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DETERMINATION OF REMOVAL OF BITTER COMPOUND IN UN-BOILED PALMYRAH TUBER FLOUR

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Abstract

Bitterness of Un-boiledpalmyrah tuber flour is a hindrance for the development of palmyrah tuber flour products. A study was conducted to determine an appropriate method to remove the bitterness of un-boiled palmyrah tuber flour. The debittering process was performed using both hard water and distilled water in three different treatments. During the first treatment, the palmyrah tuber flour was soaked in hard water for three hours and filtered. The water was replaced once every hour. In the second treatment, the palmyrah tuber flour was soaked in distilled water for one hour and filtered. In the third treatment, the palmyrah tuber flour was soaked in distilled water for three hours and filtered. The water was replaced once every hour. The filtered flour was then dried using an oven. The dried flour was divided into two portions. 10g of dried flour from one of the portion was dissolved in 200ml water. Both dried and liquid samples were then subjected to sensory evaluation to check the level of bitterness. Both the dried and liquid samples gave strong bitterness, little bitterness and no bitterness for first, second and third treatments respectively. Removal of flabelliferin was seen by the change of colour of the water.

Keywords: Bitter, Debittering, Flabelliferin, Palmyrah tuber flour.

Introduction

Un-boiled palmyrah tuber flour is known as Odiyal flour which is used to prepare pittu and kool traditionally in Jaffna (E.R.Janszet al.2002). Odiyal flour is obtained from palmyrah tubers. Palmyrah tuber is cleaned, washed, the tubers split and dried in sun for five days. Dried tubers are ground and sieved to obtain un-boiled palmyrah tuber flour.

The bitter taste in the un-boiled palmyrah tuber flour prevents it from being used in cooking. The reason of the bitterness of Odiyal flour is the presence of flabelliferin. Therefore debittering process is carried out to remove bitter compound by soaking the Odiyal flour in water (E.R.Janszet al.2002).

Materials And Methods

Materials

Un-boiled palmyrah tuber flour, Hard water, Distilled water, Muslin cloth, Hot air oven.

Methods

The debittering study was performed using hard water taken from Jaffna and distilled water using three different treatments. All treatments were replicated six times. 750g of Un-boiled palmyrah tuber flour was taken and divide into three portions. Each portion contains 250g of palmyrah tuber flour.

Treatment 1 – 250g of Un-boiled palmyrah tuber flour was taken and soaked in 400ml hard water for three hours at room temperature and filtered using muslin cloth. The water was replaced once every hour and dried using hot air oven for 5hours.

Treatment 2 – 250g of Un-boiled palmyrah tuber flour was taken and soaked in 400ml distilled water for one hour at room temperature. Then soaked Odiyal flour was filtered using muslin cloth and dried using hot air oven for 5hours.

Treatment 3 – 250g of Un-boiled palmyrah tuber flour was taken and soaked in 400ml distilled water for three hours at room temperature and filtered using muslin cloth. The water was replaced once every hour and dried using hot air oven for 5hours.

Dried palmyrah tuber flour of each treatment was divided into two portions. 10g of dried flour from one portion was dissolved in 200ml water. Then dried and liquid samples were subjected to sensory panelists containing ten members to check the attribute bitterness using 5 – point Hedonic scale from no bitterness (5) to strong bitterness (1).

Results and Discussion

Bitter compound of un-boiled palmyrah tuber flour is flabelliferin (E.R.Jansz et al.2002). According to sensory evaluation results dried and liquid samples gave strong bitterness, little bitterness and no bitterness for first, second and third treatments respectively because during the first treatment hard water was used. Hard water contains minerals such as calcium, chloride and iron. These minerals bind with water molecules. This means bitter compound flabelliferin is unable to bind with the water molecules and be removed from un-boiled palmyrah tuber flour. Therefore, bitterness of un-boiled palmyrah tuber flour remained.

During the second and third treatments distilled water was used. There are no minerals in distilled water so flabelliferin could dissolve with pure distilled water easily as water is also a polar liquid.

In second treatment bitterness of un-boiled palmyrah tuber flour was reduced but not fully removed as the soaking time and quantity of distilled water were not enough to remove flabelliferin from un-boiled palmyrah tuber flour. In the third treatment there is no bitter taste because adequate time and quantity of distilled water was available to remove flabelliferin from palmyrah tuber flour.

Removal of bitterness of un-boiled palmyrah tuber flour was seen by the change of colour of the water as shown in the figure 1, 2 and 3.

Figure 1- 1st Extraction

Figure 2 - 2nd Extraction

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Figure 3 - 3rd Extraction

According to figure 1, 2 and 3, in the first extraction of the flabelliferin made the colour of the water changed to dark brown. Then in the second and third extraction, the colour of the water was light brown and light yellow respectively.

Conclusion

Bitter taste compound flabelliferin can remove by soaking palmyrah tuber flour in distilled water for three hours at room temperature trice while replacing water hourly.

Removal of flabelliferin from un-boiled palmyrah tuber flour was seen by the change of colour of the water. Colour of the water was dark brown, light brown and light yellow during the first, second and third treatments respectively.

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Reference

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