

DETERMINATION OF NUTRITIONAL CONSTITUENTS OF CURRY LEAVES POWDER

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Abstract

Curry leaves (*murraya koenigii*) are nutrients rich and value adding dietary plant. It contains plenty amount of macronutrients and micronutrients which possess several medical characteristics to cure diabetes, hyperlipidemia, heart disease, bone problem, diarrhoea, menopause etc. In the present study, curry leaves were dehydrated (shade drying) at a temperature of 27-32⁰C for 15 days and powder was formed. Nutritional analysis of curry leaves powder showed the presence of moisture 5.16±0.009, ash 11.49±0.026, crude fibre 11.22±0.02, crude fat 3.33±0.01, crude protein 12.70±0.026, carbohydrate 61.26, calcium 2218.36±1.50, phosphorus 68.66±0.043, iron 12.69±0.009, zinc 2.46±0.02, sodium 43.02±0.029 potassium 427.35±0.35, magnesium 147.11±0.052 by using standard laboratory methods.

Keywords- Curry leaves, Diabetes, Hyperlipidemia, Menopause, Dehydrated.

Introduction

In Indian medicinal system Ayurveda is a traditional method to cure many ailments 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 the family of *Rutaceae* which represents more than 150 genera and 1600 spices. It is also known by different name like Karivempu, Barsunga, Karipatta, meetha neem etc in India (Nishan M. & Subramanian P. 2015). It is an essential spice in India, popularly used in south Indian vegetarian and fish dishes as well as in Sri Lankan meat and chicken curries. Curry leaves are being used in many recipes because it gives a nice aroma and flavour to the recipes (Chaudhary A. 2020).

Different parts of plant included leaves, fruits, bark, and root are having therapeutic quality for treating different diseases and it has great potential to providing useful drugs for human. Curry leaves (*Murraya koenigii*) are rich in carbohydrates, proteins, Amino acids and carbazole alkaloids (Mandal S. 2016). Curry leaves plant have ethanobotanical, pharmacognostic, phytochemical and pharmacological properties. The leaves are used as tonic, stomachic, carminative, internally in dysentery, vomiting and also used as antihelminthic, analgesic, cures piles, allays heat of the body, thirst, inflammation and itching (Handral *et al.* 2012).

It contains considerable amount of minerals like calcium, potassium, phosphorus, magnesium along with selenium, iron zinc, manganese in trace amounts and also contain a good amount of free amino acids as well as fresh curry leaves are excellence source of β -carotene. Bioactive compound of curry leaves have functions like antidiabetic, anticancer, antiulcer, anti-oxidative and it has great potential against cardiovascular disorder, obesity and hypertension. Phytoconstituents like phenolic and Flavonoides compound are responsible for Anti-obesity and lipid- lowering activities due to strong antioxidant capacity (Nouman S. M. *et al.* 2015). The presence of ascorbic acid, total phenol and total Flavonoides provide good source of dietary antioxidants (Vyas V. G. *et al.* 2015). Presence of polyphenols and antioxidants in curry leaves have potential to reduce the extent of cognitive disorder. The carbazole alkaloids in *murraya koenigii* have excellent antioxidant characteristics and mahanimbine and koenigine have high antioxidant and free radical scavenging properties (Essa M. M. *et al.* 2014).

Gaikwad *et al.* (2013) reported that the supplementation of curry leaves chutney showed improvement in blood pressure level among treated hypertensive subjects. The leaves are used to help blood circulation and menstrual problems and fresh leaves have efficacy to cure dysentery whereas roasted leaves are helpful to stops vomiting (Chaudhary A. 2020). People who are suffering from calcium deficiency and osteoporosis problem can used curry leaves as calcium supplements (Singh *et al.* 2014). The fresh juice of curry leaves used in treatment of certain eye disorder, especially in arresting the development of cataract (Sharangi A. B. & Guha S. 2013).

Taking curry leaves tea with cow milk provides relief from skin infections and rashes and its fruit juice cures insect bites and stings of poisonous creatures. The curry leaves, among the green leafy vegetables, are a rich source of micronutrients. It is essential to popularise among the population who is suffering from micronutrient deficiency and proper utilization of curry leaves in the diet can mitigate the problems of micronutrient deficiency whereas consumption of curry leaves in empty stomach helpful to reduces blood sugar of diabetic subjects (Mandal S. 2016). *Murraya koenigii* have numerous medical properties and using it in daily dietary can be important source of medicine to enhance healthy human life.

Material and methods

Procurement of curry leaves

The fresh curry leaves (*Murraya koenigii*) were procured from local nursery of Jaunpur district (U.P.).

Processing and dehydration of curry leaves

The curry leaves were separate from stalks for healthy leaves and extraneous foreign materials were removed. The leaves were washed thoroughly with the running water till the all impurities washed out. The conventional shade drying method was used for the dehydration of curry leaves. Purely washed leaves were spread over the floor in well ventilated room for dehydration at a temperature of 27-32°C for 15 days (Salve R. V. *et al.* 2020).

Formation of curry leaves powder

When the leaves were completely dried, these were collected to make fine powder and ground in a mixture grinder. The dehydrated curry leaves powder were packed in low dense polythene bags and stored for further use.

Determination of nutrients in curry leaves powder:

Proximate content

Proximate content namely moisture, ash, crude fibre, crude fat and crude protein of curry leaves powder were determined by standard laboratory procedure of AOAC (2000). Carbohydrate content of curry leaves powder was calculated by difference method.

