

ISOLATION AND SCREENING MARINE ACTINOMYCETES WHICH PRODUCE ANTIMICROBIAL ACTIVITY

Rofiq Sunaryanto^{a,b}, Bambang Marwoto^b, Tun Tedja Irawadi^a, Zainal Alim Mas'ud^a and Liesbetini Hartoto^a

^a Sekolah Pasca Sarjana Institut Pertanian Bogor Kampus IPB Dermaga Kabupaten Bogor Jawa Barat

^b Balai Pengkajian Bioteknologi BPPT Kawasan PUSPIPTEK Serpong Tangerang Banten 15340

(E-mail : rofiasn@yahoo.com)

Abstract

Isolation and screening marine *Actinomycetes* that can produce antimicrobial compound has been conducted. Isolation is conducted in three different places, that is on Banten West Coast, Cirebon North Coast, and Yogyakarta South Coast. Isolation is conducted by two methods pretreatments that are with acid method and heat shock method. The result of this research has been obtained 50 isolates of *Actinomycetes*. The result of screening was obtained 4 isolates that could inhibited *E. coli*, 5 isolates could inhibited *Streptococcus aureus*, 4 isolates could inhibited *Bacillus subtilis*, 4 isolates could inhibited *Pseudomonas aeruginosa*, 5 isolates could inhibited *Candida albican*, and 4 isolates could inhibited *Aspergillus niger*. Result of morphology and DNA identification of isolate A11 showed *Streptomyces sp.* Morphology of isolate A11 has branching hyphae with spore sack at the end of hyphae. The Minimum Inhibition Concentration (MIC) of isolate A11 extract to *Bacillus subtilis* was 120,86 µg/ml.

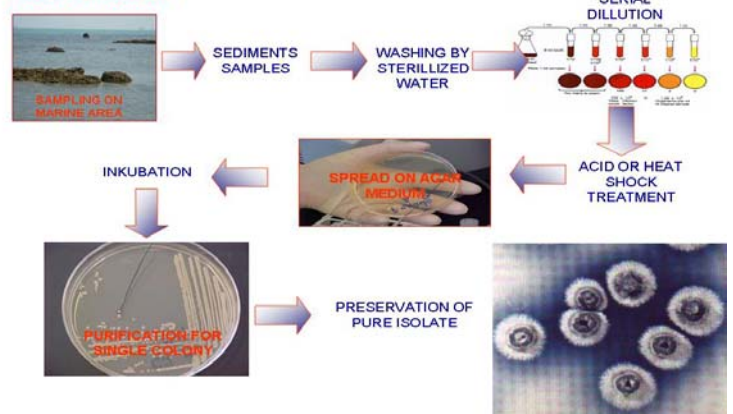
Keyword : marine *Actinomycetes*, isolation, screening, antimicrobial activity.

PREFACE

- The marine environment is becoming increasingly appreciated as a rich and untapped reservoir of novel natural products. (Lam.K.S, 2006)
- The oceans cover 70% of the Earth's surface and harbor most of the planet's biodiversity. Although marine plants and invertebrates have received considerable attention as a resource for natural product discovery, the microbiological component of this diversity remains relatively unexplored (Fenical.W & Paul.R.J. 2006)
- Over 22.000 compounds which are often highly biologically active, have now been isolated from microorganism, plants and animals. (Bardy, 2005)
- These active compounds are expected as discovery of new drugs or antibiotic, etc.

METHODS OF RESEARCH

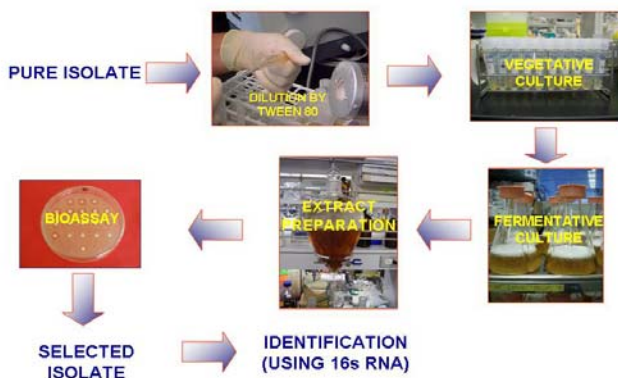
Process of isolation



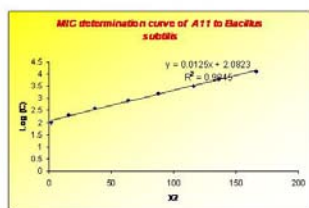
RESULT OF ISOLATION AND ANTIMICROBIAL TEST

No	Sample	Location of sampling	treatment	Diameter of inhibition (mm)					
				<i>E.coli</i>	<i>S.aureus</i>	<i>B.subtilis</i>	<i>P.aeruginosa</i>	<i>C.albican</i>	<i>A.niger</i>
1	PCL11	Pantai utara Cirebon	HS						7
2	PCL13	Pantai utara Cirebon	HS	7	7	7	7		
3	A64	Pantai barat banten	HS						15
4	A610	Pantai barat banten	A		12				
5	A11	Pantai barat banten	HS	18	15	14	14		
6	A21	Pantai barat banten	HS				7		9
7	A32	Pantai barat banten	HS		12				7
8	A93	Pantai barat banten	A	10,16		8,67	9,51		
9	A44	Pantai barat banten	A					10,61	
10	A54	Pantai barat banten	HS		8,56			8,67	
11	YK21	Pantai selatan yogyakarta	HS						14
12	YK41	Pantai selatan yogyakarta	HS	9,71		8,71	9,53	9,01	
13	YK43	Pantai selatan yogyakarta	A					8,58	

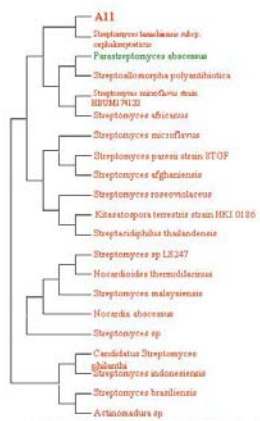
Process of screening



Morphology of A11 (*Streptomyces sp.*)



MIC 120,86 µg/ml



PHYLOGENIC TREE OF A11

CONCLUSION

- The result of screening was obtained 4 isolates that could inhibited *E. coli*, 5 isolates could inhibited *Streptococcus aureus*, 4 isolates could inhibited *Bacillus subtilis*, 4 isolates could inhibited *Pseudomonas aeruginosa*, 5 isolates could inhibited *Candida albican*, and 4 isolates could inhibited *Aspergillus niger*.
- Morphology and DNA identification of isolate A11 (isolate which have the strongest antibakteri) showed *Streptomyces sp.* The Minimum Inhibition Concentration (MIC) of isolate A11 extract (crude) to *Bacillus subtilis* was 120,86 µg/ml.

