



University of Zabol  
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**The Thesis Submitted for the Degree of M.Sc  
(in the field of Genetic)**

**Evaluation of aminoglycosides  
resistance pattern and *aadB* & *aphA6*  
genes frequency  
In clinical strains of *Acinetobacter  
baumannii* in Zahedan**

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## **Abstract**

### **Introduction & Objective:**

*Acinetobacter baumannii* is one of the most important opportunistic pathogenic bacteria that causes serious nosocomial infections including ventilator-associated pneumonia, bacteremia, urinary tract infections, meningitis and surgical wound infections and is one of the most dangerous gram-negative bacteria. It infects approximately one million people worldwide each year, half of which are caused by multidrug-resistant strains of MDR. Antibiotic resistance to aminoglycosides in this bacterium is due to the acquisition, increased expression, or amplification of aminoglycoside-modifying enzyme genes and efflux pump 8. Aminoglycoside modifying enzymes include aminoglycoside acetyltransferase (AAC) aminoglycoside phosphotransferase (APH) aminoglycoside nucleotide transferase (ANT or AAD).

### **Materials and Methods:**

In this cross-sectional study, 100 strains of *Acinetobacter* were collected from different clinical samples of patients referred to teaching hospitals in Zahedan. Discs were evaluated for gentamicin (10 µg), amikacin (30 µg), tobramycin (10 µg), and kanamycin (30 µg) discs. Then the bacterial genome was extracted and the presence of *apha6* and *aadB* genes were identified using specific primers and PCR.

### **Results:**

*Acinetobacter baumannii* isolates were resistant to kanamycin (86%), amikacin (82%), gentamicin (75%) and tobramycin (67%). *Apha6* genes were detected in 56% and *aadB* genes in 5% of isolates.

### **Conclusion:**

Due to the high resistance of *Acinetobacter baumannii* to most antibiotics, the results of this study show that resistance to aminoglycosides is increasing and these antibiotics are not a suitable option for the treatment of infections caused by *Acinetobacter baumannii*.

Keywords: *Acinetobacter baumannii*, Aminoglycoside, *apha6*, *aadB*