

قال الله تعالى

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} عَلَيْهِمْ وَلَا الصَّالِحِينَ

صدق الله العظيم

سورة الفاتحة

## Dedication

*I dedicate this work:*

- *To my mother and father.*
- *To my brothers and sisters.*
- *To my teachers, relatives, friends, and colleagues.*

## Acknowledgement

My greatest acknowledgement to Dr. Humodi Ahmed Saeed for his encouragement and patience throughout this project. Honestly, this work would not have been done without his nonstop guidance. I am very grateful to the staff of the Department of Microbiology faculty of medical laboratory science Sudan University of Science and Technology.

Thanks and appreciation to Dr. Mogahid Mohammed Elhassan for his effort in the performance of molecular analysis. Also great thanks to my colleague Muntasir Ibrahim who spared no effort to helping me.

Especial thanks to Miss. Suheir Ramadan and Miss. Igbal A. Ahmed for their technical assistance.

## **Abstract**

Extended-spectrum beta-lactamases (ESBLs) is one of the problems that face the world now in the treatment of bacterial infection. This study was conducted in the Research Laboratory in Sudan University of Science and Technology. The study was carried out during the period from December 2009 to May 2010, to detect TEM, SHV and CTX-M genes in ESBLs- producing *Salmonella paratyphi C*. The *Salmonella paratyphi C* strains were obtained from the Research Laboratory. All strains were checked for purity by subculturing on nutrient agar and examined microscopically. Bacterial DNA was extracted from each isolate using boiling method. Multiplex PCR was used to detect these genes. The result showed the presence of *TEM* gene only in 33% of the isolates. It is concluded that, *TEM* is the commonest gene in *Salmonella paratyphi C* isolates. Further studies with large number of bacterial strains are required to validate this result.

تعتبر إنزيمات البيتا لاكتام الممتدة الطيف واحده من المشاكل التي تواجه العالم الان في علاج العدوى البكتيرية. هذه الدراسة نفذت في مختبر البحوث بكلية علوم المختبرات جامعة السودان للعلوم والتكنولوجيا في الفترة من ديسمبر / 2009 إلى مايو / 2010، للكشف عن الجينات ( *TEM* و *SHV* و *CTX-M* ) في السلمونية النظيرية التيفية (C) المنتجة لإنزيمات بيتا لاكتام الممتدة الطيف. تم الحصول على سلالات السلمونيلا النظيرية التيفية (C) من مختبر الابحاث بالجامعة والتأكد من ذقانها بإعادة ترريعها على الأجار المغذي ومن ثم فحصها مجهريا. تم استخلاص الحمض النووي المذكور الاوكسجين للسلالات باستعمال طريقة الغليان. استخدمت طريقة تفاعل البلمرة المتسلسل المتعدد للإرسال للكشف عن هذه الجينات. اظهرت النتيجة وجود الجين *TEM* في 33% من السلالات. وخلصت الدراسة إلى أن الجين *TEM* هو الأكثر شيوعا في سلالات السلمونية النظيرية التيفية (C). وان دراسات اضافية بعدد كبير من السلالات البكتيرية مطلوبة لاثبات هذه النتيجة.

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## List of Abbreviations

BP	Base pair
CTX-M	Cefotaxime
DW	Deionized water
DNA	Deoxynucleic acid
dNTPs	Deoxynucleotide pyrimidines
DDD	Double Disc Diffusion
ESBLs	Extended Spectrum Beta Lactamases
MgCL <sub>2</sub>	Magnesium chloride

PCR	Polymerase Chain Reaction
SHV	Sulphydryl variable
TBE	Tris base Boric acid EDTA
TEM	Temoniera
TSI	Tri Sugar Iron
UTI	Urinary Tract Infection
UV	Ultraviolet Light
OXA	<u>Oxacillin</u>
NCCLS	National Committee Clinical Laboratory standards