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响应面法优化广金钱草多糖的酶法提取工艺

Optimization of Enzymatic Extraction Technology for Polysaccharides from Desmodium Styracifolium by Response Surface Method

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中文关键词： 广金钱草多糖 酶法 响应面法 提取工艺

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中文摘要:

目的 研究酶法提取广金钱草多糖的最佳工艺条件。方法 在单因素实验的基础上，根据Box-Behnken试验设计原理，采用加权评分法以广金钱草提取物中多糖得率和多糖含量为综合评价指标，建立二次多项式回归方程的预测模型，构建以综合评分为响应值的响应曲面和等高线图，考察酶解温度、酶解时间和酶用量3个主要因素对多糖提取效果的影响以及因素间的交互作用。结果 回归模型拟合性良好，置信度较高。酶法提取广金钱草多糖的最佳工艺条件为：料液比1∶40，pH 5.5，酶解温度49.94 ℃，酶解时间1.53 h，酶添加量为2.00%。主要因素对提取效果的影响程度为：酶解时间>酶解温度>酶用量。各因素之间存在交互作用，且达到极显著水平。结论 酶法处理可提高广金钱草多糖的提取效率。本实验优选的工艺稳定可行，可为相关生产加工企业提供有益的参考。

英文摘要:

OBJECTIVE To study the optimal technological conditions for extracting Desmodium styracifolium polysaccharides. METHODS According to Box-Behnken design principle and results of single-factor experiments, the quadratic polynomial mathematical model, response surface and contour line map were analyzed. The effects of enzymatic hydrolysis time, temperature and enzyme amount on the polysaccharides yield were explored by using yield and content of polysaccharides as evaluating indicators. RESULTS The degree of fitting and confidence level for mathematical model was satisfactory. Optimum extraction technology conditions were as follows: the ratio of

liquid to solid 1∶40, pH 5.5, enzymatic hydrolysis temperature 49.94 ℃, time of 1.53 h and cellulase amount of 2.00%. The effect order of three factors on polysaccharides yield was as follows: enzymatic hydrolysis time>enzymatic hydrolysis temperature>enzyme amount. The interaction effects of different factors were highly significant. CONCLUSION Optimized extraction technology is stable, feasible, highly efficient. It could provide references for the industrial production.