

SUMMARY

The rise of oil drilling and processing activities due to the high need for petroleum usage as fuel contributes to the production of waste in the environment. The waste is commonly in the form of crude oil sludge containing hydrocarbon compounds which are known to be toxic and carcinogenic. The common physical and chemical treatments seemed to be inefficient since they spend a lot of cost and still release residues to the environments. One of cost efficient and eco- friendly effort needed is by bioremediation. Bioremediation of crude oil sludge containing hydrocarbons involves the action of biological agents such as bacteria. Bacteria capable of degrading the hydrocarbon compounds into less toxic compounds in biotransformation are called Hydrocarbonoclastic Bacteria.

The research included isolation, screening, identification, and application of the isolates to remedy crude oil sludge. This research was aimed to obtain the potential hydrocarbonoclastic bacteria isolated from crude oil sludge in the area of petroleum-contaminated soil in degrading paraffin, to know the capability of hydrocarbonoclastic bacteria in degrading paraffin and to know the identity of the bacteria. Soil samples were taken from the oil mining concession area which called Zamrud Petroleum Production Field of BOB. PT. Bumi Siak Pusako-Pertamina Huluin Dayun, Siak Regency, Riau. The experiment method was Completely Randomized Design. The treatment was potential bacterial isolates. The main parameter was TPH content. The data were represented as the number of degraded petroleum percentages and analyzed by using Analysis of Variance (ANOVA). The identification of potential bacteria referred to *Bergey's Manual of Systematic Bacteriology*.

The results obtained four potential isolates capable of degrading paraffin coded as ASI5, BSI3P, BSI3 and BSI5. Isolate ASI5 showed the highest degradation capability in degrading as amount of 81.84% TPH, followed by BSI3P, BSI3 and BSI5 with the percentage of degraded TPH as amount of 78.16%, 55.68%, and 47.98%, respectively. All of the isolates were identified as members of the genus *Geobacillus*.

Keywords: *Petroleum, Hydrocarbon, Bioremediation, Hydrocarbonoclastic Bacteria*