

DETERMINATION OF VITAMIN CONTENT IN CURRY LEAVES (*MURRAYA KOENIGII*) POWDER INCORPORATED MATHRI

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Abstract

Indigenous herbs are gaining popularity nowadays, it is nutraceutical important and immense numerous health benefits due to their natural compounds, antioxidants, and bioactive ingredients. Curry plant (*Murraya koenigii*) is a well-known herbal plant in India, it belongs to *Rutaceae* family. It is an outstanding source of vitamin and other essential nutrients. Mathri is a popular traditional snacks, easy to prepare, consume and store for a period of time. The present study aims to develop Mathri by partial replacement of wheat flour with curry leaves powder (5%, 7%, 9%) in variable proportions i.e. M1, M2, M3 whereas control mathri was prepared with wheat flour (M0). All treatments were analysed for vitamin content i.e. beta carotene, vitamin B (B1, B2, B3), vitamin C and vitamin E. Standard procedures were used to analyse the nutritional constituents in Mathri. The analysis resulted a significant ($p \leq 0.05$) increase in beta carotene and vitamin C with higher level of incorporation of curry leaves powder in Mathri. Beta - carotene content was undetectable in control mathri but increased with incorporation of curry leaves powder i.e. 299.73(μ g), 418.06(μ g), 520.04(μ g)/100g in M1, M2 and M3 respectively. Vitamin C content was

also undetectable in control mathri but increased significantly with the incorporation of curry leaves powder in all treatments i.e. 0.11mg, 0.19mg and 0.27mg/100g in M1, M2, M3 respectively. Whereas vitamin B content (B1, B2, B3) showed a slight increase in incorporated mathri compared to the control. Thus, the incorporation of curry leaves powder into other recipes considerably enhance the vitamin content.

Keywords: *Indigenous herb, Antioxidants, Bioactive ingredients, Mathri*

Introduction

Ayurveda is a traditional method to cure many ailments in Indian medicinal system from thousands of the years and close to 80% of population, in developing countries used Herbal plants for their primary healthcare (Gupta P. *et al.* 2011). Curry leaves (*Murraya koenigii*) belongs to *Rutaceae* family which represents more than 150 genera and 1600 species (Nishan M. & Subramanian P. 2015). It is an essential spice in India, mainly used in south Indian vegetarian and fish dishes as well as other food recipe [4].

Curry leaves plant have ethnobotanical, pharmacognostic, phytochemical and pharmacological properties [5]. Different parts of plant including leaf, fruits, bark, and root are having therapeutic quality for treating various ailments. Curry leaves (*Murraya koenigii*) are richer source of carbohydrates, proteins, Amino acids, carbazole alkaloids, minerals, vitamins and other plant compositions [8].

Presence of Bioactive compound in curry leaves have potential like antidiabetic, anticancer, antiulcer, anti-oxidative [9], also rich in polyphenols and antioxidants which contributes to reduce

the extent of cognitive disorder instead of it has high antioxidant and free radical scavenging properties [4].

Mathri is a beloved snack enjoyed by people of all age groups, it is a kind of flaky biscuit, can be enjoy with tea. Traditionally formulated using wheat flour, ajwain, salt, and water. It is convenient to store and consume for an extended period of time. Since it is formulated with wheat flour, it tends to lack essential micronutrients [6]. The incorporation of curry powder into the mathri offers a novel approach to increasing their nutritional quality.

Present study aims to develop mathri incorporated with curry powder. Developed mathri were analysed for vitamin content. This study seeks to promote a healthy snack among people of all ages.

