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AMPAI SOROS: EFFECT OF TEMPERATURE AND SURFACTANT ON
BIOREMEDIATION OF CRUDE OIL IN SOIL BY *CANDIDA TROPICALIS*.
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Effects of temperature and surfactant, Tween 80, on bioremediation of crude oil in soil (1% w/w contamination) by *Candida tropicalis* were studied in slurry bioreactors. The mesophilic temperatures (20°, 30° and 40°C) were determined for the optimal temperature to promote the degradation of the Tapis crude oil in soil in Thailand. The result showed that 30°C was the optimal temperature for this experiment, and the removal percentage (combined biodegradation and abiotic losses) of total hydrocarbon (THC) was 94.70%. At 20° and 40°C, the percentages were lower, 87.16% and 90.57%, respectively. The individual hydrocarbons or the major peak components (MPC) in the Tapis crude oil were C₉ to C₃₀. The degradation of major peak components showed the highest removal percentage at 30°C (80.28%). At 20° and 40°C, the removal percentages of the major peak components were similar, 72.89% and 71.74%, respectively.

Nonionic surfactant, Tween 80, was used in this experiment. The result indicated that the removal percentage of crude oil in soil was not greatly enhanced by Tween 80. On the other hand, Tween 80 was not toxic and also did not show the inhibition effect on the degradation. At 30°C, the removal percentages of total hydrocarbon were 94.61% compared to 94.70% of control. At 20° and 40°C, the removal percentages were slightly increased. At 20°C, the removal percentages of total hydrocarbon were 87.74% with surfactant and 87.16% without surfactant (control). At 40°C, the removal percentages of total hydrocarbon were 90.69% with surfactant and 90.57% without surfactant (control). The removal percentages of the major peak components also indicated the highest percentage at 30°C with surfactant (80.52%), but the removal percentage of control (without surfactant) was similar (80.28%). At 20° and 40°C, the removal percentages of the major peak components were lower, 74.92% and 77.60% with surfactant, respectively, while those of control were 72.89% and 71.74%, respectively.

This study showed that the optimal temperature for degradation of the Tapis crude oil in soil in Thailand was 30°C, and that Tween 80 did not greatly enhance the removal percentages, but did not decrease the removal percentages.