

ผลของการเตรียมตัวอย่างเบื้องต้นต่อการเปลี่ยนแปลงคุณภาพของผลิตภัณฑ์ สะตอบแห้ง

EFFECT OF PRETREATMENTS ON THE QUALITY OF DEHYDRATED *PARKIA SPECIOSE*

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บทคัดย่อ

งานวิจัยมีวัตถุประสงค์เพื่อศึกษากรรมวิธีการผลิตสะตอบแห้งแบบลมร้อนต่อการเปลี่ยนแปลงคุณภาพของสะตอบแห้ง โดยก่อนการอบแห้งสะตอสดจะถูกเตรียมตัวอย่างด้วยการแช่สารละลายแคลเซียมคลอไรด์ และสารละลายโซเดียมคลอไรด์ ที่ระดับความเข้มข้นร้อยละ 1 1.5 และ 2 (โดยน้ำหนัก) เป็นเวลา 5 นาที ที่อุณหภูมิ 70 องศาเซลเซียส แล้วทำการลวกที่อุณหภูมิ 85 องศาเซลเซียส เป็นเวลา 15 วินาที โดยตัวอย่างที่ไม่ได้ผ่านการแช่สารละลายเป็นชุดควบคุม แล้วนำไปอบแห้งที่อุณหภูมิแตกต่างกัน (50 60 และ 70 องศาเซลเซียส) จากผลการวิเคราะห์คุณภาพทางด้านกายภาพ เคมี และทางด้านประสาทสัมผัส พบว่า ปริมาณความชื้นของสะตอลดลงเมื่ออุณหภูมิในการอบแห้งเพิ่มสูงขึ้นในขณะที่อัตราการอบแห้งเพิ่มสูงขึ้น โดยปริมาณความชื้นต่ำสุด คือ ร้อยละ 6.55 พบในสะตอบแห้งที่ผ่านการอบแห้งด้วยอุณหภูมิ 70 องศาเซลเซียส เป็นเวลา 7 ชั่วโมง อุณหภูมิจึงเป็นปัจจัยสำคัญที่มีผลต่อการเปลี่ยนแปลงคุณภาพทางด้านความชื้น อัตราการทำแห้ง และการเปลี่ยนแปลงสี การเปลี่ยนแปลงสีน้ำตาลจะเกิดขึ้นน้อยที่สุดในสะตอที่ผ่านการเตรียมตัวอย่างเบื้องต้นและอบแห้งด้วยอุณหภูมิ 60 องศาเซลเซียส การเตรียมตัวอย่างเบื้องต้นด้วยสารละลายแคลเซียมคลอไรด์ และโซเดียมคลอไรด์ให้ผลไม่แตกต่างกันต่อการเปลี่ยนแปลงคุณภาพของสะตอบแห้ง ผู้ทดสอบให้การยอมรับต่อสะตอบแห้งที่ผ่านการเตรียมตัวอย่างเบื้องต้นทั้งคุณภาพทางประสาทสัมผัสด้าน สี กลิ่น รสชาติ เนื้อสัมผัส และความชอบโดยรวม และผู้ทดสอบให้คะแนนความชอบต่อผลิตภัณฑ์สะตอบแห้งที่ผ่านการแช่สารละลายแคลเซียมคลอไรด์ร้อยละ 1.0 และอบแห้งที่อุณหภูมิ 60 องศาเซลเซียส มากที่สุด

คำสำคัญ: การเตรียมตัวอย่างเบื้องต้น ตู้อบลมร้อน การทำแห้ง สะตอ

Abstract

The drying process caused a significant changing in the chemical-physical properties of drying products. Therefore, the purpose of this study was to evaluate the effect of drying process and pretreatments on the physicochemical properties of dried *Parkia speciosa* seeds. Seeds of *Parkia speciosa* were dried in cabinet tray drier at three different temperatures (50, 60 and 70°C). Physicochemical and sensory qualities of dried *Parkia speciosa* were determined and compared with the control sample. Moisture content of *Parkia speciosa* seeds decreased with drying temperatures, whereas rehydration ratio increased. When compared with the unblanched treatment, drying the blanched *Parkia Speciosa* seeds at 70°C was the most pronounced factors affecting moisture content, dehydration ratio and colour degradation. The lowest moisture content of 6.55% was found in sample dried at 70°C. Less browning from drying was observed in blanched samples, which were dehydrated at 60°C. It was found that the proper condition for drying temperature was dried at 60°C for 5 hrs as considered from the sensory evaluation.

