Antibacterial activity of the plant-derived compounds 23-methyl-6- O -desmethylauricepyrone and (Z, Z)-5-(trideca-4,7-dienyl)resorcinol and their synergy with antibiotics against methicillin-susceptible and -resistant Staphylococcus aureus

Joray, Mariana Belén, Gonzalez, María Laura, Palacios, Sara María and Carpinella, María Cecilia (2011) *Antibacterial activity of the plant-derived compounds 23-methyl-6- O -desmethylauricepyrone and (Z, Z)-5-(trideca-4,7-dienyl)resorcinol and their synergy with antibiotics against methicillin-susceptible and -resistant Staphylococcus aureus.* Journal of Agricultural and Food Chemistry, 59 (21). pp. 11534-11542. ISSN 0021-8561

Resumen

The present study investigated the antibacterial activity of two plant-derived compounds, 23-methyl-6-O-desmethylauricepyrone (1) and (Z,Z)-5-(trideca-4,7-dienyl)resorcinol (2), and their synergistic effects with erythromycin and gentamicin against methicillin-susceptible (MSSA) and gentamicin- and methicillin-resistant Staphylococcus aureus (MRSA). Studies of the individual antibacterial activity of each plant-derived compound and synergy experiments were carried out, by the microdilution test in agar and by the checkerboard method, respectively. Compound 1 showed minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) values of 2 and 8 µg/mL, respectively, against both strains of S. aureus, while compound 2 exhibited anti-MSSA and anti-MRSA activity with MICs and MBCs of 4 and 8 and 2 and 8 µg/mL, respectively. Time-kill curves showed that, while compound 1 produced complete killing of both strains at 24 h from the beginning of the experiment, 2 produced the same effect in the first hour. Combinations of 1 with erythromycin or gentamicin showed a notable synergism against MSSA, which enabled the antibiotic concentration to decrease by up to 300 or 260 times, respectively. When the aminoglycoside was placed together with compound 2, only an additive effect was observed. The assayed compounds did not produce erythrocyte hemolysis or genotoxicity and they did not affect macrophage viability at the effective or higher concentrations. These results suggest that both compounds could be considered as promising antibacterial agents while compound 1 could be used in combinatory therapies with erythromycin and gentamicin.

TIPO DE DOCUMENTO: Artículo

DOI: https://doi.org/10.1021/jf2030665

PALABRAS CLAVE: (Z,Z)-5-(trideca-4,7-dienyl)resorcinol. 23-methyl-6-O-desmethylauricepyrone. MRSA. MSSA. Synergy.

TEMAS: Q Ciencia > QD Química

UNIDAD ACADÉMICA: Universidad Católica de Córdoba > Facultad de Ciencias Químicas