Actinomycetes Enumerated from Sediments Associated with Three Mangrove Species in Puerto Princesa City, Philippines, with Notes on the Antibacterial Potential of Isolates from The Rhizosphere of Mangrove Plant *Camptostemon Philippinensis*

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INTRODUCTION

- **Actinomycetes:**
  - Order Actinomycetales; Class Actinobacteria
  - Aerobic, gram-positive and filamentous bacteria
  - slow growing prokaryotes
  - widely distributed in nature can be found in every natural substrates:
    - water, air, soil, foodstuffs, manure and composts

INTRODUCTION

Mangrove forests:

- highly productive ecosystems which comprise of unique woody plant communities
- form unique saline environments
- are nutritionally versatile

It is believed to have the potential of becoming new reservoir for highly diverse actinomycetes.

- **Palawan**

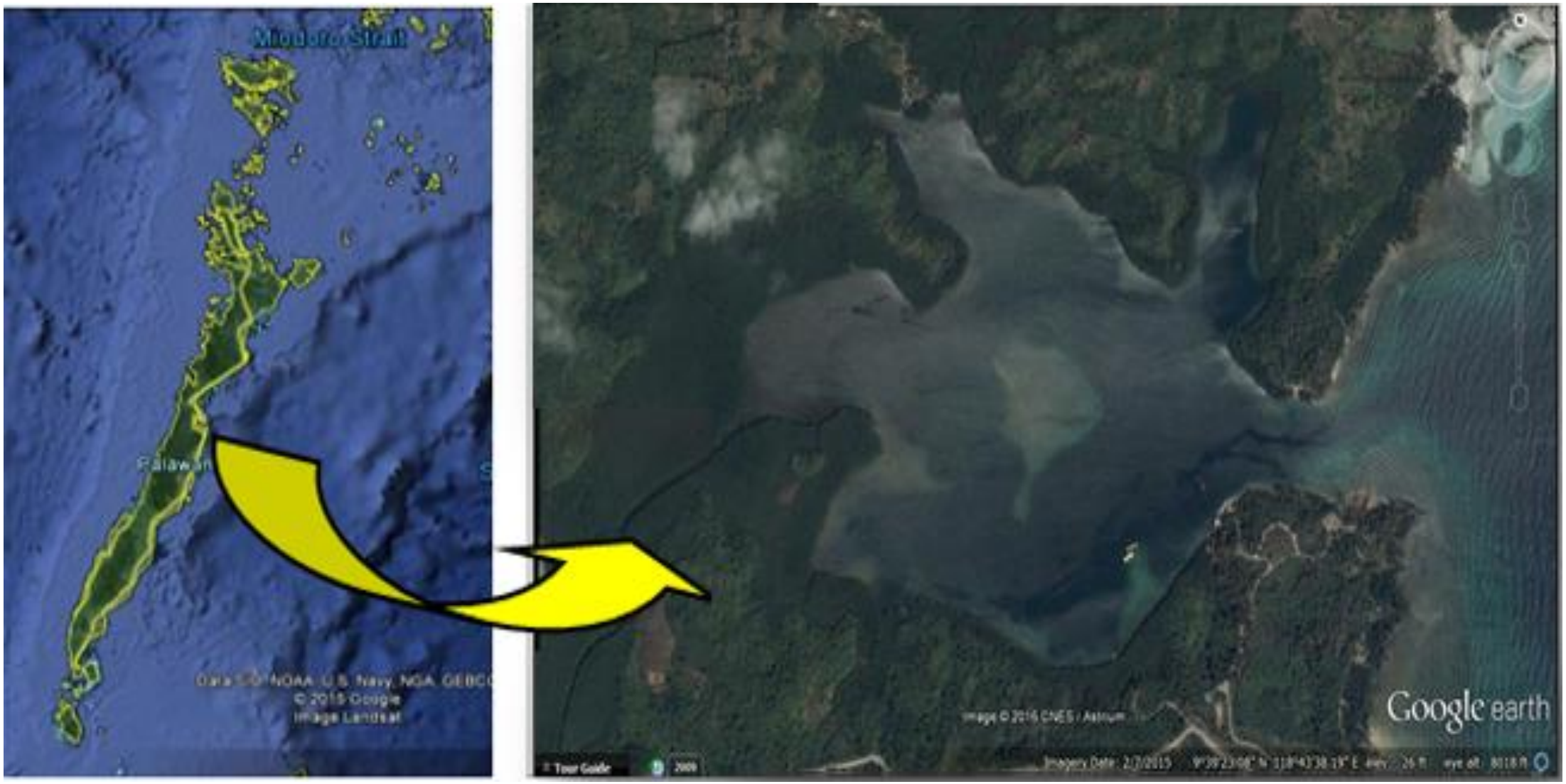
  - Mangrove and Swamp Forest Reserve
  - have 23 mangrove species belonging to 11 families
  - out of the 28 true mangrove species recorded in the Philippines and 73 species of mangroves worldwide