Prior to drying at 60°C, fresh *Parkia Speciosa* seeds were blanched in hot water at 85°C for 15s and pre-treated with calcium chloride (CaCl₂) and sodium chloride (NaCl) solution (0, 1, 1.5 and 2 % w/w) for 5 min at 27°C. Dried seeds without pretreatment was considered control sample. Pretreatment seeds with CaCl₂ and NaCl solution induced similar changes of physicochemical properties of dried *Parkia speciosa*. All pretreated samples were acceptable when sensory qualities were evaluated. The most acceptable sample was *Parkia speciosa* seeds pretreated with 1% CaCl₂ and dried at 60°C. Therefore, the blanching pretreatment prior to drying *Parkia speciosa* seeds results in sensory properties.

Keywords: Pretreatments, Hot air drying, Rehydration, *Parkia speciosa*

Introduction

Parkia speciosa is a Southern Asian edible legume, which known as “sator”. These seeds are found in many tropical countries including Indonesia, Malaysia, Philippine and Thailand. They have been a popular ingredient that can be consumed fresh or cooked with the traditional dish in the south of Thailand and they are also consumed pickled in brine [1]. *Parkia speciosa* seeds are also used as traditional medical food that possess anti-diabetes, hypoglycaemic activity [2-3] and antimicrobial properties [4]. Previous studies have reported that *Parkia speciosa* contain antioxidant (Thiazolidine-4-carboxylic acid) which has anticancer activity [5-6]. Other research showed that polysaccharide extract from pod also have functional properties of antioxidant and rheological properties [7].

Dehydration of fruits and vegetables seems to be convenient alternative process for long term storage. Drying technique is one of the commercially used methods of food preservation. The main feature of drying process is to reduce the free water content in order to avoid microbial spoilage and shelf life could be extended to a year [8] Generally, hot air drying is efficient method but the high temperature and

long time drying affects the quality of conventionally dried food products including texture, flavour, colour and nutrients [9]. In addition, hot air drying also lead to poor rehydration characteristics of dried products caused by cell collapse after moisture loss [10].

Pretreatment is an important step in the drying processing. Various pretreatments prior to drying such as blanching, chemical treatments and osmotic solutions can speed up drying rate, prevent browning, keep texture and help volatile compounds. Therefore, pretreatments have been suggested for maintaining good quality characteristics of dried products. [11]

Pretreatments with chemical substances such as sodium metabisulphite, citric acid, ascorbic acid, sodium chloride and calcium chloride are widely used to prevent physical changes during drying and extend the shelf life of several dried products including apples, carrot, cantaloupes, pear, peach and pineapple [12-15] In previous published studies, the use of calcium chloride and sodium chloride have been reported in improving overall quality of end products, e.g. lowering discoloration by preventing enzymatic browning reaction and improving texture characteristic by interaction of calcium ions with biopolymer [16]. Therefore, chemical pretreatments and drying temperatures were optimized to obtain good quality of dried *Parkia speciose* seeds.

Objectives

This research aimed to study optimal preparing conditions of dried *Parkia speciose* seeds. The effect of different-drying temperatures and types and contents of pre-treating solution on the qualities of dried *Parkia speciose* seeds was observed. The information obtained could be useful to finding proper drying condition in order to minimize the quality degradation.

Methods

Preparation of *Parkia speciose* seeds

Fresh *Parkia speciosa* pods were purchased from the local market located in Surat Thani. They were washed and the seeds were removed from their pods. The immature and broken seeds were separated from the sample. The *Parkia speciosa* seeds were kept in plastic bag at 4°C before pretreatments and drying.

Drying experiments

Fresh *Parkia speciosa* seeds were blanched by immersing them in hot water at $85 \pm 3^\circ\text{C}$ for 15 second, followed by cooling to room temperature (25°C) using chilled water ($8 \pm 3^\circ\text{C}$). The ratio of blanching water and *Parkia speciosa* seeds was 500 ml/ 250 g. After blanching, *Parkia speciosa* seeds were dried as a single layer in a cabinet type dryer (Enviro-Pak, MRC 5000, United State) at 50, 60 and 70°C to final moisture content of 10%. Dried seeds were cooled for 10 min, packed in polyethylene bags kept at 4°C before analysis. Qualities of dried product were determined including moisture content, colour,

rehydration ratio and sensory properties. A control treatment was obtained from fresh *Parkia speciosa* seeds. All treatments were replicated.

