Preliminary study on solid state fermentation of *Monascus purpureus* for pigment production in 2.3 L stirred drum bioreactor

Mohamad Al Aamin B. Razali and Farhan M. Said
Faculty of Chemical and Natural Resources Engineering
Universiti Malaysia Pahang, 25000, Kuantan, Pahang.
Corresponding author: farhan_msaid@yahoo.co.uk

Abstract

Monascus sp. are well known as natural colorant producer in food industries. Several studies has been conducted to economically cultivate the *Monascus* sp. using solid state fermentation (SSF), however, the potential of using strirred drum bioreactor in SSF for *Monascus* sp. cultivation are relatively understudied. Oil palm frond (OPF) petiole has been used as potential substrate due to its nutritional contents and to expand the value of local agricultural waste. This study reports on color production by *Monascus purpureus* FTC 5357 in 2.3 L, benchtop scale stirred-drum bioreactor, emphasised in term of its aeration rate, agitation programme and working capacity of the substrate. The fungus was grown on moistened OPF substrate supplemented with soy meal peptone. The effects of different aeration rates, agitation programme, and substrate load capacity on color production were reported. The solid state fermentations were carried out at room temperature. Aeration rate showed a positively correlated interaction to pigment productions which the highest pigment reading are on 1.0 vvm and gradually reduced with lower aeration rate, and non-aerated culture showed lowest pigment reading, due to overheating of substrate bed. The agitation programme also showing the positive trend of interaction, in which the 8 cycles per day showed the highest production. On the substrate load capacity, the pigment productions were peaked at the 30% of drum loading capacity. Obtained results suggest that OPF substrate were capable of cultivating *M. purpureus*, and aeration rate of humidified air, substrate load capacity and agitation programme were significantly influenced the pigment production in solid state fermentation of *M. purpureus.*

Keyword : *Monascus* sp., solid state fermentation, stirred drum bioreactor, Oil palm frond.