Title : Evaluation of Biosurfactant Production Potential of Rock-Inhabiting Yeasts

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ABSTRACT

The demand for microbial biosurfactants has continuously increased due to their safety and environmental friendliness. This study aimed to evaluate the biosurfactant production potential of rock inhabiting yeasts. In a previous study, 29 yeast isolates obtained from limestone and sandstone in northern Thailand were screened based on their emulsification index at 24 h (EI24), and 13 isolates exhibiting EI24 values greater than 50% were selected. The present study further evaluated these 13 selected isolates using several biosurfactant-related assays, including determination of EI24, oil spreading assay, Parafilm M assay, drop-collapse test, CTAB–methylene blue agar plate method, and growth assessment at different temperatures. Eight yeast isolates exhibited EI24 values greater than 60% using kerosene, with *Kwoniella heveanensis* R05S1-01 showing the highest value (67.42 ± 1.34%). The EI24 values obtained using diesel oil were lower than those obtained using kerosene, with the highest value observed in isolate S1R2-01, a putative novel species (40.47 ± 1.07%). This isolate also exhibited the largest oil spreading diameter (0.74 ± 0.01 cm). Positive results in the drop-collapse test and Parafilm M assay were observed in certain isolates, and blue halos on CTAB–methylene blue agar were detected in several isolates. In addition, only two isolates (R01S1-01 and ER03S1-28) were able to grow well at 40 °C. These findings indicate that rock-inhabiting yeasts represent a promising microbial resource for biosurfactant production and suitable candidates for further investigation of biosurfactant stability and future applications.

Keywords: Biosurfactants, Emulsification index (EI24), Oil spreading assay, Rock-inhabiting yeasts

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