



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2019; 8(4): 475-476

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www.thepharmajournal.com

Received: 21-02-2019

Accepted: 25-03-2019

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Development and popularization of broken walnut kernels products

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Abstract

Walnuts are commonly referred as *AKHROT* in India and we consume walnuts in daily life. Walnuts contain a number of neuroprotective compounds including vitamin E, folate, omega- 3 fats and antioxidants that support brain health, protect heart and improves digestive system. Globalization has changed the economic, political, social and cultural system of nations across the globe. Phenomenon like urbanization, growing middle class, westernization, working parents etc. has contributed to the fast growth of walnut processing industry. There is a lot of interest in nuts globally and demand for walnut kernels is increasing and a lot more potential for value added products Presently in Jammu and Kashmir walnuts are mostly consumed as fresh in the form of walnut kernels and some broken kernels are being used by baking industry for development of walnut pastry, a novel product of Kashmir. A study was carried out to develop products using broken kernels viz. roasted walnuts, honey glazed walnuts and jaggery walnuts. The sensory scores on basis of colour, flavour, taste, body and overall acceptability was judged on five point organoleptic scale. The results revealed that all the products developed were highly acceptable.

Keywords: walnut, antioxidant, value addition, broken kernels and processing industry

Introduction

Jammu and Kashmir produces some 3.5 lacs quintals of walnut every year thus contributing around 98 percent of the total walnut output in India. Of this, The Kashmir valley alone produces 95 percent and the rest is grown in Doda and Kishtwar districts of the Jammu region. Conversion of crop into value added product will improve economic returns of both grower and processor. Farming community as well as food processors will be benefitted by value added walnut products development technologies leading in reduction of wastage in walnut processing industry.

Walnut trade occupies an important place in rural economy of Jammu And Kashmir State. David Hayes *et al.* (2015) ^[5] presented in a study that nuts are rich in unsaturated fatty acids, proteins, carbohydrates, dietary fibre, vitamins and minerals. Shibu *et al.* (2014) ^[4] reported that consumption of nuts help to reduce blood cholesterol levels and in preventing coronary heart diseases, due to which nuts are regarded as functional/health foods. Walnuts from J&K state are exported as whole in shell or in kernel form to various Indian and foreign markets which generates revenue of more than 700-800 crores annually.

Walnut processing provides employment opportunities to a large section of population. The J&K state has been designated as walnut export zone by APEDA as the state has the monopoly of growing quality walnuts. As per WTO agreements global competition in walnut trade has to meet quality standards of the buyer countries. In shell walnut quality depends on shell colour, shell thickness, suture seal, kernel size, kernel colour, taste, flavour fungal infection, rancidity etc.

After harvesting of nuts, adoption of non-scientific traditional practices of dehulling, washing, sun drying, nut cracking, kernel drying, packaging and storage are responsible for poor quality of whole nuts or walnut kernels. The poor quality nuts with stain marks on surface are not appealing. Similarly kernel colour, texture, and rancidity problems lower the quality grade of the produce which fetches poor price in the market and as such the income level of producers is declined.

For sustainable rural income, production and sale of good quality walnuts is of paramount importance. Walnut processing at rural level has tremendous potential in employment generation. An attempt has been made in this investigation to develop the walnut kernel products viz. roasted walnut kernel, honey glazed and jaggery coated walnuts.