Pretreatments

After blanching, samples were separated into two groups. Half of the group was pretreated by dipping in an aqueous solution of 1.0, 1.5 and 2.0% (w/w) NaCl and CaCl₂ for 10 min at 25°C. The ratio between *Parkia speciosa* seeds and dipping solution was 1:2. Then *Parkia speciosa* seeds were dried in hot air drier at 60°C for 5 hours. For control sample, *Parkia speciosa* seeds were dipped in distilled water for 10 min at 25°C and dried at 60°C for 5 hours. Qualities of dried product was determined including moisture content, rehydration ratio, colour and sensory properties. All treatments were replicated.

Moisture content

The moisture contents of the fresh and dried *Parkia speciosa* seeds were determined according to the hot air oven method described by the AOAC method (2005).

Rehydration ratio

The rehydration ratio of dried *Parkia speciosa* seeds was evaluated by immersing 5 g of samples in hot water at 100°C. Samples were drained and weighted at 2, 4, 6, 8 and 10 min. The rehydration ratio is defined as the ratio of weight of the rehydrated sample to weight of dried sample [17]

Colour measurement

The colour of dried *Parkia speciosa* seeds was measured using a colorimeter (Minolta, CR-400, Tokyo, Japan) based on the CIELab colour space, after calibration with the white and black glass standards. Colour changes were measured by three parameters in terms of L^* (Lightness), a^* (redness and greenness) and b^* (yellowness and blueness).

Sensory evaluation

The sensory evaluation of rehydrated samples was carried out by 30 panelists. A balanced 9-point hedonic scale was employed to evaluate acceptance on appearance, colour, flavor, taste, texture, and overall acceptability.

Statistical Analysis

The experiments were conducted in three replications. The results were reported as the mean value with standard deviation. Comparison of means was performed by one-way analysis of variance (ANOVA) and analysis Least Significant Difference (LSD) at 95% significance level. Statistical analyses were performed using SPSS for windows, Version 22.0 (SPSS Institute, Inc., Cary, NC).

Results

Effects of drying temperatures on the quality of dried *Parkia speciosa* seeds

The effect of temperature on physico-chemical characteristics of untreated dried *Parkia speciosa* seeds was evaluated. Changes of moisture content, colour and rehydration ratio of dried *Parkia speciosa* seeds at three temperatures of 50, 60 and 70°C are presented in Table 1. The total drying time to reach a final moisture content lower than 10% required ranged of drying time from 8 h at 50°C to 5 h at 70°C.

The results show that the drying temperature had significant effect on the colour changes. The a^* and b^* values in the blanched dried *Parkia speciosa* seeds with significant difference between the lowest 50°C and the highest 70°C temperatures for both treatments. The L^* values of the blanched dried *Parkia speciosa* seeds no significant differences with different drying temperatures. The colour measurement of dried *Parkia speciosa* seeds at different three temperatures were similar trend with 50, 60°C. On the other hand, the drying process led to dried *Parkia speciosa* seeds being darker than the fresh *Parkia speciosa* seeds (control). The results observed that dried *Parkia speciosa* seeds all three temperatures takes negative values for greenish colour and b^* value takes positive for yellowish colour. However, the darker appearance of colour formation was shown in dried at 70°C.

The influence of the drying temperatures on moisture content, is shown in table 1, fresh *Parkia speciosa* seeds having an initial moisture content of 70.11%. The moisture content was decreased continuously when the drying temperature was increased, the lowest value occurred at 70°C (6.55%). For the rehydration ratio parameter, the change in rehydration ratio of *Parkia speciosa* seeds dried at 70°C exhibited higher rehydration ratio than the seeds dried at 50°C. It was concluded that drying the blanched treatment at 60°C were useful drying process to avoid quality changes, especially colour parameter, for dried *Parkia speciosa* seeds.

Table 1 Physicochemical characteristics of *Parkia speciosa* seeds dried with different temperatures.

Drying temperatures (°C)	L^*	a^*	b^*	Moisture content (%)	Rehydration ratio
Control	91.54 ^a ± 57.1	-17.42 ^a ± 0.56	32.09 ^a ± 2.17	70.11 ^a ± 3.71	3.34 ^d ± 0.19
50	50.01 ^b ± 2.15	-14.19 ^b ± 0.64	26.10 ^b ± 2.71	10.99 ^b ± 1.34	5.92 ^c ± 0.26
60	48.42 ^b ± 1.42	-16.21 ^a ± 1.13	30.73 ^a ± 2.29	8.81 ^c ± 0.16	6.18 ^{bc} ± 0.11
70	48.38 ^b ± 2.26	-7.55 ^c ± 2.27	19.91 ^c ± 5.32	6.55 ^d ± 1.87	7.94 ^a ± 0.10

^{abc} different letters in the same column indicate a significant difference ($P \leq 0.05$).

