



ACCUMULATION OF HEAVY METAL AND PHYTOCHEMICAL CHARACTERIZATION OF CURRY LEAVES (MURRAYA KOENIGII)

*S. D. Chaudhari and P. R. Mahajan

*Department of Zoology, D.D.N. Bhole College, Bhusawal (MS)

Department of Zoology, Sardar Patel College, Ainpur, Tal.Raver, Dist.Jalgaon (MS)

Communicated : 09.08.2023

Revision : 26.08.2023 & 13.09.2023
Accepted : 22.09.2023

Published : 30.10.2023

ABSTRACT:

In herbs like *Murraya Koenigii* is basically Indian cooking, which help to enhance the flavor of the dish, But there is more to humble carry leaf than simply flavor. In present investigation leaves contains major nutrient like N, P, K, S and Na were 2.86%, 0.63%, 0.28%, 1.83%, 0.80% respectively on dry weight basis, it contains 18.42% total protein, 4.76% total fat and almost 76.60% carbohydrate. The leaves also contains comparable amount of antioxidant like ascorbic acid, flavonoid and total phenol as well as linolenic acid PUFA, which is very good for health

Keywords:- *Murraya Koenigii* Heavy metal Phytochemical Phenol.

INTRODUCTION :

(*Murraya Koenigii*) is the curry tree is a tropical sub tropical in the family rutaceae, which is native to India and Sri Lanka. Its leaves are used to many dishes in India and neighboring countries. In Indian cooking basically contains a handful of herbs help to enhance the flavor of the dish. Curry leaves is the common ingredients in Indian cooking added in the end to garnish the dishes. Often used curries the leaves generally called by the name 'curry leaves' also translated as "sweet neem leaves". The leaves of *Murraya Koenigii* are also used as an herb in Ayurvedic Medicine. They are believed adjuvant Action on non insulin dependent diabetics (people with type 2 diabetes). Curry leaves have a great impact as anticarcinogenic action (Forbath et al, 2000) Curry leaves have properties that help lowering one's blood cholesterol levels (Jing-Tian Xie et al, 2006) The leaf add a special flavour to every dish it is added to but there is a more to humble curry leaf than simply flavor. Packed with carbohydrate, fiber, calcium, phosphorous, iron, magnesium, copper, minerals and vitamin like nicotinic acid and vitamin C, vitamin A, vitamin

B, vitamin E, antioxidants, plant sterols, amino acids, glycosides and flavonoids, curry leaves help your heart function better, fights infections and can enliven your hair and skin with vitamin.

METHODOLOGY:

The leaves of *Murraya Koenigii* was collected from three different places of local market of Bhusawal and treated as replication. The amount of reducing carbohydrate and true protein was estimated as per Nelson (1944) Antrone reagent (Hedge and Hof either, 1962) and Folin Phenol reagent (Lowery et al, 1951) methods respectively. The phenol content in was determined by method of Malik and Singh (1980) using methanolic extract. Standard Graph was prepared from quantification using gallic acid as a standard. Request off total phenol were expressed as mg of gallic acid equivalents per gm of fresh weight of sample. Total ascorbic acid was quantified. quantified according to method described by Omaye et al, (1979). Total ascorbic acid was expressed in mg 100 g leaves sample. Total flavonoid was estimated using 1 ml of methanolic extract in which 0.5 ml of 2% of m/v AlCl₃ in methanol ad



0.5 ml potassium acetate (120 nM) were added in incubated at room temperature 30 minutes. Absorbance was read at 415 nm. Quercetin was standard and result were expressed as mg of quercetin equivalents per gm of fresh weight sample Chanda and Dave 2009.

