

PHENOTYPIC CHARACTERIZATION OF STAPHYLOCOCCI ISOLATED FROM SMALL RUMINANTS

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Abstract

Staphylococcal infections are common in small ruminants and are represented by localized infections of the skin, hooves and mammary gland.

The pathological samples for bacteriological examination were taken from a total of 37 sheep and goats with different lesions and the primary inseminations were made on agar with 5% sheep defibrinated blood. Biochemical properties were revealed by API Staph system. The isolates were tested against novobiocin and methicillin using the Kirby-Bauer method with biodiscs.

37 strains of staphylococci were isolated and included in *S. aureus* ssp. *aureus* species (32 strains) and in *S. xylosus* species (5 strains).

16 methicillin-resistant strains were identified that belong to those two staphylococci species, confirming thus the epidemiological circuit of these strains also in small ruminants.

Key words: *S. aureus* subsp. *aureus*, *S. xylosus*, small ruminants.

INTRODUCTION

Staphylococcal infections are common in small ruminants and are represented by localized infections of the skin, hooves and mammary gland. These infections are caused by *S. aureus* subsp. *aureus* and less often by other staphylococci species. (Cătana, 2001; Velescu, Tănase and Irina, 2010)

These infections have a variable clinical evolution and the staphylococci strains that produce them have a complex epidemiological circuit, some of which are pathogenic for humans, too. (Mørk, 2012; Velescu, Tănase and Irina, 2010)

In the last years, there have also been isolated, from small ruminants, methicillin-resistant strains of staphylococci, which proves their intra and interspecific movement and that the occurrence of methicillin resistance represents a remarkable zoonotic risk. (Mørk et al., 2012; Leitner et al., 2011)

The research was made in order to identify and characterize phenotypically the strains of staphylococci isolated from small ruminants.

MATERIALS AND METHODS

The pathological samples for bacteriological examination were taken from a total of 37 sheep and goats with different lesions and the primary inseminations were made on agar with 5% sheep defibrinated blood.

The isolated strains were sorted based on cultural, morphological and tinctorial characters.

The clumping factor was revealed by Prolex Staph Latex fast kit, mannitol fermentation was tested on Chapmann medium and the biochemical properties were revealed by API Staph system. (Codiță, 2008)

After the final biochemical identification, the isolates were tested against novobiocin and methicillin using the Kirby-Bauer method with biodiscs. (Codiță, 2008)

RESULTS AND DISCUSSIONS

After the primary insemination from the pathological samples, 37 strains were isolated of which 32 strains formed yellow colonies and produced β -haemolysis while 5 strains

formed white unhaemolytic colonies. All strains were Gram positive and on the bacterioscopic examination, the bacterial cells were grouped in clusters and, rarely, in pairs. These preliminary tests showed that bacterial strains with cultural, morphological and tinctorial features typical for staphylococci were isolated from samples of pathological material taken from sheep and goats with different lesions.

The isolated strains fermented the mannitol and produced clumping factor, and with API Staph system were standardized and included in the following species: *S. aureus* subsp. *aureus* and *S. xylosus*. All the strains standardized and included in these species were susceptible to novobiocin, and a total of 21 strains were methicillin-resistant, 16 of *S. aureus* subsp. *aureus* and 5 of *S. xylosus*.

The methodology used for phenotypic characterization of staphylococci isolated from small ruminants is fast and can be taken in routine diagnosis. Staphylococcal strains, phenotypically classified in those two species, were isolated from sheeps and goats, most of them belonging to *S. aureus* subsp. *aureus* species.

The strains included in *S. xylosus* species are ubiquitous and less pathogenic in small ruminants. (Velescu, Tănase and Irina, 2010)

The strains of *S. aureus* subsp. *aureus* were isolated from mammary and hooves infections, but also from the skin without problems.

Identification of methicillin-resistant strains demonstrates the porting of *mec* gene, but also a complex epidemiological circuit of these strains, which was demonstrated by several researchers.

CONCLUSIONS

37 strains of staphylococci were isolated by the used methodology, which based on the phenotypic characters were included in *S. aureus* subsp. *aureus* species (32 strains) and in *S. xylosus* species (5 strains).

The isolated strains were susceptible to novobiocin, a constant character that differentiates the *Staphylococcus* genus from *Micrococcus* and *Streptococcus* genus.

16 methicillin-resistant strains were identified that belong to those two staphylococci species, confirming thus the epidemiological circuit of these strains also in small ruminants.

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