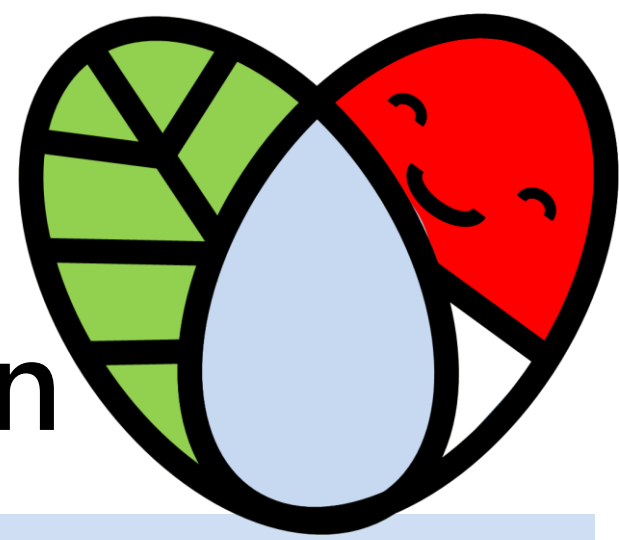


# Applying the Taguchi Method in Improving the Brewage with Tea Leaf by *Saccharomyces cerevisiae*

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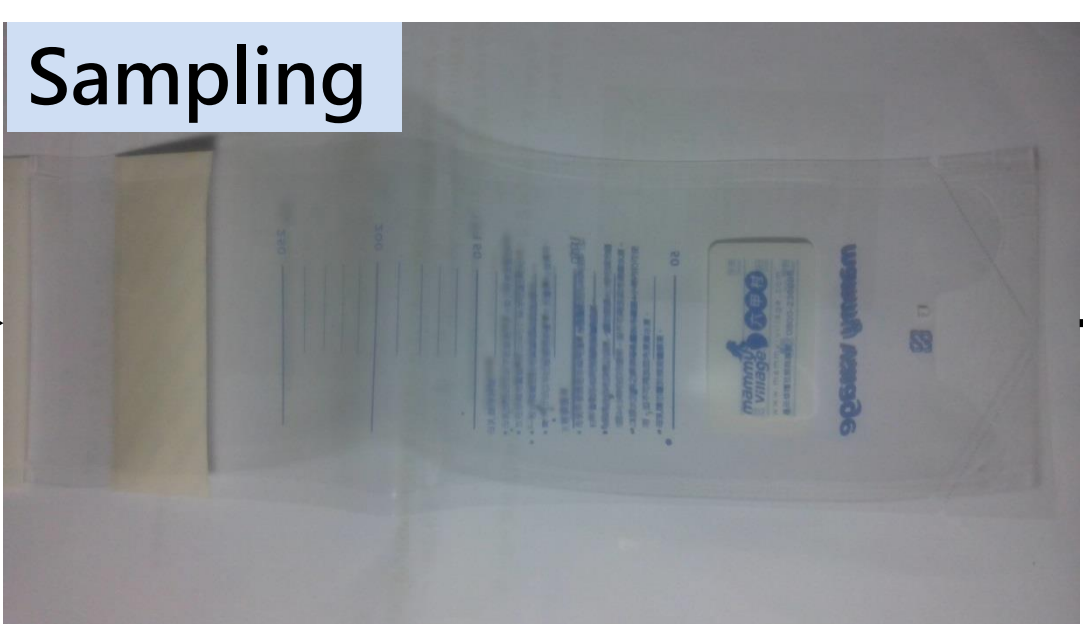
## INTRODUCTION

The brewage are popular in the commercial market. For getting different flavor, different agricultural products are used in the fermented process such as fruit, nuts and coffee bean. In this study, tea leaves were adopted to produce brewage with tea-flavor and the bacteria were separated from the fresh tea leaves. For getting better flavor and anti-oxidants, Taguchi method were used to improve the ratio of tea leaf, sugar, temperature, and flavor quality.

