

## Production cursors of lipopeptides families by some *Bacillus* spp.

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**Abstract:** The influence of voulme mean power dissipation ( $P_{VL}$ ) and volumetric oxygen transfer coefficient ( $k_{LA}$ ) as cursors on lipopeptides production types and levels were estimated for 8 *Bacillus* strains. The optimal oxygenation conditions for synthesis of lipopeptides families (surfactins, kurstakins, iturns and fengycins) by *Bacillus* strains are different. Surfactins and kurstakins production is clearly favoured at good oxygenation of the cells ( $k_{LA}$ ) more than  $0.06\text{ s}^{-1}$ , while optimal fengycin and iturns production could be obtained at moderate oxygen supply ( $k_{LA} = 0.01$  and  $0.015\text{ s}^{-1}$  respectively). The low ( $P_{VL}$ ) could be sufficient for synthesis of each lipopeptide in small flasks. However, it is difficult to obtain similar productivities in higher volume flasks even at the corresponding higher ( $P_{VL}$ ). The maximum production of *B. amyloliquefaciens* FZB42 were 294, 62 and  $210\text{ mg.L}^{-1}$  surfactin, fengycin and mycosubtilin, respectively. *B. amyloliquefaciens* S499 were 872, 103 and  $103\text{ mg.L}^{-1}$  surfactin, fengycin and bacillomycin respectively. *B. subtilis* ATCC 21332 were 1060 and  $226\text{ mg.L}^{-1}$  of surfactin and plipastatin respectively. While, *B. subtilis* 168 has no production. The production of *B. licheniformis* ATCC 14580 strain was  $358\text{ mg.L}^{-1}$  of lichenysin, and *B. pumilus* was produced  $642\text{ mg.L}^{-1}$  of pumilacidin. Also, the strains of *B. thuringiensis kurstaki* and *B. thuringiensis israelienne* NRRL HD-522 were produced 102 and  $62\text{ mg.g}^{-1}$  cells respectively of kurstakin. Therefore, to scale-up production process from Erlenmeyer flasks to the fermentation on large-scal, this two cursors should be scrutinize ( $k_{LA}$  and  $P_{VL}$ ) as indicators for bioreaction direction.

**Key words :** Lipopeptides, *Bacillus* spp., oxygen supply ( $k_{LA}$ ), power dissipation ( $P_{VL}$ ).