Material and method

Curry leaves powder was previously formed by researcher. Formation of value added Mathri were prepared by adding different ratio of Wheat flour and curry leaves powder. Curry leaves powder was incorporated in wheat flour at 5, 7 and 9% level for three treatments namely M1 (95:5), M2 (93:7) and M3(91:9) respectively and control mathri (M0) was prepared by wheat flour. Mathri were prepared by standard procedure with slight modifications [11]. It was formulated in addition of oil, ajwain, salt and water. All ingredients were mixed well, added water, make hard dough, divided into small balls, roll the balls, make round shape and deep fried in edible oil. The ingredients for all treatments are explained in below table 1: -

Table1: Ingredients used in preparation of Mathri (g/100g):

Sr. No.	Ingredients	M0	M1	M2	M3
1	Wheat flour (g)	100	95	93	91
2	Curry leaves powder (g)	00	5	7	9
3	Oil (for dough) (ml)	15	15	15	15
4	Salt (g)	3	3	3	3
5	Ajwain (g)	2	2	2	2
6	Water (ml)	±60	±60	±60	±60

Nutrition analysis:

Mathri were analysed for vitamin content i.e. beta carotene, vitamin B (B1, B2, B3), vitamin C and vitamin E. β carotene analysed by AOAC (2000), vitamin B (B1, B2, B3) analysed according to Koche, D. (2011), vitamin C was analysed by AOAC (2000) procedure and vitamin E analysed according to AOAC (1990) procedure.

Statistical analysis:

the data obtained from investigation were analysed statistically using means and standard deviations, employed analysis of variance (ANOVA) to evaluate the p- value, and significant

differences among the treatments were assessed using the critical difference (C. D.) at the 5% level.

Result and discussion

The present study was aimed to develop mathri by partially replacing wheat flour with curry leaves powder. The data pertaining to the effect of incorporating curry leaves powder at various levels (5, 7 and 9%) on vitamin content are shown in below table.

Table 2: Vitamin content of curry leaves powder incorporated Mathri (per 100g)

Vitamin content	Beta carotene(μg)	Vitamin B1 (mg)	Vitamin B2(mg)	Vitamin B3(mg)	Vitamin C (mg)	Vitamin E (mg)
M0	ND	0.34 \pm 0.01	0.31 \pm 0.005	1.39 \pm 0.17	ND	0.71 \pm 0.06
M1	299.73 \pm 0.55	0.35 \pm 0.02	0.32 \pm 0.02	1.43 \pm 0.09	0.11 \pm 0.005	0.73 \pm 0.02
M2	418.06 \pm 0.27	0.36 \pm 0.005	0.33 \pm 0.03	1.47 \pm 0.12	0.19 \pm 0.01	0.75 \pm 0.01
M3	520.04 \pm 0.59	0.38 \pm 0.01	0.35 \pm 0.06	1.52 \pm 0.03	0.27 \pm 0.04	0.79 \pm 0.005
C.D.($p \leq 0.05$)	0.80	NS	NS	NS	0.04	NS

Values are Mean \pm S.D. of three independent determinations.

C.D. - Critical difference

The beta carotene content was undetectable in control mathri but it was observed a significant increase at C. D. ($P \leq 0.05$) = 0.80 in beta carotene content with higher level of curry leaves powder incorporation at different level (M1, M2, M3) resulted i.e. 299.73 μ g, 418.06 μ g, 520.04 μ g/100g respectively in developed mathri. The significant increase in beta carotene content indicates a high concentration in curry leaves powder, may help to maintain good eyesight and boost immune system. The addition of curry leaves powder into mathri can turn them into a rich source of β carotene.

The vitamin B (Thiamine, Riboflavin, Niacin) content across the all treatments, resulted statistically no significant difference ($P \leq 0.05$). There was a slight rise in vitamin B content observed. The vitamin B1 (thiamine) content in mathri was found with 0.35mg, 0.36mg, 0.38mg/100g at 5, 7 and 9% incorporation of curry leaves powder respectively, whereas control mathri was resulted 0.34mg/100g vitamin B1 content. Vitamin B2 (Riboflavin) recorded in control mathri was 0.31mg and it was observed 0.32mg, 0.33mg and 0.35mg/100g at 5, 7 and 9% incorporation of curry powder respectively. Vitamin B3 (Niacin) content was found at 5, 7 and 9% incorporation of curry leaves powder i.e. 1.43mg, 1.47mg and 1.52mg/100g respectively into incorporated mathri whereas control was resulted 1.39mg/100g vitamin B3.

