STUDY ON EXTRACTION METHODS OF CHINESE YAM POLYSACCHARIDE

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Abstract: Aim:Study on the extraction of Polysaccharide from Chinese yam;Methods:Taking the content of polysaccharide as index,determinating by phenol-sulfuric acid method;Results:The best condition reflux is that liquid material ratio1:10,100°,3 hours, 3 times.Conclusion:The polysaccharide content of yam was 12.64%.

Key words: Yam Polysaccharide;Reflux Extraction;Phenol-Sulfuric Acid

Yam species called shuyu, also known as Huai yam[1].It can be used for the treatment of diabetes[2]. Yam contains many ingredients[3].Yam polysaccharides have many effects[4].There are many ways to extract polysaccharides from yam.Qiu Sha Hui[5] discussed the extraction methods of polysaccharides.In this paper,we discussed the effects of ultrasonic, water bath and reflux on the yield of yam polysaccharide.

1 Reagents and Instruments

1.1 Materials and Reagents:Yam slices (Run-Zhong herbal factory of Harbin city; phenol (Tianjin Yongda Chemical Reagent Co., Ltd.), sulfate (Beijing chemical plant), glucose (Chinese food and Drug Inspection Institute).

1.2 Instrument:DZTW heating set (Yong Guangming medical instrument factory of beijing); SB-5200D ultrasonic cleaning machine (Ningbo Xinzhi biological Technologies Inc); DF-101Z constant temperature type of magnetic stirrer (the Great Wall branch trade Co., Ltd of zhengzhou.); DGX-9143B-1 dry box (Shanghai fuma Equipment Co. Ltd.); UV VIS spectrophotometer (UV-1601PC)

2 Methods and Results

2.1 Preparation of glucose reference solution:Weighing glucose standard sample 4.9mg and add water to 25mL to abtain 0.196mg/mL reference solution.

2.2 Study on extraction technology of yam Polysaccharide

2.2.1 Investigation of extraction methods:Extracting 3 copies yam slices according to ultrasonic,water bath, backflow method.Reflux extraction has the highest content of polysaccharide, so it is the best method to extract the yam polysaccharide.

2.2.2 Orthogonal experimental design of reflux extraction process:Orthogonal experiments show that the solid-liquid ratio is1:10,water temperature is100,3h,3 times.

2.3 Determination of the maxim absorption wavelength:The precise amount of 1mL of the test solution and the reference solution to the test tube, adding 0.8mL of 5% phenol solution, quickly adding 7mL concentrated sulfuric acid, mix immediately, in 30 ℃ water bath for 30min.Scanning in the wavelength range of 400-600nm . The maximum absorption wavelength was 485nm..

2.4 Establishment of standard curve:Precising amount of glucose reference solution0,0.1,0.3,0.5,0.7,0.9mL to plug out the tube,adding water to 1mL,0.8mL of 5% phenol solution,7mL concentrated sulfuric acid, mix immediately,in 30℃ water bath for 30min.Determining at 485nm.y=5.6492x-0.0048,r2=0.9992.

2.5 Methodological Investigation

2.5.1 Precision:Taking 0.5 mL of the standard solution,parallel six copies,determining absorbance,RSD=0.084%,indicating that the precision of the experimental instrument is good.

2.5.2 Repeatability:Weighing six pieces of yam,extracting and determinating them according 2.2.2,and 2.4,RSD=1.25%, indicating that the method is reproducible.

2.5.3 Stability:Measuring polysaccharid every 30min,Continuous determination of 2h,RSD=0.141%,The results showed that the sample has good stability within 2h.

2.5.4 Sample recovery:Drawing 0.25mL polysaccharid and reference substance 2.74mg into the 100mL volumetric flask,volume with distilled water.Measuring according to the 2.4,recovery the rate is 100.46%, RSD=0.44%.

