International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

The Impact of Different Drying Methods on the Proximate Composition of *Ocimumgratissimum* (African Basil)

Ajayi, Adebola

Department of Food Technology, The Federal Polytechnic, P.M.B, 50, Ilaro, Ogun State, Nigeria

Abstract: ***Ocimumgratissimum is a leafy vegetable belongs to the Lamiaceae family it is commonly called African Basil. Ocimumgratissimum leaves have strong aroma and are widely used as local condiments in diets. The leaves were destalked sorted thoroughly, washed with potable water to remove dirts, before dividing into four lots. One lot was used for the control and the other three lots was sun, oven and cabinet dried and milled into powder. The impact of different drying methods on proximate composition and mineral contents of Ocimumgratissimum (African basil) were investigated. The dried leaves showed that the proximate composition contents ranged between 9±0.4% and 13.01±0.21%, 10.0.1±0.01 and 11.34±0.11%, 5.31±0.11% and 6.12±0.01%, 11.12±0.13 and 12.10±0.05%, 10.45±0.01% and 10.91±0.01% and 55.1±0.11 and 61±0.01% for moisture, protein, fat, ash, crude fiber, and total carbohydrate respectively. The results showed that the cabinet drying method had better characteristic values than the other drying methods. In conclusion, cabinet drying methods can be used to keep the quality attribute of Ocimumgratissimum.***

Keywords: Drying methods, minerals analysis. *Ocimumgratissimum*, Proximate composition

1. Introduction

Vegetables play an important role in maintain general good health. They are understood to mean the leafy parts of plant used as foods. A vegetable includes leaves, stems, roots flower, seeds, fruits, bulbs, tuber and fungi [19, 18]. They are essential components of the human diet which contains a number of nutritional important such as vitamins A, B and C. Vegetables are good sources of valuable nutrients such as protein, minerals, vitamins, fiber and other nutrients which are usually in short supply in daily diets [13]. There are various leafy vegetables that are regular ingredients in the diets of average Nigerian like Ocimumgratissimum.

Ocimumgratissimum is a leafy vegetable. It is commonly known as African Basil. It is a herbaceous plant which belongs to the family lamiaceae [6]. It is a herberceous plant which belongs to the family Lamiaceae [6]. It is widely distributed in tropical and warm temperature regions [15]. The strong aroma of the leaves is used in flavouring soups and also as a flavor spicing meat products. Ocimumgratissimum is very rich in volatile essential oils [7]. Ocimumgratissimum is generally subjected to different processing before consumption such as blanching, squeezing, washing, boiling and drying. These various processing methods deplete the nutritional value of the vegetable. The literature on the impact of drying on the nutrients of Ocimumgratissimum are limited. Therefore, the aim of this study was to investigate the impact of different drying methods on the proximate composition and mineral contents of Ocimumgraatissimum (African Basil).

2. Sample Preparation

Freshly harvested Ocimumgratissimum leave were obtained from a local farm in Ilaro, After collection, they were broughinto the Food Process Engineering Workshop of the Department of Food Technology, Federal polytechnic Ilaro, Ogun state, Nigeria for identification and authentication. About one kilogram of the leaves were destalked, sorted thoroughly, washed with potable water to remove all dirts before dividing into four lots. One lot was used for the control and the other three lots were dried using sun, oven and cabinet drying methods. The dried Ocimumgratissimum leaves were powdered using Apex mill and packed into Low Density Polythene Film (LDPE) 75 micron thickness and subjected to analysis .

2.2 Proximate Analysis

The proximate analysis of the samples for moisture, ash and fat were determined using procedure described by [4]. The kjeldahl method was applied to determine nitrogen content [5]. The nitrogen content obtained was then multiplied by a factor, 6.25, to arrive at protein content. The standard methods by [11] were also used to determine fat and fiber contents. The carbohydrate was estimated by difference by subtracting the total sum of percentage crude[20]. All determination were performed in triplicates

3. Results and Discussion

Table 1: Proximate composition of fresh and dried *Ocimumgratissimum*leaves using different drying methods (% dry weight basis).

