

Comparative Analysis of ESBL-Carrying Plasmids from *Escherichia coli*, *Klebsiella pneumoniae* and *Salmonella enterica* Strains Isolated from Poultry, Pigs and Humans

A. SMET^{1,2}, A. MARTEL¹, D. PERSOONS¹, J. DEWULF¹, M. HEYNDRICKX³, A. CLOECKAERT⁴, K. PRAUD⁴, L. HERMAN³, F. HAESEBROUCK¹, AND P. BUTAYE^{1,2}

Faculty of Veterinary Medicine, Ghent University, Merelbeke, Belgium¹

CODA, Brussels, Belgium²

Unit Technology and Food, Melle, Belgium³

Institute National de la Recherche Agronomique, Nouzilly, France⁴

Background: Cephalosporin resistance is emerging in animal and human bacteria in Belgium. Cephalosporin resistant microbiota of food-producing animals may represent a reservoir of resistance genes for pathogens of humans and animals. In this study the location of three extended-spectrum β -lactamases (ESBLs), *bla*_{TEM-52}, *bla*_{CTX-M-2} and *bla*_{CTX-M-15}, present in different members of *Enterobacteriaceae* isolated from humans, broilers and pigs were studied.

Methods: Thirteen isolates were investigated based on their origin. Conjugation experiments were carried out with *E. coli* J5, resistant to rifampicin, as the recipient strain. Transconjugants were selected on MacConkey agar plates supplemented with ceftiofur (8 mg/liter) and rifampicin (250 mg/liter). After Plasmid DNA purification, size and incompatibility (inc) group of each plasmid was defined. Restriction fragment length polymorphisms with EcoRI on plasmid DNA was carried out. Southern blotting with probes *bla*_{TEM} and *bla*_{CTX-M} was performed.

Results: Plasmid analysis revealed a ~ 150 kb ESBL-carrying plasmid for all isolates, except for one *Salmonella* Infantis strain (*bla*_{TEM-52} ~ 100kb). The *bla*_{CTX-M-2}, *bla*_{TEM-52}, and *bla*_{CTX-M-15}-carrying plasmids belonged to IncHI2, IncI1 and IncI1, respectively. Within the *bla*_{CTX-M-2} or *bla*_{CTX-M-15}-carrying plasmids, only the plasmids of *E. coli* from human origin gave a different fingerprint. Small differences in fingerprints indicated that the *bla*_{TEM-52} gene occurred on different but related plasmids.

Conclusion: These results may indicate that bacteria share a common gene pool. Further studies are needed to better understand the link between these related plasmids.

Corresponding author: Annemieke.Smet@Ugent.be