ANTIBIOTIC-PRODUCING BACTERIA FROM THE GUT OF ABALONE *Haliotis asinina*

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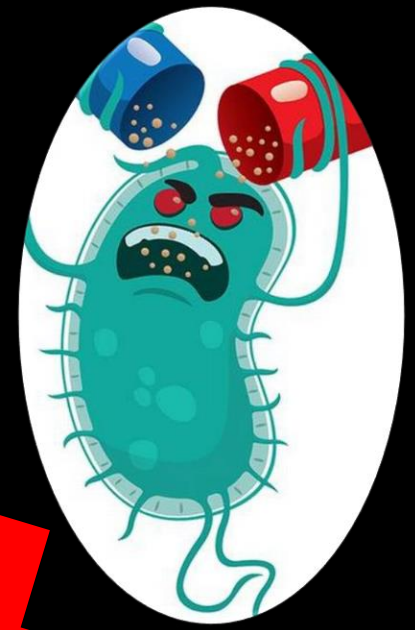
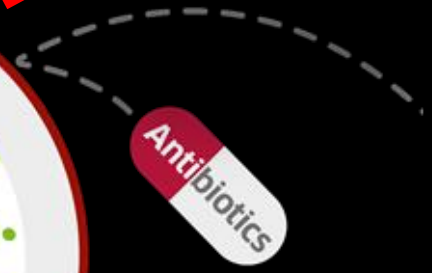
PROJECT DESCRIPTION





PROJECT DESCRIPTION

Haliotis asinina

Photo credit: Malaysian Chinese Kitchen

Photo credit: AFCOL

Culture system

OBJECTIVES OF THE PROJECT

- The aim of this study was to isolate bacteria with potential antibiotic properties from the gut of *Haliotis asinina*.
  - isolate bacteria from the gut of cage-cultured abalone;
  - test the antibacterial potential of the isolated microorganisms against *Escherichia coli* and *Staphylococcus aureus* and;
  - characterize and identify the isolated bacteria that would inhibit the test microorganisms.

METHODOLOGY

Sample collection

Abalone cage-culture, Pamantolon, Taytay, Palawan

Isolation of bacteria

- Sample homogenization
- Serial dilution
- Incubation

Test for antibiotic potential

- Streak method
- Kirby Bauer Disk Diffusion method

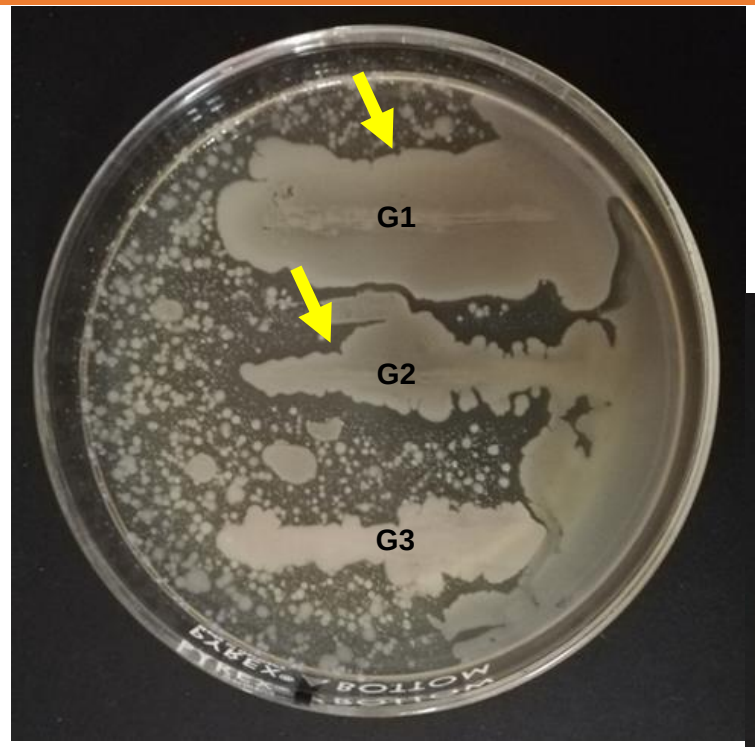
Characterization and identification of isolates with antibiotic potential