Drying Methods	Moisture	Protein	Fat	Ash	Crude Fibre	Carbohydrate
Fresh	52.72±0.11	12.98±0.10	4.81±0.11	10.95±0.02	10.21±0.01	49.02±0.23
sun dried	13.01±0.21	1.34±0.11	5.31±0.11	11.12±0.13	10.45±0.01	55.01±0.11
oven dries	10.24±0.01	10.01±0.01	5.65±0.12	11.24±0.14	10.64±0.12	60.01±0.01
cabinet dried	0.09±0.14	10.0±0.14	6.12±0.01	1.1212.10±0.05	10.91±0.01	61.01±0.01

Values are mean of triplicate determination.

The proximate composition of fresh and dried *Ocimumgratissimum* leaves using different drying methods are presented in Table I. The results showed that the moisture content, crude protein, crude fat, total ash, crude fiber and carbohydrate were 52.72±0.11 %, 12.98±0.10, 4.81±0.11, 10.95±0.02, 10.21±0.01% and 49.02±0.23% respectively for fresh *Ocimumgratissimum*. The moisture content for the different drying methods ranged from 9.0±0.4% and 13.0±0.21% having the highest value of 13±0.2 for sun dried sample while the cabinet dried *Ocimumgratissimum* had the least value of 9.0±0.14%. This value was similar to the value reported by [21], but lower than the result highlighted by [26] for vernoniaamyadiatina. Moisture content is used as a quality parameter of food products, as it influences the shelf stability of foods; the lower the moisture the better the storage potential of the food product [2]. This is an indication that cabinet dried *Ocimumgratissimum*will keep for a longer time because of its low moisture content. The crude protein contents of *Ocimumgratissimum* for sun, oven, cabinet dried were 11.30±0.11%, 10.61±0.01% and 10.49±0.14% respectively. These values were higher than 7.00% that was reported by [12] and however lower than 23.74% highlighted by [19]. The decrease in the protein content could be as a result of heating applied to the different drying methods.

The crude fat for all the different drying methods ranged between 5.31±0.11% and 6.12±0.01%. The cabinet dried had highest crude fat content of 6.12±0.01%. These value were higher than those reported by[1] that had value ranged between 2.29% and 2.26% for Adansoniadantata leaves. Crude fat content of food products in an index of storability in respect of lipid oxidation. The ash content represents the mineral contents of the drying methods were increased and ranged between 11.12±0.13% and 12.10±0.05%. The cabinet dried had the highest with 12.10±0.05%. These values were higher than that was reported in literature by [17] which ranged between 6.72±0.03% and 7.93±0.11% for vernoniaamyadiatina.

The crude fiber of 10.91±0.0%1 was obtained for cabinet dried *Ocimumgratissimum*. The least value of 10.45±0.1% was for sun dried while the oven dried was 10.64±0.12%. The value were similar to 10.38% reported by [8] but higher than 5.2% for S.monostrachyns [16]. Adequate intake of dietary fiber is recommended for healthy food. The carbohydrate contents of dried leaves of *Ocimumgraticimum* subjected to different drying methods ranged from 55.10±0.1% and 61±0.01%. These values obtained were higher than those values reported by [1] who reported values of 52.23% for sun dried and 51.90% for cabinet dried baobab leave. These value obtained were low when compared to the value of 63.91% reported in literature by [3]. *Ocimumgratissimum* is a good source of carbohydrate which constitutes a major class in naturally occurring organic compounds used to maintain life in plants and animals.

4. Conclusion

It can be concluded that the cabinet drying methods had better characteristics values than the other drying methods.

