

1-1-2013

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Recommended Citation

Phlicharoenphon., Wichitra; Gritsanapan, Wandee; and Sithisarn, Pongtip (2013) "NUTRITIONAL VALUES AND TLC FINGERPRINT OF SCAPHIUM SCAPHIGERUM FRUIT GEL," *The Thai Journal of Pharmaceutical Sciences*: Vol. 38: Iss. 0, Article 16.

Available at: <https://digital.car.chula.ac.th/tjps/vol38/iss0/16>

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NUTRITIONAL VALUES AND TLC FINGERPRINT OF *SCAPHIUM SCAPHIGERUM* FRUIT GEL

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KEYWORD: Samrong, *Scaphium scaphigerum*, nutritional values, TLC fingerprint

INTRODUCTION

Samrong (*Scaphium scaphigerum* (G. Don) Guib. & Planch) is a tree in Sterculiaceae family. The traditional uses of the gel from the fruits of this plant are to use as laxative and weight control agents and for the treatments of cough and sore throat and using as expectorant¹⁾. After soaking in water, samrong seed coats become a brown glass jelly which can be used as a bulk laxative and promote the satiety. This gel contains polysaccharide PP-III, which the subunits are mannosaccharides; galactose, arabinose and rhamnose¹⁻³⁾. Even though there are a lot of beverage and dessert preparations, especially healthy drinks for weight control from samrong fruits gel, however there is no report about the specification and the quality control of this gel before. Therefore, this experiment was set up in order to evaluate the nutritional values such as carbohydrate, total sugar, fat, protein, soluble and insoluble fiber contents of samrong fruit gel and dried powders using methods according to AOAC 2005 guideline. Investigation of phytochemical characteristic was also conducted by thin layer chromatography (TLC).

MATERIALS AND METHODS

Plant material Samrong fruits were purchased from Chantaburi province, Thailand in April, 2013. The specimen was compared with the authentic plant material of Forest Herbarium, Wildlife and Plant Conservation Department of Thailand. Samrong fruits were prepared by cleaning and cutting upper and lower parts of the fruits and soaked in distilled water at room temperature. Then the contaminations were separated. The swollen samrong fruit gel was rinsed and boiled in distilled water at temperature of 100°C for 60 minutes. The swollen samrong fruit gel was left on the sieve until the water was drained. Samrong fruit gel was passed through the fabric filter, dried in hot air oven (65-70°C for 8 hours) then powdered through the sieve No. 20. The fresh gel and dried samrong gel powder were analyzed for the nutritional values as described below.

Analysis of nutritional values Nutritional values such as carbohydrate, total sugar, fat, protein, soluble fiber and insoluble fiber contents in samrong fruit gel and dried powder were evaluated using the methods according to AOAC 2005 guideline⁴⁾.

Preparation of samrong fruit gel Samrong gel powder (5 g) was swelled in water (1000 ml) for 16 hours then the gel was separated. Samrong gel (5 g) was mixed with 95% ethanol (210 ml) and left at 4°C for 12 hours then filtered. The obtained precipitate was hydrolyzed by adding 15 ml of 5% sulfuric acid solution. The solution was heated on the water bath (90°C) for 2 hours. The solution was cooled and neutralized using barium carbonate. The mixture was filtered and a supernatant was used for TLC analysis.

TLC condition The hydrolyzed fraction of samrong fruit gel and the authentic monosaccharides were analyzed by thin layer chromatography using the condition as follow;

Adsorbent: Silica gel GF₆₀

Solvent system: 1-propanol : ethyl acetate : water (4:0.5:0.5 v/v/v)

Detection: 10% sulfuric acid in methanol. After spraying, the TLC plate was heat at 100°C for 10 minutes

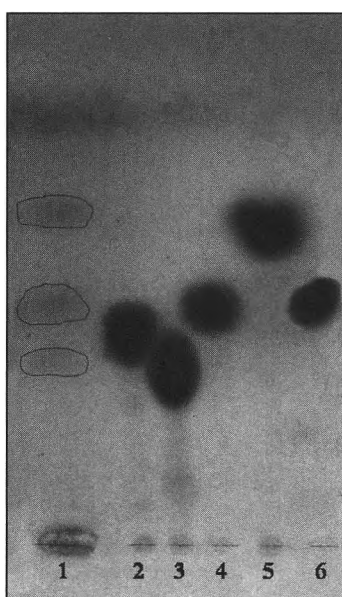
RESULTS

As shown in **Table 1**, samrong fruit gel (100 g) showed the absence of any energy, total fat, carbohydrate and total sugar with $0.25 \pm 0.00 \times 6.25$ g of protein. This gel powder contained low soluble and insoluble dietary fiber contents (0.57 ± 0.01 and 1.26 ± 0.01 g, respectively). Samrong fruit gel dried powder (100 g) contained low energy of 335.5 ± 0.71 kcal with 28.75 ± 0.18 and 316.8 ± 0.49 g of protein and carbohydrate, respectively. This gel powder showed the absence of any fat with higher amounts of soluble and insoluble dietary fibers (5.21 ± 0.16 and 89.93 ± 0.06 g, respectively) and small amount of total sugar (0.47 ± 0.01 g).

