BIOTECHNOLOGICAL PROCESS FOR OBTAINING CITRIC AND ITACONIC ACIDS

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Abstract

Citric and itaconic acids were obtained by submerged batch fermentation and provided good results (0.31 g/Lh - 31.8% yield and 0.47 g/Lh - 29.1% yield, respectively). These products are very important for fine chemicals, food and pharmaceutical industries.

Key words:

biotechnological process, citric acid, itaconic acid

Introduction

Citric and itaconic acids, Image 1, are extremely important as basic products being used in the chemical, food and pharmaceutical industries¹.

Image 1. Citric and itaconic acids.

In this work we report preliminary results obtained from submerged batch fermentation processes for production of these acids using fungal strains on bench scale.

Results and Discussion

In the fermentation processes the strains *Aspergillus niger* ATCC 11414 and *Aspergillus terreus* ATCC 10020 were used, which are producing the citric and itaconic acids, respectively, using peptone, yeast extract, glucose and 1-octanol in culture media.

The fermentation processes were carried out in Infors HT - Multfors bioreactors, 48h and the products were purified using the perstraction technique². The results obtained provided good yields of citric acid (0.31 g/Lh, 31.8% yield) and itaconic acid (0.47 g/Lh, 29.1% yield), Chart 1.

Chart 1. Production of citric and itaconic acids.

Fungal (ATCC)	Residual glucose (g/L)	Citric acid (g/Lh; %)	Itaconic acid (g/Lh; %)
11414	13.6	0.31; 31.8	-
10020	5.4	-	0.47; 29.1

Image 1 shows the fermentation profile of citric and itaconic acids.

Image 1. Production of citric and itaconic acids.

Conclusions

Good yields of citric and itaconic acids production have been obtained and modifications are being carried out in the fermentation process to increase the productivity of these acids and will be reported in the future.

Acknowledgement

The authors thank FAPESP (2016/12074-7), CAPES (1643936) and CNPq for financial support.

¹ Bafana, R.; Pandey, R. A., *Crit. Rev. Biotechnol.*, **2018**, 38, 68.

² Bella de Jesus, T. S.; Fardelone, L.C.; Moran, P. J. S.; Rodrigues, J. A. R.; T. B.; Paim, G. P.; Nunhez, J. R. WO2018112577.