**Bulletin of Environment, Pharmacology and Life Sciences**
Bull. Env.Pharmacol. Life Sci., Vol 4 [7] June 2015: 108-111

Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804


**ORIGINAL ARTICLE**

# Factors Affecting to β-Carotene Extraction from Sweet Potato

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**ABSTRACT**
*Sweet potatoes (Ipomoea batatas L.) are rich in dietary fibre, minerals, vitamins, and antioxidants, such as phenolic acids, anthocyanins, tocopherol and b-carotenee. Caroteneoids have been linked with the enhancement of immune system and decreased risk of degenerative diseases such as cardiovascular problems, age-related macular degeneration and cataract formation. Our research is to investigate some technical factors affecting to β-carotene extraction in the sweet potato. Our results show that the extraction is appropriated by solvent n-Hexane at 80°C in 4 hours.*
***Keywords:*** *Sweet potato, β-carotene, extraction, n-Hexane*

Received 12.03.2015 Revised 01.04.2015 Accepted 10.04. 2015

## INTRODUCTION

Sweet potato (*Ipomea batatas*) is the sixth most important food crop after rice, wheat, potatoes, maize, and cassava [5]. Sweet potatoes are highly nutritious vegetables. Sweet potatoes are known as a rich source of carbohydrates, beta-carotene, ascorbic acid, and minerals [3]. Besides acting as antioxidants, caroteneoids and phenolic compounds also provide sweet potatoes with their distinctive flesh colours (cream, deep yellow, orange and purple) [2]. It has long been known that the orange-fleshed sweet potato contains beta-carotene, responsible for conferring pro-vitamin A activity that contributes to the prevention of vitamin A deficiencies and night blindness [6]. Sweet potato is also a rich source of vitamin B1 (Thiamin) and vitamin C [4, 7]. The sweet potato has been reported to have numerous health benefits including antimutagenic, antioxidant, hepato-protective, cardio-protective, and antidiabetic effects, which have been attributed to the sweetpotato's phytochemical constituents [1].
The main purpose of this research is to investigate some technical factors affecting to β-carotene extraction in the sweet potato.

## MATERIAL AND METHOD

### Material

Orange-fleshed sweet potato is collected in Mekong River Delta, Vietnam.

**Figure 1. Orange-fleshed sweet potato**

### Research method

***Experiment #1: Effect of solvents to β-carotene extraction***

We examine 4 kinds of solvents such as ethanol, acetone, diethyl ether and n-Hexane in different temperatures from 50-80°C.

***Experiment #2: Effect of temperature to β-carotene extraction***

After finding the best solvent, we examine the effect of temperature (50, 55, 60, 65, 70, 75, 80, 85°C) to β-carotene extraction.

***Experiment #3: Relationship between extraction time and β-carotene residue***

We examine different extraction durations (60, 90, 120, 150, 180, 210, 240, 270 and 300 minutes) to β-carotene residue.

**Statistical analysis**

All data are processed by Excel.

## RESULT AND DISCUSSION

***Effect of solvents to β-carotene extraction***

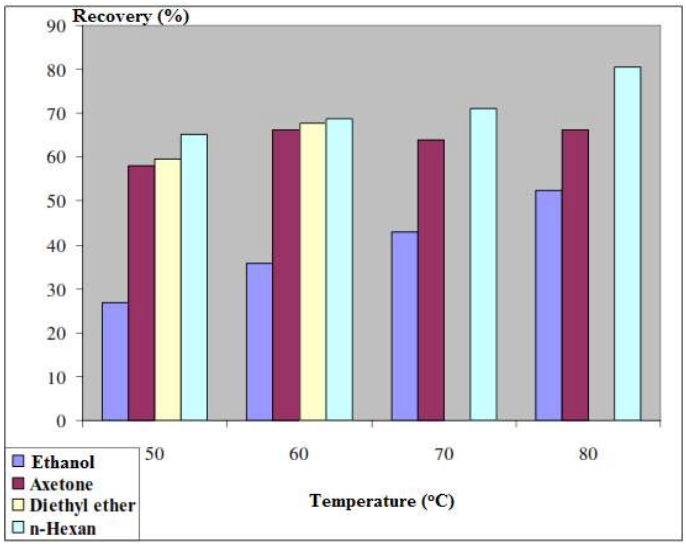


**Figure 2. Effect of solvents to β-carotene extraction**

From figure 2 above, we decide to choose n-Hexane for β-carotene extraction in the orange-fleshed sweet potato.

