RESEARCH PAPER — FOOD SCIENCE RESEARCH JOURNAL

e ISSN-2230-9403 ■ Visit us : *www.researchjournal.co.in*
Volume 9 | Issue 1 | April, 2018 | 201-204
DOI : 10.15740/HAS/FSRJ/9.1/201-204

Assessment of therapeutic effect of moringa fortified products

Archana Kumari and Jitendra Singh

Moringa oleifera has very high nutritional properties that would be useful as a food supplement especially in those relegated communities. Besides its nutritional and medicinal applications *Moringa oleifera* is very useful as an alley crop in the agro-forestry industry. It is useful not only for human beings but also for animals and also in various industrial applications. It has been processed into a medicine it contains acetone which can be prepared into herbal formulation which is an effective anti-malaria bio agent. Such trees have the potential to be a source of new drugs. It is also an effective water clarifier using the seed thus providing millions of people with clean drinking water. This study indicates that the developed products of biscuit with moringa can be easily prepared under optimized condition. The various parameters such as moisture, crude protein, iron, total ash and calcium were analyzed. The sensory evaluation of products on all attributes (appearance, taste, flavour, texture, colour and overall acceptability) was found in biscuit which was highly acceptable, due to *Bajra* flour, wheat flour, *Moringa oleifera* leaves, milk cream and butter. The analysed nutritional content (protein, iron, calcium) of developed products concluded that nutritive value of moringa was highest then other developed products. The benefits for the treatment or prevention of joint pain disease or infection that may accrue from taking moringa fortified biscuits daily. In this study we determined the effect of a biscuit fortified with moringa leaves on the vitamins and minerals status of women between age group 35 to 50 and above living in an area with a known prevalence of diseases.

Key Words : *Moringa oleifera*, Nutritional value, Therapeutic effect

How to cite this article : Kumari, Archana and Singh, Jitendra (2018). Assessment of therapeutic effect of moringa fortified products. *Food Sci. Res. J.*, **9**(1): 201-204, **DOI : 10.15740/HAS/FSRJ/9.1/201-204**.

INTRODUCTION

Food production capacity is faced with an ever-growing number of challenges including a world population expected to grow to nearly 9 billion by 2050 and a falling ratio of arable land to population. Among the benefits of using pesticides for crop protection is that these products are vital to increasing food production (Basra *et al.*, 2011). Some 20 to 40 percent of the world's potential crop production is already lost annually because of the effects of weeds, pests and diseases (according to the Food and Agriculture Organization of the United Nations or FAO). The crop protection industry's primary aim is to enable farmers to grow an abundant supply of food in a safe manner and prevent costs from increasing. Food production processes benefit from continual advancements in agricultural technologies and practices in fact a population now nearly twice as large has more food available per capita than 40 years ago. Agricultural productivity is key to ensuring that this demand can be met at an affordable price and crop protection products help increase productivity and usable crop yields. This

MEMBERS OF RESEARCH FORUM

Author for correspondence :
Archana Kumari, Krishi Vigyan Kendra, Kasturbagram, Indore (M.P.) India (Email : archusinghmki1988@gmai.com)

Associate Authors' :
Jitendra Singh, Krishi Vigyan Kendra, Kasturbagram, Indore (M.P.) India

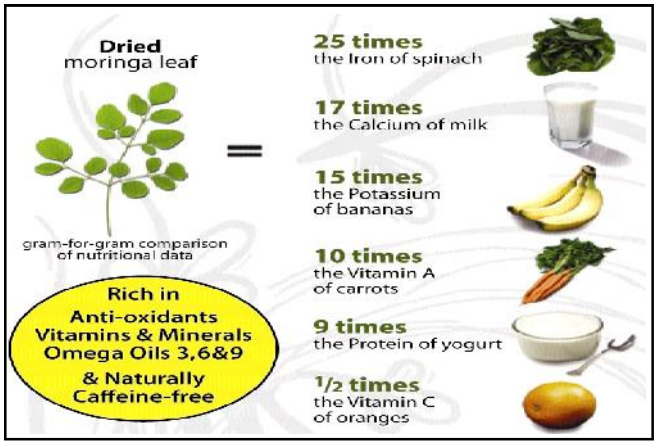
Table A : Value of fresh drumstick leaves (*Moringa oleifera*) per 100 gram

