Antibiotic Resistance Assessment of Halophilic Bacteria Isolated From the Indian Sundarbans Estuary

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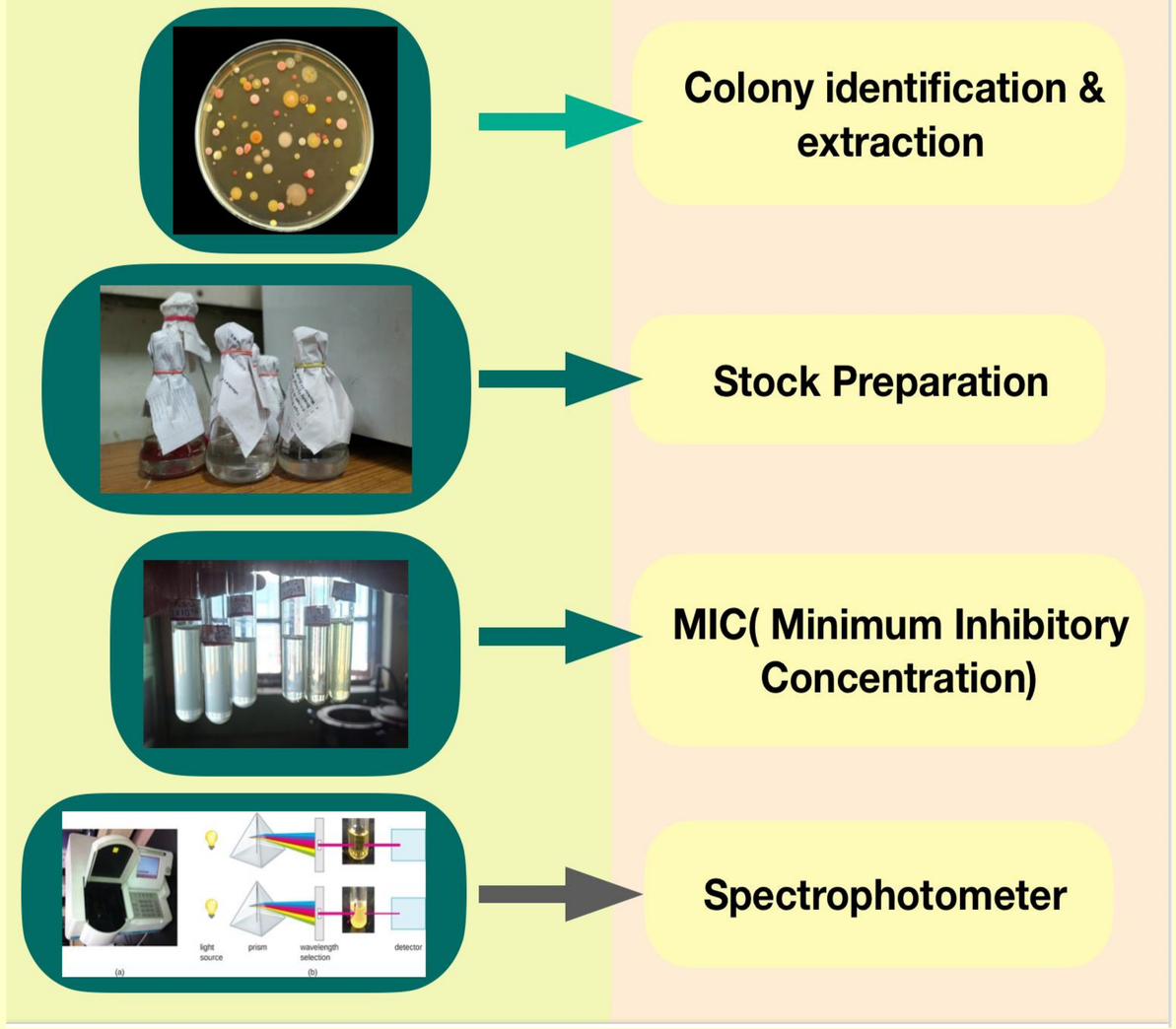
INTRODUCTION

- A serious and expanding concern to human and environmental health is the prevalence and spread of antibiotic resistance genes as new ecological pollutants.
- Halophilic bacteria may resist antibiotics not typically associated with halophilic environments. This may be due to the overlap in the stress responses to high salt concentrations and antibiotic exposure.
- The Sundarbans estuary is at a critical juncture due to anthropogenic pressures. Therefore, Sustainable practices, International Cooperation, and local involvement are crucial to preserving this vital ecosystem for future generations.

OBJECTIVES

- Evaluation of antibiotic resistance of the evolutionary forms of halophilic bacteria by 16sRrna sequencing to establish.
- Identification of antibiotic resistant diseases and the impact on society.

METHODOLOGY



RESULTS

After analysing the bacterial colonies in both the types of soil samples the following value have been found:

Table 1.

	BEFORE 15 TRANSFERS			
	SL.NO	EXPERIMENT		CONTROL
		OD Value	MIC	
RS	1	0.081	1mg/ml	1.673
	2	0.013	0.01mg/ml	
	3	0.062	0.1mg/ml	
	4	0.73	1mg/ml	
NRS	1	0.091	1mg/ml	1.9
	2	0.083	1mg/ml	
	3	0.082	1mg/ml	
	4	0.065	0.1mg/ml	

Table 1: Minimum Inhibitory Concentration of the bacterial strains before 15 transfers

	AFTER 15 TRANSFERS			
	SL.NO	EXPERIMENT		
		OD Value	MIC	CONTROL
RS	1	0.751	1mg/ml	
	2	0.291	0.01mg/ml	1.673
	3	0.453	0.1mg/ml	
	4	0.735	1mg/ml	
NRS	1	0.898	1mg/ml	
	2	0.873	1mg/ml	1.9
	3	0.82	1mg/ml	
	4	0.541	0.1mg/ml	

Table 2: Minimum Inhibitory Concentration of the bacterial strains after 15 transfers.

DISCUSSION

The Sundarbans estuary is at a critical juncture due to anthropogenic pressures. Sustainable practices, international cooperation, and local involvement are crucial to preserving this vital ecosystem for future generations.Moreover halophilic microorganisms with a spectrum of action in vitro: antimicrobial and anticancer. The action mechanisms of these molecules, the urgent need to introduce alternative lead compounds and the current aspects on the exploitation.

CONCLUSION

- The results showed that some bacterial strains resisted specific antibiotics, while others were susceptible. The degree of resistance varied depending on the bacterial species and the type of antibiotic tested.
- The findings support the hypothesis that bacteria can develop or acquire antibiotic resistance over time, often through mechanisms such as mutation or horizontal gene transfer.
- This experiment underscores the importance of careful antibiotic use to prevent the development and spread of resistant bacteria. Further studies are needed to investigate the genetic and environmental factors that contribute to antibiotic resistance as well as explore alternative treatments and strategies for combating resistant infections.

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