Mineral content

Mineral content viz. calcium, iron, zinc, potassium and magnesium of curry leaves powder were determined by AAS according to the procedure of Lindsey and Norwell (1969) and phosphorus content was determined by calorimetrically according to the procedure of Chen *et al.* (1956) whereas sodium was analysed by digital flame photometer according to the method of Ranganna (1986).

Statistical analysis

The data were performed using mean and standard deviation statistical tools.

Result and discussion

Moisture:

Moisture content in curry leaves powder was 5.16%. Salve RV *et al.* (2020) reported 4.85g/100g moisture in curry leaves powder.

Ash:

Ash content in curry leaves powder was 11.49%. It shows that curry leaves are rich in mineral content. These values were comparable with the value of Igara CE *et al.* (2016) i.e. 15.60 % and reported 10.85gm/100g ash by Salve RV *et al.* (2020).

Crude fibre:

Curry leaves powder had fair amount of fibre i.e. 11.22%. It can be considered as good ingredient of fibre in diet. This fibre value was comparable with the value 12.95g reported by Salve RV *et al.* (2020) whereas Igara CE *et al.* (2016) reported 6.30 % fibre in curry leaves powder.

Crude fat:

Fat content in curry leaves powder was 3.33%. It was low in amount as compare to other proximate content. It can be used as supplement for weight loss included as low fat diet. These values were comparable with the value of Uraku A.J. and Nwankwo V.O. (2015) reported 5.13% fat, Igara CE *et al.* (2016) reported 6.48 % fat while Salve RV *et al.* (2020) reported 5.10 g/100g of fat in curry leaves powder.

Crude protein:

It had found good amount of protein i.e. 12.70%. It can be preferred as valuable source of protein. These values were comparable with the value 10.38g reported by Salve RV *et al.* (2020) and Igara CE *et al.* (2016) reported 8.38% protein whereas Sudha M.L. *et al.* (2014) reported 16.9 % protein in curry leaves powder used other drying treatment for development of powder.

Carbohydrate:

Curry leaves powder had abundant amount of carbohydrate i.e. 61.26%. It shows that curry leaves powder is a good source of carbohydrate. These values were comparable with the value 60.24gm reported by Parnami M. & Varma K. (2019) and reported 39.44% by Igara CE *et al.* (2016) whereas Salve RV *et al.* (2020) reported 55.87g/100g in curry leaves powder.

Table 1: Result of proximate content of curry leaves powder

Proximate content	Values (%)
Moisture	5.16±0.009
Ash	11.49±0.026
Crude fibre	11.22±0.02
Crude fat	3.33±0.01
Crude protein	12.70±0.026
Carbohydrate	61.26

Triplicate values are expressed as mean± STD

Minerals content:

Calcium:

Calcium content was found in abundant amount i.e. 2218.36 mg/100g which was highest among other minerals. It shows that curry leaves can be used as supplement in diet for calcium deficiency. Parnami M. & Varma K. (2019) reported 2218.22mg calcium in their study and Lal M. & Kaur N. (2019) reported 2111.70 mg/100g calcium whereas Singh *et al.* (2014) reported 2040mg/100g in curry leaves powder, used another drying technique for dehydration of curry leaves.

Phosphorus:

Phosphorus content of curry leaves powder was 68.66mg/100g. Salve RV *et al.* (2020) reported 68.50mg/100g phosphorus in curry leaves powder.

Iron:

Curry leaves powder was found with appreciable amount of iron i.e. 12.69mg/100g. The iron value was comparable with the result of Salve RV *et al.* (2020) reported 19.40mg/100g of curry leaves powder while Uraku A.J. and Nwankwo V.O. (2015) reported 9.44mg/100g of iron in their study.

Zinc:

Zinc content i.e. 2.46mg/100g was found in curry leaves powder. Presence of zinc may be helpful to regularise insulin hormone and boost immunity. These values were comparable with the value of 2.432mg reported by Parnami M. & Varma K. (2019) and reported 2.43mg reported by Salve RV *et al* (2020).

Sodium:

It had 43.02mg/100g of sodium in curry leaves powder. It was high in amount and could be unfavourable in hypertension due to direct link with it. This value was comparable with the value 47.81mg/100g reported by Parnami M. & Varma K. (2019) whereas Uraku A.J. and Nwankwo V.O. (2015) reported 46.00mg/100g sodium in curry leaves powder.

Potassium:

Potassium content was found in fair amount i.e. 427.35mg/100g. Salve RV *et al* (2020) reported 428.35mg/100g.

Magnesium:

Magnesium content was found in good amount i.e. 147.11mg/100g. This value was comparable with the amount of 144.18mg/100g reported by Salve RV *et al* (2020).

Table: 2 Result of mineral content of curry leaves powder (mg/100g)

Mineral content	Values(mg/100g)
Calcium	2218.36±1.50
Phosphorus	68.66±0.043
Iron	12.69±0.009
Zinc	2.46±0.02
Sodium	43.02±0.029
Potassium	427.35±0.35
Magnesium	147.11±0.052

Triplicate values are expressed as mean± STD

Conclusion

The results of present study showed that curry leaves have great nutritional potential because it contains good amount of carbohydrate, protein, fibre, fat and minerals which provides therapeutic characteristics to cure many ailments like diabetes, heart disease, bone problems, hyperlipidemia etc. Therefore, curry leaves powder can be suitable ingredients for improving nutritional properties of dishes and may improve the health status.

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