

食品—应用研究

响应面法优化解脂耶罗维亚酵母 $Yarrowia lipolytica$ ypy01 淀粉酶发酵条件研究

柳志强¹, 李晓宇², 张横江³, 刘美珍³

1. 海南大学环境与植物保护学院
2. 海南大学热带作物种质资源保护与开发利用教育部重点实验室; 海南大学环境与植物保护学院
- 3.

摘要:

利用Plackett - Burman (PB) 设计和响应面法对解脂耶罗维亚酵母 $Yarrowia lipolytica$ ypy01 淀粉酶生产条件进行了优化。PB设计筛选到3个显著因子, 分别为可溶性淀粉浓度、蛋白胨浓度和初始pH。采用响应面法对3个显著因子进一步优化, 获得了最佳培养基组成: 0.84%可溶性淀粉, 2.25%蛋白胨, 1%酵母粉, 3%NaCl, 0.05% MgSO₄, 0.05% CaCl₂, 初始pH为6.8, 在最优条件下, 淀粉酶产量达到2012.50 U/mL。

关键词: 响应面法

Optimization of Amylase Production from *Yarrowia lipolytica* ypy01 by Using Response Surface Methodology

Abstract:

The aim of this work was to optimize the operational parameters of marine yeast *Yarrowia lipolytica* ypy01 to increase amylase production using Plackett - Burman (PB) design and response surface methodology (RSM). The results of PB design showed that the concentrations of starch and peptone and initial pH were the most significant factors to influence amylase production. A Central Composite Design (CCD), which is the standard design of RSM, was then employed to further optimize these three factors. The experimental results indicated that the optimized composition of medium was 0.84% starch, 2.25% peptone, 1% yeast extract, 3% NaCl, 0.05% MgSO₄, 0.05% CaCl₂ and pH 6.8. Under the optimized conditions, the amylase production was up to 2012.50 U/mL in shake flask experiments.

Keywords: response surface methodology

收稿日期 2010-11-09 修回日期 2011-01-05 网络版发布日期 2011-07-15

DOI:

基金项目:

海南省自然科学基金项目;海南大学科研启动基金项目

通讯作者: 李晓宇

作者简介:

作者Email: lixiaoyu911@yahoo.com.cn

参考文献:

[1] Kandra L, Gyemant G, Remenyik J. α -Amylases of medical and industrial importance. *J Mol Struct.* 2003, 666-667: 487-498.

[2] Gupta R, Gigras P, Mohapatra H, et al. Microbial α -amylases: a biotechnological perspective. *Process Biochem.* 2003, 38: 1599 - 616.

[3] Li HF, Chi ZM, Wang XH. Purification and characterization of extracellular amylase from the marine yeast *Aureobasidium pullulans* N13d and its raw potato starch digestion. *Enzyme and Microbial Technology.* 2007, 40: 1006 - 1012.

[4] Miller GL. Use of dinitrosalicylic acid reagent for determination of reducing sugar. *Anal Chem.* 1959, 31: 426-428.

扩展功能

本文信息

- Supporting info
- PDF (592KB)
- [HTML全文]
- 参考文献[PDF]
- 参考文献

服务与反馈

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- 引用本文
- Email Alert
- 文章反馈
- 浏览反馈信息

本文关键词相关文章

- 响应面法

本文作者相关文章

- 柳志强
- 李晓宇
- 张横江
- 刘美珍

PubMed

- Article by Liu,Z.J
- Article by Li,X.Y
- Article by Zhang,H.J
- Article by Liu,M.Z

[5] Li XY, Liu ZQ, Chi ZM. Production of phytase by a marine yeast *Kodamaea ohmeri* BG3 in an oats medium: Optimization by response surface methodology. *Bioresource Technology*, 2008, 99: 6386 - 6390.

[6] Liu BL, Tzeng YM. Optimization of growth medium for production of spores from *Bacillus thuringiensis* using response surface methodology. *Bioprocess, Eng.* 1998, 18: 413-418.

[7] Elibol M. Optimization of medium composition for actinorhodin production by *Streptomyces coelicolor* A3(2) with response surface methodology. *Process Biochem.* 2004, 39: 1057 - 1062.

本刊中的类似文章

1. 孙玉霞 史红梅 蒋锡龙 魏彦锋 杨丽英. 响应面法优化葡萄枝条中多酚化合物提取条件的研究[J]. *中国农学通报*, 2011,27(第7期4月): 466-471
2. 程艳 张克诚 赵明富 孙蕾 崔增杰 檀贝贝. 应用SAS软件优化武夷菌素产生菌发酵培养基[J]. *中国农学通报*, 2010,26(21): 268-272
3. 马挺军 秦晓健 贾昌喜. 超高压提取大豆卵磷脂的工艺研究[J]. *中国农学通报*, 2010,26(19): 46-51
4. 温志英 张 朝. 响应面优化柑桔皮黄色素微波辅助提取工艺[J]. *中国农学通报*, 2011,27(第4期2月): 350-355
5. 王群 郑海涛 葛尧 何计国. 酶法制备鳕鱼鱼皮胶原蛋白肽及其清除超氧阴离子自由基的研究[J]. *中国农学通报*, 2011,27(第14期6月): 87-93
6. 葛青萍 刘国明 孙红兵 杨晓峰 凌宏志 平文祥. 响应面法优化玉米芯半纤维素水解条件[J]. *中国农学通报*, 2011,27(第18期7月): 64-68