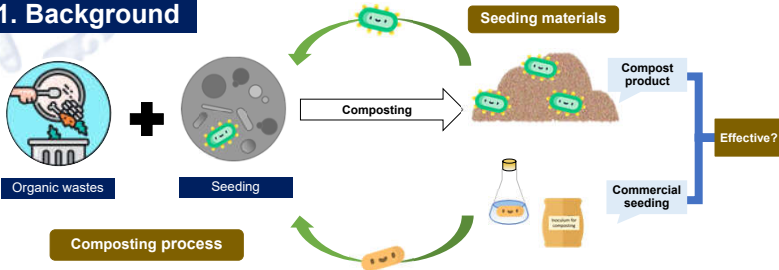


## 1. Background



Inoculation of microorganisms for decomposition of organic matter is effective to accelerate the composting process. On the other hand, since microorganisms exist in organic waste, the inoculated microorganisms cannot colonize. Therefore, the effect of acceleration cannot be expected.

**Problem:** The effect remain unclear the effective in promoting of composting process.

**Objective:** To elucidate the effects of seeding material on the microbial community succession and organic matter degradation during composting

## 2. Methodology

**Table 1** Ratio of composting raw material (Total 4.8 g-dry weight/reactor).

Rabbit food	Rice	Sawdust	Seeding *
7	3	9	1

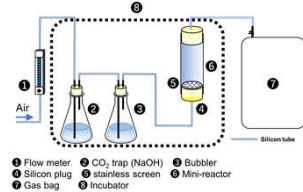
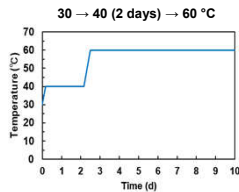
\* Run 1: AllesG, Run 2: Compost A, Run 3: Compost B

**Table 2** Organic acid (mg/g-ds)<sup>[1]</sup>

Acetic acid	Propionic acid	Butyric acid	Lactic acid
2.90	3.02	2.43	12.5

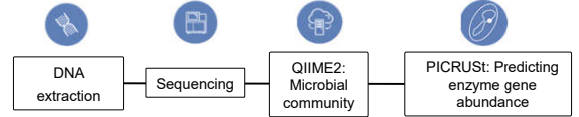
**Condition**  
 Moisture content : 40-60%  
 Aeration rate : 5.5 mL/min  
 Turning : 1 time/day  
 Sampling time: day 0, 1, 3, 5, 7 and 10

### Composting condition

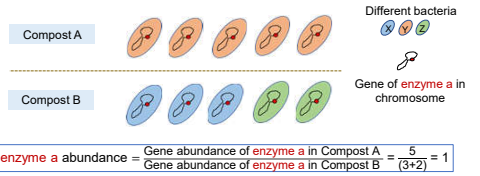


- CO<sub>2</sub> evolution rate (mol/day) = The amount of CO<sub>2</sub> emitted from reactor per day
- Conversion of carbon (%) =  $\frac{\text{Cumulative CO}_2 \text{ (mol)}}{\text{Initial carbon (mol)}} \times 100$

### Microbial community and microbial function

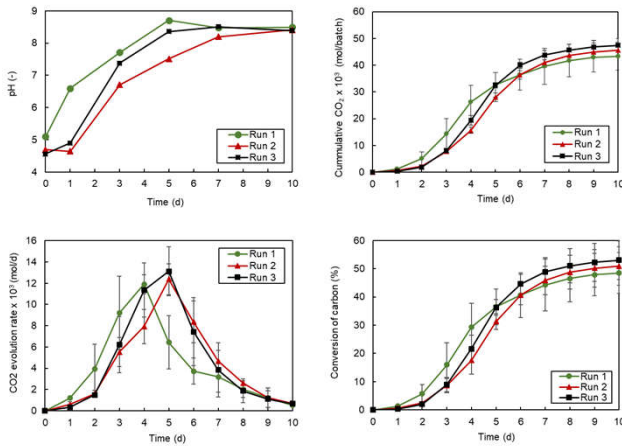


**Example:**

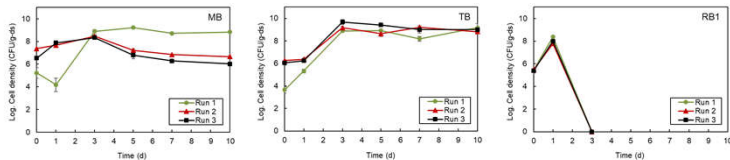


## 3. Results & Discussion

### pH, organic matter degradation and cell density

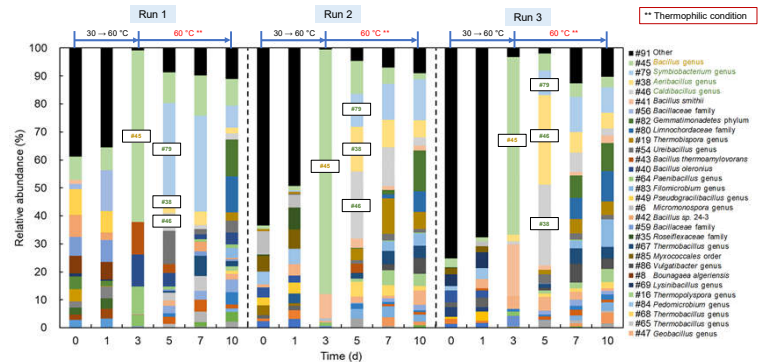


- pH kept increased to neutral level by degradation of organic acids.
- The patterns of organic matter degradation were slightly different.
- However, conversion of carbon were similar in all condition at the end of process.

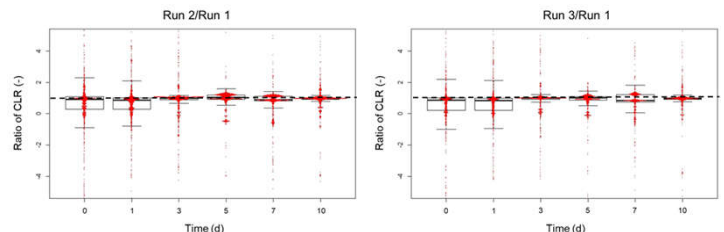


- Run 1 may contain microorganisms that can grow in wide range of temperatures.
- Log. cell densities of thermophilic bacteria are same among 3 runs.

### Microbial communities and Prediction of bacterial function



- Bacteria that favor thermophilic condition existed in very low concentration at the initial stage. Then, they increased according to temperature increment.
- The microbial community among 3 runs were considerably different.
- Especially, Run 1 was clearly different from Run 2 and Run 3 in the middle stage where organic matter was degraded vigorously.



- Most of the enzymes showed the ratio converged to almost 1.
- The result implies that the microbial functions are similar even irrespective of seeding materials were used.

## 4. Conclusion

- Degree of organic matter degradation were similar by using different type of seeding material.
- The microorganisms that exist in seeding materials greatly influence the succession of microbial communities during the composting.
- The microbial functions are similar even existent microorganisms in composts are different.

### Reference

[1] Sundberg et al., *Bioresource Technology*, Volume 102, Issue 3, Pages 2859-2867 (2011).