OBJECTIVES:

This study aims to enumerate culturable actinomycetes associated with the rizosphere of *Camptostemon philippinensis.* Specifically,

1. To determine the abundance of culturable actinomycetes from the sediments associated with the different mangrove species namely *Camptostemon philippinensis, Osbornia octodonta* and *Rhizophora x lamarckii*;
2. To isolate and screen actinomycetes with antibacterial potential;

Study Area


Mindoro Strait
Palawan
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Collection of Samples

for the enumeration of actinomycetes:

- using sterile plastic containers
- three (3) rhizosphere core samples approximately 100 g each was collected from the root environment
- collected through scraping directly from the root.

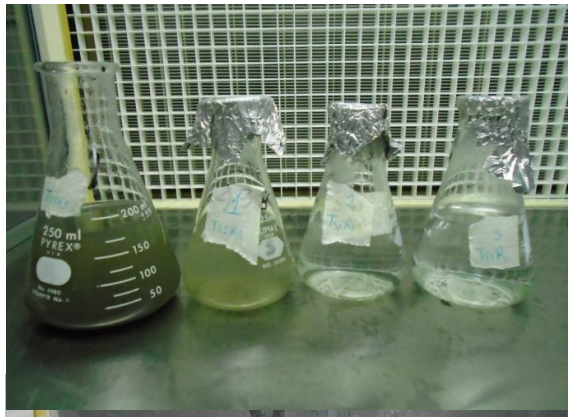
Laboratory analysis

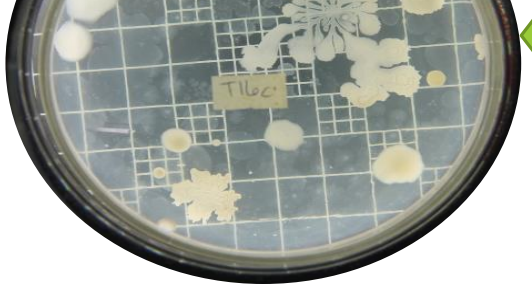
Enumeration of Actinomycetes

Pre-treatment of sediment samples

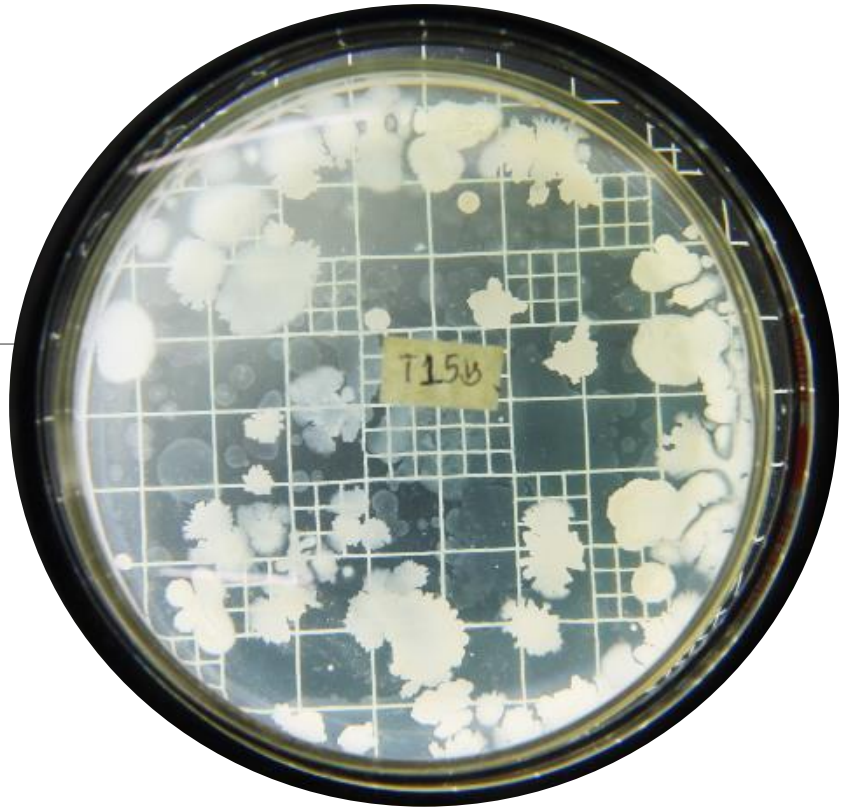
Selective Isolation of Actinomycetes from the Sediment Samples

