

Potato Processing Wastewater as a Substrate for Red Pigment Production from Immobilized Gamma-Irradiated Cells of *Monascus purpureus*

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ALTHOUGH pigment production by *Monascus* spp. in chemically defined media is well documented (in submerged cultures and free cells), very few information is available about the use of agro-industrial wastes and immobilized cells. In this study immobilized irradiated spores (in sponge cubes) of *M. purpureus* (24 h age and 0.5g cubes/50 ml medium) produced high amount of red pigment reached up to 2.32g/ l, after 4 days of incubation, compared with the amount of pigment produced by the free cells (1.84 g/ l). Also, potato processing wastewater (PPW) was examined as the main culture medium for red pigment production by this fungus

- under optimizing culture conditions for repeated batches. The results showed that with irradiated immobilized cells, the maximum amount of red pigment production (1.96 g/ l) was recorded at the second batch. Moreover, high reductions of biochemical oxygen demand (BOD); 82.6 % for this waste was obtained during the second batch. The data revealed that very little amount of soluble toxic substances in the extracted sample leading to only 8% dead chicken embryos.

Keywords: *Monascus* sp., pigments, submerged fermentation, gamma rays.

There is worldwide interest in process development for the production of pigment from natural sources, due to a serious safety problem with many artificial synthetic colourants, which have widely been used in foodstuff, cosmetic and pharmaceutical manufacturing processes (Kim *et al.*, 1995). It is well known that a variety of plants, animals and micro organisms produce pigments (Johns and Stuart, 1991). Although, there are a number of natural pigments, only a few are available in sufficient quantities to be useful for industry because they are usually extracted from plants (Lauro, 1991).