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<th>Author</th>
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<td>Production and Characterisation of A Novel Polysaccharide From Bacillus Lichenformis NCIB 11634</td>
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UNIVERSITY OF NIGERIA

THIS PROJECT REPORT BY
K. N. RAURI

Was Accepted in Part Fulfillment of
The Requirement For The Degree Of
M. Pharm

OF THIS UNIVERSITY
THE DATE OF AWARD IS
30-8-68

PROF. S. E. OJO

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PRODUCTION AND CHARACTERISATION OF
A NOVEL POLYSACCHARIDE FROM
Bacillus licheniformis NC18 II634

BY

EDURU, WERN KAMU
(PC/M. PHARM/84/2241)

DEPARTMENT OF PHARMACOEFLION
UNIVERSITY OF NIGERIA
NSUKA

AUGUST, 1988
PRODUCTION AND CHARACTERISATION OF
A NOVEL POLYSACCHARIDE FROM
Bacilluslicheniformis WClB 11634

BY

EMEZE, NWEBE KASU
B. Pharm. (Hons) Nig., M.P.S.N.

A DISSERTATION SUBMITTED TO THE
DEPARTMENT OF PHARMACOGNETICS IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD
OF MASTER OF PHARMACY DEGREE
OF THE UNIVERSITY OF NIGERIA, NUKKA

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UNIVERSITY OF NIGERIA
NUKKA
DECLARATION

We certify that fences Kava fence carried out this research work in the Department of Pharmaceutics. The work presented herein is original and has not been previously reported anywhere else.

.............................................
PROF. O.K. EKOMA

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DR. A.S. GHORASHY

SUPERVISORS

.............................................
DR. C. O. CHIKI
(HEAD OF DEPARTMENT)
DEDICATION

To my, Fedda Agnec Kava Shube, for her patience, understanding and overwhelming love.
1.8. Object of Research

2. MATERIALS AND METHODS

2.1. Materials

2.1.1. Micro-organism

2.1.2. Chemicals and Media

2.2. Methods

2.2.1. Preparation of Culture Media

2.2.2. Activation and Maintenance of the Micro-organism

2.3. Investigation of the Morphological, Culture, and Biochemical Characteristics of the Organism

2.4. Estimation of Stable pH for Recovery of the Polysaccharide from Broth

2.5. Production of Polysaccharide

2.6. Isolation and Purification of the Polysaccharide

2.7. Investigation of the Nature of Enzyme Involved in the Polysaccharide Synthesis

2.8. Screening for Antimicrobial Activity

2.9. Determination of the Optimal Growth and Production Temperatures

2.10. Determination of the Optimum pH for Growth and Production of Polysaccharide

2.11. Estimation of Protein Content by Lowry Method

2.12. Estimation of Reducing Sugar

2.13. Biochemical Properties: Optimum Medium for Growth and Polymer Biosynthesis

2.14. Determination of Calibration Curve: Colony Forming Unit Per ml (cfu ml^-1) and Cell Density of Shutter Culture at Different Incubation Times
2.15. Determination of the Sugar Units of the Polysaccharide

2.16. Rheology of the Polysaccharide

2.17. Stability of Emulsion Formulated with the Polysaccharide

2.18. Investigation of the Stability of Suspension Formulated with the Polysaccharide

3. Correlation Between Colony Forming Units per ml (cfu ml⁻¹) and Optical Density Measurement as a Means of Monitoring Bacterial Growth

4. RESULTS AND DISCUSSION

5. GENERAL CONCLUSION

APPENDIX

REFERENCES
ABSTRACT

A new strain of Bacillus *licheniformis* ATCC 11634, initially isolated by Udecia, was the subject of this investigation.

The optimum conditions for growth and production of extracellular polysaccharide by this organism; its morphological, culture and biochemical characteristics were examined. Furthermore, the technological applications of this polysaccharide gum were ascertained. The organism grows best in Caspar-Dox broth. The optimal pH was found to be between 7 and 8; while that of temperature was 20 and 35°C.

Production of the polysaccharide was achieved in a semi-synthetic medium. The polysaccharide was purified and deproteinated using the Sevag method; and the protein content estimated by method of Lowry et al. The relative number of cells was determined by measuring the absorbance at 530 nm and using the surface viable count method developed by Miles and Misra. A normal bacterial curve was obtained in both cases. After acid hydrolysis of the polysaccharide, paper and thin layer chromatographic methods were used for the identification of the sugar units. The main sugars identified were D-glucose, D-mannose and D-xyllose. The polysaccharide was thus characterized as a heteropolymer.