References

[1] Abioye, V.F, Adejuiyitan, J.A and Idowu, C.F (2014). Effect of different drying methods on the nutritional quality attributes of baobab leaves. (Adansoniadigitala) Agric. Biol. J.N AM, 5(3): 104-108
[2] Adegunwa, M.O, Adeniji, A.A Adebowale A.A and Bakare H.A (2015) Quality Evaluation of Kokoro Produced from Maize-pigeon pea flour blend. Journal of Culinary Science and Technology 13(3): 200-213
[3] Aluko, B.T Oloyede, O.I and Afolayan, A.J (2012). Phytochemical and nutrient compositions of the leaves of Ocimumcanumsims. African Journal of Biothechnology.Vol 11 (03) pp12,697-12701
[4] AOAC, 2000 Official Methods of Analysis (5th Ed) American Oil Chemist Society Washington, DC. USA
[5] Bassole, I.H.N, Neble R, Javadogo, A., Quattara, C.T, Barro, N and Traore, S.A (2005). Compostion and Antimicrobial Activities of the leaf and Flower of Essential Oils of LippiachavalieriOcimumcanum from Bukina Faso Afri. J. Biotechnol. 4(10): 1150-1160
[6] Calixto J.B (2000). Efficacy, Safety, Quality Control, Marketing and Regulatory Guidelines for Herbal Medicines (Plytotherapentic Agents): Afr.J Biomed. Research. 22: 119-189
[7] Ekundayo. O, Laakso, I and Hitunen R (1989). Consistuents of Volatile Oil from Leaves of OcimumCanumsims. Flavor.Fragnence Journal 4:17-18
[8] Fagbohun, E.D, Lawal, O.U and Ore, M.E (2012) The Proximate, Mineral and Phytochemical Analysis of the Leaves of Ocimumgratissimum, Melantherascanders and leagevinensis and their medicinal values International Journal of Applied Biology and Pharmaceutical Technology. 3(1): 15-22
[9] Ijhida, H, Juzuno, H Sugiyana, N, Innami, S and Todokoro T (2007) National Evaluation of Chemical Components of Leaves, Stalks and Stem of Sweet Potatoes Food Chemistry 68359-367
[10] Isong, EU and Idan, U.U (1997). Comparatives Studies on the Nutritional and Toxic Composition of Three Variety of Lieanthera Africana, Plants Food and Human Nutrition vol 55 pp79-84.
[11] Kirk, P.5 and Sawyer, R (1991) Fats and Oil. Pearson's Composition and Analysis of Food. 9th Ed. Imman Group Limited U.K pp 641
[12] Mlitan, A.M, Sasi, M.S and Alkherraz. A.M (2014) Proximate and Minor mineral Contents in Some Selected Basil leaves of Ocimumgratissimum L, in Libya. International Journal of Chemical Engineering and Application, Vol 5 no 6
[13] Mohammed, M.I and Sharif, N (2014). Mineral Composition of Some Leafy Vegetables Consumued in Kano, Nigeria, Nigerian Journal of Basic and Applied Science, 19 (2), 208-211.
[14] Obichi, E.A Monago, C.C and Belonwu, D.C (2015) Nutritional Qualities and Phytochemical Compositions of SolenustemonMonostachyus (Family Lamiaceae) Journal of Environment and Earth Science Vol 5 No 3 pp 105-111
[15] Okigbo, R.N and Ogbonnanya O.U (2006) Antifungal Effects of Two tropical plants extractsOcimumgratissimum and

Afromaumummelegueta on Post-harvest Yam Discoreaspp root. Afri. J Biotechno 5(9): 727-231
[16] Pandey, M, Abidi, A.B, Signh, R.P.I (2006). Nutritional Evaaluation of Leafy Vegetable paratha Journal of Human Ecology, vol 19 PP 155-156
[17] Tsado, A.N, Lawal B, Santali, E.S Shaba, A.M Chirama D.N Balarabe, M.M Jiya, A.G and Alkali, H.A (2015) Effect of Different Processing Methods on Nutritional Composition of Bitter Leave (VernoniaAmygdalina) journal of Phamarcy Volume 5, Issued pp 8-14
[18] Uwaegbute, A.C (1986). Vegetables: Nutritional and Utilization in Food Crops Production Dotan Publishers Ltd.
[19] Uzo, J.O (1989). Tropocal Vegetable Production in Food Crops Production Doutan publishers Ltd. Ibadan pp 45-49
[20] Wardlaw, G.M and Kassel, M.W (2002, Mineral Dieatary Needs, Absoption Transport and Extraction in Perspective in Nutrition (5th Ed), Mc Grawhil Companies Inc pp418-464

Author Profile

Ajayi Adebola, B.Sc, MSc (Food Technology) is presently Head of Department, Department of Food Technology, Federal Polytechnic, Ilaro, Ogun State, Nigeria. His area of interest is Food Processing Engineering. He has published and presented papers in Local and International journals and conferences. He is also a member of various professional bodies of Food Technology. He is happily married and blessed with children