## MATERIALS AND METHODS



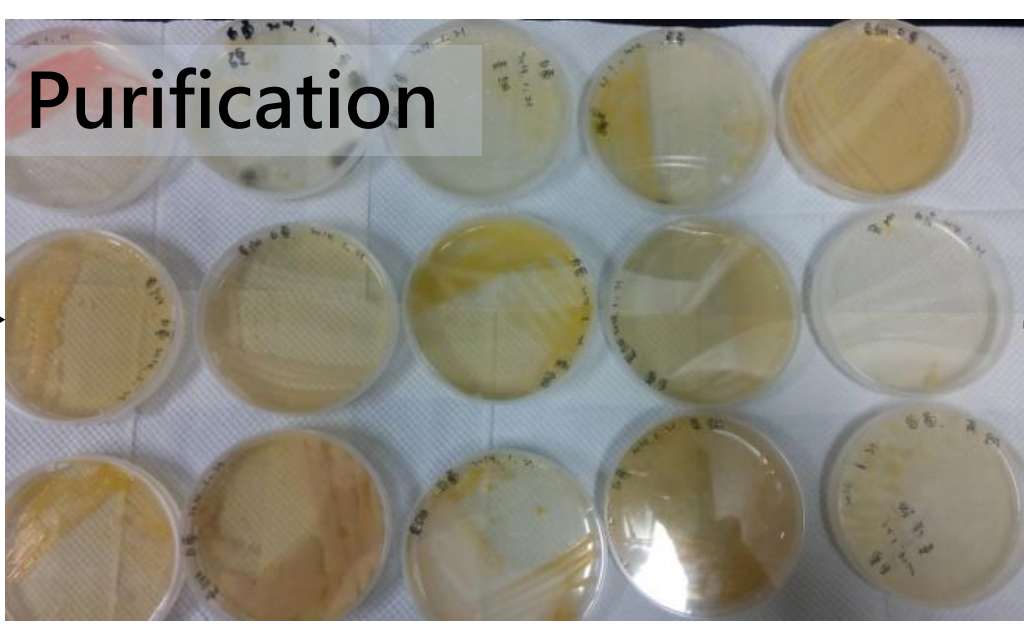
Tea-leaf: sampling from 23° 31'53.3"N 120°38'37.6"E



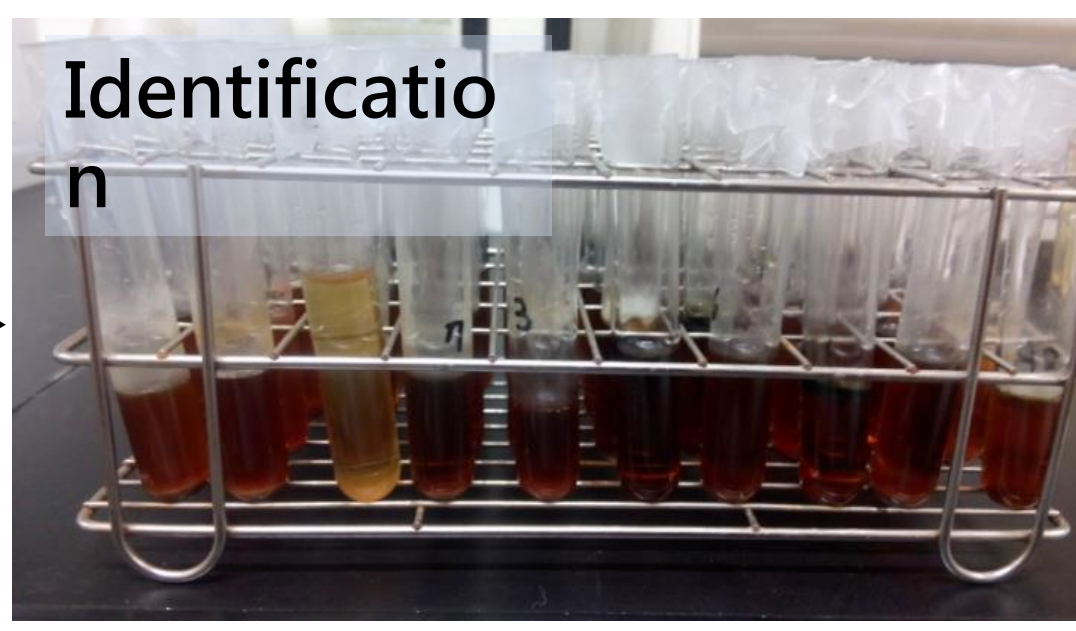
Packed into a sterilized bag, and brought back the laboratory