RESULTS AND DISCUSSION:

The major nutrient content of curry leaves N, P, K, S and Na were 2.91%, 0.63%, 0.31%, 1.92% and 0.84% respectively (Table - 1). The proximate contents of total protein, total fat and total carbohydrate were 18.44, 4.81 and 67.62% respectively. Leaves also contain total phenol (3.20 gm/g) Ascorbic acid 23.41 mg/100g and total flavonoid 17.38 mg/g which were associated with higher antioxidants acting, therefore it is necessary to investigate total phenolic content (Kandoliya et al, 2015). The heavy metal contents Chromium (Cr), Lead (Pb) Arsenic (As) and Mercury (Hg) were 2.24 ppm 0.50 ppm 6.42 ppm and 1.05 ppm. Trace element were analysed by ICP-MS out of these heavy element Cd and Pb were below described limit, the content of Cr, As and Hg limit (Table 2) as per international standard limit of Cr, Pb, As and Hg were 1.5 pp, 1 ppm (Awasthi, 2000). The food chain contamination of heavy metals has become a burning issue in recent years because of their potential accumulation in biosystem through contaminated water, soil and irrigation water. The leave of *Murraya Koenigii* is a comparable good quality, which is medicinally important.

REFERENCES:

Awasthi S. K., 2000, Prevention of Food Adulteration Act No. 37 of 1954, Central and State Rules as Amended for 1999, Third Ed., Ashoka Law House, New Delhi.

Chanda S., and Dave R. (2009), In Vitro Models for antioxidant activity evaluation and some medicinal plants possessing

antioxidant properties: An overview, Afr J. Microbiol Res, 3:981-996.

- Hedge J. E. and Hoveiter, B.J. (1962) In : Methods in Carbohydrate Chemistry, Vol.17, (Eds.,) Whistler, R.L. and BeMiller J.N., Academic Press, New York, P. 420.
- Jackson M. L. (1973), 'Soil Chemical Analysis', Prentice Hall of India Pvt. Ltd., New Delhi.
- Jing-Tian Xie, Wei-Tien Chang, Chong-Zhi Wang, Sangeeta R Mehendale, Jing Li, Ramlingam Ambihaipahar, Umadevi, Ambibaipahar, Harry H Fong, Chun- Su Yuan (2006), Curry Leaf (*Murraya Koenigii* Spreng) Reduces Blood Cholesterol and Glucose Levels in Ob/ob mice. Am J Chin Med. 34, 279.
- Lowery O. H., Rasembrough, N. J., Farr, A. L. and Randall, R. J. (1951), Protein Measurement with folin-phenol reagent, J. Biol.Chem. 192, 265-275.
- Malik C. P. and Singh M. B. (1980), In Plant Enzymology and Histo Enzymology Kalyani Publication, New Delhi.
- Nelson, N. (1944), A Photometric Adaptation of Somogyi method for determination of glucose, J. Biol Chem., 135:375-380.
- Omaye, S.T., Turnbull, J.D. and Saubelinch, H.E. (1979) Selected methods for the determination of Ascorbic acid in Animal Cells, Tissues and Fluids, Methods in Enzymology, 62(1) : 3-10.
- V. K. Kandoliya, N. P. Bodar, V. K. Bajaniya, H. V. Bhadja, B. A. Golakiya (2015) Determination of Nutritional Value and Antioxidant from bulbs of different onion (*Annum Cepa*) variety a comparative study Int. J. Curr. Microbiol App. Sci 4(1) : 635-641.

Table 1 – Nutritional Composition of Curry Leaves

Parameter	Concentration	Micro-nutrition	Concentration PPM
Total Protein	18.44 ± 1.38%	Mn	37.83 ± 2.82
Total Fat / Oil	4.79 ± 0.03%	Zn	17.30 ± 1.30
Total Carbohydrate	67.62 ± 2.54%	Cu	11.60 ± 0.61
Reducing Sugar	3.51 ± 0.13%	Mo	2.05 ± 0.10
Total Phenol	3.20 ± 0.07 mg/g	Ni	5.83 ± 0.33
Ascorbic Acid	25.07 ± 0.78 mg/100gm	Li	0.18 ± 0.07
Total Flavonoid	17.37 ± 0.57 mg/g	Al	Trace
Total N	2.90 ± 0.13	Mg	Trace
Total P	0.64 ± 0.03		
Total K	0.32 ± 0.02		
Total S	1.95 ± 0.08		
Total Na	0.86 ± 0.03		

Table 2 – Heavy Metal Contamination Detected in Curry Leaves

Heavy Metal	Concentration PPM
Cr	2.242 ± 0.022
Pb	0.501 ± 0.015
As	6.620 ± 0.323
Hg	1.085 ± 0.048