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Plasmid conjugation in E. coli field isolates exposed to biocides

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Low concentrations of antimicrobials are known to increase the conjugation frequency (CF) of *E. coli*, facilitating the spread of antimicrobial resistance, while the impact of biocides on plasmid conjugation is still unclear. CFs were analyzed for suitable donor-recipient combinations of *E. coli* from livestock, food and human sources using liquid mating and subsequent enumeration of recipients and transconjugants on selective agar plates. Subinhibitory concentrations of benzalkonium chloride, chlorhexidine digluconate, octenidine dihydrochloride and glutaraldehyde were added to the mating mix and CFs were determined with and without biocide supplementation. In the mating experiments, we included two ampicillin resistant donor strains (carrying IncFII or IncN plasmids) and four recipients (carrying IncFI or p0111 or no plasmids). Chromosomally encoded tetracycline (n=3) or ciprofloxacin (n=1) resistance served as selective markers for the latter. Overall, CF mean ranged between 6.5x10-6 and 1.2x10-3. Our findings emphasize the presence of considerable strain-specific variation and show that the exposure to biocides can influence the CF in *E. coli*. These results call for further investigation to better understand the impact of biocide exposure on the spread of antimicrobial resistance among bacterial populations.

Keywords

antimicrobial resistance, biocide, E. coli, plasmid

Registration-ID code

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Professional Status of the Speaker

PhD Student

Junior Scientist Status

Yes, I am a Junior Scientist.

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