

Antimicrobial susceptibility of *S. aureus* strains isolated from a ham plant in France.

Granier, S. A.*, De Buyser, M.-L., Dorwling-Carter, M., Kerouanton, A., Brisabois, A.

Bacterial Characterization and Epidemiology Unit, AFSSA-Lerqap, 23 avenue du General de Gaulle, 94706 Maisons-Alfort Cedex, France.

* corresponding author : s.granier@afssa.fr

Abstract

As MRSA (methicillin resistant *Staphylococcus aureus*) were recently isolated from pigs in the Netherlands (1), we were incited to evaluate the resistance gene circulation inside *S. aureus* strains isolated from swine food products.

A study, build in 2002, established the biodiversity of *S. aureus* isolates originated from a single raw ham industrial unit located in western France. Biotypes and pulsotypes from 106 isolates from raw material ham, end product and plant environment were determined. Isolates split up into 7 biotypes and about forty pulsotypes, which delineated a total of 23 sub-groups with 80% of homology and indicated the presence of numerous *S. aureus* strains in the plant.

Antimicrobial resistance phenotype was determined by the disk diffusion method for 40 strains representing 39 distinct pulsotypes.

Forty three percent of those strains presented no resistance at all to the 16 antimicrobials tested. Seventeen percent were resistant to at least two antibiotics. On the other hand, 12 strains were suspected to display a reduced susceptibility to glycopeptides and eight strains to be MRSA. The cross check of those suspected phenotypes is currently being performed as recommended by the Antibioqram Comity of the French Society for Microbiology.

Anyway, resistance rates observed in this study seem to be considerably lower than the one observed for human clinical *S. aureus* strains.

Introduction

As MRSA (methicillin resistant *Staphylococcus aureus*) were recently isolated from pigs in the Netherlands (1), we were incited to evaluate the resistance gene circulation inside *S. aureus* strains isolated from swine food products.

A study, build in 2002, established the biodiversity of *S. aureus* isolates originated from a single raw ham industrial unit located in western France. The strain collection constituted during this study was also studied for its antimicrobial resistance profiles.

Material and Methods

Bacterial identification and **Biotyping** has been performed as previously described (2).

Pulsed field electrophoresis has been performed as previously described (3).

Antimicrobial susceptibility tests have been performed by the disc diffusion method as recommended by the Antibioqram Comity of the French Society for Microbiology (<http://www.sfm.asso.fr/>). 16 antimicrobials have been tested : Penicilline G, Cefoxitin, Fosfomycin, Teicoplanine, Erythromycin, Lincomycin, Tetracyclin, Fusidic acid, Pristinamycin, Neomycin, Gentamicin, streptomycin, ciprofloxacin, Sulfamides, Cotrimoxazole, Rifampicin.

MRSA confirmation was performed, as recommended by the Antibioqram Comity of the French Society for Microbiology, by PCR detection of *mecA* gene as previously described Predari et al. (4)

GISA confirmation have been performed as recommended by the Antibioqram Comity of the French Society for Microbiology (<http://www.sfm.asso.fr/>), using MH agar plates containing 5µg/mL of Teicoplanine.

Results

Strain typing :

Biotypes and pulsotypes from 106 isolates from raw material ham, end product and plant environment were determined. Isolates split up into 7 biotypes and about forty pulsotypes, which delineated a total of 23 sub-groups with 80% of homology and indicated the presence of numerous *S. aureus* strains in the plant.

Antimicrobial resistance determination :

Forty three percent of those strains presented no resistance at all to the 16 antimicrobials tested. Seventeen percent were resistant to at least two antibiotics.

On the other hand, 12 strains were suspected to display a reduced susceptibility to glycopeptides and eight strains to be MRSA. After further investigations **no MRSA** have been detected. As a matter of fact, *mec A* gene has not been detected in any of the strains displaying a reduce diameter to cefoxitin. Gisa investigation is still in progress.

Conclusion and Discussion

Resistance rates observed in this study seems to be considerably lower than the one observed usually for human isolates.

In respect to the recent public health concern in the Netherlands, it is absolutely clear that a study in a unique plant is not enough to assess the low level of resistance observed.

The *S. aureus* strains associated to the swine channels should be now further investigated from the farm to the fork.

References

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