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BOOK OF ABSTRACTS

11TH MEETING OF YOUNG RESEARCHERS
UNIVERSITY OF PORTO

- **14145 | Spread of arsenic tolerance genes among Salmonella enterica serotype 4,[5],12:i:- major European clone**

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Salmonella is a major foodborne zoonotic pathogen, with metals (copper-Cu/silver-Ag), currently used in the animal-production setting, possibly contributing to the emergence of multidrug-resistant (MDR) serotypes/clones, such as S. 4,[5],12:i:- (PMID-25816978). However, the selection of such bacteria by arsenic due to the environmental contamination by anthropogenic activities (e.g. use of coccidiostatics/pesticides or waste in farms) remains poorly explored. Our objective was to study the occurrence of arsenic tolerance (AsT) genes, their genetic location and tolerance phenotypes in major S. 4,[5],12:i:- clones from different sources.

We include 82 S. 4,[5],12:i:- isolates (Portugal: 2002-2015 and Austria: 2013-2014) recovered from humans (n=50), food (n=17), food-animal production (n=8), pets (n=3) and aquatic environment (n=4). They are representative of the major clones (PT-European/Spanish/Southern-European; AU-European) and present MDR (n=73/82-89%) profiles and Cu/Ag tolerance (n=67/82-82%). Screening of AsT genes, *arsB* and *acr3* (both coding for arsenical efflux pumps), was done by PCR/sequencing. MIC_{Na2HAsO4} were determined in aerobic and anaerobic atmospheres by agar dilution method. Genomic location of AsT was assessed by I-CeuI/S1-PFGE-hybridization.

A high occurrence of AsT genes (only *arsB*) was found in isolates from Portugal (36/63-57%) and Austria (18/19-95%), with all belonging to the emergent pig-associated S. 4,[5],12:i:- European clone. Isolates carrying *arsB* showed higher MIC_{Na2HAsO4} (MIC₅₀=>128mM) than those without these genes (MIC₅₀=1-2mM) in both aerobic/anaerobic conditions. The *arsB* was chromosomally located, together with Cu/Ag tolerance genes and antibiotic resistance genes.

The high occurrence of *arsB* genes conferring high MICs to Na₂HAsO₄, among MDR S. 4,[5],12:i:- European clone suggests that AsT, along with tolerance to other metals, might have contributed to their successful expansion, particularly in food-animal farm environments.