

# Assessment of the antipeudomonal activity of three essential oils using flow cytometry approach

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## Abstract

Beside its rapidity, flow cytometry is a very sensitive technique allowing both the detection of dead, metabolically active, viable and viable but no-cultivable cells. This approach was used, in this work, to estimate the antibacterial activity of essential oils (EO) from three aromatic herbs: *Mentha spicata* (MS), *Mentha pulegium*, and *Rosmarinus officinalis* against *Pseudomonas aeruginosa* ATCC 27853, which is an opportunist and food spoilage bacteria. The functional damages induced in *P. aeruginosa* treated with the three oils and incubated at 4 °C, 7 °C and 37°C was assessed and growth of tested strain was followed over time together with Suber green, Propidium iodide and ChemChrome V6. Irrespective of the culture conditions (the tested oil, its concentration, the time and the incubation temperature), significant reduction rate was observed compared with control, but there was generally no significant difference between the effects of all oils. In fact, after 10 h of incubation at 37°C, the total population in the treated inoculums with EO of *Mentha pulegium* at 0.4% concentration was 4 times lower than control preparation. At 7°C, metabolically active bacteria in the inoculums without treatment represented 25.65% on the 5<sup>th</sup> day, dropped to 12% on 10<sup>th</sup> day, then increase to the 37% on the 21<sup>st</sup> day. Whereas, the percentage of those treated was around 13, 10 and 15%, on the 5<sup>th</sup>, 10<sup>th</sup> and 21<sup>st</sup> day, respectively. We have noted that the incubation at 4 °C led to the stress of the cells with or without oils and the percentage of active cells was less or equal 8 % at the 21<sup>st</sup> day.

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