Table 1 Nutritional values of gel and gel powder of *Scaphium scaphigerum* fruits determined by methods according to AOAC 2005 guideline.

Nutritional values	Nutritional values (per 100 g)	
	Samrong fruit gel	Samrong fruit gel powder
Energy (kcal)	Not detected	335 ± 71
Protein (Nx6.25) (g)	0.25 ± 0.00	28.75±0.18
Total fat (g)	Not detected	Not detected
Carbohydrate (g)	Not detected	316.8 ± 0.49
Soluble dietary fiber (g)	0.57 ± 0.01	5.21 ± 0.16
Insoluble dietary fiber (g)	1.26 ± 0.01	89.93 ± 0.06
Total sugar (g)	Not detected	0.47 ± 0.01

Thin layer chromatography of the hydrolyzed fraction of samrong fruit gel showed the bands at Rf values of 0.32, 0.44 and 0.60 suggesting the presences of monosaccharides galactose, arabinose and rhamnose, respectively (Figure 1).

**Figure 1** : Thin layer chromatography fingerprint of hydrolyzed fraction of *Scaphium scaphigerum* fruit gel.

TLC condition The hydrolyzed fraction of samrong fruit gel and the authentic monosaccharides were analyzed by thin layer chromatography using the condition as follow;

Adsorbent: Silica gel 60

Solvent system: 1-propanol : ethyl acetate : water (4:0.5:0.5 v/v/v)

Detection: 10% sulfuric acid in methanol. After spraying, the TLC plate was heat at 100°C for 10 minutes

Track; 1= samrong fruit gel hydrolyzed fraction, 2 = standard glucose, 3 = standard galactose, 4 = standard arabinose, 5 = standard rhamnose, 6 = standard mannose

DISCUSSION

The fresh samrong gel showed very low nutritional values such as no energy, fat, carbohydrate and sugar with very low amounts of fibers. While the gel powders prepared from the fresh gel of samrong promoted the constituent with high insoluble dietary fiber content, low amount of carbohydrate, protein, sugar and calorie with none of fat content. Even though samrong gel in the dried powder form contained small amount of energy, protein, sugar and carbohydrate, it contained higher amount of dietary fiber than the fresh gel. Therefore, this dried gel powder could be used to promote the satiety as the weigh control agent. TLC fingerprint of the hydrolyzed fraction of samrong fruit gel showed the chromatographic bands corresponded to monosaccharides galactose, arabinose and rhamnose supporting the previous report about

the subunits of polysaccharides PP-III 1), the main phytochemical in samrong fruit gel. However, other physical properties including swell volume, total acidity, total ash and loss on should be performed in the future to qualitatively control of this samrong gel powders.

CONCLUSION

Samrong fruit gel powder promoted a high insoluble dietary fiber with low amounts of calorie and other nutritional suggesting the possibility to be applied as weight control agent.

ACKNOWLEDGMENTS

The authors express their gratitude to Thailand Research Fund (TRF) for financial support.

REFERENCE

1. วันดี กฤษณพันธ์. สำรอง : สมุนไพรที่สรรพคุณไม่เป็นรองใคร. วารสารเภสัชกรรมสมาคมแห่งประเทศไทยในพระบรมราชูปถัมภ์ 2550: 1/2550: 11-14
2. กิตติยา ภูเจริญ, พรณทิพา สิงห์ประชา. ผลิตภัณฑ์อาหารเสริมเส้นใยอาหารจากผลสำรอง (โครงการพิเศษ). กรุงเทพมหานคร.มหาวิทยาลัยมหิดล; 2546
3. ชนินันท์ ลิ้มปิชาลัย. ผลของปริมาณโปรตีนในกัมสำรองต่อสมบัติอิมัลชัน ปริมาณกรดฟีนอลิก และความสามารถต้านออกซิเดชัน (วิทยานิพนธ์). กรุงเทพมหานคร. มหาวิทยาลัยเกษตรศาสตร์; 2551.
4. Official methods of analysis of AOAC International; 2005 / William Horwitz, editor. Gaithersburg, Md.: AOAC International, c 2005. (Ref. 543/AOAC/18th ed. Appendix D. p.9/Appendix E.p.2-3)