- Morphological, biochemical
- 16sRNA gene sequencing
- Phylogenetic analysis

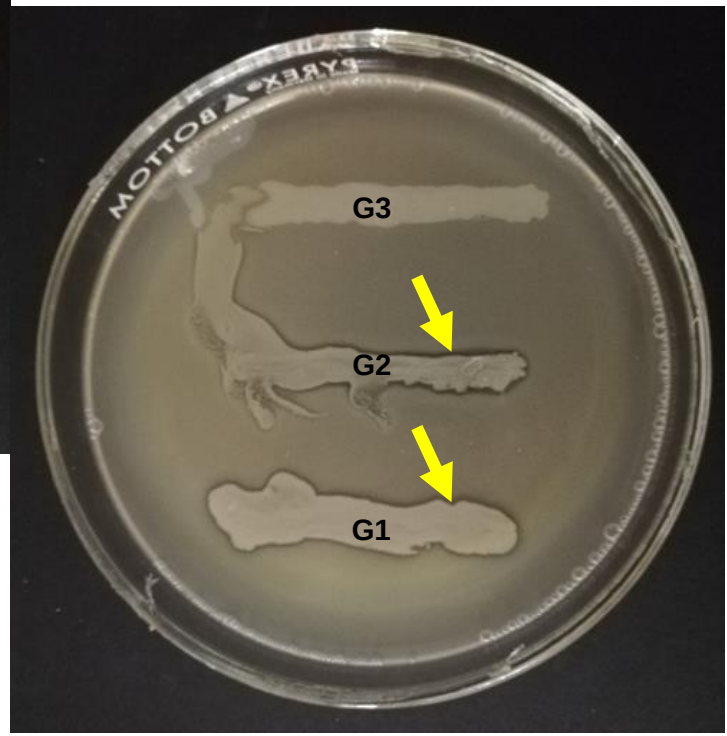
RESULTS

Screening for antibiotic potential

- A total of 30 colonies were screened for antibiotic potential
- Only G1 and G2 had zones of inhibition when tested against *E. coli* and *S. aureus*



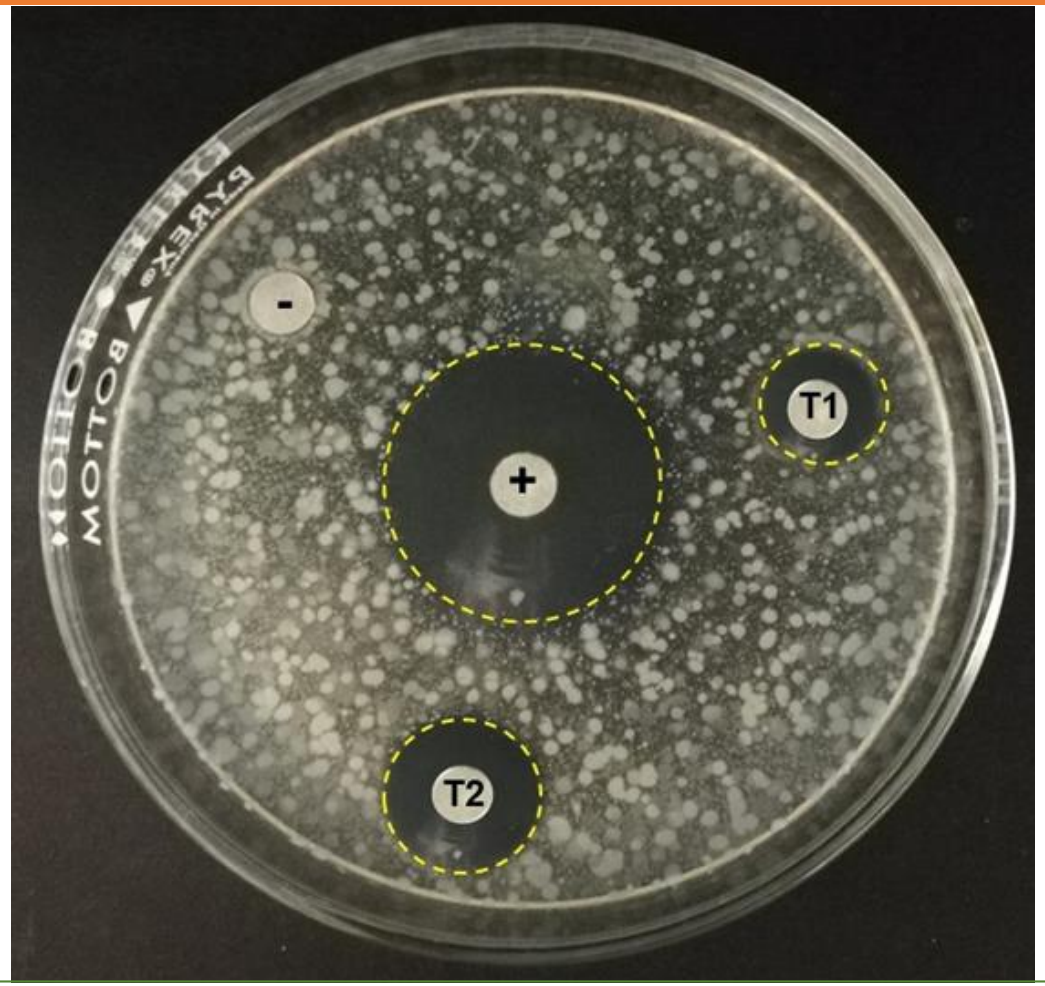
Representative plate showing ZOI of G1 and G2 against *E. coli*



