BIOTECHNOLOGY SOCIETY OF NIGERIA

SOUTHWEST CHAPTER

1ST ANNUAL INTERNATIONAL CONFERENCE

THEME:

BIOTECHNOLOGY RESEARCHES:

EXPANDING THE HORIZON OF FOOD SECURITY AND SAFETY, AGRICULTURE, HEALTH, ENVIRONMENT AND INDUSTRY

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BOOK OF ABSTRACTS

PROGRAMME OF THE EVENTS

THE LOCAL ORGANIZING COMMITTEE OF THE

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BSN-SW2019/MIB/003

SCREENING OF BACTERIA FOR POLYHYDROXYLALKANOATE PRODUCTION FROM HYPERSALINE WATER BODY, LAGOS, SOUTHERN NIGERIA.

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ABSTRACT

This project was carried out to isolate and identify polyhydroxylalkanoate (PHA) producing bacteria associated with hypersaline water body, in Lagos, Nigeria. The samples were collected with the aid of a clean sterile 1 Litre capacity water sampler from three different locations of 6.35□ N 3.28□ E (St1); 6.35□ N 3.40□ E (St2); and 6.36□ N 3.47□ E (St3) and depths of 0 - 07 m, 50 m and 100 m below water surface. Isolation, 16S rDNA molecular identification of bacteria, PHA potential and yield with 2% glucose were carried out with standard microbiological methods. The following isolates were identified to have remote and close similarities with sequences deposited in NCBI as *Achromobacter agilis* strain E2B, *Acinetobacter calcoaceticus*, *Alcaligenes faecalis*, *Alcaligenes* spp., *Azospirillum brasilense*, *Bacillus* spp., *Enterobacter cloacae* strain IARI-SL-41, *Falsochrobactrum ovis* strain B1315, *Lysinibacillus fusiformis* strain 28XG99, *Ochrobactrum* spp., Providencia HYPERLINK "https://blast.ncbi.nlm.nih.gov/Blast.cgi"stuartiiHYPERLINK "https://blast.ncbi.nlm.nih.gov/Blast.cgi" strain AR_0026, *Pseudomonas* spp., *Streptococcus agalactiae* strain Neha2, *Vagococcus fluvialis* strain AWW1. The percentage of the uninduced PHA producing bacteria was 62.6% (n=190) while 2% glucose induced PHA producers was 31.1% (n=119). The highest PHA yield of 1.2630 ± 0.0170 gL^{-1} was obtained with *Alcaligenes faecalis* strain N1-4. The comparison of the PHA yield with the standard PHA (crotonic acid) revealed a higher double concentration (1.0 gL^{-1}) produced by 3.7% (n=119) of the test bacteria. This research has established a large scale production potential of PHA synthesizing bacteria particularly *Alcaligenes faecalis* strain N1-4 for applications in medicine, engineering, agriculture, entertainment and household utilities.

KEYWORDS: Polyhydroxylalkanoate (PHA), Hypersaline water body, PHA Producing bacteria, PHA yield

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SCREENING OF BACTERIAL ISOLATES FROM PLANT LEAVES FOR XANTHAN GUM PRODUCING POTENTIAL

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ABSTRACT

Xanthan gum is a microbial polysaccharide produced by the plant pathogen *Xanthomonas campestris,* it is of great commercial importance due to its rheological properties and water solubility and has been used in various industries as a thickening and stabilizing agent. This research aimed to produce xanthan gum using *Xanthomonas campestris* isolated from diverse sources (tomato, pepper, mango and banana leaves) in Niger State, Nigeria. Leaves with black rot spots were collected from the plants in selected farms within Minna metropolis and transported to the research laboratory. The leaves were washed in normal saline and tenfold dilutions were prepared. Aliquots (1.0 mL) were plated on Nutrient agar and incubated at 37°C for 48 h. Colonies with yellow colour were Gram stained. Gram negative rod bacteria were subjected to emulsification test. Isolates (eight, 61.5%) with yellow colonies, Gram negative rods that exhibited stable emulsion in carbon enriched medium were regarded as potential xanthan gum producers. Biochemical tests on the isolates revealed that the bacteria were *Xanthomonas campestris* and were coded accordingly (PP02, MG03, PP04, BN06, BN07, TM08, TM09 and MG11). Maximum xanthan production (21.01g/l) was observed in TM09 (isolate from tomato leaves) while BN07 (isolate from banana leaves) had the least (0.02g/l) gum produced. The results suggest that the strain of *Xanthomonas* that infects tomato produce more gum than those from pepper, mango and banana leaves.

KEYWORDS: Biochemical characterization and identification, Emulsification, Xathan gum, Rheological properties