2.6 Sample content:Weighing six pieces of yam,extracting and determinating them according 2.2.2,and 2.4,polysaccharide content is 12.64% ,RSD=0.44%

3 Discussion:In the extraction process of soluble yam polysaccharide, temperature and times are the main factors influencing the extraction of polysaccharide, the optimum extraction conditions are liquid material ratio 1:10, water extraction temperature 100, time 3h, extraction times of 3 times.

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PREPARATION AND ANALYSIS OF COMPOUND LIPOSOME OF IRINOTECAN AND DIHYDROMYRICETIN

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Objective: To prepare compound liposome loading of irinotecan and Dihydromyricetin, and evaluate its pharmaceutical properties. Methods: The encapsulated rate of compound liposomes was determined by dextran gel method. The particle size distribution and Zeta potential were measured by nano-particle size and Zeta potential analyzer. Results: The EE of compound liposome loading of irinotecan and Dihydromyricetin was 82.58% and 71.45% respectively. The mean diameters of compound liposome were (123.1±1.8) nm and its PdI was below 0.20 and its Zeta potential was (-24.3±0.51) mV. Conclusion: The established method is fit for the preparation of compound liposome of irinotecan and curcumin. The analysis method is simple and accurate, which can be used to evaluate the property of compound liposome.

Keywords: irinotecan; dihydromyricetin; liposome; preparation

Dihydromyricetin（DMY）is a kind of dihydrogenated flavonols isolated from leaves and leaves of Vinegar, with anti-inflammatory, liver protection, regulating immunity and other pharmacological effects [1]. Irinotecan (CPT-11), as a Topo Ⅰ inhibitor [2], differs from traditional enzyme inhibitors in converting this ribozyme into a substance that is detrimental to DNA, the Topo- drug-DNA complex and is stable body. Liposomes as an effective drug delivery carrier, effectively control the drug release, prolong the plasma half-life of drugs, improve the bioavailability of drugs, reduce the toxic effects of drugs, etc., in the field of medicine has been rapid development.

Objective： In this study, dihydromyricetin was encapsulated in phospholipid bilayer, and irinotecan was encapsulated in the aqueous phase of phospholipid bilayers by active drug loading technology, and a synergistic anti-cancer model was designed.

1. Materials and methods

1.1 Instruments and reagents

Zetasizer Nano-ZS90 nano-particle size and Zeta potential analyzer; 756PC visible UV spectrophotometer;Hydrochloric acid irinotecan; dihydromyricetin ; Dihydromyricetin standard.

1.2 Methods

1.2.1 Preparation of Dihydromyricetin-irinotecan Compound Liposomes

Phospholipids and cholesterol in proportion, DMY dissolved in ethanol, take ammonium sulfate solution placed in ampoules, heating and insulation, the lipid solution into the phosphate buffer, continue to stir, so that ethanol volatile completely. The suspension was placed in a water bath ultrasonic system for ultrasound. Then, into the treated dialysis bag, placed in saline dialysis. Upon completion, add CPT-11 aqueous solution and incubate. Followed by a 0.22 μm microfilm.

1.2.2 Determination of enthalpy of irinotecan-dihydromyricetin complex liposome

The amount of compound liposomes was 0.5 mL. Sephadex G-50 was used as the eluent, and the flow rate was 1ml / min. A total of 25 copies were collected every 2mL. The contents of DMY and CPT-11 in the eluent were determined. The content of DMT and CPT-11 in the liposomes were recorded as W p, Of the drug content recorded as W t, according to the following formula to calculate the entrapment efficiency:

Enclosure rate (%) = W p / (W p + W t) × 100%

1.2.3 Determination of particle size, particle size distribution and zeta potential

Accurately measure the product 0.1 ml, diluted with ultrapure water 10 times, gently shake mix, remove the bubbles, into the instrument to detect the room, with Zetasizer Nano-ZS90 nano-particle size analyzer measured particle size distribution, the average particle size and Zeta Potential.

2.Results and discussion

The EE of compound liposome loading of irinotecan and Dihydromyricetin was 82.58% and 71.45% respectively. The