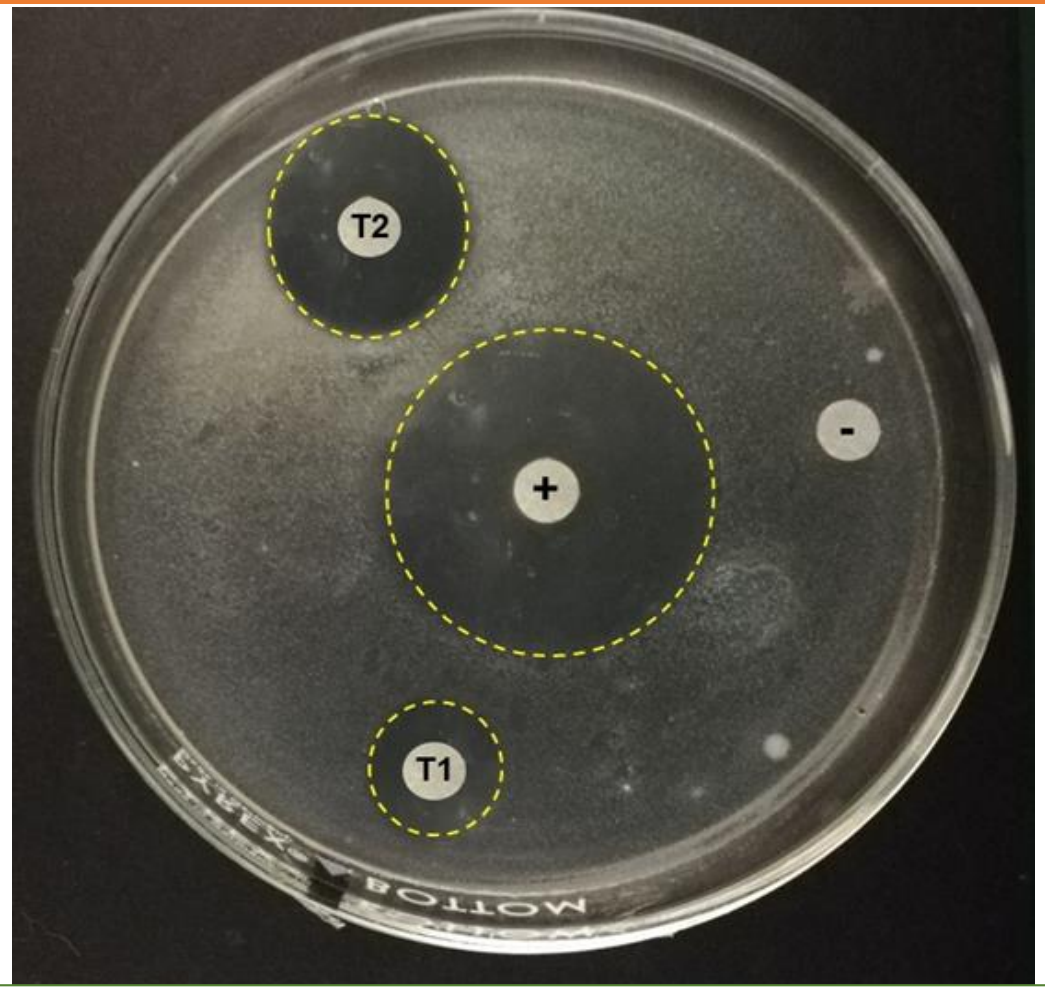
Representative plate showing ZOI of G1 and G2 against *S. aureus*