Screening for antibacterial activity

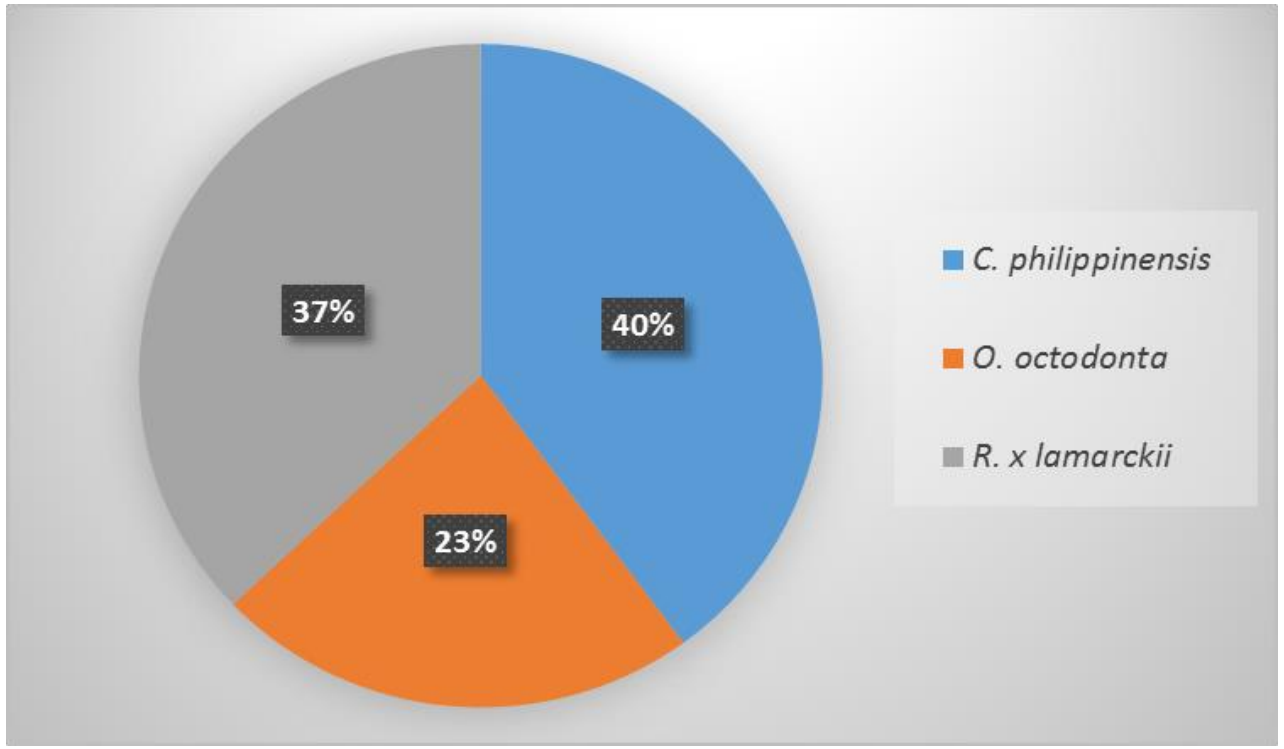




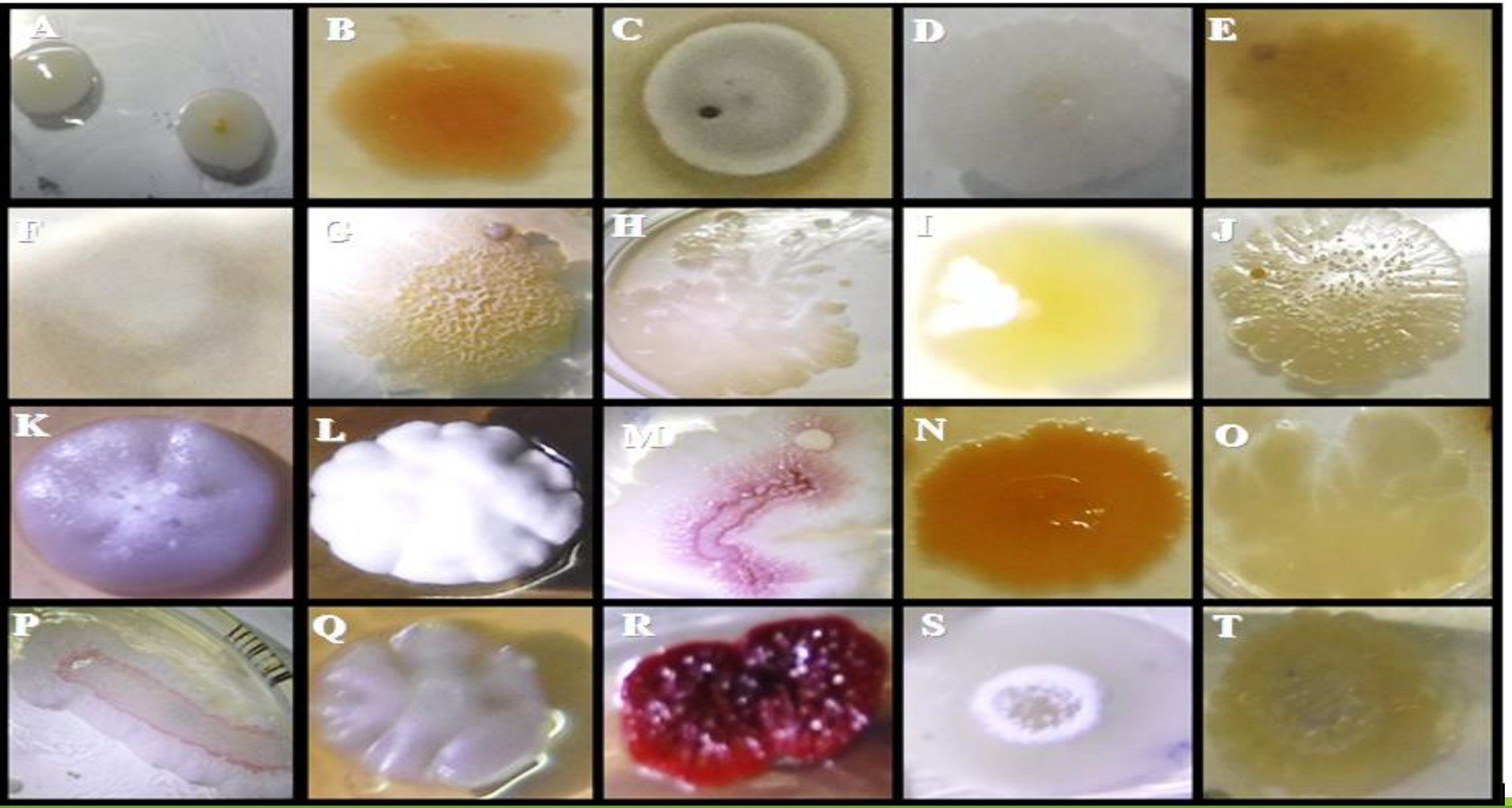
RESULTS AND DISCUSSION



Enumerated Actinomycetes



A total of 178 actinomycetes colony forming units (CFUs) had been successfully enumerated.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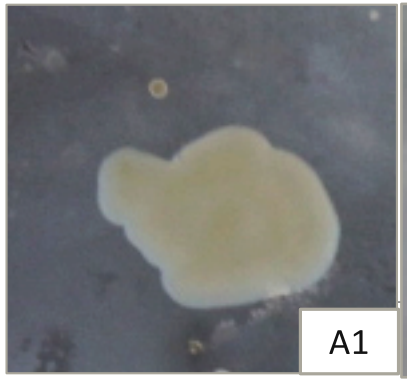

