ENVIRONMENTAL FACTORS AFFECTING BURKHOLDERIA PSEUDOMALLEI BIOFILM FORMATION

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Abstract. Melioidosis is highly prevalent in Northeast Thailand which is associated with high incidence of \textit{Burkholderia pseudomallei} present in the soil of this region. \textit{B. pseudomallei} when present in biofilm becomes resistant to numerous environmental factors and also to certain antibiotics. In this study, we examined the effects of several environmentally relevant factors (salinity, iron, manganese and temperature) on biofilm formation of four clinical ribotypes of \textit{B. pseudomallei} commonly found in Northeast Thailand. The results showed that biofilm formation increased when \textit{B. pseudomallei} were grown in modified Vogel and Bonner’s medium containing 0.85-1.7 M NaCl or 100-500 \(\mu\)M iron (FeSO\textsubscript{4}). Low temperature (20ºC) also induced more biofilm formation than 30ºC or 37ºC. On the other hand, protease production and bacterial motility were adversely affected but not in the case of low temperature. Results from this study should be useful in the development of prevention measures or controlling \textit{B. pseudomallei} biofilm formation in the environment.

Keywords: \textit{Burkholderia pseudomallei}, biofilm, environmental factors