ZOI – Zone of Inhibition

RESULTS



Zones of inhibition (yellow circles) of isolates from the gut of *Haliotis asinina* against *Escherichia coli* using Kirby Bauer disk diffusion method (T1=G1; T2=G2)



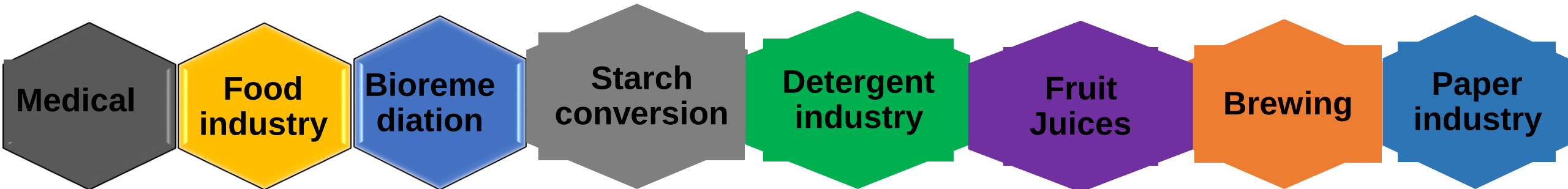
Zones of inhibition (yellow circles) of isolates from the gut of *Haliotis asinina* against *Staphylococcus aureus* using Kirby Bauer disk diffusion method (T1=G1; T2=G2)

