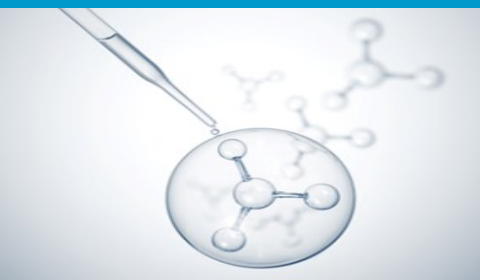


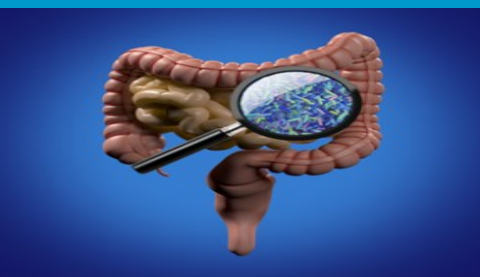
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THIRD INTERNATIONAL SYMPOSIUM ON NATURAL ANTIMICROBIALS:



Current status, challenges and perspectives



ANTIMIC 2022

3rd INTERNATIONAL SYMPOSIUM ON NATURAL ANTIMICROBIALS:
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ANTIMICROBIAL ACTIVITY OF COMMENSAL *STAPHYLOCOCCUS* SPP. ISOLATES FROM NASAL MICROBIOTA OF STORKS, PETS AND HUMANS

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Context, problematics, and objectives: Bacteriocins are antimicrobial proteinaceous substances secreted by some bacteria, to confer a selective advantage to the producer in terms of niche colonization ability. *Staphylococcus* is a genus widely distributed in the environment that frequently colonize the skin and mucous membranes of humans and animals and has also been described as bacteriocin producer. In this respect, the objective of this study was to analyze the antimicrobial-activity (AA) in a large collection of coagulase-positive and -negative staphylococci (CoPS and CoNS, respectively) isolates of different origins and to characterize the antimicrobial-producer (AP) isolates.

Methodology: AA was evaluated in 272 staphylococci, including 18 different species (CoNS, n=15 and CoPS, n=3) recovered from different origins (storks, n=213; humans, n=33; and dogs, n=26). All the isolates were tested for AA by the *spot-on-lawn* method against 14 indicator bacteria, including multi-drug-resistant bacteria and relevant pathogens. In the AP isolates, cell free supernatants (CFS) sterilized by filtration or boiling and concentrated (by a speed-vacuum or 1-butanol extraction) were obtained. Their AA were analyzed by *agar-diffusion-assay* against the 14 indicator bacteria. For an in deep study of the compounds responsible for the AA, the susceptibility to 5 proteolytic enzymes (trypsin, alpha-quimiotrypsin, protease, proteinase K and papain) of the concentrated extracts was analyzed against a methicillin-resistant *S. pseudintermedius* (MRSP) indicator bacteria.

Results and discussion: Seventeen (13 CoNS and 4 CoPS) isolates from dogs and storks of the 272 staphylococci tested (6.3%) showed AA by the *spot-on-lawn* method against at least one of the 14 indicators tested. Focusing on CFS, only 4 isolates showed AA after filtration and 3 after boiling (inhibiting from 7.1 to 42.8% of the indicator bacteria, in both cases). Moreover, speed-vacuum concentration (n=8 isolates) and 1-butanol extraction (n=13 isolates) revealed AA against the indicator bacteria from 7.1% to 64.3% ranges. Five out of the 17 AP isolates (*S. pseudintermedius*, *S. pasteurii*, *S. simulans* of dog origin; and *S. hominis* and *S. chromogenes* of stork) were relevant due to their intense AA against relevant indicator bacteria, including methicillin-resistant *S. aureus* and MRSP, among others. In two of them (1 *S. hominis* and 1 *S. pseudintemedius*), enzymatic treatment was performed, and the AA was lost verifying the protein nature of their antimicrobial compounds that will be further characterized.

Conclusion: Nasal staphylococci of storks and dogs, especially CoNS, produce bacteriocins that can be important in the modulations of their nasal microbiome.