Nutrients	Moisture (g)	Ash (g)	Protein (g)	Iron (mg)	Calcium (mg)
Drumstick leaves	75.0	7.6	6.7	0.85	440

Table B : Nutrient content in *Moringa oleifera*

Sr. No.	Nutrients	Leaves raw	Dried Leaves (Nutritive Value 100g)	Pods Raw
1.	Energy	64 kcal(270kJ)	37kcal(150KJ)	-
2.	Carbohydrates	8.28g	8.53g	38.2g
3.	Fat	1.40g	0.20g	2.3g
4.	Protein	9.40g	2.10g	27.1g
5.	Dietary fibre	2.0g	3.2g	19.2g

type research is remarkable step in the context of development of products for health benefits of people by supporting energy production, immune function and highly dense nutritional content its such a beautiful complement to vibrant health. From the evaluation founded that moisture, ash, protein, iron and calcium content in three teaspoon 30.02; 3.00; 17.46; 1.54; 473.50, respectively were maximum statistically significant the other ratio of products. The total utilization of food from origin is an integral aim of these resource. Nutritional analysis indicates that moringa leaves contain affluence of essential, disease preventing nutrients (Atawodi *et al.*, 2010). It is a sub-tropical species that is known by different regional names as benzolive, drumstick tree, kelor, marango, mulangay, nébéday, saijhan, mooringai and sajna



Nutrient constituents in *Moringa oleifera* :

It has very high nutritional properties that would be useful as a food supplement especially in those relegated communities. Besides its nutritional and medicinal applications *Moringa oleifera* is very useful as an alley crop in the agro-forestry industry (Abuye *et al.*, 2003). It is useful not only for human beings but also for animals and also in various industrial applications. *Moringa oleifera* being processed into a medicine it contains acetone which can be prepared into herbal formulation which is an effective anti-malaria bio agent (Kumalaningsih, 2011). Such trees have the potential to be a source of new drugs. It is also an effective water clarifier using the seed thus providing millions of people with clean drinking water.

METHODOLOGY

The present study was conducted in the department of Food Science and Nutrition, M.A.B College of Home Science, Chandra Shekhar Azad Agriculture University and Technology, Kanpur. The materials and methods adopted in the experiments conducted for attainment of various objectives of present investigation have been elaborated.

Procurement of raw materials:

Selection of the moringa fresh leaves from C.S.A campus in Kanpur City.

Preparation of sample:

Selection of sample
↓
Sorting
↓
Washing
↓
Boiling
↓
Filtration
↓
Collect the extract

OBSERVATIONS AND ASSESSMENT

The study deals with chemical analysis, correlation co-efficient of prepared moringa leaves, sensory evaluation of Recipes as biscuits fortified with moringa leaves and therapeutic effect of products through feedback (Joint pain). Table 1 and Fig. 1 were shows that moisture content of flour is very important for its shelf life, lower the moisture content the better its storage stability. The mean score of control sample was 10 while the mean value of moisture in various samples (biscuit) was 3.1 in M_1, 3.5 in M_2, 3.5 in M_3, 3.7 in M_1+B, 3.6 in M_2+B, 3.7 in M_3+B and 3.7 in beetroot fibre. From the table founded that moisture content in control was maximum statistically significant and minimum in M1. Moringa leaves can easily lose moisture after harvesting, therefore harvest early in the morning and complete the initial phase of processing in the same day if possible. The value of Ash were found minimum in sample combination M_1+B (2.21%), M_1 (2.22%), M_2 (2.23%) and M_2+B (2.25%) statistically significant at par over control (4.67%). M_3 (3.00%) and M_3+B (3.01%) statistically significant under line by same bar over control (4.67%). The result from the table shows that control and fortified products were significant at 1% level of critical difference. The mean score of protein content in control sample of biscuit was 24.0 while the mean value of protein for M_1; M_2; M_3; M_1+B; M_2+B ; M_3+B and beetroot fibre fortified products were 17.38, 17.41, 17.46, 17.56, 17.72, 18.21, 18.0, respectively. From the table founded that protein content of M_3+B were higher than beetroot fibre comparatively and lower of M_1 (17.38). The mean score of control was 2.50 and the mean value of iron in samples was maximum 2.71 in M_3+B and minimum 1.48 in M_1. The result from the table shows that control and fortified products were significant at 1%