Control was fresh *Parkia speciose* seeds

Table 2 shows the sensory properties of dried *Parkia speciose* seeds with different drying temperatures. Rehydrated *Parkia speciosa* seeds dried at 70°C received the lowest scores for all sensory attributes. No significant differences were found in colour, texture among rehydrated *Parkia speciosa* seeds at 50°C and 60°C. The highest score of overall acceptance was the dried *Parkia speciose* seeds at 60°C. Therefore, the drying temperature at 60°C. for 5 hr was use for optimum drying temperature to dehydration process.

Table 2 Sensory scores of *Parkia speciosa* seeds dried with different temperatures.

Drying temperature s (°C)	Appearance	Colour	Flavour	Taste	Texture	Overall acceptance
Control	7.30 ^a ± 1.21	7.33 ^a ± 1.45	6.70 ^a ± 1.21	6.53 ^{ab} ± 1.33	6.67 ^a ± 1.15	6.87 ^{ab} ± 1.12
50	6.33 ^b ± 1.42	6.20 ^b ± 1.45	6.37 ^{ab} ± 1.27	6.30 ^{bc} ± 1.44	6.43 ^a ± 1.25	6.37 ^b ± 1.27
60	6.77 ^{ab} ± 1.52	6.60 ^b ± 1.61	6.90 ^a ± 1.40	7.17 ^a ± 1.26	6.90 ^a ± 1.18	7.13 ^a ± 1.22
70	5.53 ^c ± 1.20	5.43 ^c ± 1.17	5.87 ^b ± 1.28	5.70 ^c ± 1.29	5.80 ^b ± 1.19	5.60 ^c ± 0.97

^{abc} different letters in the same column indicate a significant difference ($P \leq 0.05$).

Control was fresh *Parkia speciosa* seeds

Effect of pretreatments on the quality of dried *Parkia speciosa* seeds

Different types and concentrations of pre-treating salts solution have been studied for improvement the colour and texture of *Parkia speciosa* seeds before drying process. The pretreatment by using CaCl_2 and NaCl solution was studied as shown in Table 3. From the CIE colour parameter measurement results (Table 3), the colour of pre-treatment *Parkia speciosa* seeds that were processed by dipping difference concentration of solutions from 1 to 2 % of NaCl had no effect on the colour characteristics comparable with the untreated samples (control). However, pre-treatment samples that were soaking with CaCl_2 had the higher degree of lightness (L^*), with a slightly lower green (a^*) and yellow (b^*) than that of untreated samples. a^* value of dried *Parkia speciosa* seeds in all treatment were decrease and the different between pre-treated sample with 1.5 and 2% CaCl_2 and control sample were statistically significant ($P < 0.05$). Therefore, pretreatment with CaCl_2 had adverse effect on green colour of dried *Parkia speciosa* seeds.

In comparison with control sample of moisture content, there was no significant ($p \leq 0.05$) difference in final moisture content of dehydrated product for all pre-treatment sample which ranged between 9.19 and 8.51 %. Effects of pretreatments on moisture content were not clearly shown. However, soaking of *Parkia speciosa* seeds in CaCl_2 after blanching showed slightly higher moisture content in comparison to those other pre-treatments of *Parkia speciosa* seeds with NaCl.

Concentration of the dipping solution had an influence on the rehydration ratio. There was increased with increase in the chemical solution. From Table 3, it is apparent that the dried *Parkia speciosa* seeds with the best physico-chemical characteristics was obtain from 2% CaCl_2 pre-treated samples due to highest rehydration ratio (7.05) among the other chemical pre-treatment. It has been shown that soaking of *Parkia speciosa* seeds in CaCl_2 solution prior to drying apparently results in faster and better rehydration. Soaking of *Parkia speciosa* seeds in 2% CaCl_2 solution prior to drying resulted in more rehydration ratio.

From Table 3, it is apparent that the dried *Parkia speciosa* seeds with the best physico-chemical characteristics was obtain from 1% CaCl_2 pre-treated samples. All pre-treated samples appeared minor changes colour in comparison with control sample (without pre-treatment). It is also reported that soaking of sample in some chemical solution including CaCl_2 can improve drying time faster and better preserves colour during drying process.

