

## CHARACTERIZATION OF RESISTANCE PLASMIDS AND EFFECT OF SILVER NANOPARTICLES AND ESSENTIAL OILS ON THEIR MOBILITY

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Antibiotic resistance is a serious global public health concern. The dissemination of antibiotic resistance genes is largely mediated by plasmids, among which conjugative plasmids represent the main mechanism contributing to the emergence of resistant strains. This study aims to characterize extended-spectrum  $\beta$ -lactamase (ESBL)-encoding conjugative plasmids in *Escherichia coli* and to evaluate the effect of silver nanoparticles (AgNPs) and essential oils (EOs) on their mobility. 19 *E. coli* isolates were analyzed: 9 of clinical origin (EcoC) and 10 of food origin (EcoQ). The 19 bacteria were confirmed as *E. coli*, and ESBL production were determined at the phenotypic level by double disc assays and genotypic level by PCR. Plasmid profiles and mobility were assessed by conjugation. Transconjugants were analyzed for plasmid acquisition, associated antibiotic resistance, and ESBL production. Based on the results obtained to date, we found that the 19 *E. coli* isolates grew on LB agar supplemented with cefotaxime (Ctx 4  $\mu$ g/mL), suggesting that they are ESBL producers. PCR amplification of the *lacY*, *cydA*, *uidA*, and *lacZ* genes confirmed their identity as *E. coli*. Regarding ESBL production, all isolates were found to be positive, and the *bla*<sub>CTX-M</sub> gene was amplified by PCR in all 19 strains. Plasmid profiling revealed that all isolates carried between 1-7 plasmids, ranging from ~1.4 kb to >100 kb in size; all isolates harbored at least one plasmid larger than 50 kb. 16 of the 19 *E. coli* strains successfully transferred ESBL-encoding plasmids via conjugation. All transconjugants exhibited Ctx resistance and tested positive for *bla*<sub>CTX-M</sub> amplification. Plasmid transfer conferred resistance to  $\beta$ -lactams, ciprofloxacin, gentamicin, tetracycline, and trimethoprim-sulfamethoxazole. Ongoing experiments aim to further characterize in more detail the conjugative plasmids molecularly and to evaluate the impact of AgNPs and EOs on their transferability. Collectively, the data to date indicate that ESBL-producing *E. coli* carry conjugative plasmids responsible for the dissemination of resistance to multiple antibiotics.