



Novel metabolic pathways of dieldrin by *Pseudonocardia* sp. KSF27



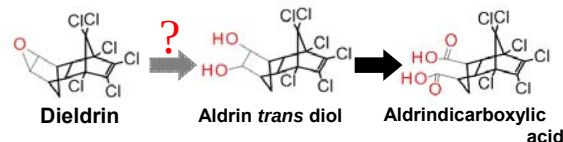
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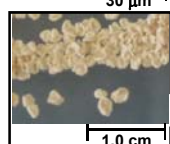
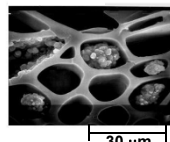
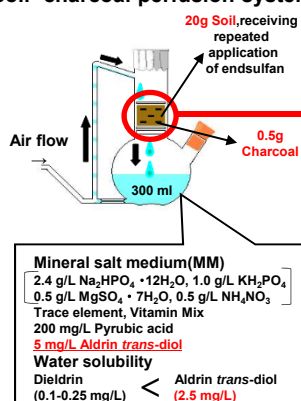
< Introduction >

- Dieldrin is insecticide that is high toxicity and long persistence in the environment.
- Therefore, contamination with dieldrin is still a serious environmental problem and an efficient remediation method is required.
- We isolated a novel aerobic dieldrin-degrading bacterium (Sakakibara et al., 2011)
- However, we could not detect initial metabolite of dieldrin.
- In continuation of this study, we found a novel metabolic pathway of dieldrin by *Pseudonocardia* sp. KSF27.



1, How to isolate KSF27 from soil ?

Soil- charcoal perfusion system



Remove bacteria-enriched charcoal from soil

The enriched charcoal (1g) was clashed and suspended in 50 mM phosphate buffer

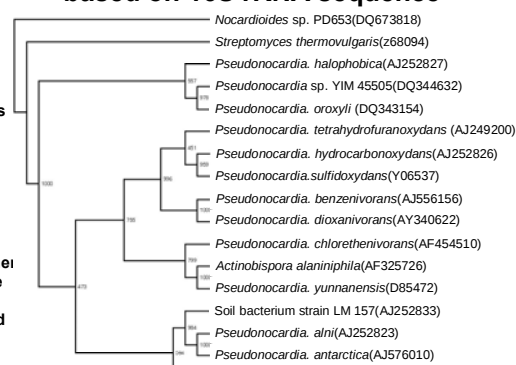
The buffer was added to the suspension to formulate a 10⁻⁵ – fold dilution

The diluted suspension was then inoculated on a R2A agar plate

The colonies were isolated and tested for aldrin trans-diol degradation in MM

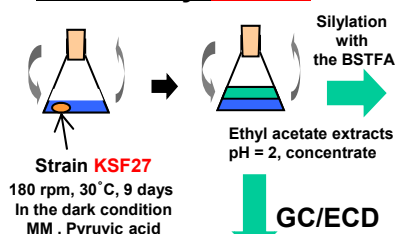
Isolation of KSF27

Phylogenetic affiliation of KSF27 based on 16S rRNA sequence

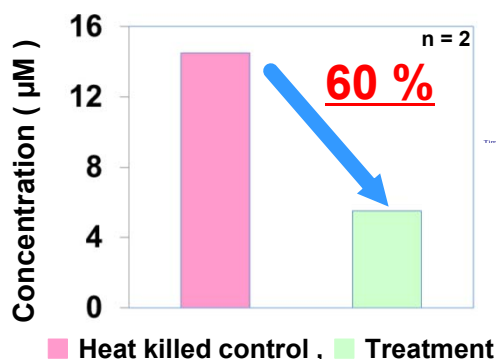


Pseudonocardia sp.

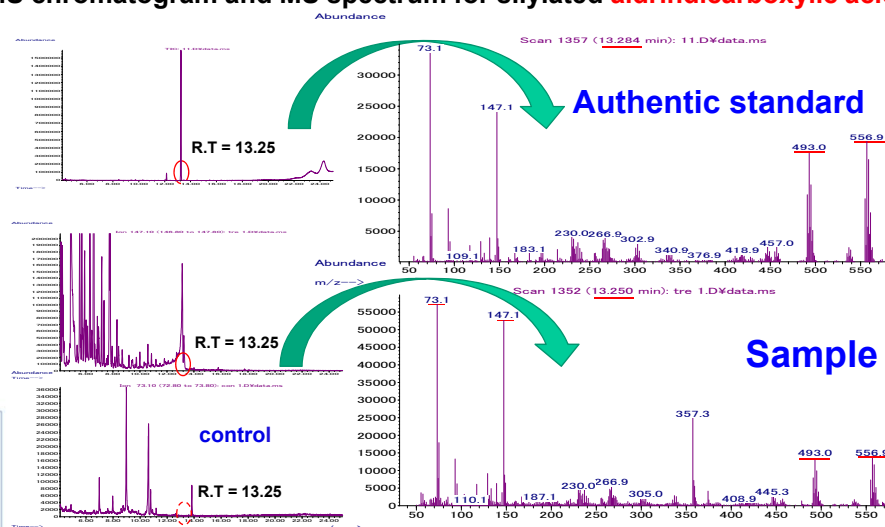
2, How to degrade Dieldrin by KSF27 ?



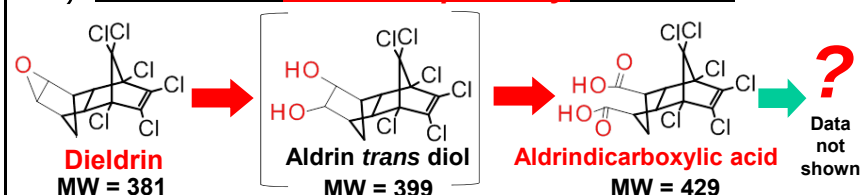
Degradation of dieldrin



The GC/MS chromatogram and MS spectrum for silylated aldrindicarboxylic acid



3, How about metabolic pathway of dieldrin ?



< Highlight !! >

- Strain KSF27 degraded dieldrin from 14.5 μM to 5.5 μM during 9 days.
- We identified aldrindicarboxylic acid as dieldrin metabolite.
- We are searching other metabolites of aldrindicarboxylic acid by strain KSF27.

Reference; Futa Sakakibara et al. (2011) *Biochemical and Biophysical Research Communications.*, 411:76-81.

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