

Proximate Nutritional Analysis of Dried Watermelon seed

G.Rekha¹, A. Leema Rose²

G.Rekha, Research Scholar, Department of chemistry, Holy cross College, Trichy. Address; G.Rekha, W/o K.Suresh 1/30 Santhana Ganapathy Street, Ammachathiram, Kumbakonam, Thanjavur (DT). E-Mails: rekaond@gmail.com Tel: 9952273782

Abstract— To carry out proximate of dried watermelon seed in order to ascertain their nutritional content values. Dried seeds of moringa oleifera lam were plucked from watermelon fruits growing at Tamil nadu, Egbooda, Oshiri in Onicha area of Ebonyi State, Nigeria. The period of sampling was for 2 weeks in the month of March. The seeds were dried at room temperature and their proximate contents determined using standard analytical techniques. Ash and moisture contents were determined using the Association of Official Analytical Chemists (AOAC) method. Fat, crude fibre and protein content were determined using soxhlet fat extraction method and kjeldahl method respectively. In addition, carbohydrate content was determined using arithmetic difference method. Results show that the mean nutritional content of the samples were: 68.4% protein, 6.4% moisture, 1.2% crude fibre, 47.1% Fat, Ash 2.6% Ash and 25.8% carbohydrate.

Keywords— Watermelon seed; nutritional value; ash, carbohydrate, fat, moisture, fibre, protein.

INTRODUCTION

Watermelon (*Citrullus lanatus*) is of the cucurbitaceae family. As a member of the cucurbitaceae, watermelon is related to the cantaloupe, squash and pumpkin and other plants that grows on vines on the ground. Watermelon is a good source of carotenoid and lycopene. Lycopene has been found to be protective against a growing list of cancer [1].

Watermelon is also expectedly high in citrulline; an amino acid the body make use of to make another amino acid, arginine (used in the urea cycle to remove ammoniacal from the body) [2]. Watermelon is delectable, thirst-quencher which helps quench the inflammable that contributes to conditions like asthma, atherosclerosis, diabetes, colon cancer and arthritis [3]. Cucurbit seeds are source of food particularly protein and oil [4]. Dehulled cucurbit seeds were reported to contain about 50% fat and 35% protein [5].

Watermelon fruit contained many smooth compressed seeds that thickened at the margin and of black or yellow-white colour [6]. Achu, et al., [7] reported high lipid level in five cucurbitaceae oil- seeds from different regions in Cameroon. Oil provides concentrated energy in diet and enhanced palatability. It worthy to note that major edible oils are from palm oil and peanut which are capital and labour intensive [8] and therefore there is need to source for good, cheap and novel source of oils that would be useful domestically and perhaps industrially.

The aim of this research work is to determine some functional properties of the seed and physicochemical properties of the oil extract with a view of harnessing it for consumption and possible industrial usage.

2. Experimental Section

2.1 Sampling

Matured watermelon fruits (fresh condition) were purchased from market, Ikirun, Osun State, Nigeria. The fruits were sliced open using a clean stainless steel laboratory knife. The seeds were washed severally with distilled water, sun-dried for a week, sorted to remove bad ones, shelled, grinded with a laboratory blender, packed in an air tight container and stored in desiccators (containing silica gel) ready for further analysis.

2.2 Proximate analysis

The proximate compositions of the dried Watermelon seed were determined using standard analytical methods. All measurements were done in duplicates and values presented in percentage.

2.2.1 Ash content determination

2g of the sample was weighed into a crucible in a muffle furnace and heated at 130⁰C for three hours until it became gray ash. The dish was removed from the muffle furnace using crucible tong and placed in desiccators to cool. The weight of ash was obtained by the difference.

2.2.2 Moisture content determination

5g of the sample was then placed in a preweighed Petri dish, and then placed in an oven to dry at 130⁰C for three hours. The dish and dry sample were transferred to desiccators to cool at room temperature before being weighed again. The experiments were repeated until constant weight was obtained.

2.2.3 Fat content determination

Fat was determined using soxhlet fat extraction method [10]. 250ml oil flask was washed thoroughly and dried in oven at 130°C for 30 minutes and then placed in desiccators to cool. 2g of the dried sample was then weighed accurately into labeled thimbles. Cooled oil flask was filled with 200ml hexane and boiled at 180°C. The extraction thimble was plugged lightly with a cotton wool and the oil flask containing hexane was placed in the extraction thimble to boil and the soxhlet apparatus was allowed to reflux for three hours. The thimble was removed carefully and the hexane on top of the container was collected and drained into another container for reuse. When the flask was free of hexane, it was removed and boiled for an hour at 130°C. It was finally transferred from the oven into desiccators to cool before weighing.

2.2.4 Fibre content determination

Crude Fibre content was determined by Weende's method [11]. 2g of the defatted sample was weighed into a 500ml beaker and 200ml of 1.25% H₂SO₄ was added and the mixture was boiled under reflux for 45 minutes. The solution was filtered with whatman filter paper; the residue was rinsed thoroughly with distilled water until it was no more acid. The residue was transferred into a 250ml beaker and 200ml of 1.25% NaOH was added and boiled for 45 minutes in a digestion apparatus after which it was filtered and rinsed with distilled water until the filtrate was neutral. The residue was transferred into a crucible and placed in electric oven at 130°C for three hours to dry. It was then removed and placed in desiccators to cool before weighing. After weighing, the sample was incinerated, cooled in desiccators and reweighed.

