

Effect of Acclimatization Time to Microbial Cell Growth and Biosynthesis of Mesophilic Gammaproteobacterium, in Orbital Shake Flasks

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Abstract. Growth pattern of *Pseudomonas putida* (ATCC 49128), was found to predominantly rely on the age of the inoculums, prior to its contact with physical and chemical agents and nutrient availability. Under suitable inoculums, bacteria tend to grow faster in a batch type of growth pattern which is usually sustained until after nutrient depletion. In this research, the bacterial growth pattern was studied in an incubator shake flask using 8 g nutrient media and physical operational parameters temperature of 37 °C and agitation of 180 rpm over a period of 24, 48 and 72 hours. Prior to this, *P. putida* was added into 20.0 ml nutrient broth and incubated in an incubator for 24 hours at 37 °C, before adding it to 180 ml nutrient broth 30% (v/v⁻¹). Growth, via acclimatization was initially observed after 1hr of inoculation with an overwhelming exponential growth of 2.69-2.57 within first 24 hr, exceeding the 48 and 72 hrs ranges. This additionally relates to particular cell biomass growth rate (μ) of 0.58 hr⁻¹, 3.87 number of generation (n), generation time (g) 1.09 and growth rate constant (k) of 0.01 hr⁻¹, achievable within 24 hrs. It was therefore concluded that the sensitivity of this strain to time is significant, as optimal growth was achieved within 24 hrs of acclimatization, thereby showing a drastic reduction in the time of growth.

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