

Biodegradation of Di-(2-ethylhexyl) phthalate and 2-Ethylhexyl alcohol

Ji-Hye Baek¹ · Byoung-In Sang[†] · Byung-Mu Lee¹

¹College of Pharmacy, Sungkyunkwan University

[†]Water Environment and Remediation Research Center, Korea Institute of Science and Technology, Seoul, Korea

e-mail: biosang@kist.re.kr

ABSTRACT

Di-(2-ethylhexyl) phthalate (DEHP), also known as dioctyl Phthalate(DOP), is used as a plasticizer in PVC, and 2-ethylhexyl alcohol (2-EH) is used as an intermediate in the manufacture of plasticizers and also used as a solvent, a lubricant, and a finishing compound for paper and textiles. They are known as hepatocarcinogen, endocrine disrupter, and a contaminant in blood storage bags, which cause severe damage to human. We isolated bacteria, which use phthalate as carbon and energy sources, from soil highly contaminated with phthalate. *Micrococcus* sp., *Rhizobium* sp., and *Brevibacillus* sp. were identified through 16S ribosomal DNA (rDNA) sequencing. Degradation rate and growth rate of each degraders were measured and their morphological characteristics were analyzed by SEM (Scanning Electron Microscopy).

Key words: DEHP, 2-EH, Biodegradation, SEM

Table 1. Biodegradation of DEHP and 2-EH by candidate soil bacteria

Chemical	DEHP						DEHP and 2EH				2-EH	
	A1	A2	A3	A6	A7	A8	A17 DOP	C7 2-EH	DOP	2-EH	B2	A16
Concentration (mg/L)	79.5	4.9	27.8	6.5	34.8	42.1	49.3	27.7	27.7	10.2	52.2	59.3
Increased cell mass (g/L)	0.25	0.40	0.35	0.65	0.10	0.75	0.90		0.37		0.27	0.40

Table 2. Identification of soil bacteria by 16S rDNA

Strain #	Closest match, %	Similarity, %
A8	<i>Micrococcus formosus</i>	99
A16	<i>Brevibacillus formosus</i>	99
A17	<i>Rhizobium</i>	99

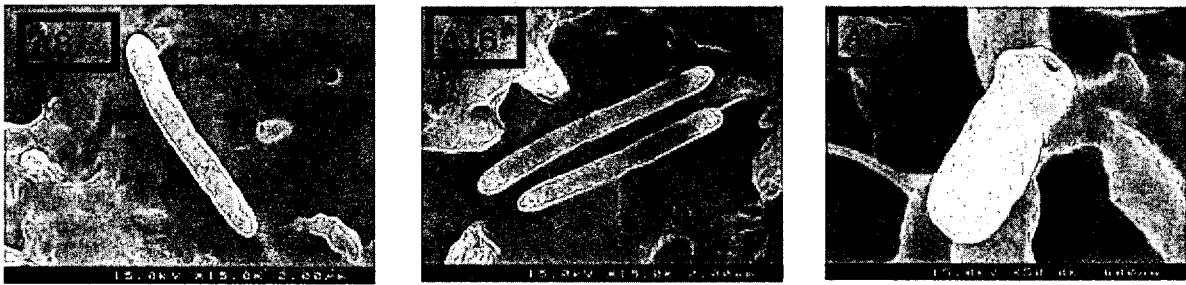
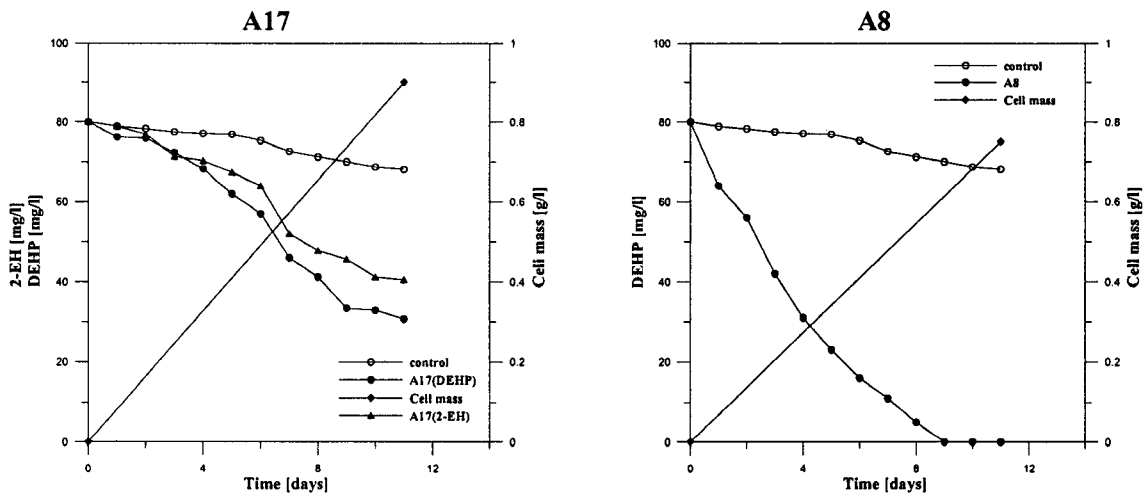


Fig. 1 Morphological characteristics by SEM (A8, A16, A17)



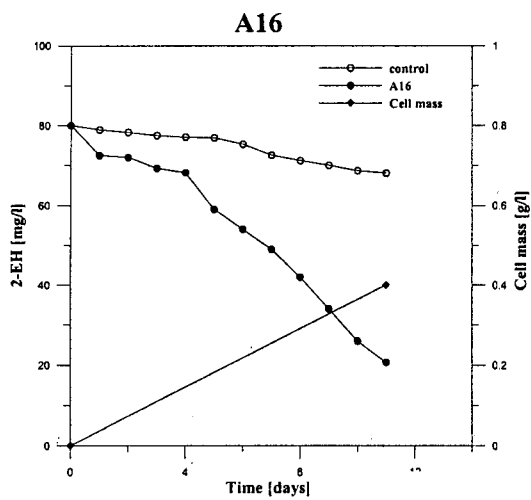


Fig. 2 Biodegradation and cell mass of DEHP and 2-EH (12 days at 30°C)