

Nutrients and culture conditions requirements for the degradation of phenol by *Rhodococcus* UKMP-5M

ABSTRACT

The capability of *Rhodococcus* UKMP-5M, isolated from petroleum contaminated soil, in the degradation of phenol was studied using shake flask culture. The effect of nutrients and cultivation conditions on growth of this bacterium and phenol degradation was investigated. Among the different types of medium tested (M1, M2, M3 and M4), M1 was found to be the preferred medium for growth of this bacterium and phenol degradation. The optimized cultivation conditions for growth of *Rhodococcus* UKMP-5M and phenol degradation were; 30°C, initial pH 7.5 and buffer concentration ranged from 5 to 50 mM. Improvement of growth and phenol degradation was achieved in medium supplemented with 2 g I⁻¹ glucose. In addition, NaCl at a concentration of 0.1 g I⁻¹ was required to enhance growth and phenol degradation. The addition of 0.4 g I⁻¹ (NH₄)₂SO₄ into the culture medium greatly enhanced phenol degradation. At optimal medium composition and cultivation condition, *Rhodococcus* UKMP-5M was able to utilize phenol at concentration up to 900 mg I⁻¹. Results of this study showed that *Rhodococcus* UKMP-5M has potential to be used in the degradation of phenol.

Keyword: Cultivation parameters; Phenol degradation; *Rhodococcus* UKMP-5M