Table 3 Effects of pretreatments on physicochemical characteristics of dried *Parkia speciosa* seeds.

Treatments	L*	a*	b*	Moisture content (%)	Rehydration ratio
Control	47.61 ^b ± 1.04	-15.32 ^a ± 1.46	28.19 ^b ± 2.60	8.08 ^b ± 0.19	6.02 ^b ± 5.56
1% NaCl	47.87 ^b ± 1.01	-15.79 ^a ± 1.05	30.35 ^a ± 2.06	8.63 ^{ab} ± 0.19	6.36 ^b ± 1.70
1.5% NaCl	48.17 ^{ab} ± 2.32	-15.90 ^a ± 1.71	28.90 ^b ± 3.64	9.19 ^a ± 1.35	6.34 ^b ± 5.52
2% NaCl	47.81 ^b ± 1.53	-12.60 ^b ± 1.58	25.59 ^c ± 4.52	8.51 ^{ab} ± 0.82	6.79 ^b ± 6.90
1% CaCl ₂	49.68 ^a ± 2.23	-14.31 ^{ab} ± 1.39	26.05 ^b ± 1.34	9.13 ^a ± 0.33	6.31 ^b ± 1.17
1.5% CaCl ₂	48.58 ^{ab} ± 1.22	-12.90 ^b ± 1.88	25.52 ^c ± 3.66	9.10 ^a ± 0.91	6.33 ^b ± 2.39
2% CaCl ₂	47.64 ^b ± 1.02	-13.26 ^b ± 0.61	23.96 ^d ± 2.76	8.81 ^{ab} ± 0.16	7.05 ^a ± 0.98

^{abc} different letters in the same column indicate a significant difference ($P \leq 0.05$).

Control was dried *Parkia speciosa* seeds without pretreatments.

For sensory qualities, dried *Parkia speciosa* seeds pretreated with 1% CaCl₂ had the highest score of appearance, texture and overall acceptability. On the other hand, pretreatment with NaCl solution did not apparently influence the sensory attributes of dried *Parkia speciosa* seed (Table 4). The effect of different pre-treatments on sensory attributes has also been assessed as shown in Table 3. The scores for appearance colour, flavour, taste, texture and overall acceptance were found maximum for CaCl₂ pre-treated dried *Parkia speciosa*. The rehydrated *Parkia speciosa* seeds prepared from dried *Parkia speciosa* seeds pre-treated with 1% CaCl₂ had the highest overall acceptability with score of 7.58. While, the control sample that prepared from untreated *Parkia speciosa* seeds had the lowest score (6.44). Appearance and texture score also were highest for the *Parkia speciosa* seeds prepared from 1% CaCl₂ pre-treated samples.

Table 4 Sensory scores of dried *Parkia speciosa* seeds pretreated with different treatments.

Treatments	Appearance	Colour	Flavour	Taste	Texture	Overall acceptance
Control	6.16 ^c ± 1.58	6.10 ^c ± 1.40	6.42 ^b ± 1.40	6.18 ^c ± 1.32	6.16 ^c ± 1.30	6.44 ^b ± 1.26
1% NaCl	7.22 ^{ab} ± 0.86	7.24 ^{ab} ± 1.03	7.04 ^a ± 0.98	7.10 ^a ± 1.17	7.04 ^{ab} ± 1.23	7.42 ^a ± 0.83
1.5% NaCl	7.12 ^b ± 0.82	7.04 ^{bc} ± 1.10	6.69 ^b ± 0.90	6.69 ^b ± 1.18	6.81 ^{bc} ± 1.09	6.98 ^b ± 1.13
2% NaCl	6.80 ^b ± 1.08	7.04 ^{ab} ± 1.08	6.58 ^b ± 0.96	6.64 ^b ± 1.28	6.52 ^c ± 1.10	6.72 ^b ± 1.11
1% CaCl ₂	7.60 ^a ± 0.87	7.56 ^a ± 1.06	7.32 ^a ± 0.93	7.34 ^a ± 1.49	7.36 ^a ± 1.26	7.58 ^a ± 1.10
1.5% CaCl ₂	6.92 ^b ± 1.11	6.64 ^{bc} ± 1.20	6.52 ^b ± 0.81	6.54 ^c ± 0.92	6.70 ^b ± 0.83	6.88 ^b ± 0.95
2% CaCl ₂	6.90 ^b ± 1.00	6.82 ^b ± 0.99	6.52 ^b ± 1.14	6.48 ^{bc} ± 1.28	6.74 ^b ± 1.20	6.76 ^b ± 1.03

^{abc} different letters in the same column indicate a significant difference ($P \leq 0.05$).

