

# # C626282 : MAJOR MICROBIOLOGY  
KEY WORD: DIBENZOTHIOPHENE / MICROBIAL DESULFURIZATION

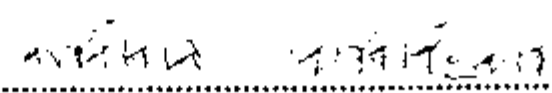
PORNPIMOL PREMCHAIPORN : DEGRADATION OF DIBENZOTHIOPHENE BY  
*Bacillus* K10. THESIS ADVISOR : ASST. PROF. ANCHARIDA AKARACHARANYA, Ph.D.  
THESIS CO-ADVISOR : ASST. PROF. VARAPORN LEEPIPATPIBOON, Dr. rer. nat.  
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By using dibenzothiophene as the representative of organic sulfur in lignite, 342 bacterial strains capable of degrading dibenzothiophene were isolated. Only one strain isolated, K10, degraded dibenzothiophene by 4S pathway which removed only sulfur molecule from the molecule of dibenzothiophene. Bacterial strain K10 had an optimal growth temperature at 45° C, when grown in nutrient broth-yeast extract medium, but showed maximum growth at 25-30° C in sulfur free mineral medium. Among the ingredient of sulfur free mineral medium, when more higher yeast extract was added the higher growth was obtained. Similar results can also be obtained by the addition of biotin, cyanocobalamin, vitamin mixture, alanine, tryptophan, casein, beef extract, peptone and tryptone in place of yeast extract. Analysis of the culture filtrate revealed the present of 2-hydroxybiphenyl, an intermediate indicating that dibenzothiophene was degrading via 4S pathway, only in sulfur free mineral medium that further supplemented with yeast extract, casein and beef extract. Optimal condition for the degradation of dibenzothiophene to 2-hydroxybiphenyl by strain K10 in sulfur free mineral medium containing dibenzothiophene was 0.20% (w/v) casein in place of yeast extract, 200 rpm shaking at 30° C for 3 days, with 2-hydroxybiphenyl obtained was 18.0 ug/100ml. The activity of dibenzothiophene degrading enzyme was found activated by NADH. A reverse relationship between dibenzothiophene and 2-hydroxybiphenyl was observed. There was no any plasmid found in strain K10 cell, therefore, the gene encoded dibenzothiophene degrading enzyme must be located in the chromosome.

ภาควิชา.....จุลชีววิทยา.....

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