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Genetic definition of *Staphylococcus aureus* ST398 isolated from cattle, sheep and goat based on *mecA*, *spa*, *VanA*, *VanB* and *SCCmec* genes

Abstract:

Methicillin-Resistant *Staphylococcus aureus* (MRSA) is one of the most important causes of hospital and community-acquired infections, and due to its potential pathogenicity and increasing resistance to antibiotics, it is one of the most important health problems in The world has changed. *Staphylococcus aureus* is a symbiotic skin and mucous membrane in animals and humans and is an important pathogen in humans that causes various life-threatening infections. Methicillin-resistant *Staphylococcus aureus* strain ST398 has been identified as the main strain causing infection in humans who have close contact with livestock. This strain has been reported from different geographical regions such as America, Europe and Asia. To conduct the research, 400 samples including 130 cow samples, 140 sheep samples and 130 goat samples were randomly prepared from the nasal mucosa of animals from November 2019 to July 2014. Sampling was done based on the season, sex, age, traditional or industrial nature of livestock in different areas of West Azerbaijan province. *Staphylococcus aureus* was isolated using microbiological and biochemical methods. Amplification of the 16srRNA gene was used to confirm the *Staphylococcus aureus* species. In order to identify the isolates of methicillin-resistant *Staphylococcus aureus* (MRSA), disk diffusion and amplification of a fragment of the *mecA* gene were performed. The presence of ST398 strain in MRSA isolates was done using its specific primers. *SCCmec* type was determined for types I, II, III, IVa-IVd, V, and the *spa* gene coding for protein A was evaluated to determine the specific identity of *Staphylococcus aureus* ST398. The study of *VanA*, *VanA* genes was done using gene-specific primers. Of all the samples, 69 were *Staphylococcus aureus* isolates, and out of seven isolates that were resistant to methicillin, five isolates were ST398 strain, which showed type III, Va, *SCCmec*. And three isolates had *spa* gene. None of the *Staphylococcus aureus* isolates were vancomycin resistant. Also, all isolates were resistant to cefixime, two isolates were resistant to vancomycin and one isolate was resistant to penicillin.

Key words: *Staphylococcus aureus*, ST398 strain, cattle, sheep and goat, *mecA*, *spa* and *SCCmec* genes