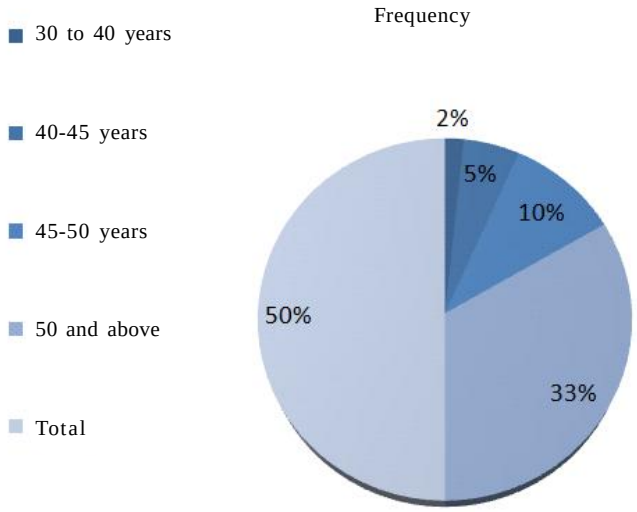


Fig. 1 : Distribution of respondent according to therapeutic effect of products through pre-feeding

Table 1 : Mean score of analysed nutritional content of developed products of moringa fortified biscuit

Sr. No.	Treatments	Moisture (%)	Ash (%)	Protein (g)	Iron (mg)	Calcium (mg)
1.	Control	10	4.67	24.00	2.50	483.00
2.	M_1	3.1	2.22	17.38	1.48	470.83
3.	M_2	3.5	2.23	17.41	1.52	472.50
4.	M_3	3.5	3.00	17.46	1.54	473.50
5.	M_1+ B	3.7	2.21	17.56	1.65	474.27
6.	M_2 + B	3.6	2.25	17.72	1.61	475.33
7.	M_3 + B	3.7	3.01	18.21	2.71	481.13
8.	Beetroot fibre	3.7	4.12	18.00	2.63	480.10
S.E. (diff)±		0.29	0.464	1.043	0.145	1.327
C.D. (P=0.01)		0.62**	0.984**	2.212**	0.307**	2.813**

**indicates significance of value at P=0.01

Table 2 : Correlation co-efficient between analysed nutritional content

Nutrients	Moisture (%)	Ash (%)	Protein (g)	Iron (mg)	Calcium (mg)
Moisture	1				
Ash	0.7425*	1			
Protein	0.9951*	0.7709*	1		
Iron	0.4442	0.7800*	0.5103	1	
Calcium	0.6517	0.8350*	0.7061*	0.9420	1

*indicates significance of value at P=0.05

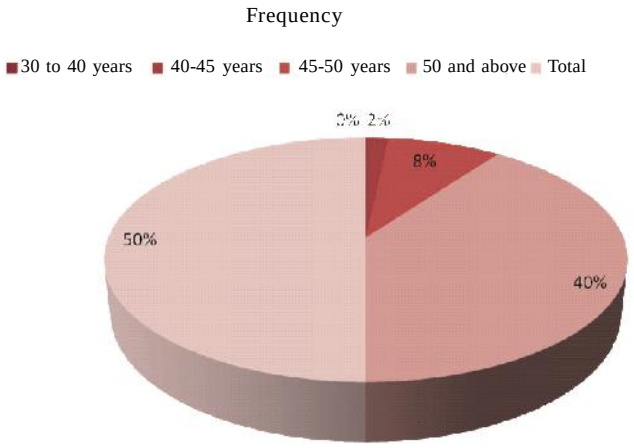


Fig. 2 : Distribution of respondent according to therapeutic effect of products through post feeding

