

## Stress Conditions Induced by Carvacrol and Cinnamaldehyde on *Acinetobacter baumannii*

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Résumé en anglais	<p><i>Acinetobacter baumannii</i> has emerged as a major cause of nosocomial infections. The ability of <i>A. baumannii</i> to display various resistance mechanisms against antibiotics has transformed it into a successful nosocomial pathogen. The limited number of antibiotics in development and the disengagement of the pharmaceutical industry have prompted the development of innovative strategies. One of these strategies is the use of essential oils, especially aromatic compounds that are potent antibacterial molecules. Among them, the combination of carvacrol and cinnamaldehyde has already demonstrated antibacterial efficacy against <i>A. baumannii</i>. The aim of this study was to determine the biological effects of these two compounds in <i>A. baumannii</i>, describing their effect on the rRNA and gene regulation under environmental stress conditions. Results demonstrated rRNA degradation by the carvacrol/cinnamaldehyde mixture, and this effect was due to carvacrol. Degradation was conserved after encapsulation of the mixture in lipid nanocapsules. Results showed an upregulation of the genes coding for heat shock proteins, such as groES, groEL, dnaK, clpB, and the catalase katE, after exposure to carvacrol/cinnamaldehyde mixture. The catalase was upregulated after carvacrol exposure which is related to an oxidative stress. The combination of thiourea (hydroxyl radical scavenger) and carvacrol demonstrated a potent bactericidal effect. These results underline the development of defense strategies of the bacteria by synthesis of reactive oxygen species in response to environmental stress conditions, such as carvacrol.</p>
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