

Enzymatic production of lauroyl and stearoyl monoesters of D-xylose, L-arabinose, and D-glucose as potential lignocellulosic-derived products, and their evaluation as antimicrobial agents

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Supplementary data

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1. ^1H NMR spectra of fatty acid esters of monosaccharides

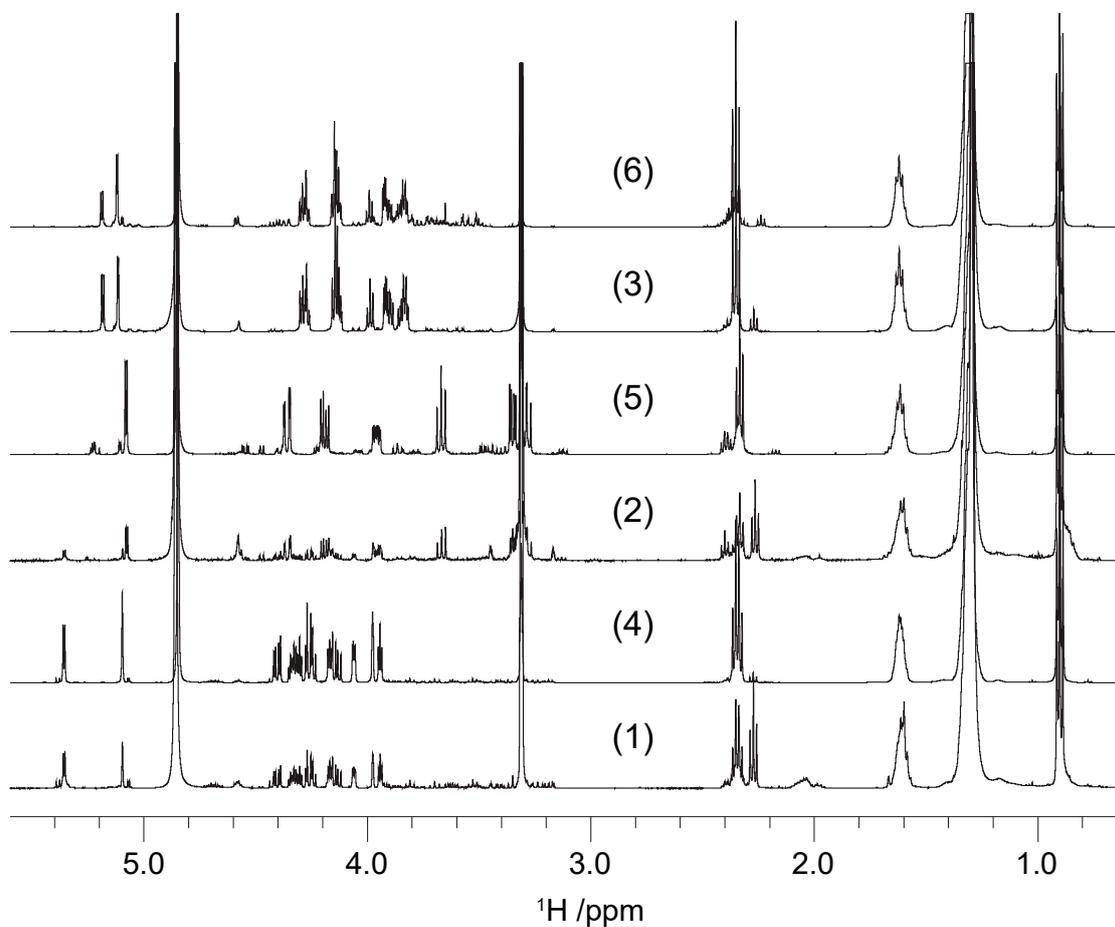


Figure S1. ^1H -NMR spectra (500 MHz, 298 K, MeOD-d_4) of compounds **1-6**.

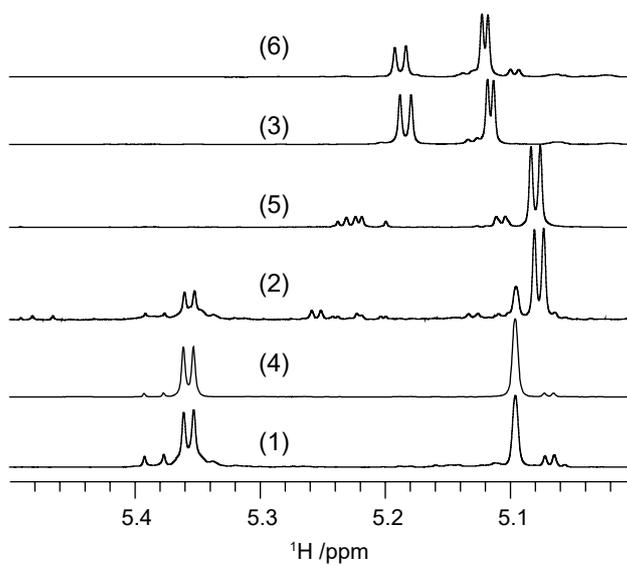


Figure S2. Selected region of the ^1H -NMR spectra (500 MHz, 298 K, MeOD-d_4) of compounds **1-6** showing the major anomeric resonances.