Control was dried *Parkia speciosa* seeds without pretreatment.

Conclusions and Discussion

Effect of drying temperatures on the quality of dried *Parkia speciosa* seeds

Moisture content of the pretreated samples decreased faster than control sample. The reason is due to blanched seeds had higher initial moisture content from water uptake during blanching. Pretreated samples had porous structure and consequently more water removal during drying was observed [23].

In addition, the moisture content was influenced by temperature and drying time. *Parkia speciosa* seeds dried at 70°C exhibited higher rehydration ratio than the seeds dried at 50°C. Drying temperature caused the physical and chemical changes during drying process [24]. This may be due to changes in the structure of dried product because of temperature rise. It was confirmed that the dried products with higher temperature had the higher capacity to absorb water when reconstituted [25, 27, 8, 11]. The formation of dark color in seeds dried at high temperature (70°C) might be due to high temperature caused pigment development during drying. A similar observation was also reported in dried garlic slice. [11].

Rehydrated seeds previously dried at high temperature (70°C) received the lowest acceptance score when sensory qualities were evaluated. It is because of extensive heat generation. This indicated that the drying process in particular high temperature (at 70°C) together with blanching as pretreatments could affect on the physico-chemical characteristics and sensory evaluation of dried *Parkia speciosa* seeds. However, colour is a significant attribute of dried products which influence consumer decision. It was concluded that pretreatments with blanching before drying at 60°C was useful to avoid quality changes, especially colour parameter, in dried *Parkia speciosa* seeds.

Effect of pretreatments on the quality of dried *Parkia speciosa* seeds

Blanching and chemical pre-treatment with CaCl₂ had adverse effect on green colour of dried *Parkia speciosa* seeds. High content of calcium salts induced breakdown of chlorophyll [18]. Greenness of vegetables comes from the presence of chlorophyll. This result agreed with the application of CaCl₂ in ready-to-use carrot shreds [19]. Moreover, the darker appearance might be due to the oxidation of the

phenolic compounds during the drying processing [20]. Therefore, combination of blanching with soaking in 1% CaCl_2 had positive effect in prevention of the enzymatic browning by inactivation of polyphenol oxidase before drying. This might be attributable to the effect of calcium on rehydration in maintaining structural of membranes and cell walls [20-21]. This could be due to calcium inhibited the browning reaction by binding with the carbonyl group and green colour of dried product was maintained and high score of colour was obtained. In addition, calcium helps in reducing the tissue damage during drying by increasing cell rigidity and porous tissue of plant cell wall could be preserved. The changes in the structure during drying affect texture and shrinkage. Changes were loss because of calcium cross-links with pectin of plant cell wall [22]. Therefore, osmotic dehydration by dipping the product in a brine solution such as CaCl_2 prior to drying can made soften tissue and increase the drying rate by removing the surface resistance

Pretreatments by soaking in NaCl solution improved drying time and faster rehydration rate and also preserved colour but it had no affect on firmness during drying [5]. However, it did not apparently influence the sensory attributes of dried *Parkia speciose* seeds in comparison with control sample (without pre-treatment).

The effects of different pre-treatments on the quality characteristics of dried *Parkia speciose* seeds at three different temperatures were investigated. The quality of pre-treatment by soaking sample with 1% CaCl_2 solution and blanching of dried *Parkia speciosa* seeds at 60°C were found better than the others method according to the analysis results evaluated quality characteristics of dried product. However, drying process can be efficiently useful to control quality of final product by choosing appropriate preparation of product in a comprehensive method pre-drying process. It would be clear that the most appropriate drying temperature in order to preserve colour and avoid changes structure/texture of *Parkia speciose* seeds dried by using hot air tray conveyer would be around 60°C that provided the short of drying time.

All result indicated that the pre-treatment conditions with dried *Parkia speciose* seeds, especially with blanching 95°C for 10 second and soaking in 1% CaCl_2 was sufficient to produce dried *Parkia speciosa* seeds which exhibited less colour and with good rehydration characteristic as compared to hot air drying dried *Parkia speciose* seeds without pre-treatment. It was can be used for preservation of high quality dried *Parkia speciosa* seeds, which was preferred by sensory evaluation and could be desirable property for developing dried *Parkia speciosa* seeds with another drying method. Thus, the blanching with calcium pretreatment can be potential to retain the quality of dried *Parkia speciosa* seeds.

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