With YPD medium



Separation purely from each single colony

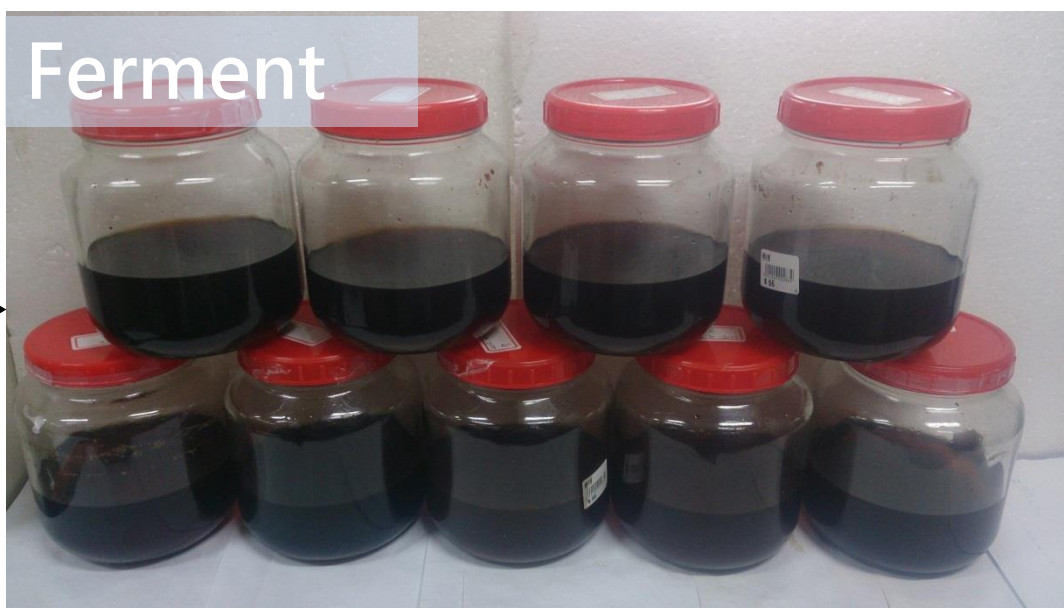


Identified with producing alcohol



Get mass yeast by jar fermentor

Taguchi method				
	Level 1	Level 2	Level 3	
Strain	BCRC 21670	BCRC 22548	Separated from site	
Water : Longan (w/w)	10:1	10:1.5	10:0.6	
Water : tea leaf (w/w)	50:1	10:0.28	100:1	
Sugar (°Bx)	24	17	10	



In room temperature



Taste and clean DPPH

## RESULTS AND DISCUSSIONS

### 1. Fresh tea-leaf yeast identification

The strain which can produce alcohol were identified by DNA sequence. The result in BLAST was indicated this strain could be *Saccharomyces cerevisiae*.

### 2. Taguchi method (L<sub>9</sub>)

Best formula:  
For taste: BCRC 22548; water : longan (w/w) 10:0.6; water: tea leaf (w/w) 10:1.5; sugar 24°Bx

