ISOLATION AND PURIFICATION OF POLYSACCHARIDE PRODUCED BY AN ISOLATED BACTERIUM ASSOCIATED WITH MARINE SPONGE, *Aaptos* sp.

By
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JABATAN SAINS SAMUDERA
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PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:
Isolation and purification of polysaccharide produced by an isolated bacterium associated with marine sponge, *Aaptos* sp. oleh Herni binti Kadir , No. Matrik UK7821 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperolehi ljazah Sarjana Muda Sains (Biologi Marin), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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LIST OF ABBREVIATIONS

URE	Urea
ADH	Arginine
ODC	Ornithine
LDC	Lysine
TET	Aliphatic thiol
LIP	Fatty acid ester
KSF	Sugar aldehyde
SBL	Sorbitol
GUR	-Nitrophenyl-β,D-glucuronide
ONPG	o-Nitrophenyl-β,D-galactoside
βGLU	p-Nitrophenyl-β,D-glucoside
βXYL	p-Nitrophenyl-β,D-xyloside
NAG	p-Nitrophenyl-n-acetyl-β,D-alucosaminide
MAL	Malonate
PRO	Proline-β-naphthylamide
GGT	γ-Glutamyl-β-naphthylamide
PYR	Pyrrolidonyl-β-naphthylamide
ADON	Adonitol
IND	Tryptophane
CTAB	Cetyltrimethylammonium bromide

TFA	Trifluoroacetic acid
HCl	Hydrochloric acid
SSW	Sucrose Sea Water
nm	Nanometer
L	Liter
g	Gram
sp.	Species
glc	Glucose
µL	Micro liter

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ABSTRACT

The study was done in order to identify the selected polysaccharide–producing bacterium isolated from the outer part of marine sponges, *Aaptos* sp., to isolate and purify polysaccharide produced by the bacterium, and to investigate the chemical properties of the polysaccharide. The isolated bacterium associated with marine sponge, *Aaptos* sp. was identified as *Shigella* sp. after the biochemical tests were carried out, with the combination of RapID™ ONE Plus System (Remel, USA) identification kit. All the biochemical tests characterized the characteristics of the bacterium. This gram negative bacterium gave an average yield of 228mg/L crude and 121mg/L acidic polysaccharide. The polysacharide contains glucose, galactose, rhamnose and another two unknown residues. R_{glc} value of galactose and rhamnose were 0.952 and 1.951 for crude polysaccharide while 0.945 and 1.655 for acidic polysaccharide. All the analyses were carried out and conducted by using Chromatography Paper (PC) and High Performance Liquid Chromatography (HPLC).

PEMENCILAN DAN PENULENAN POLISAKARIDA OLEH BAKTERIA YANG BERGABUNG DENGAN SPAN, *Aaptos* sp.

ABSTRAK

Kajian yang telah dilakukan bertujuan untuk mengenalpasti bakteria yang bergabung dengan Span Marin, *Aaptos* sp., untuk menghasilkan polisakarida daripada bakteria yang telah dikenalpasti, dan untuk mengkaji komponen gula yang terkandung dalam polisakarida tersebut. Bakteria tersebut telah dikenalpasti sebagai *Shigella* sp. setelah menjalani ujian biokimia beserta dengan kit RapID™ ONE Plus System (Remel, USA). Ujian tersebut telah mencerminkan ciri-ciri bakteria ini. Bakteria gram negatif ini telah berjaya menghasilkan sebanyak 228mg/L polisakarida mentah dan 121mg/L polisakarida asidik yang mengandungi glukosa, galaktosa, rhamnosa dan dua lagi komponen gula yang tidak diketahui. Nilai R_{glc} bagi galaktosa dan rhamnosa untuk polisakarida mentah adalah 0.952 dan 1.951 sementara untuk polisakarida asidik pula adalah 0.945 and 1.655. Semua analisa yang telah dilakukan adalah dengan menggunakan teknik Kertas Kromatografi (PC) dan kaedah High Performance Liquid Chromatography (HPLC).