ROLE OF FATTY ACIDS AS ENVIRONMENTAL REGULATOR ON PROTEUS MIRABILIS SWARMING AND BIOFILM FORMATION IN CATHETER-ASSOCIATED URINARY TRACT INFECTION

THESIS

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ABSTRACT

P. mirabilis is a common cause of C-UTI. This study evaluates the effect of stearic, plamitic and myristic acids to LB culture medium, on swarming, biofilm formation and EPS production of 30 *P. mirabilis* strains isolated from 300 urine samples collected from 300 catheterized patients. Myristic and palmitic acids could inhibit swarming and EPS of *P. mirabilis*. Only myristic acid could inhibit biofilm formation, while stearic acid enhanced swarming and EPS production of *P. mirabilis*.

Key Words:

- C-UTI. Catheter - associated urinary tract infection
- EPS: exopolysaccharides
- hrs: hours
- LB: Lauri Bertani
- *P. mirabilis*: Proteus mirabilis

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

α:	Alpha.
aad:	Amino acid deaminase.
Adon:	Adonitol.
AI-2:	Autoinducer 2.
AmpC:	Ambler's molecular class C.
ATF:	Ambient temperature fimbriae.
bp:	Base pair.
β:	Beta.
C:	Complement.
Ca^{2+}:	Calcium.
CFU/ml:	Colony forming unit per milliliter.
CFU:	Colony forming unit.
CLED:	Cystine lactose electrolyte deficiency.
Ccm:	Cell-cell migration.
cmfA:	Colony migration factor.
CPG:	Casamino- peptone-glucose.
C-terminus:	Carboxy terminus.
CTX:	Cefotaxime.
C-UTI:	Catheter-associated urinary tract infection.
CβL:	AmpC β-lactamases.
DKPs:	Diketopiperazines.
DNA	Deoxyribonucleic acid.

DPPC:	Diplamitoylphosphatidylcholine.
E. coli:	*Escherichia coli.*
EDTA:	Ethylene diamine tetra-acetic acid.
EPS:	Exo/Extracellular polysaccharides.
ESBLs:	Extended spectrum β-lactamases.
FAS:	Fatty acid synthetase.
Fig.:	Figure.
fla:	Flagellin gene.
flh:	Flagellar hyperexpression gene.
Fur:	Ferroxamine upregulator.
γ:	Gamma.
gidA:	Growth and intiation of differentiation.
GIT:	Gastrointestinal tract.
hβD1:	Human β-defensin 1.
HAUTI:	Hospital-acquired urinary tract infection.
HLA:	Human leucocytic antigen.
Hly:	Hemolysin.
HPF:	High power field.
hrs.:	Hours.
ID_{50}:	Infective dose 50.
Ig:	Immunoglobulin.
K. aerogenes:	*Klebsiella aerogenes*.
K. penumoniae:	*Klebsiella pneumoniae.*
KCN:	Potassium cyanide.

kD_a:	Kilo dalton.
L. Lactis:	*Lactococcus lactis*.
LB:	Luria – Bertani.
LD_{50}:	Lethal dose 50.
$LD_{50}S$:	Lethal dose 50 strain.
Log:	Logarithmic.
LPS:	Lipopolysaccharides.
Lrp:	Leucine-responsive regulator protein.
M. morganii:	*Morganella morganii.*
mg/l:	Milligram per liter.
mg/ml:	Milligram per milliliter.
Mg^{2+}:	Magnesium.
MIC:	Minimal inhibitory concentration.
min.:	Minute.
mM:	Millimole.
mm:	Millimeter.
mol :	Mole.
MPC:	Methacryloyloxyethyl phosphoryl choline.
MR/K:	Mannose - resistant/*Klebsiella*-like.
MR/P:	Mannose - resistant/*Proteus*-like.
mRNA:	Messenger ribonucleic acid.
mrp:	Mannose resistant pilin.
µg/ml:	Microgram per milliliter.
µL:	Microliter.
µm:	Micrometer.