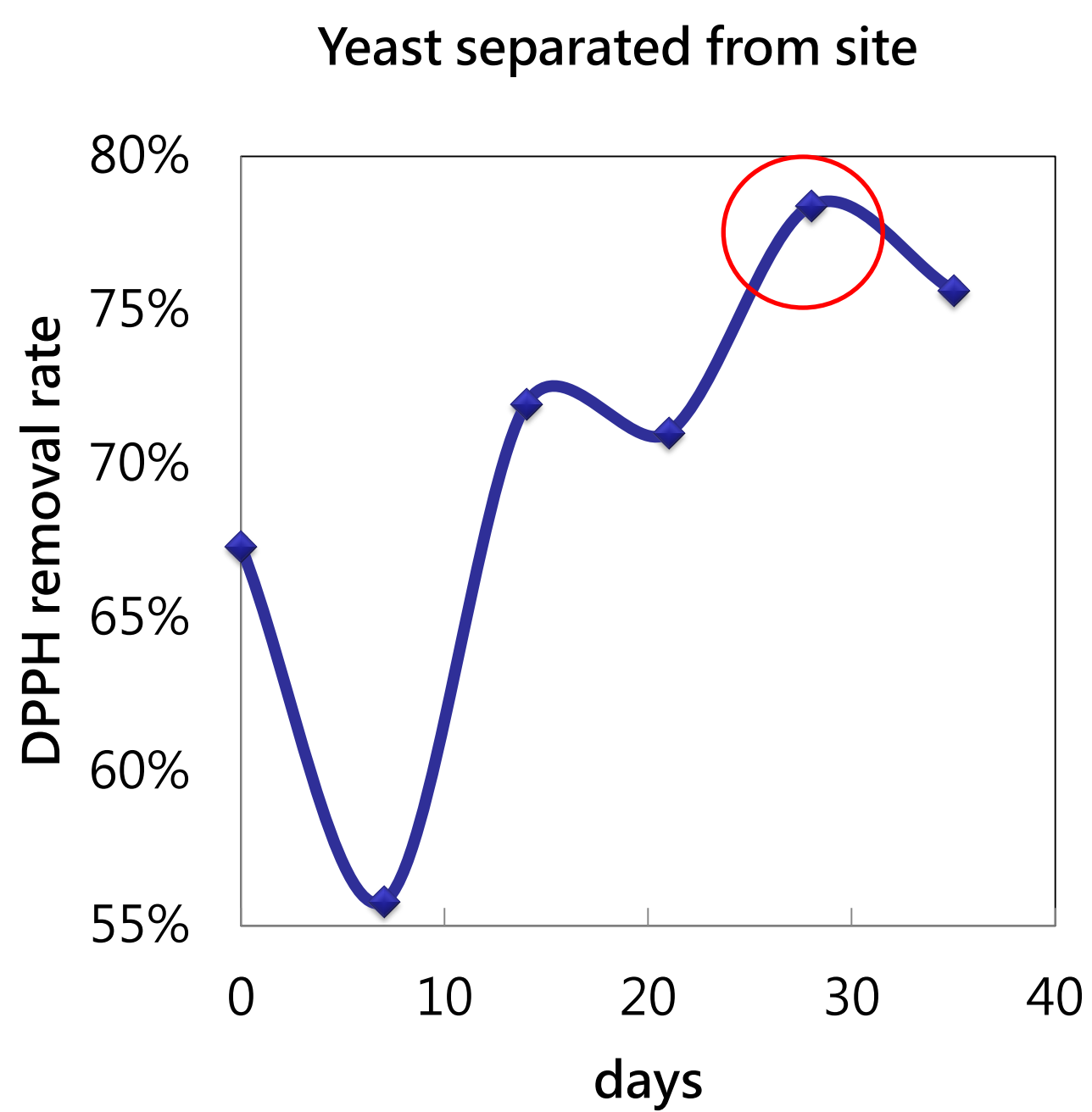
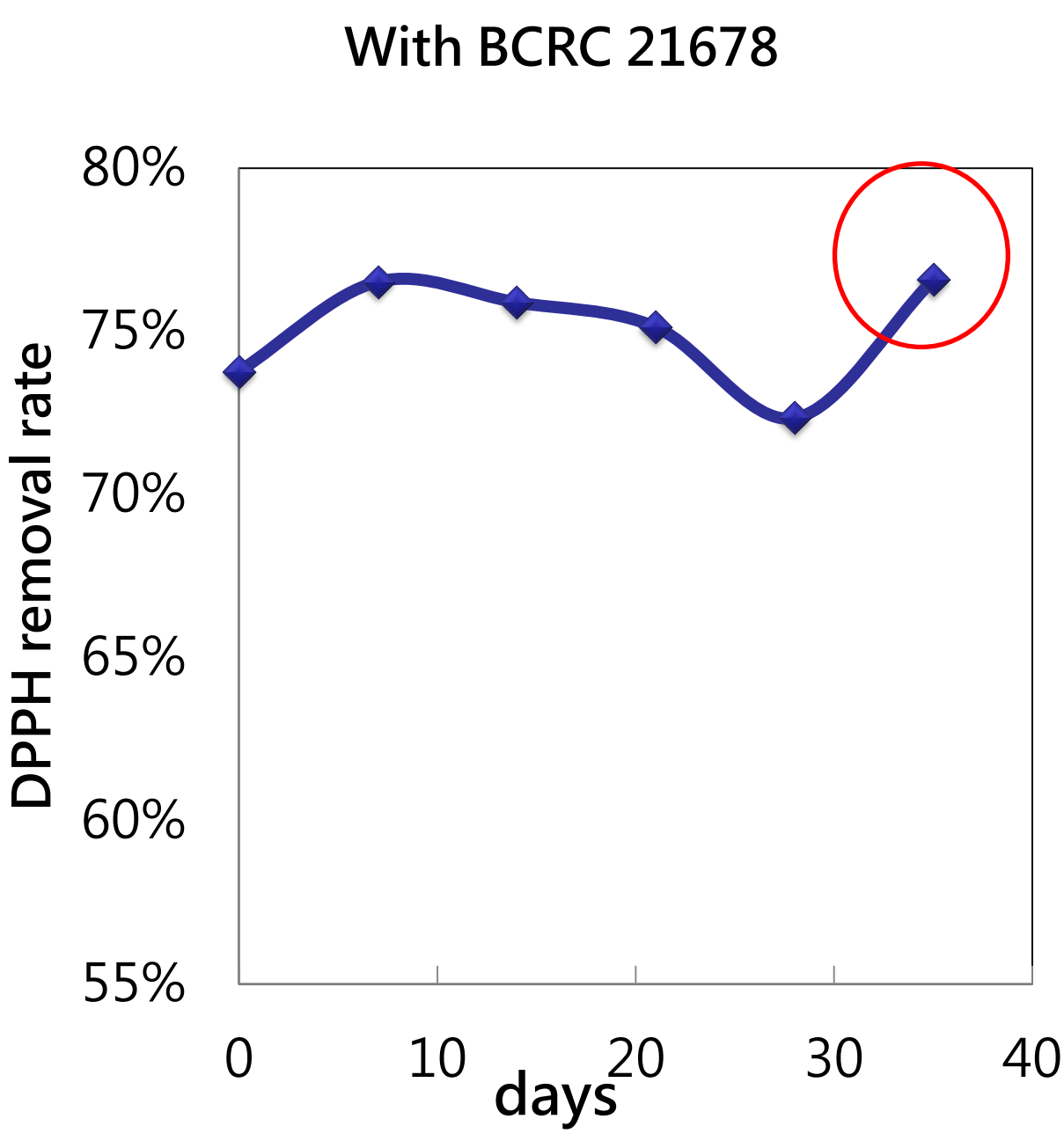
For clean DPPH: Yeast from site; water : longan (w/w) 10:1.5; water: tea leaf (w/w) 10:0.6; sugar 17°Bx

