شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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Department of Microbiology

Studies on Molecular Detection of Acinetobacter species from meat

Thesis presented by

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For The degree of

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Dedication

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Abstract:
Although food is very important for the human life, it may be life threatening. Foodborne diseases are spreading worldwide through the increasing rate of fresh and undercooked food consumption. Foodborne pathogens including many types of bacterial species. This study was conducted to determine; the prevalence of *Acinetobacter* species isolated from meat samples, its phenotypic characteristics, its antimicrobial resistance profile; and their genotypic characteristics. A total of 110 samples collected from chicken (n=50), beef (n=44), rabbit (n=10), and mutton (n=6) were examined bacteriologically. The suspected colonies were identified biochemically then tested for their antimicrobial resistance, biofilm formation, hemolytic activity then confirmed by PCR for some genes; *rpo*B, *tra*T, fimH, and *eps*A. 9 *Acinetobacter* species (8.2%) were recovered where, 55 of examined samples were non-lactose fermenter with an incidence of 50%, 29 of examined samples were late lactose fermenter with an incidence of 26% and the rest of samples showed no growth or were lactose fermenter. The isolates showed high resistance to ceftriaxone, imipenem, ceftazidime and ticarcillin/Clavulanic acid in a percentage of 89%, 77.8%, 66.7% and 66.7 %, respectively. While, low resistance was found to Sulfamethazole/trimethoprim, doxycycline and amikacin in a percentage of 44.4%, 33.3% and 11.1%, respectively. However, the isolates showed no resistance to ciprofloxacin. All the isolates were MDR with MDR_{index} (more than 0.5), only one isolate was weak biofilm producer but, no isolate was able to the hemolysis of the sheep RBCS. 88.9% of the isolates expressed *tra*T and *fim*H genes but, only 5.6% of the isolates could express *eps*A gene. It can be concluded that *Acinetobacter* species could be isolated from meat samples of animal origin in Egypt.
Key words: *Acinetobacter*-species, meat, AST, PCR, virulence.

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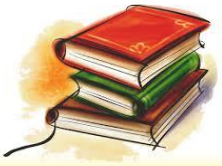
List of Abbreviations

ACB	*Acinetobacter calcoaceticus-baumannii*
AK	Amikacin
APC	Antigen presenting cells
ATP	Adenosine triphosphate
BA	Blood agar
BIs	Blood stream infections
BHI	Brain heart infusion
bp	base pair
CIP	Ciprofloxacin
CLSI	Clinical and Laboratory Standards Istitute
COT	Sulfamethoxazole/Trimethoprim
CTR	Ceftriaxone
CTX	Cefotaxime
DNA	Deoxyribonucleic acid
DO	Doxycycline
EDTA	Ethylene Diamine Tetra Acetic Acid
ELISA	Enzyme Linked Immunosorbent Assay
EMB	Eosin methylene blue agar
HA	Herellea agar
ICU	Intensive Care Units
IPM	Imipenem
LAM	Leeds *Acinetobacter* medium
LB	Luria Bertani

LPS	Lipo poly saccharides
M.A	MacConkey agar
MCP	Macrophage chemotactic protein
MIP	Macrophage inflammatory protein
OD	Optical Density
OMP	Outer membrane proteins
OMV	Outer membrane vesicles
PCR	Polymerase Chain Reaction
RNA	Ribonucleic acid
rRNA	Ribosomal ribonucleic acid
ROS	Reactive oxygen species
SOM	Somato statin
TIM	Ticarcillin/Clavulanic acid
TLR	Toll-like receptor
TCP	Tissue culture plate
VAP	Ventilator-calcoaceticus-baumannii



Introduction

1. Introduction

Acinetobacters are major concern because of their acquired resistance to multiple antimicrobial drugs and disinfectants. They are characterized by rapid transformation, survival despite of dessiccation so persist for long time in the environment especially hospital environment **(Wagner *et al*., 1994).**

The genus *Acinetobacter* belongs to the bacterial genera which are normally found in many foods and food products, especially refrigerated fresh ones. Because the genus is considered to be ubiquitous, the primary food-source environments are soil and water. However, plants and plant products, animal hides, human skin, air and dust can also be considered as sources to foods contamination **(Jay, 1996**).

Acinetobacters are most frequently reported in fresh meat and poultry. Because the internal tissues of healthy slaughtered animals are normally free of bacteria at the time of slaughter, the stick knife, animal hide, hand of handlers (skin), storage containers and environments (water) must be considered as primary sources. Ground meat has a greater surface area therefore the growth of aerobic organisms, including Acinetobacter, is favored. In general, low temperature favors typical spoilage by flora. On organs, like liver, kidney, heart, tongue of bovine, porcine and ovine origins, the surface numbers of microorganisms range from $\log_{10}$ 2-5 cm^2. *Acinetobacter* has been reported to belong to the initial biota (**Bouvet and Grimont, 1986).**

The incubation temperature is the main reason that only certain bacterial genera are found on spoiled meat.