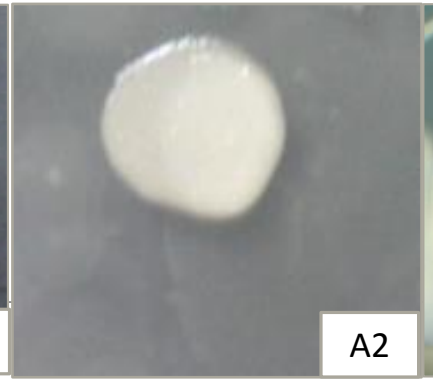

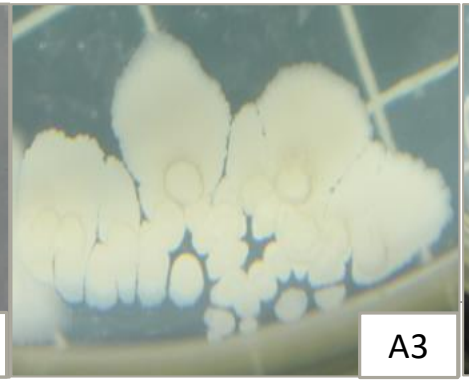

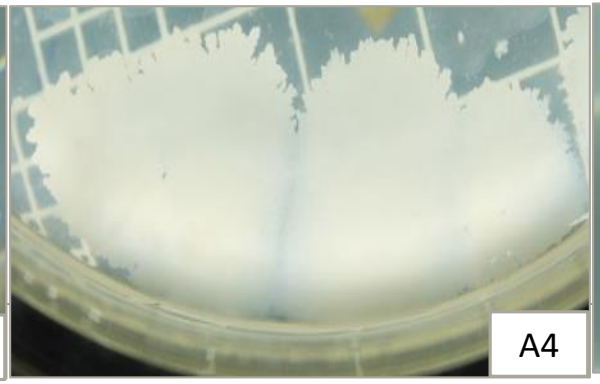

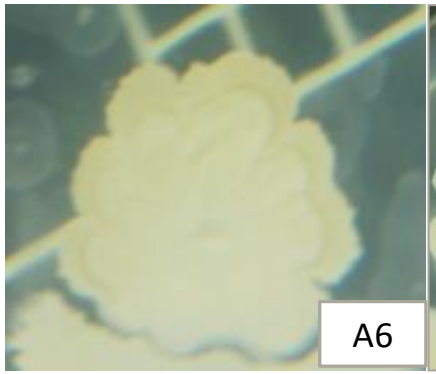

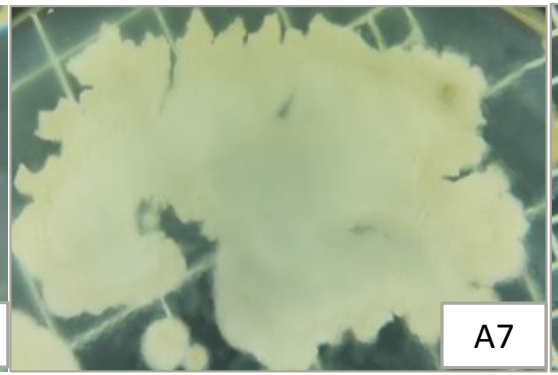

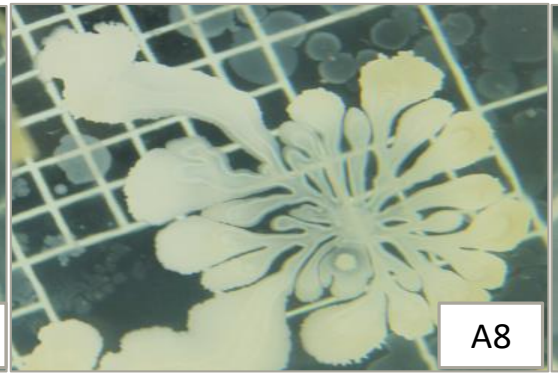

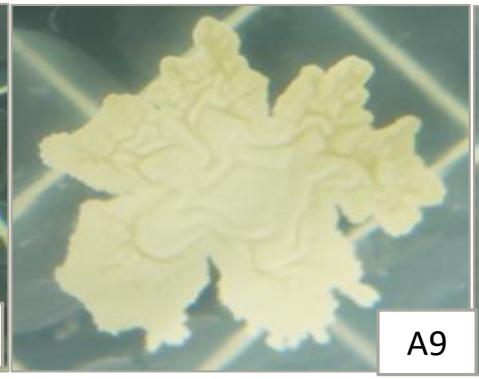

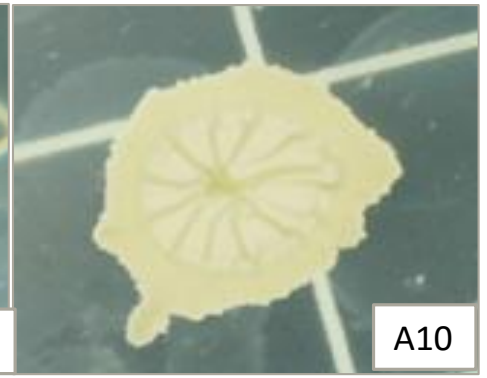

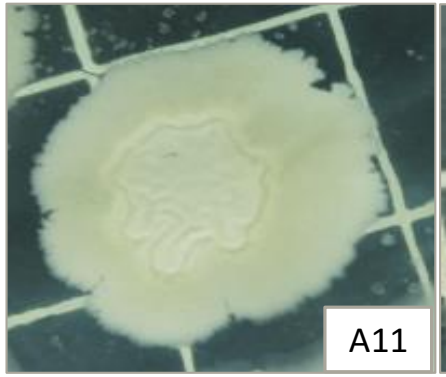

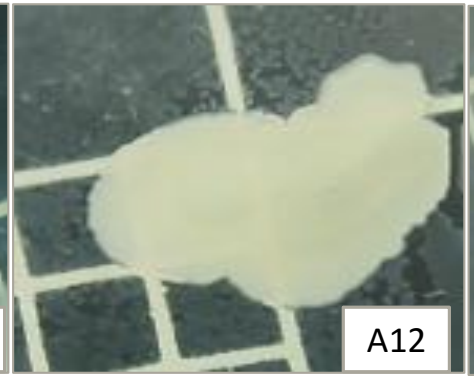

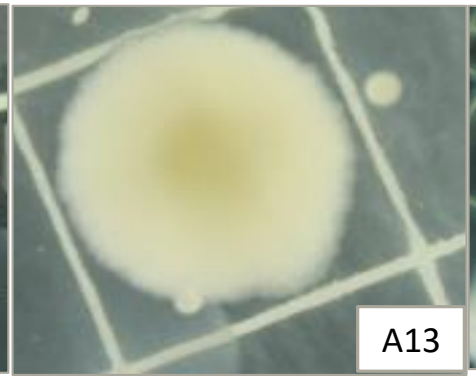

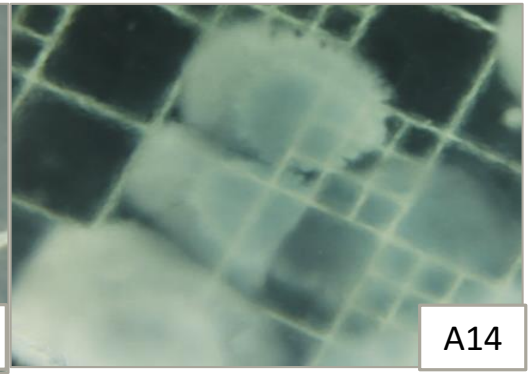

14 distinct colonies isolated from *C. philippinensis* differing in cultural morphology.

Antibacterial Potential

Colony Code	*Escherichia coli*	*Staphylococcus aureus*
A3	5.50±1.32	- -
A4	3.00±1.12	- -
A5	5.33±0.71	- -
A7	5.67±2.02	- -
A9	4.67±0.47	- -
A10	4.00±1.49	- -
A11	2.00±0.41	- -
A12	**12.33±3.83**	**10.67±2.32**
A14	4.00±0.71	- -

Selected actinomycetes colonies that showed antimicrobial activities using streak plate method.

CONCLUSION AND RECOMMENDATIONS

Results of this study revealed the presence of relatively large number of enumerated colonies from the rhizosphere soil of *Camptostemon philippinensis* which suggest that it is a potentially rich source of actinomycetes with some antibiotic-producing potential.

Thus, further studies particularly on characterization and anti-microbial activity of actinomycete isolates against antibiotic resistant microorganisms are hereby recommended.

The presence of antibiotic producing actinomycetes would help elucidate the claims of medicinal applications of this mangrove species and would help increase its ecological importance.

Also, it is recommended that the national and local government units must support the strict implementation of the different environmental laws and regulation for the protection of mangrove ecosystem.

Thank you!