Taste @ 28 <sup>th</sup> day				
Level	Strain	Water : Longan (w/w)	Water : tea leaf (w/w)	Sugar (°Bx)
1	19.40	19.79	20.24	21.54
2	20.05	18.22	20.69	18.35
3	18.58	20.03	17.11	18.15
Effect	1.47	1.80	3.58	3.39
Rank	4	3	1	2

Clean DPPH @ 28 <sup>th</sup> day				
Level	Strain	Water : Longan (w/w)	Water : tea leaf (w/w)	Sugar (°Bx)
1	41.99	41.96	31.78	31.93
2	31.99	42.14	42.18	42.14
3	42.21	32.09	42.23	42.13
Effect	10.22	10.05	10.45	10.21
Rank	2	4	1	3

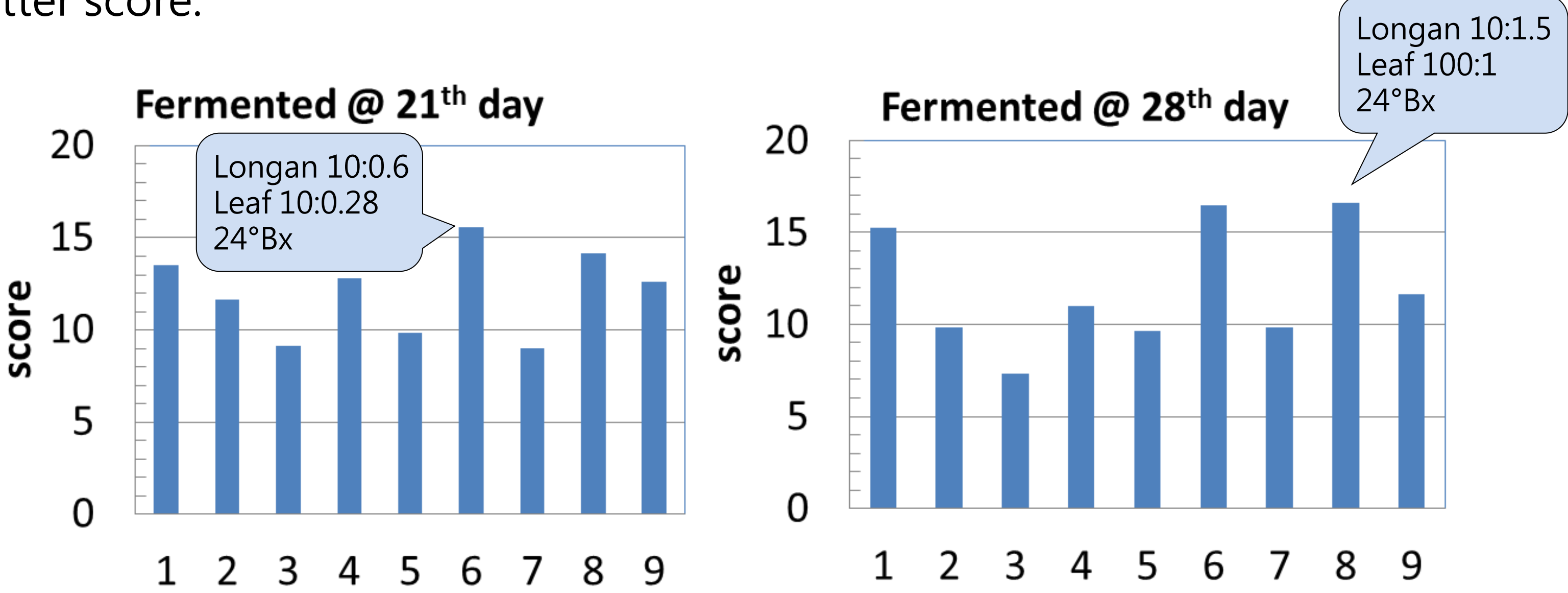
### 3. Anti-oxidizes (DPPH)

Brewage use the yeast separated from site can get better DPPH removal rate.



### 4. Ferment duration and taste

The score  $\geq 17$  is golden class;  $16 \geq \text{score} < 17$  is **silver class**. At 28<sup>th</sup> day, can get better score.



## Conclusion

1. *Saccharomyces cerevisiae* could be separated from the tea leaf of the farmland.
2. The separated strain for the brewage can get better anti-oxidize performance.
3. Best formula:  
For taste: BCRC 22548; water : longan (w/w) 10:0.6; water: tea leaf (w/w) 10:1.5; sugar 24°Bx  
For clean DPPH: Yeast from site; water : longan (w/w) 10:1.5; water: tea leaf (w/w) 10:0.6; sugar 17°Bx