camphor were the major constituents of the sage essential oil sample. The biofilm experiments demonstrated a very high activity of both oils to biofilm production, where basil oil showed a higher efficiency by inhibiting up to 92.7% of the biofilm produced by the control, while sage oil exhibited a reduction of 9.8 to 76.8%. Promising results were also obtained when the oils were applied to mature biofilms, where reductions of 2.4-84.1% and 13.8-75.8% were measured for basil and sage oils, respectively. The results on motility evaluation showed that, in the presence of both oils, swimming, swarming and twitching motility patterns were significantly affected. Experiments on the pyocyanin production showed a reduction from 20.7-60.9% and 5.0-60.5% caused by the basil and sage oils, respectively.

Considering all the obtained results, it can be concluded that both basil and sage essential oils present highly efficient antipseudomonal agents which could be used against infections caused by this pathogen.

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