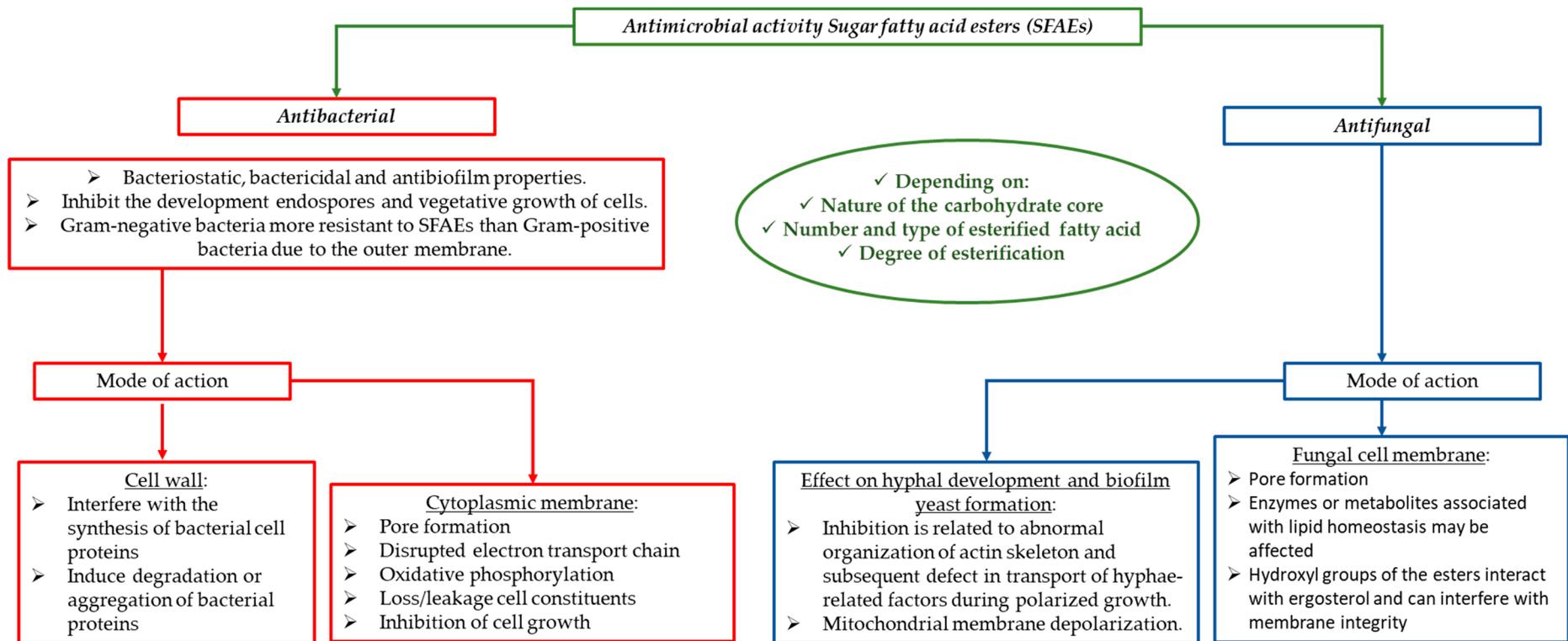


Figure S3. Modes of action of antimicrobial activity of sugar fatty acid esters [1–11].

Table S1. Zones of inhibition of lauroyl and stearyl monoesters of sugars reported in the literature since 2018. Results of antimicrobial activity against the microorganisms tested in our study.

Compound	Method	Concentration	<i>S. aureus</i>	<i>B. subtilis</i>	<i>E. coli</i>	<i>P. aeruginosa</i>	<i>C. albicans</i>
Mannose monolaurate [13]	agar disk-diffusion	100 µg/disc	-	8.54	2.41	-	-
Glucose monolaurate [14]	agar well-diffusion	6.25 µg/well	12	10.6	8	-	14.3
Fructose monolaurate [14]	agar well-diffusion	6.25 µg/well	19.2	13.7	8	-	14.3
Galactose monolaurate [14]	agar well-diffusion	6.25 µg/well	16.2	10.6	8.2	-	15.0
Sucralose monostearate [7]	agar disk-diffusion	20 µmol/disc	0	-	0	0	-
Trehalose monolaurate [12]	agar well-diffusion	50 mM/well	nd	nd	nd	15	nd

nd: no activity detected.

Table S2. Minimum inhibitory concentration of lauroyl and esteroyl monoesters of sugars reported in the literature since 2018. Results of antimicrobial activity against the microorganisms tested in our study.

Compound	MIC (µg/mL)				
	<i>S. aureus</i>	<i>E. coli</i>	<i>P. aeruginosa</i>	<i>B. cereus</i>	<i>C. albicans</i>
Sucrose monostearate [15]	64	512	-	-	-
Sucrose monolaurate [15]	128	128	-	-	-
Lactose monolaurate [2]	>512	>512	>512	<1000	256
Lactose monolaurate [2]	nd	nd	nd	nd	-
Mannose monolaurate [9]	128	>256	-	-	256

nd: no activity detected.

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