COMPARATIVE STUDY OF BIOFILM PRODUCING AND NON-PRODUCING *Escherichia coli* ISOLATED FROM URINE SAMPLES OF PATIENTS VISITING A TERTIARY CARE HOSPITAL OF MORANG, NEPAL

A
Dissertation Submitted to the
Department of Microbiology, Central Campus of Technology,
Tribhuvan University, Dharan, Nepal
In Partial Fulfillment of the Requirements for the award of
Degree of Masters of Science in Microbiology
(Medical)

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RECOMMENDATION

This is to certify that **Miss Manita Tumbahangphe** has completed this dissertation work entitled **"Comparative Study of Biofilm Producing and Non-producing *Escherichia coli* isolated from Urine Sample of Patients Visiting a Tertiary Care Hospital of Morang, Nepal"** as a partial fulfillment of the requirements for M. Sc degree in Microbiology **(Medical)** under my supervision. To my knowledge, this work has not been submitted for any other degree.

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CERTIFICATE OF APPROVAL

On the recommendation of Asst**. Professor Mr. Hemanta Khanal** this dissertation work of **Manita Tumbahangphe** entitled **"Comparative Study of Biofilm Producing and Non-producing *Escherichia coli* isolated from Urine Sample of Patients Visiting a Tertiary Care Hospital of Morang, Nepal"** has been approved for the examination and is submitted for the Tribhuvan University in partial fulfillment of the requirements for M. Sc degree in Microbiology (**Medical**).

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ABSTRACT

Escherichia coli is the normal flora found in the intestines of warm blooded animals including humans and birds. It has been reported that *E. coli* is responsible for more than 80-85% of UTI cases. Several studies suggest that the prevalence of MDR *E. coli* is increasing day by day which is a matter of concern for the clinical therapies. The urine sample was inoculated onto the CLED agar and was incubated at 37°C for 24 hours. *E. coli* colonies were counted. The positive isolates of *E. coli* were identified by different biochemical tests such as indole test, methyl red test, Voges-Proskauer, citrate utilization test, TSIA, carbohydrate fermentation tests and starch hydrolysis test. This study reported 15% prevalence of *E. coli* out of 400 urine samples. All isolated strains of *E. coli* were tested for antibiotic susceptibility testing by using Kirby Bauer disk diffusion method. 100% of *E. coli* isolates showed resistance to both Ampicillin and Amoxicillin while 100% were sensitive to Chloramphenicol. This analysis also showed 70% (42/60) as MDR *E. coli* isolates. The maximum isolates (75%) were found to be Biofilm producers. Similarly, microtitre plate method was considered to be the most efficient screening method as compared to tube and congo red agar method. Similarly, resistance to other antibiotics such as Nalidixic acid (71.11% vs 46.66%), Norfloxacin (53.33% vs 46.66%), Cotrimoxazole (42.22% vs 26.66%) was comparatively higher among biofilm producers than non-biofilm producers.There was a significant correlation ($P<0.05$) between biofilm and MDR. Hence, the antibiotic resistance shown by biofilm producers was comparatively higher than non-biofilm producers.

Keywords: *E. coli,* Biofilm, Multidrug resistance, UTI

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AMR	=	Antimicrobial Resistance
UTI	=	Urinary Tract Infection
MDR	=	Multidrug Resistance
WHO	=	World Health Organization
CLSI	=	Clinical and Laboratory Standards Institute
KDa	=	Kilo Dalton
EMB	=	Eosine Methylene Blue
TSIA	=	Triple Sugar Iron Agar
MR	=	Methyl Red
VP	=	Voges-Proskauer
MP	=	Microtitre Plate
TM	=	Tube Method
CRA	=	Congo Red Agar