CONTENTS

Contents

RESULTS

Contents

LIST OF TABLES

Contents

LIST OF FIGURES

Contents

Contents

ABBREVIATIONS

Abs. Absorbance.
Amm: Ammonium.
APT: Attached Proton Test
ATCC: American Type Culture Collection.
ATR: Attenuated Total Reflectance.
C. salexigens: *Chromohalobacter salexigens*.
CM: Carboxyethylated.
COSY: Correlation Spectroscopy.
CPSs: Capsular Polysaccharides.
Da: Dalton
DMEM: Dulbecco's Modified Eagle's Medium.
DMF: Di-Methyl Formamide.
DSS: 4,4-Dimethyl-4-Silapentane-1-Sulfonic Acid.
EDTA: Ethylene Di amin Tetra Acetic acid.
ELISA: Enzyme Linked Immune Sorbent Assay.
EPS: Exo Polysacharide.
F and **R**: Forward and Reverse.
FBS: Fetal Bovine Serum.
FT-IR : Fourier Transform Infra-Red.
GPC: Gel Permeation Chromatography
HMBC: Heteronuclear Multiple-Bond Correlation.
HSQC: Heteronuclear Single Quantum Correlation.
IC_{50}: Half maximal inhibitory concentration.
Kb: Kilo Base.
MTT :(3-[4, 5-di-Methylthiazole-2-yl]-2,5-diphenyltetrazolium bromide).
NDP: Nucleoside Di-Phosphate.
NMR: Nuclear Magnetic Resonance.
OD: Optical Density.
PCR: Polymerase Chain Reaction.
SA: Sulfated.
SGC: Sehgal and Gibbons Complex medium.
TCP: Tricalcium Phosphate.
TSA: Tryptic Soy Agar.
TSB : Tryptic Soy Broth.
µg: Micro Gram.
***µ*L**: Micro Liter.

ABSTRACT

Newly isolated halophilic bacterial strains from Egyptian hyper saline source were identified as *Chromohalobacter salexigens* KT989776 and *Chromohalobacter salexigens* KT989777 were selected for its ability to produce extracellular polysaccharides. Following the optimization of initial pH, temperature, nitrogen, carbon, phosphorous sources In addition to determination of the optimum concentrations of these sources, sodium chloride concentration was also determined and incubation period of the growth medium. The resulted polymers from the two strains were identified by paper chromatography, NMR and FT-IR spectroscopy as a homopolymer levan. Chemical modifications (carboxymethylation and sulphation) were preceded and the biological activity (anti-tumor, fibrinolytic and prebiotic activity) of resulted levan and its derivatives were also determined. In addition, replacement of sucrose with molasses was tested. The optimum temperature and pH for levan production ranged between 25- 30 ^{o}C and 8, respectively. Optimum sodium chloride concentration and sucrose concentration was 15% and 30-50 gram per liter respectively. The most effective factor was the sequence incubation at 30 ^{o}C followed by storage at 4 ^{o}C which cause sharp increase in polymer production. Hence, *Chromohalobacter salexigens* has been described as a levan producer microorganism for the first time according to our knowledge. The maximum levan production was 10.5 and 11.9 mg per ml for *C. salexigens* KT989776 and *C. salexigens* KT989777 respectively under optimum conditions.

It was proved that the resulting levan and its derivatives exhibit anti-tumor, fibrinolytic and prebiotic activity.

Key words: Chromohalobacter salexigens, levan, carboxymethylation, sulphation and fibrinolytic, Halophiles.