



# Isolation and Characterization of Microbes from Waepella Hot Spring

INDRAYANI INDRAYANI<sup>1\*</sup>, AMIRUDDIN HAMBALI<sup>1</sup>, RESKI PRAJA PUTRA<sup>1</sup>, ARDIANSYAH<sup>2</sup>

---

<sup>1</sup>Study Program of Agricultural Technology Education, Faculty of Engineering,  
Universitas Negeri Makassar, South Sulawesi, Indonesia

<sup>2</sup>Aquaculture Department, Agricultural Polytechnic State of Pangkep, Makassar-Pare Pare  
Km. 83,  
South Sulawesi, Indonesia

Dipresentasikan pada 5<sup>th</sup> International Symposium of Marine Science and Fisheries  
Faculty of Marine Science and Fisheries, Hasanuddin University, Makassar, 5 June 2022



# Introduction

---

- ❖ Thermophilic Bacteria commonly found in hot springs.
- ❖ Have the potential to produce commercial products, including the amylase enzyme
- ❖ Amylase enzyme is widely used in the food and beverage industries.
- ❖ This study aims: to isolate and characterize microbes from Waepella hot springs in Sinjai Regency, South Sulawesi which have the potential to be developed as amylase enzyme producer.



# Materials and methods

---

## Sampling Site

- Waepella Hot Spring Sinjai Regency
- 3 stations

## Sample Collection

- Using sterile glass bottles
- Water quality measurements (Temperature, pH, salinity)

## Isolation

- Agar Plating Technique
- TSA medium
- Repeated streaking to obtain pure colonies

## Morphological characterization

- Cell shapes
- Colony colors



# Materials and methods

---

## Gram staining

- Gram positive (purple)
- Gram negative (pink/red)

## Catalase Test

- Catalase positive (air bubble formed)
- Catalase negative (no air bubble)

## Endospora Test

- Schaefer-Fulton method (stain with malachite green and safranin)
- Endospora positive – stain green
- Endospora negative-stain pink/red

## Amylase activity test

- Starch hydrolysis method
- Clear zone around the colony (+)
- Dark zone around the colony (-)



# Results and discussion

**Table 1. Water quality parameters at the Waepella Hot Spring Sinjai**

Parameters	Station		
	Station 1	Station 2	Station 3
Temperature (°C)	55	53	49
Salinity (ppt)	0	0	0
pH	7.43	7,61	7,28



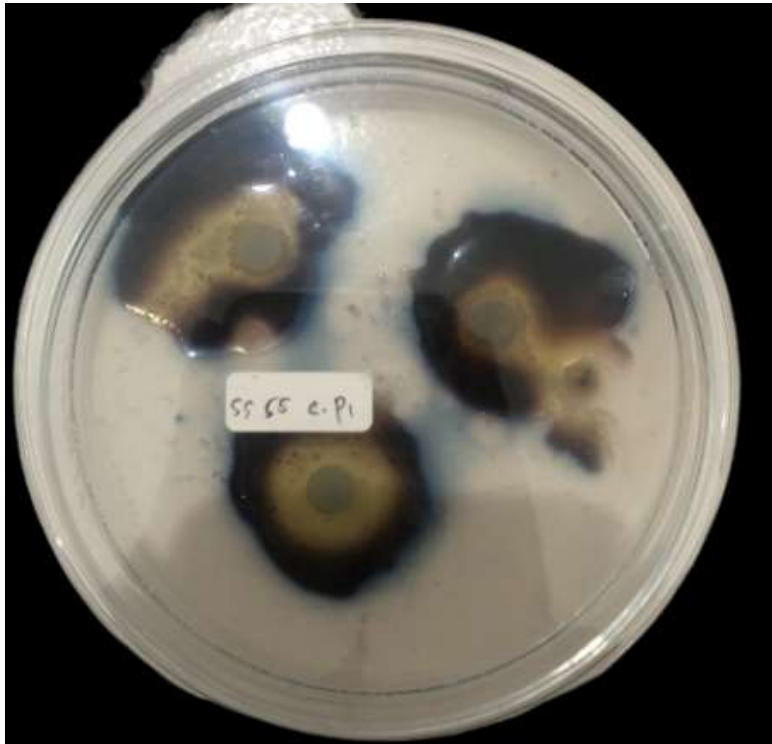
**Table 2. Characteristics of Thermophilic bacteria isolated from hot springs Waepella Hot Spring Sinjai**

No	Isolate codes	Colony Colors	Gram Staining	Cell Shapes	Catalase Test	Endospora Test
1.	ISO SA.49.1.1	White	positive	Rod	-	+
2.	ISO SA.49.2.1	White	negative	Rod	-	-
3.	ISO SA.49.1.2	White	negative	Cocci	+	+
4.	ISO SA.49.2.2	White	positive	Cocci	+	-
5.	ISO ST.53.1	White	negative	Cocci	+	-
6.	ISO ST.53.3	White	negative	Rod	+	-
7.	ISO ST.53.4	Yellow	negative	Cocci	+	-
8.	ISO SS.55.1.1	White	Negative	Cocci	+	-
9.	ISO SS.55.2.1	White	positive	Cocci	+	+
10.	ISO ST 53 P1	White	Negative	Cocci	+	-
11.	ISO ST 53 P2	White	Negative	Cocci	+	+



