

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

: قال الله تعالى

**قَالَ يَا قَوْمِ أَرَأَيْتُمْ إِن كُنتُ عَلَىٰ بَيِّنَةٍ مِّن رَّبِّي
وَرَزَقْنِي مِنْهُ رِزْقًا حَسَنًا وَمَا أَرِيدُ أَنْ أُخَالِفَكُمْ
إِلَىٰ مَا أَنهَاكُمْ عَنْهُ إِن أَرِيدُ إِلَّا الْإِصْلَاحَ مَا
اسْتَطَعْتُ وَمَا تَوْفِيقِي إِلَّا بِاللَّهِ عَلَيْهِ تَوَكَّلْتُ
وَإِلَيْهِ أُنِيبُ (88)**

صدق الله العظيم

سورة هود الآية 88

Dedication

To my parents who support me
throughout my life.

To my supervisor Dr. Humodi Ahmed
Saeed

To the coming generation that I hope
will benefit from my work.

Acknowledgement

First of all thanks to Allah that my work is brought to reality.

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Abstract

Extended-spectrum β -lactamases (ESBLs) have become widespread throughout the world and are now found in a significant percentage of *Citrobacter youngae* and other enterobacteriaceae strains in certain countries. 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 *C. youngae*.

Six *C. youngae* strains were obtained from the Research Laboratory. All strains were checked for purity by sub-culturing on nutrient agar and examined microscopically. Bacterial DNA was extracted from each isolate using boiling method. Multiplex PCR was adopted to detect these genes. The result revealed the presence of *TEM* gene only in four of the isolates. It is concluded that, TEM gene is the commonest gene in *C. youngae* isolates. Further studies with large number of bacterial isolates are required to evaluate this result.

المستخلص

تعتبر الإنزيمات الممتدة الطيف منتشرة في كل العالم وتوجد بنسب وافية في سلالات الليمونية اليوزقية والسلالات الأخرى ضمن عائلة الأمعائيات في دول معينة. هذه الدراسة نُفذت في مختبر البحوث في جامعة السودان للعلوم والتكنولوجيا في الفترة من ديسمبر/ 2009 إلى مايو/ 2010، للكشف عن الجينات (*TEM* و *SHV* و *CTX-M*) في الليمونية اليوزقية المنتجة لإنزيمات بيتا لاكتام واسعة الطيف.

تم الحصول على ستة عزلات الليمونية اليوزقية من مختبر البحوث بالجامعة والتأكد من نقاوتها بإعادة تزييعها على الأجار المغذي ومن ثم فحصها مجهرياً. تم استخلاص الحمض النووي منقوص الأكسجين للسلالات باستعمال طريقة الغليان. استخدمت طريقة تفاعل البلمرة المتسلسل المتعدد الإرسال للكشف عن هذه الجينات. أظهرت النتيجة وجود الجين *TEM* في أربع عزلات. وخلصت الدراسة إلى أن الجين *TEM* هو الأكثر شيوعاً في سلالات الليمونية اليوزقية. وأن دراسات إضافية بعدد أكبر من العزلات الباكترية مطلوبة لإثبات 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
M	Marker
MgCL ₂	Magnesium chloride
NA	Nutrient Agar
PCR	Polymerase Chain Reaction
SHV	Sulfhydryl variable
TBE	Tris base Boric acid EDTA
TEM	Temoniera
UV	Ultraviolet Light