

Research Title	Development of Red Rice Yeast Fermentation Process for Improved Secondary Metabolites Production by Mutant <i>Monascus purpureus</i> IFRPD 4046 from Broken Milled-Rices
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The selection of optimum types and ratio of Chinart, wheat and Hom Nin broken milled-rices on the production of antioxidant and antimicrobial activities and monacolin content under solid state fermentation (SSF) by mutant *Monascus purpureus* IFRPD 4046 was investigated. Statistical mixture design experiment found that the suitable ratio of Chinart, wheat and Hom Nin broken milled-rices for the highest antioxidant and antimicrobial activities and monacolin content was 0.34 : 0 : 0.66, 0.5 : 0.5 : 0, and 0.33 : 0.67 : 0, respectively. The highest valudated values of antioxidant activity and monacolin content were 420.27±9.67 mg trolox / g DW and 445.52 mg/kg, while antibacterial activity against *P. acnes* DMST 14916, *Stap. aureus* TISTR 1466 and *Stap. epidermidis* TISTR 518 were 7.36 6.50 and 5.77 mm respectively. The up-scale solid state fermentation in plastic box, the results found that the antioxidant activity and monacolin content showed an increase by 1.68-fold (705.07±8.85 mg trolox / g DW) and 1.62-fold (719.87 mg/kg), respectively. The inhibition zone of red yeast rice extract against *P. acnes* DMST 14916 and *Stap. epidermidis* TISTR 518 exhibited an increase by 2.17-fold (16.00±3.06) and 1.18-fold (7.66±4.07) mm respectively except *Stap. aureus* TISTR 1466 (5.00±0.58 mm). Minimum inhibition concentration value (MIC) of red yeast rice extract against *P. acnes* DMST 14916 and *Stap. epidermidis* TISTR 518 และ *Stap. aureus* TISTR 1466 was 0.39, 0.78 and 50 mg/mL The properties of monacolin and antibacterial activity compounds were stable at high temperature, alkaline, acid and oxidation conditions except antioxidant activity compound.

Keywords: Red rice yeast, Monacolin, *Monascus* sp., antioxidant activity, antimicrobial activity, Chai Nart Broken Rice, Wheat Broken Rice, Homin Broken Rice