

Kinetics and modeling of red pigment fermentation by *Monascus purpureus* FTC 5391 in 2-litre stirred tank fermenter using glucose as a carbon source

ABSTRACT

The experimental data from batch fermentation were analysed to form a kinetic model of the process. The unstructured model, based on logistic and Leudeking- Piret equations, was suitable to describe growth, substrate consumption and red pigment production by *Monascus purpureus* FTC 5391. The maximum specific growth rate (μ_{max}) of 0.055/h and 0.065/h were obtained from simulated modelling of *M. purpureus* FTC 5391 during growth in shake flask and 2-litre stirred tank fermenter, respectively. The maximum red pigment, P_{max} and cell concentrations, X_{max} obtained in batch fermentation using 2-litre stirred tank fermenter (20.63 UA500 and 13.2 g/litre) and using shake flask (9.26 UA500 and 11.425 g/litre) with overall productivity (P) was 0.122 UA500/h and 0.055 UA500/h, respectively. The production of red-pigment by *M. purpureus* FTC 5391 appeared to be a non-growth associated process; whereby rapid red-pigment production occurred during non-growth phase after the depletion of glucose in the medium.

Keyword: *Monascus purpureus*; Red pigment; Shake flask; Fermenter; Growth associated; Non-growth associated