**Table 2. Amylolytic Activity of Thermophilic bacteria isolated from hot springs Waepella Hot Spring Sinjai Regency**

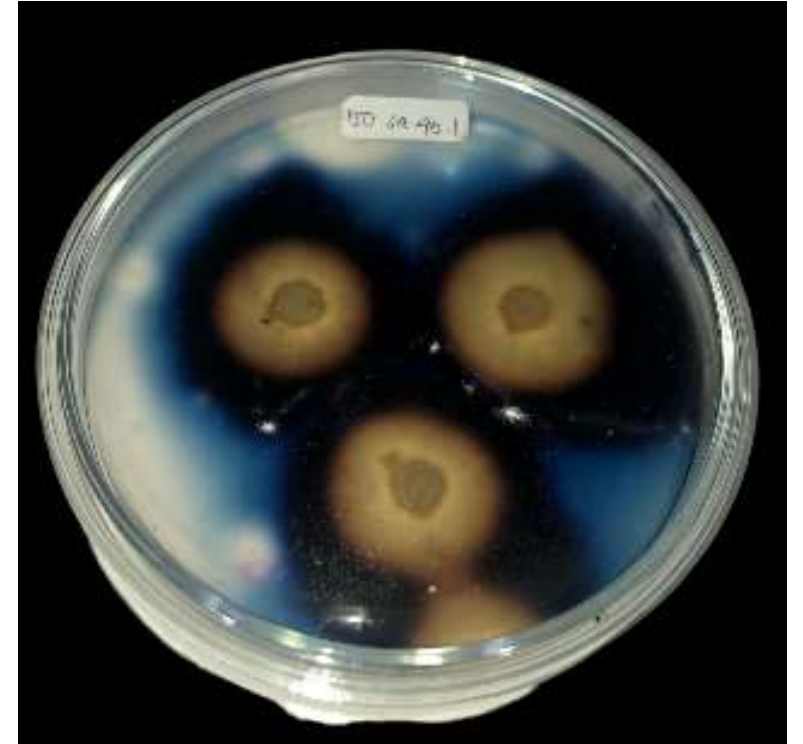
No	Isolate Codes	Day 1	Day 2	Day 3
1	ISO SS 55.P1	0	4.2±0	5.73±0.15
2	ISO ST 53.1	0	0	0
3	ISO ST 53.3	0	0	0
4	ISO ST 53.4	7.23±0.23	8.07±1.40	10.7±2.43
5	ISO SA 49.1.1	3.97±0.76	12.27±0.6	19.6±0.62
6	ISO SA 49.2.1	11.1±0.15	12.23±0.38	18.57±0.60
7	ISO SA 49.1.2	0	0	0
8	ISO SA 49 2.2	0	0	0
9	ISO ST 53 PI	0	5.77±0.75	11.47±0.74
10	ISO ST 53 P2	0	8.3±0.7	15.63±0.76
11	ISO SS 55 P2	9.77±0.21	15.60±0.52	22.6±0.44



SS 55°C P1



ISO SA 49.2

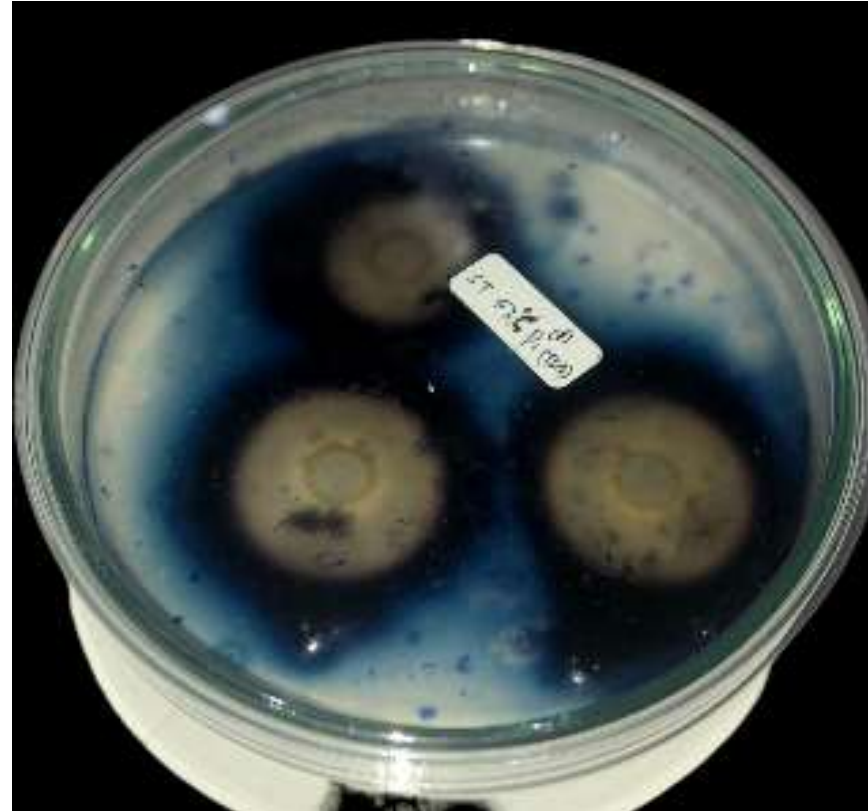


ISO SA 49.1





ISO ST 53.4



ST 55°C P2 (1) (TSA)



# Conclusion & future direction

---

- ❖ Successfully establish 11 isolates, 7 of them have amylolytic activity
- ❖ Isolates ISO SS 55 P2 has the highest amylolytic activity
- ❖ Current study: optimize the enzyme production under different conditions (pH, temperature and incubation time)



**THANK YOU**