level of critical difference. The mean score of calcium content in control sample of biscuit was 483 while the mean value of calcium for M_1 (470.83); M_2 (472.50); M_3 (473.50); M_1+B (474.27); M_2+B (475.33); M_3+B (481.13) and beetroot fibre (480.10). From the table founded that calcium content in M_3+B was maximum and minimum in M_1 statistically significant. Calcium which builds strong bones and teeth and helps prevent osteoporosis. 40% of the calcium needs for a child aged 1-3. It can be observed from Table 2 correlation co-efficient between nutrients, ash per cent of moringa fortified biscuits significantly correlated with calcium at 5% level of significant and ash percent was positively correlated with protein and iron both (Bamishaiye *et al.*, 2011). Moisture per cent positively correlated with ash per cent and protein of moringa fortified biscuits. Protein of the moringa fortified biscuits non significant with iron and significant with calcium at 5% level of significant. Iron of the moringa fortified biscuits positively significantly correlated with calcium.

Conclusion :

This study indicates that the developed products of biscuit with moringa can be easily prepared under optimized condition. The various parameters such as moisture, crude protein, iron, total ash and calcium were analyzed. The sensory evaluation of products on all attributes (appearance, taste, flavour, texture, colour and overall acceptability) was found in biscuit which was highly acceptable, due to *Bajra* flour, wheat flour, Moringa oleifera leaves, milk cream and butter. The analysed nutritional content (protein, iron calcium) of developed products concluded that nutritive value of moringa was highest then other developed products (Sreenivasan and Jyotsna, 2009). The benefits for the treatment or prevention of joint pain disease or infection that may accrue from taking moringa fortified biscuits daily. In this study we determined the effect of a biscuit fortified with moringa leaves on the vitamins and minerals status of women between age group 35 to 50 and above living in an area with a known prevalence of diseases.

LITERATURE CITED

Abuye, C., Urga, K., Knapp, H., Selmar, D., Omwega, A.M., Imungi, J.K. and Winterhalter, P. (2003). A compositional study of Moringa stenopetala leaves. *East African Med. J.*, **80**(5): 247-252.

Atawodi, S.E., Atawodi, J.C., Idakwo, G.A., Pfundstein, B., Haubner, R., Wurtele, G., Bartsch, H. and Owen, R.W. (2010). Evaluation of the polyphenol content and antioxidant properties of methanol extracts of the leaves, stem, and root barks of *Moringa oleifera* Lam. *Nigeria. J Med Food.*, **13**(3) : 710-716.

Bamishaiye, E.I., Olayemi, F.F., Awagu, E.F. and Bamshaiye, O.M. (2011). Proximate and Phytochemical Composition of Moringa oleifera Leaves at Three Stages of Maturation. *Advance J. Food Sci. & Technol.*, **3**(4): 233-237.

Bartolomeo Platina and Leon Wyczólkowski (2011). Phenolic contents and antioxidant activity of some food and medicinal plants. *Internat. J. Food Sci. & Nutri.*, **56**(4): 287- 291.

Basra, S.M.A., Iftikhar, N.M. and Afzal Irfan (2011). Potential of Moringa (*Moringa oleifera*) Leaf Extract as Priming Agent for Hybrid Maize Seeds. *Internat. J. Agric. & Biol.*, **13**(6):1006–1010.

Kumalaningsih (2011). Nutritional and medicinal value of Moringa oleifera leaves: Potential and Prospects. *Forestry Bulletin*, **11**(1):46-58.

Sreenivasan and Jyotsna (2009). Nutritional characterization of Moringa (*Moringa oleifera* Lam.) leaves. *African J. Biotechnol.*, **10**(60): 12925-12933.

Received : *22.02.2018;* **Revised:** *11.03.2018;* **Accepted :** *26.03.2018*