Growth and utilization of oil sludge as a source of carbon by locally isolated beneficial microorganisms

ABSTRACT

Recent advance technologies have showed that microorganisms plays an important role in the natural ecosystem and act as bio-control of the environment. As microorganisms have become more concern in environment technology, the understanding of microorganism's life cycle and its factor influencing its life span must fully understand. Therefore, in this study, three isolated beneficial microorganisms identified as Chromobacterium violeceum- MAB-Cr1, Pseudomonas aeruginosa- BAS-Cr1 and Stenotrophomonas maltophilia-RAS-Cr1 was used to identify the growth phase in utilization of oil sludge at different concentration levels. These microorganisms were isolated from Titan Petrochemical, Pasir Gudang Johor and have been proven to degrade phenol based on the previous study done. The experiment was conducted in a conical flasks with addition of different concentrations of oil sludge at 5%, 10%, 15% v/v as a sole carbon. After 24 hours of incubation, the growth of microorganisms were assessed using spectrophotometer at 600nm and the standard growth profile were plotted according to the concentrations studied. The results showed that all strains exhibited lag, exponential, stationary and death phase in oil sludge utilization. The maximum optical density (OD) was observed in C. violaceum-MAB-Cr1 (0.85; 10% v/v), P. aeruginosa-BAS-Cr1 (0.82; 10% v/v) and S. maltophilia-RAS-Cr1 (0.91; 15% v/v). It can be concludes that as the highest concentration of oil sludge present in the medium, the longest survival rate recorded for all strains studied. This findings proved that all strains have capability and potential to tolerate in high concentration of oil sludge.