



## **ROLE OF *STENOTROPHOMONAS MALTOPHILIA* IN THE DEGRADATION OF ANTIBIOTICS AND HYDROCARBONS**

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Antibiotics, aromatic hydrocarbons and polyaromatic hydrocarbons (PAHs) are emerging contaminants of water. The present study assess the efficiency of *Stenotrophomonas maltophilia* a potential degrader of Microcystins, on the removal of antibiotics; Oxytetracycline (OTC) and Ampicilin (AMP), crude oil and PAHs ; Napthalene and Phenanthrene.

0.5ml of overnight starved bacterial suspensions were introduced into media containing each antibiotic at 50ppm to 300ppm. Triplicate samples were incubated at 280C with shaking at 100rpm. 0.5ml sample aliquots were removed at 2 days interval for a period of 14 days. Samples were analyzed by High Performance Liquid Chromatography (HPLC). Crude oil degradation was determined by inoculating 0.5ml of bacterial suspension (equalized to  $A_{590} = 0.35$ ) into 9ml of filter sterilized (0.2 $\mu$ m) sea water, containing 0.5ml of crude oil at 1% (v/v). Triplicate samples were prepared and incubated at 280C  $\pm$ 10C with shaking at 100rpm. 1ml sample aliquots were removed at every two days interval and remaining crude oil quantity was assessed spectrophotometrically at 400nm. PAH degradation was studied by inoculating the bacterial strain into LB broth incorporated with PAH (1% v/v) and redox indicator (2% v/v) and incubated at room temperature (28oC) with shaking at 180rev/min for 14 days. 1ml sample aliquots were removed at every two days interval and remaining Napthalene and Phenanthrene quantity were assessed spectrophotometrically at 609 nm.

*S. maltophilia* degraded OTC and AMP at rates of  $1.43 \pm 0.02 \mu\text{g/day}$   $0.89 \pm 0.06 \mu\text{g/day}$  respectively. *S. maltophilia* showed complete degradation of OTC and AMP at 200ppm and 250ppm respectively. Moreover, 82% of crude oil, 64.6% of Napthalene and 37.5 % of phenanthrene removal was recorded following 14 days of incubation. Therefore, *S. maltophilia* posses genes which are responsible to degrade Microcystins, antibiotics and hydrocarbons. Thus, it can be utilized as a bioremediation agent of many environmental contaminants.

**Keywords:** *Oxytetracycline (OTC)* , *Ampicilin (AMP)* , *Crude oil*, *Poly aromatic hydrocarbons (PAHs)*, *Stenotrophomonas maltophilia*.