RESULTS

Characteristics of antibiotic producing bacteria

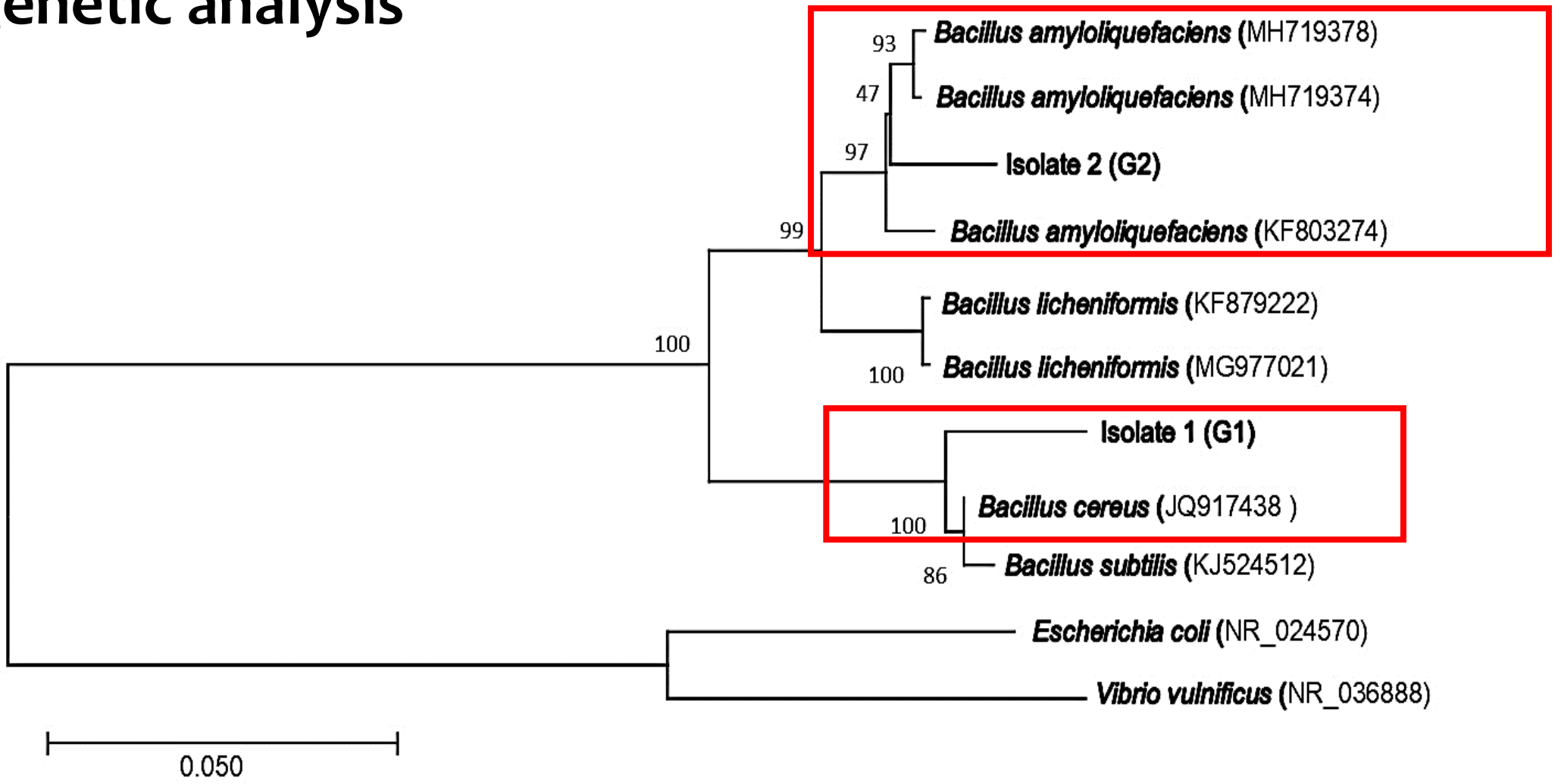
				Growth											
Isolate	Gram stain	Cell shape	Motility	TCBS	agar slant	4-6°C	20-25°C	40°C	0% salt	5% salt	6% salt	Gelatinase	Catalase	Lactose Fermenter	Hydrolysis of Starch
G1	G+	Rod	Motile	Yellow	Beaded	-	+	+	+	+	+	+	+	-	+
G2	G+	Rod	Motile	Green	Rhizoid	-	+	+	+	+	+	+	+	-	+

Applications



RESULTS

Phylogenetic analysis



Phylogenetic analysis of the 2 isolates and their closest relatives based on 16SrRNA gene

- **Possible applications of *Bacillus amyloliquefaciens***
  - Synthesizes a natural antibiotic protein barnase (Molohon et al. 2011)
  - Improve root tolerance to salt stress (Chen et al. 2016)
  - Probiotics (Ahmed et al. 2014)
  - Biocontrol agent and biofertilizer (Belbahri et al. 2017)
  - Remediation in aquaculture water (Xie et al. 2013)

- **Possible applications of *Bacillus cereus***
  - some harmless strains of B. cereus are used as a probiotic feed additive to reduce *Salmonella* in the animals' intestines.
  - Biocontrol agent (Sunaina 2005)

CONCLUSION

- Bacteria with antibiotic potential were isolated from the gut of abalone *H. asinina,* identified to be *Bacillus* species most closely related to *Bacillus amyloliquefaciens* and *Bacillus cereus*

RECOMMENDATIONS

- Further studies on the characteristics of two isolates
- Studies on isolation of biactive components
- Studies on possible applications such as probiotics, natural antibiotics, immunostimulant, etc.

ACKNOWLWDGEMENT CHED DARE TO