

Identification, molecular characterization and antimicrobial susceptibility profile of *Staphylococcus aureus* in two dairy herds with mastitis problems

Renata P. Santos¹, Fernando N. Souza^{1,2*}, Adriano F. da Cunha¹, Ana Cláudia D. Oliveira¹, Antônio F. de Souza Filho², Juliana Aizawa², Luiza Z. Moreno², Soraia A. Diniz¹, Alessandro S. Guimarães³, Maria Aparecida V. P. Brito³, Alice M. M. P. Della Libera², Marcos B. Heinemann², Mônica M. O. P. Cerqueira¹

¹Escola de Veterinária, Universidade Federal de Minas Gerais, Av. Antônio Carlos 6627, Belo Horizonte 31270-901, Brazil;

²Faculdade de Medicina e Veterinária e Zootecnia, Universidade de São Paulo, Av. Prof. Dr. Orlando Marques de Paiva, 87, Cidade Universitária, São Paulo 05508-270, Brazil;

³EMBRAPA - Gado de Leite, Avenida Eugênio do Nascimento, 610, Juiz de Fora 36038-330, Brazil.

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*Correspondence: Fernando Nogueira de Souza

Departamento de Clínica Médica

Faculdade de Medicina Veterinária e Zootecnia

Universidade de São Paulo

Av. Prof. Dr. Orlando Marques de Paiva 87

São Paulo 05508-270, Brazil

Phone: +55 11 30911285

Fax: +55 11 31911273

E-mail: nogueirasouza@yahoo.com.br

Summary

This research communication reports the identification of *S. aureus* isolated from milk samples by biochemical tests, matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI TOF MS) and molecular identification. Here, we also investigate whether *S. aureus* isolated from transient and persistent bovine subclinical mastitis and from nares/muzzles is genetically diverse using *spa* Typing. We also investigate the antimicrobial susceptibility of the milk and nasal/muzzles *S. aureus* isolates by Vitek 2[®] compact system. Finally, the detection of some oxacillin and/or cefoxitin-resistant *S. aureus* was confirmed using E-Test[®] and by the presence of the *mecA* and *mecC* genes. Our results showed that MALDI-TOF is a suitable method to identify bovine-associated *S. aureus*, because high agreement was found among biochemical test, MALDI-TOF MS and molecular identification. Here, non-*aureus* staphylococci are the most common bacteria in the nares/muzzles. A great proportion of multidrug resistance to antimicrobials was also observed, including resistance to critically important antimicrobials. Although, some *S. aureus* were regarded as oxacillin and/or cefoxitin resistant by Vitek 2[®] system and oxacillin-resistant by disk diffusion test, none of them were confirmed by E-test[®] and the presence of *mecA* and *mecC* genes. Our study did not strengthen the idea that *S. aureus* strains isolated from extramammary niche (i.e. nares/muzzles) is an important source for *S. aureus* strains that cause persistent IMIs in dairy cows. Furthermore, *S. aureus* isolates from transient and persistent IMIs did not differ by *spa*-typing, suggesting that the persistence of infection was mainly determined by cow factors. Thus, the high level of multidrug resistant *S. aureus* found in the two herds studied together with the predominance of a strain well adapted to the udder may contribute to the history of high prevalence of mastitis caused *S. aureus*, leading to high bulk tank milk somatic cell count in both herds.