Material and Methods

The present study was carried out in *Division of Food Science & Technology Sher-e Kashmir University of Agricultural Science & technology Kashmir*. Walnut broken kernels were procured from local walnut processing industry established at village Harwan, Srinagar. The products namely roasted walnut kernels, jaggery coated walnut kernels and honey glazed walnut kernels were developed. Roasted walnut kernels products were developed using different temperature and time variation as T1, T2 T3 (80C for 5,7,10 min) T4, T5, T6 (100C for 5, 7, 10min) T7, T8, T9 (120C for 5,7,10 min). Jaggery coated candid walnut kernel products were developed by using walnut kernels and jaggery in T1, T2 and T3 (30:60, 30:100, 30:140) T4, T5, T6 (50:60, 50:100, 50:140) T7,T8T9 (70:60, 70:100, 70:140). Honey glazed walnut products developed T1, T2 and T3(30:30,30:50,30:70)T4,T5 and T6 (50:30, 50:50 and 50:70) T7, T8 and T9 (70:30, 70:50, 70:70) respectively. Sensory evaluation of developed products was done by a panel of semi trained judges using 5 point scale in which scores of overall acceptability 5 for excellent, 4 very good, 3 good, 2 stands for fair and 1 was marked as poor while making judgement.

Result and Discussions

The sensory evaluation of roasted walnut kernel was judged best at T3 treatment at temperature of 80C for 10 min with a sensory score of 3.58 on 5 point organoleptic scale presented in Table1. Zameer *et al.* (2015, 2017) ^[3] studied in rice walnut kernel blended extruded products were well accepted organoleptic sensory scale after 3 months of ambient conditions.

Table 1: Effect of temperature and time on the roasting characteristics of walnut kernels

Sample code	Appearance	Colour	Texture	Flavor	Overall acceptability
T1	3.02	3.20	3.50	2.82	3.05
T2	3.73	3.05	3.18	3.08	3.26
T3	4.03	3.28	4.60	4.00	3.98
T4	3.03	3.50	3.50	3.50	3.38
T5	3.18	3.23	3.70	3.28	3.35
T6	3.08	3.23	3.23	3.30	3.21
T7	3.38	3.30	3.33	3.80	3.46
T8	3.60	3.47	2.80	3.20	3.22
T9	3.43	3.20	2.50	3.15	3.13

The data in Table2 depicts that jaggery coated candid walnut kernel products developed by using walnut and Jaggery in different combination were T1,T2,T3 (30:60, 30:100, 30:140) T4, T5, T6 (50:60, 50:100, 50:140) T7, T8, T9 (70:60, 70:100, 70:140). The overall acceptability score of 3.55 was judged best at T5 treatment (50:100) of walnut kernel and jaggery.

Table 2: Organoleptic evaluation of Jaggery coated walnut kernels

Sample code	Appearance	Colour	Texture	Flavor	Overall acceptability
T1	3.80	3.60	3.40	3.00	3.45
T2	3.20	3.00	2.80	2.60	2.90
T3	3.00	2.80	2.80	2.40	2.75
T4	2.50	2.60	2.70	2.50	2.57
T5	3.80	3.60	3.60	3.20	3.55
T6	2.80	2.70	2.40	2.00	2.48
T7	2.50	2.50	2.50	2.30	2.45
T8	3.00	3.20	3.20	3.00	3.10
T9	3.60	3.60	3.40	3.20	3.45

Table 3. reveals that honey glazed walnut products developed and treatments in different proportions were T1,T2 and T3 (30:30,30:50,30:70) T4,T5 and T6(50:30,50:50 and 50:70)T7, T8 and T9 (70:30,70:50,70:70). The sensory score of 4.10 was judged best T5 (50:50). Tapsell (2010) ^[2] reported walnut is much prized as dessert and dry fruit and has proved to be nutritionally valuable food.

Table 3: Organoleptic evaluation of Honey glazed walnut kernels

Sample code	Appearance	Colour	Texture	Flavor	Overall acceptability
T1	3.80	3.60	3.70	3.00	3.52
T2	3.20	2.70	2.80	2.70	2.85
T3	2.70	2.20	2.40	2.20	2.37
T4	2.70	2.60	2.70	2.70	2.67
T5	4.20	4.00	4.20	4.00	4.10
T6	3.00	3.60	3.40	3.20	3.30
T7	2.80	2.60	2.80	2.40	2.65
T8	2.60	2.40	2.40	2.40	2.45
T9	3.40	2.40	3.20	3.00	3.25

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