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Phenotypic and genotypic study of Uropathogenic *Escherichia coli*

THESIS

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By

ASMAA ASHOUR ABD EL LATIEF ZAID

(B. Sc. In Microbiology- chemistry 1996)

(M.Sc. in Microbiology- chemistry 2001)

Supervised by

Dr. Zeinab Mohamed Hassan Kheiralla

Professor of microbiology, Botany Department, University College of Women for Arts, Science and Education, Ain Shams University.

Dr. Magda Adbelmoneim Gamil

Professor of microbiology, Microbiolgy department, Faculty of Medicine, Al Azhar University.

Dr. Maha Amin Hewedy

Assistant professor of microbiology, Botany Department, University College of Women for Arts, Science and Education, Ain Shams University.

Botany Department, University College of Women for Arts, Science and Education, Ain Shams University.

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List of abbreviations

AA	**Aggregative adherence**
AN	**Amikacin**
CAZ	**Ceftazidime**
CF	**Cephalothin**
CFA	**Colonization factor antigen**
CL	**Colistin**
CPR	**Cefprizol**
CXM	**Cefuroxime**
DA	**Diffuse adherence**
F/M	**Nitrofurantoin**
HA	**Haemagglutination**
HBSS	**Hanks balanced salt solution**
IPM	**Imipenem**
MRHA	**Mannose resistant haemagglutination**
MSHA	**Mannose sensitive haemagglutination**
LA	**Localized adherence**
NA	**Nalidixic acid**
OFX	**Ofloxacin**
PBS	**Phosphate buffered saline**
PCR	**Polymerase chain reaction**
RBC's	**Red blood curposles**
UPEC	**Uropathogenic** *E. coli*
UTI	**Urinary tract infection**

Introduction

Urinary tract infection (UTI) is a serious health problem affecting millions of people and is one of the most commonly acquired bacterial infections in ambulatory and hospitalized populations *(Roos et al., 2006).*

Escherichia coli* is the head of the large bacterial family, *Enterobacteriaceae*, the enteric bacteria, which are facultatively anaerobic Gram- negative rods that live in the human gastrointestinal tracts, however, it considered one of the major causes of human infectious diseases. Furthermor, it is now recognized that there are subsets of fecal *E. coli* currently defined as uropathogenic *E. coli* (UPEC) colonize periurethral area, enter urinary tract and cause UTIs *(Vagarali et al., 2008).

Uropathogenic *E. coli* (UPEC) differ from non- pathogenic *E. coli* by the production of virulence factors which enable the bacteria to adhere to uroepithelial cells and to establish UTIs *(Oelschlaeger et al., 2002).*

Besides adherence factors, toxin, capsules, iron uptake systems and other bacterial products contribute to the virulence of the strains. The genes responsible for expression of these characteristics are normally clustered in DNA regions denominated pathogenic islands (PAIs) *(Ranjan et al., 2010).*

<u>The aim of the present study was to:</u>

The overall aims of this thesis were to study the population biology of UPEC in Egypt with a view to understanding the most significant lineages causing UTI and to inform development of rapid assays to allow identification of members of these lineages. To achieve the overall aims the following objectives were set:

1- To determine phenotypic characteristics of the *E. coli* isolates obtained from patients showing clinical signs of urinary tract infection (UTI) .

2- To detect the presence of genes coding for fimbria by PCR.

3- To compare the phenotypic and genotypic characteristics of the UPEC isolates in comparison with fecal *E. coli* isolates.

4- Finally in the present study we analyzed urinary tract *E. coli* isolates to obtain possible evidence of a correlation between biological characteristics and genetic one.

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DEDICATION

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بسم الله الرحمن الرحيم

الحمد لله الذي هدانا لهذا و ما كنا لنهتدي لولا أن هدانا الله

صدق الله العظيم
الآية ٤٣ من سورة الأعراف

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