

Isolation and identification of naphthalene degrading bacteria from a polluted environment

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Hydrocarbon pollution is one of the major environmental problems and this has led to studies on use of hydrocarbon degrading bacteria for bioremediation. Isolation of hydrocarbon degrading bacteria from a polluted environment is plausible, because the environmental conditions can have a selection pressure on the type of bacteria that can reside in a particular contaminated environment. Naphthalene is considered to be a potent pollutant which is an intermediate product of hydrocarbon combustion. Toxicity, low volatility and recalcitrance to degradation and high affinity for sediments make naphthalene bio-degradation an important intervention. This study reports the isolation of indigenous naphthalene degrading bacteria from hydrocarbon contaminated soil near a filling station.

Aqueous soil extracts were prepared using three soil samples collected near a filling station in Anuradapura. To prepare the Naphthalene supplemented Bushnell Hass (BH) agar plates, a portion (0.3 ml) of naphthalene solution (2% w/v) in methanol was added to the bottom agar surface and swirled to obtain an even distribution. Then 0.1 ml soil extract was mixed with 0.9 ml of molten BH agar medium and poured on bottom agar. The plates were then swirled to spread molten agar medium over bottom agar with a PAH layer. All plates were incubated at room temperature for 3-6 weeks and the colony count of naphthalene degrading bacteria was recorded daily. Isolated bacterial colonies were identified according to the Bergey's manual of determinative bacteriology. Appearance of bacterial colonies was observed after fifteenth day, showing a slow degradation and number of colonies gradually increased with the time (Figure 1). Gradual increase of number of colonies shows the ability of bacteria to acquire the naphthalene degrading capability with time. This can be resulted due to the decrease in naphthalene concentration below the toxicity level or ability to acquire naphthalene degrading capability with the time of incubation.

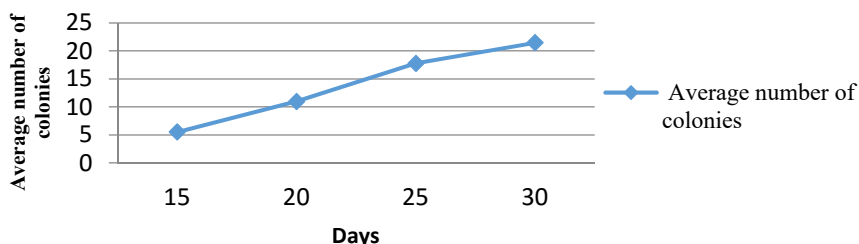


Figure 1 : Distribution of colony count with time

Isolated bacterial strains were identified as *Staphylococcus aureus*, *Staphylococcus* sp. and *Pseudomonas* sp. and they have the potential to be used in bioremediation of environments polluted with naphthalene.

Keywords: Naphthalene degradation, *Pseudomonas* sp. and *Staphylococcus aureus*