IncI1 ST3 and IncI1 ST7 plasmids from CTX-M-1-producing Escherichia coli obtained from patients with bloodstream infections are closely related to plasmids from E. coli of animal origin

IncI1 ST3 and IncI1 ST7 plasmids from CTX-M-1-producing Escherichia coli obtained from patients with bloodstream infections are closely related to plasmids from E. coli of animal origin

Fully sequenced IncI1 plasmids obtained from CTX-M-1-producing Escherichia coli of human and animal origin were compared. Twelve E. coli isolates sharing identical ESBL genes and plasmid multilocus STs sequenced on Illumina and MinION platforms were obtained from the Danish antimicrobial resistance surveillance programme, DANMAP. After de novo assembly, the sequences of plasmids harbouring bla<sub>CTX-M-1</sub> were manually curated and ORFs annotated. Within-group comparisons were performed separately for the IncI1 ST3 plasmid type and the IncI1 ST7 plasmid type. The IncI1 ST3 plasmid group was obtained from 10 E. coli isolates (2 from patients with bloodstream infections, 6 from food and 2 from animals). The IncI1 ST7 plasmids originated from E. coli isolates obtained from a patient with bloodstream infection and from a pig. Sequences of IncI1 ST3 and IncI1 ST7 plasmids harbouring bla<sub>CTX-M-1</sub> with determined origin were retrieved from GenBank and used for comparison within the respective group. The 10 IncI1 ST3 bla<sub>CTX-M-1</sub> plasmids were highly similar in structure and organization with only minor plasmid rearrangements and differences in the variable region. The IncI1 ST7 bla<sub>CTX-M-1</sub> plasmids also showed high similarity in structure and organization. The high level of similarity was also observed when including plasmids from E. coli of animal origin from Australia, Switzerland, the Netherlands and France. This study shows broad spread of a very successful CTX-M-1-producing IncI1 type plasmid among E. coli of both human and animal origin.

General information
Publication status: Published
Organisations: National Food Institute, Research group for Genomic Epidemiology, Group for Epidemiological Risk Assessment, Technical University of Denmark, Statens Serum Institut
Corresponding author: Hammerum, A. M.
Pages: 2171-2175
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Journal of Antimicrobial Chemotherapy
Volume: 74
Issue number: 8
ISSN (Print): 0305-7453
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
Original language: English
DOIs: 10.1093/jac/dkz199
Source: FindIt
Source ID: 2447440006
Research output: Contribution to journal › Journal article – Annual report year: 2019 › Research › peer-review