



University of Zabol
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Faculty of Veterinary
Group: Pathobiology
The Thesis Submitted for the Degree of M. Sc
(bacteriology)

Title: Phenotypic and Genotypic Investigation of Methicilin Resistance In
***Staphylococcus aureus* Isolates Obtained From Milk Supplied In Dairy Product Supply**
Centers In Sistan Region.

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Abstract

Staphylococcus aureus is the main human pathogen and an important cause of livestock infections.

Staphylococcus aureus is one of the most common and important causes of foodborne diseases all over the world. Milk is a very nutritious food and its freedom from any pathogenic microbes. It can be transmitted to humans and affect public health.

Some strains of bacteria belonging to the genus *Staphylococcus* are resistant to various antibiotics, including methicillin. Methicillin-resistant *S. aureus* strains contain the *mecA* gene, which encodes penicillin-binding protein 2a, which confers resistance to methicillin and other beta-lactam antibiotics (except cephalosporins).

The purpose of this research was to investigate the phenotypic and genotypic resistance to methicillin in *Staphylococcus aureus* isolates obtained from milk supplied in dairy product supply centers in Sistan region.

Materials and methods: In this research, 100 *Staph* isolates were randomly isolated from dairy supply centers in Sistan region. To isolate *Staphylococcus aureus*, it was kept in a greenhouse for 24 hours at a temperature of 37 degrees Celsius. Standard biochemical tests including catalase, coagulase and DNASE tests were used to identify *Staphylococcus aureus* after gram staining.

Antibiogram test was used to evaluate the antibiotic resistance of bacteria in phenotypic form. The drug resistance of the isolates to the antibiotics methicillin and oxacillin was determined by the disk diffusion method and according to the current guidelines recommended by the CLSI Clinical and Laboratory Standards Institute.

In order to extract DNA from the isolated bacteria, the boiling method was used, and the PCR method was also used to determine the studied gene.

Findings: 100 isolates of *Staphylococcus aureus* were isolated from 147 samples. The phenotypic evaluation of antibiotic resistance of *Staphylococcus aureus* strains showed that there is the highest resistance to methicillin (99%) and oxacillin (45%) antibiotics. Molecular analysis showed the presence of 95% *mecA* gene.

Key words: *Staphylococcus aureus*, Sistan, Milk, Phenotype, Genotype, Methicillin