Vitamin C content was undetectable in control mathri whereas a significant increase at C. D. ($P \leq 0.05$) = 0.04 was demonstrated with the incorporation of curry leaves powder at 5% (M1), 7%(M2) and 9%(M3) samples i.e. 0.11mg, 0.19mg and 0.27mg/100g respectively. The elevated level in vitamin C observed in mathri can be attributed to the addition of curry leaves powder, a well- known source of vitamin C, which also possess antioxidant properties along with other health benefits.

There was observed statistically no significant difference ($P \leq 0.05$) in vitamin E content including all the samples. The control mathri was resulted 0.71mg/100g vitamin E content whereas a minor elevation in vitamin E level was observed with addition of curry leaves powder at different level (5%, 7% and 9%) i.e. 0.73mg, 0.75mg and 0.79mg/100g respectively. The slight increase in vitamin E content in treated samples indicated the potential of curry leaves powder as an antioxidant and possess other health benefits.

CONCLUSION

In this study, Mathri were developed with addition of curry leaves powder with different ratio i.e. 95:5, 93:7 and 91: 9 by partial replacement of wheat flour powder. The investigation revealed a significant enhancement in β carotene and vitamin C content with the addition of curry leaves powder along with a slight increase in vitamin B (B1, B2 and B3) and E, when compared to control mathri. These enhancements can be attributed to the appreciable vitamin content in curry leaves powder and also possess various health benefits.

REFERENCES

1. AOAC. (1990). Official methods of analysis for. Association of Official Analytical chemists. 14th edition. Washington DC. USA.
2. AOAC. Official methods of analysis. 16th Ed. Association of official analytical chemists. Arlyngton, Virginia, USA. 2000.
3. Chaudhary, A. A Review on the Culinary Uses and Therapeutic Properties of *Murraya koenigii*. *Journal of Advancement in Pharmacognosy*, 2020, 1(1).

4. Essa, M. M., Memon, M. A., & Akbar, M. *Food and brain health*. Nova Science Publishers, Inc. 2014.
5. Handral, H. K., Pandith, A., & Shruthi, S. D. (2012). A review on *Murraya koenigii*: multipotential medicinal plant. *Asian Journal of pharmaceutical and clinical research*, 5(4), 5-14.
6. Kavya, M. R., Manasa, R., & Shivananjappa, M. (2023). Formulation and evaluation of mathri developed with partial replacement of wheat flour with Kodo millet (*Paspalum scrobiculatum*) flour. *IP Journal of Nutrition, Metabolism and Health Science*, 6(1), 28-31.
7. Koche, D. 2011. Trace element analysis and vitamins from an Indian medicinal plant *Nepeta hindostana* (Roth) Haines. *International Journal of Pharmacy and Pharmaceutical Sciences* 3: 53-54.
8. Mandal, S. (2016). Curry plant, *Murraya koenigii* L.: An indigenous spice plant with versatile medicinal property: A minireview. *International Journal of Clinical and Experimental Physiology*, 3(2), 59-65.
9. Nishan, M., & Subramanian, P. (2015). *Murraya koenigii* (curry leave)-A review on its potential. *Int. J. PharmTech Res*, 7(4), 566-572.
10. Nouman, S. M., Shehzad, A., Butt, M. S., Khan, M. I., & Tanveer, M. Phytochemical profiling of curry (*Murraya koenigii*) leaves and its health benefits. *Pak. J. Food Sci*, 2015, 25(4), 204-215.
11. MATHUR, R., JAIN, B., & SHARMA, A. (2020). NUTRITIVE VALUE AND SENSORY EVALUATION OF VALUE ADDED PRODUCTS DEVELOPED BY

INCORPORATING DRIED HARSHRINGAR (NYCTANTHES ARBOR-TRISTIS)
LEAF POWDER. *JOURNAL OF PHYTOLOGICAL RESEARCH*, 33(2).