2.2.5 Protein determination

Protein content of the sample was determined using the Kjeldahl method [12]. The total nitrogen was determined and multiplied by a conversion factor of 6.25 to obtain the protein content. 0.2g of powdered sample was weighed into a Kjeldahl digestion flask. 1g of CuSO₄ was added to the flask and 10ml conc. H₂SO₄ digested by heating under a fume hood chamber till the solution digested completely and changed to blue color. The solution was carefully removed and allowed to solidify for 1hr until a white colour was obtained. The mixture was distilled until a total of 10ml distillate was collected into 250ml conical flask was titrated with 0.1N HCl. Add 2 drops of mixed indicator (promosal green and methyl red) when the color of the distillate is light blue color change into light pink.

2.2.6 Carbohydrate determination

The carbohydrate content of the test sample was determined by estimation using the arithmetic difference method [12]. %CHO = 100 - (% fat. + % ash + % fiber + % protein)

3. Results and Discussion

Table 1 shows the results of proximate analysis of dried Watermelon seed. The results indicated that dried watermelon seeds contained appreciable amount of crude protein content (30.9 ± 0.9%) making it to be a good source of supplementary protein for man and livestock, The results also showed that Moringa seed contain nutritious compounds

Table 1: Proximate contents of the analyzed sample

S.NO	Parameters%	values
1	Moisture	6.4 %
2	Fat	47.1 %
3	Protein	68.4 %
4	Fiber	1.2 %
5	Ash	2.6 %
6	Carbohydrates	25.1 %

ACKNOWLEDGMENT

The authors acknowledge Mr. S. Kumaravel for providing laboratory facilities for this study. Thanks to Mr. S. Kumaravel from Extension Department of the Indian Institute of Crop Processing Technology for his technical support.

CONCLUSION

Conclusion must be short and precise and should reflect the work or research work you have gone through. It must have same as above in introduction paper adjustment.

Proximate analysis results show that dried watermelon seed is a good source of nutrients and thus, the plant might be explored as a viable supplement in both animal and human food. Other nutritional contents in watermelon seed not covered in this study and the possible roles on the nutritional makeup of watermelon plants are areas for further investigation in future research. Furthermore, the phytochemical constituents of watermelon seed can be further explored in the search for further uses of moringa plants as herbal remedies

REFERENCES:

1. E. Cho, J.M. Seddon, B. Roser, E.C. Willet and S.E. Hankinson, Prospective study of intake of fruits, vegetables, vitamins and carotenoids and risk of age, *Maculopathy*, 6, 2004, 883-892.
2. G.C. Ojieh, O.M. Oluba, Y.R. Ogunlowo, K.E. Adebisi, R.T. Orole, Compositional studies of *Citrullus lanatus* (Egusi melon) seed. *The internet J. of Nutr. and Wellness*, Vol. 6 No 1, 1-5.
3. J.O. Arawande, F.B. Borokin, Comparative study on chemical composition and functional properties of three Nigerian legumes (Jack beans, pigeon pea and cowpea), *J. Emerging Trends in Engineering and Applied Sciences (JETEAS)* 1 (1), 2010, 89-95.
4. FAO, Amino acid contents of foods and biological data on protein, Food policy and food science service, 1970, 72.
5. FAO, Food composition table for the near East nuts and seeds, FAO food and nutrition paper, 26, 1982, 85.
6. A.O. Ojokoh, R.T. Lawal, Changes in nutrient content of popcorn and groundnut composite flours subjected to solid substrate fermentation, *Int. J. Tropical Med. & Pub. Health*, Vol. 1 Issue 1, 50-53.
7. J.M. Nzikou, L. Mate, G. Bouanga-kalou, C.B. Ndangui, N.P.G. Pambou-Tobi, A. Kimbonguila, T. Silo, M. Linder, S. Desobry, Chemical composition of the seeds and oil of sesame (*Sesamun indicum* L.) grown in Congo-Brazzaville. *Advance Journal of food Science and Technology*, 1(1), 2009, 6-11.
8. J.K. Collins, G. Wu, P. Perkins-veazie, K. Spears, P.L. Claypool, R.A. Baker, B.A. Clevidence, Watermelon consumption increases plasma arginine concentrations in adult, *Nutr. Mar.* 23(3), 2007, 261-266.
9. L. Jian, A.H. Lee, C.W Binns, Tean and lycopene protect against prostate cancer. *Asian pac. J. Nutr.* 16 suppl. 453-457.
10. L.G. Hassan, N.A. Sanni, S.M. Dangoggo, M.J. Ladan, Nutritional value of bottle gourd (*Lagenaria siceraria*) seeds. *Global J. Pure & Applied Sci.*, Vol.4 No. 3, 2008, 301-306.
11. F. Martins, Cucurbit seed as possible oil and protein sources for small scale household use in the hot humid tropics, *oil/crop processing*, 1998, 2.
12. V.A. Sodeke, Extraction of oil from watermelon seed and analysis, *Quarterly research service*, 2005, pp. 25-30.
13. M.B. Achu, E. Fokou, C. Tchegang, M. Fotso, F.M. Techonanguiep, Nutritive value of some cucurbitaceae oilseeds from different regions in Cameroon. *African J. Biotechnology*, Vol. (4), 1329-1334.
14. C. Agatemor, Studies of selected physicochemical properties of fluted pumpkin (*Telfaira occidentalis* Hook F.) seed oil and tropical almond (*Terminalia catappia*) seed oil, *Pak. J. Nutr.* 5(4), 306-307.
15. A.O.A.C, Official methods of analysis, Association of official analytical chemists (18th edition Washington, DC, U.S.A, 2005)