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Comparative Proximate Analysis Of Cinnamon And Clove

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Abstract: *Comparative proximate nutritional composition of cinnamon and clove powder has been determined. The dried samples were obtained and the analysis was carried out using standard methods, findings revealed macronutrients contents which are highly valuable for dietary purpose and could be used for nutritional support*

Keywords: *Macronutrients, Proximate, Dietary, Nutrition*

Introduction

Spices are plant derived substances like bark bud, seed pads, root that enhance the flavor of foods to stimulate appetite and add rest to food (Jessica et al, 2019). Cinnamon is one of the oldest known spices with a high flavor that belongs to the laurel family cinnamamum (lauraceae) genus. Cinnamon has a wide number of species among which the most impart are cinnamomum zylancium and cinnamon cassia. Cinnamomum zylancium is the true cinnamon while cassia is the Chinese spices. Both have a fragrant sweet and warm flavor which is derived from its essential oil thus making it a most useful sought after ingredient in the aroma and essence industries (Huang, 2007).

Cinnamal dehyde, the principal component of cinnamon and trans-cinnamaldehydecin greatly enhance the biological activities of cinnamon (Yeh, 2013). The bark also contains procyanidine and calechins. These procyanides extracted from cinnamon possess antioxidant activities which are found to have anti-inflammatory effects against infections and tissue damage (Nangapati, 2014). It is also effective against colon cancer (Wondrack, 2010). Clove is a spice that has been used for a long time. Nutritionally, it is significant in reducing the per oxidation of lipids (Shobana, 2000). They prevent the lipid oxidation process due to the presence of natural anti-oxidants (Lee, 2011). Synthetic preservatives are now replaced by natural preservatives (Viuda, 2010).

Materials and Methods

Sample Collection

Sample of cinnamon and cloves were collected at Maiduguri Monday Market. The samples were separately pulverized and both samples were taken to the food laboratory at the National Agency for Food Drug Administration and Control (NAFDAC) Maiduguri for analysis.

Procedures

1. Moisture content

Method: Oven drying at 105^0C

A flat dish made of Silica was dried in an oven and cooled in a desiccator. The cooled dish was weighed as (W1). 5 grams of the sample were put into the dish and weighed as (W2). The dish and its content were transferred into an air oven at 105^oC to dry for about 3 hours. Using a pair of tongs, the dish was transferred into the dessicator and allowed to cool. The dish was re-weighed as W3.

$$\% \text{ Moisture} = \frac{w_2 - w_3}{w_2 - 21} \times 100$$

2. Ashing

A clean silica dish was weighed as W1 5g of the sample was added to the dish and weighed again as (W2). The sample was put on boiling water bath to dryness. This was transferred into a muffle furnace at 500^0C until fully ashed. It was then cooled in a desiccator and weighed as (W2)

3. Acidity

10ml of the sample was measure into a conical flask; 1ml of phenolphthalein was then added with 0.1MHcl in a burette and titrated until the colour changed to pink.

$$\% \text{ Acidity} = \frac{\text{Titre value} \times 0.00908}{\text{Volume of sample taken}}$$

4. Protein

After obtaining the acidity value above, 2 drops of formaldehyde were added to the conical flask and titrated again against 0.1m Hcl.

% Protein = Titre value – 0.1x1.95

5. Fat

10ml of the sample (W0) was measure into a separating funnel. 10ml of ethanol 2ml of ammonia and 50ml of petroleum spirit was added into it and was shaken and separated into a weighed conical flask (W1). The conical flask was put on boiling water and heated to dryness. The dried conical flask was cooled in a desiccator and re-weighed as (W2).

$$\% \text{ Fat} = \frac{w_2 - w_1}{w_0} \times 100$$

6. Carbohydrate

It was calculated as follows

% carbohydrate = 100 – (protein value + fat value + moisture = Ash)

Results and Discussion

Table 1: Table showing the percentage of proximate analysis of cinnamon and clove powder

Sample	Moisture %	Ash %	Protein %	Fat %	Carbohydate%
Cinnamon	8.38	2.86	3.50	4.00	81.24
Clove	10.37	5.41	1.20	12.33	70.69

Discussion

The proximate analysis of both cinnamon and cloves powder were determined and the results revealed that cinnamon in this present study contains (8.38%) moisture, a value less than that of clove which is (10.37%). Moisture is a vital aspect to consider for storage purposes and assessing shelf life, though high values are prerequisite for cell protoplasm (Abadamosi et al, 2011). Other studies revealed that a value above 10% can cause food damage (Ajuru et al, 2007). The ash value of clove (5.41%) is higher as compared to cinnamon's value of (2.86%), which suggests a higher amount of minerals present in cloves. The protein content of cinnamon is a t a value of 3.5% which is in agreement with the 3.44% that is reported by Goel and Mishara (2020). The protein content of clove is (1.20%). There were reports that recorded low levels of protein in clove (less than 10%). A level of (1.2%) comparable to this study was reported by (Suleiman *et al,* 2007).

The aromatic high flavoured spices retain and absorb their flavor due to the fat content incorporated in them. High levels of fat enhance palatability (Antia et al, 2006). Cinnamon with (4%) as compared to clove with (12.33%).

The study revealed cinnamon's main constituent as carbohydrate, clove was also found to be high in carbohydrate. The presence of these large amount of carbohydrate in these spices lowers the effects of lipids in diets. The carbohydrate content level in cinnamon is recorded as 81.26% while clove has a value of 70.69%. both are in agreement with what was reported of (Goel and Mishra 2020) of value of (80.57%) a relatively lower values were reported by (Gul and Safdar 2009) of 3.5%. A value range of 4-11% was reported by (Haider et al, 2018).

Conclusion

The analysis shows that the macro constituents in both samples of cinnamon and cloves have considerable level of nutritional values. The results revealed that cinnamon has relatively higher values than cloves. Going by the results obtained, cinnamon can be safely

recommended to those suffering from type II diabetes, high blood pressure and cardiac disorders as it is high in carbohydrates and low in fat.

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