**Effect of temperature to β-carotene extraction**

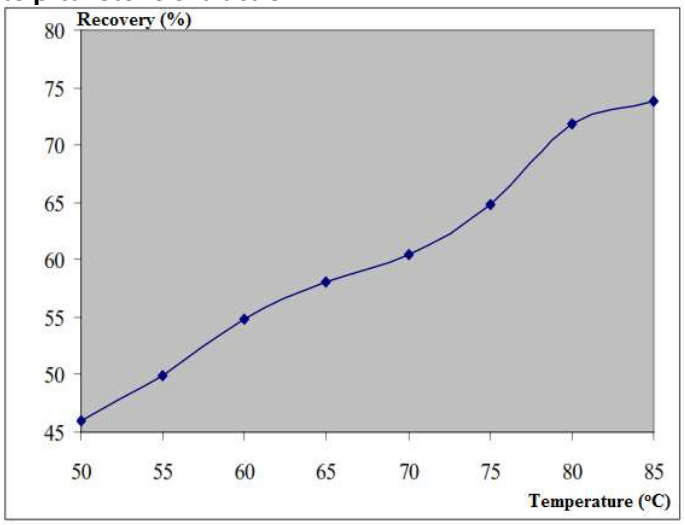


**Figure 3. Effect of temperature to β-carotene extraction**

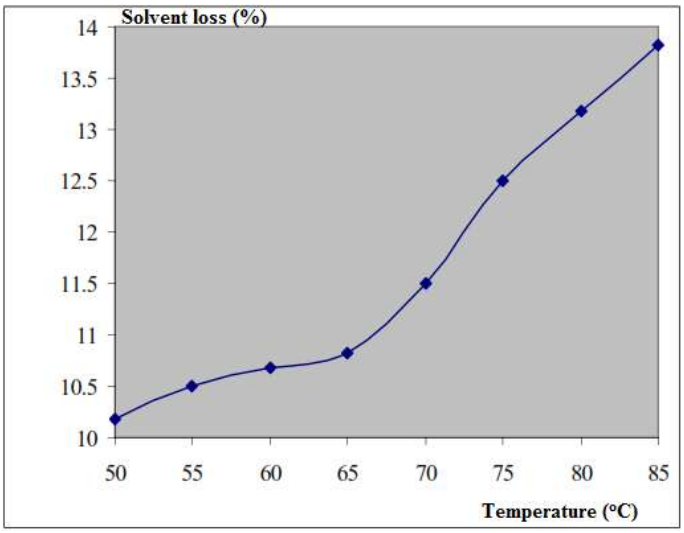


**Figure 4. Solvent loss at different temperature**

From figure 3 and figure 4 above, we choose 80°C for β-carotene extraction

**Relationship between extraction time and β-carotene residue**

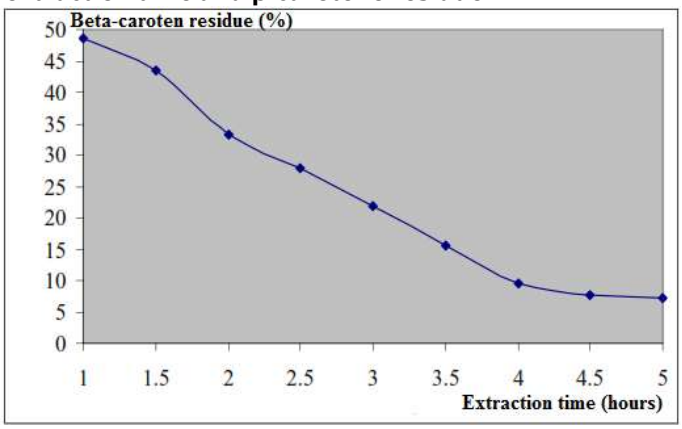


**Figure 5. Relationship between extraction time and β-carotene residue**

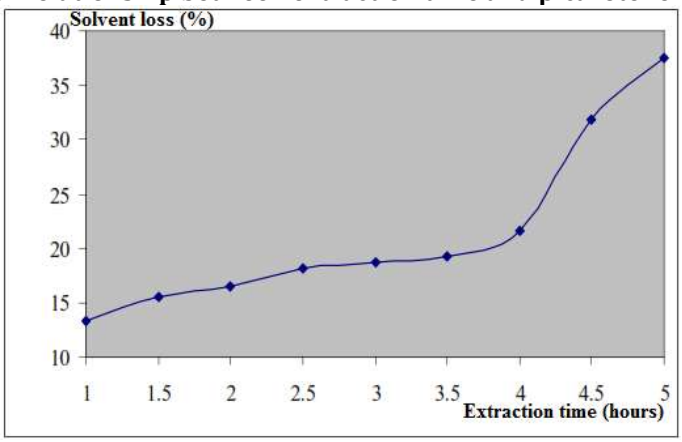


**Figure 6. Relationship between extraction time and solvent loss**

From figure 5 & 6, we choose the extraction time at 4 hours for application.

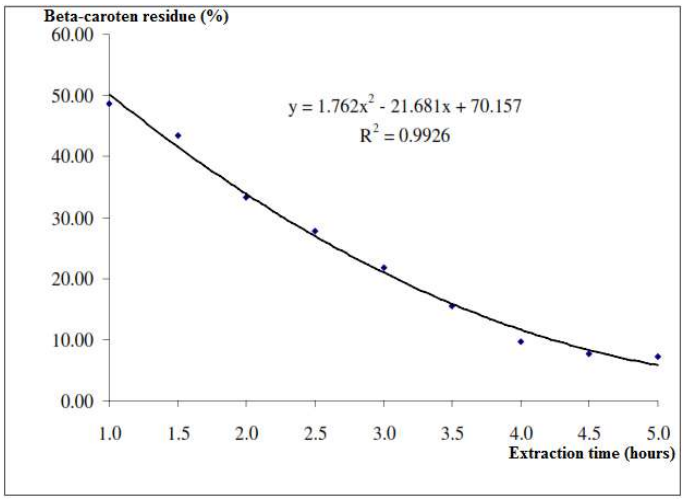


**Figure 7. β-carotene remaining by the extraction time**

## CONCLUSION

Sweet potato (*Ipomoea batatas* L.) is an important tuber crop grown in the tropics, sub-tropics and warm temperate regions of the world for its edible storage roots. The roots are used as a source of carbohydrate and dietary fibre. Dietary fibre has the potential to reduce the incidence of a variety of diseases in man including colon cancer, diabetes, heart diseases and digestive disturbances. We have successfully investigated possible conditions for extracting β-carotene in this valuable food source. This is a fundamental approach for β-carotene refinery applicable for functional food.

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**CITATION OF THIS ARTICLE**

Nguyen Phuoc Minh. Factors Affecting to β-Carotene Extraction from Sweet Potato. Bull. Env. Pharmacol. Life Sci., Vol 4 [7] June 2015: 108-111