

Title: Frequency of toxin-encoding genes in *Staphylococcus aureus* isolated from milk tanks community

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Abstract:

Staphylococcus aureus produces a wide variety of toxins including staphylococcal enterotoxins (SEs; SEA to SEE, SEG to SEI, SER to SET) with demonstrated emetic activity. The most common group of SEs is formed by 5 serotypes, which are SEA, SEB, SEC, SED and SEE, they are responsible for 95% of staphylococcal intoxication. Further the *S. aureus* secretes a number of host-injurious toxins, among the most prominent of which are the toxins α and β hemolysin (Hla and Hlb). The purpose of this study was to identify staphylococcal enterotoxins genes (*sea*, *seb*, *sed*, *seg*, *seh* and *sei*) and toxins α and β hemolysin genes (*hla* and *hlb*) in *S. aureus* isolated from 53 samples from milk tanks community in the State of Alagoas, Brazil. Primary culture of milk samples was performed in 5% ovine blood agar plates, which were incubated aerobically at 37 °C for 72 h. *S. aureus* species confirmation was performed by PCR amplification of the *nuc* gene. 39 isolates were identified as *Staphylococcus* coagulase-positive, of them 69.2% (27/39) were confirmed as *S. aureus* by amplification of *nuc* gene. A total of 13 (48.1%) of 27 isolates were positive for at least one of the *sea*, *sed*, *seh* and *sei*, genes. None of the 27 isolates harbored *seb* and *seg* genes. The gene encoding for enterotoxin A (*sea*) was the most frequent (9 isolates, 33.3%), followed by *seh* (5 isolates, 18.5%), *sei* (3 isolates, 11.1%) and *sed* (2 isolates, 7.2%). A total of 22 (51.9%) of 27 isolates were positive for both toxins hemolysin genes. The most frequently observed toxin hemolysin gene was *hla* (22 isolates, 81.5%), followed by *hlb* (14 isolates, 51.9%). These positive results of toxin genes in milk derived *Staphylococcus aureus* constitute a potential risk for consumers' health, especially staphylococcal enterotoxins genes because they are thermostable and have been associated with food poisoning outbreaks.

Keywords: enterotoxin gene, PCR, superantigen genes, SEs genes, milk

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