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To Evaluation of Total Phenolics and Flavonoids in Different Plant of Chhattisgarh.

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ABSTRACT

The aim of present work was to assess the total phenolic content (TPC) & total flavonoid content (TFC) of methanolic & water extracts of *Aegle marmelos, Asparagus racemosus, Cassia alata, Kyllinga monocephala* and *Momordica dioica* from Chhattisgarh of India. Presence of TPC in the methanolic & water extract of *A. marmelos, A. racemosus, C. alata, K. monocephala, M. dioica* as followed 13.55 mg & 15.69 mg, 18.84 mg & 20.03 mg, 33.65 mg & 36.23 ms, 38.89 mg & 40.13 mg, 16.98 mg & 20.78 mg whereas, TFC as followed 1.59 mg & 1.96 mg, 2.02 mg & 2.49 mg, 3.97 mg & 4.25 mg, 4.15 mg & 4.75 mg, 2.45 mg & 2.89 mg. The major phenolic & flavonoid compounds identified were gallic acid, vanillin, catechol and Folin-Ciocalteu reagent, Sodium carbonate, sodium nitrile and quercetin. And this was also supported by significant correlation with TPC and TFC. To the best of our knowledge, this is the first paper presenting comprehensive data on TPC & TFC properties of these plants of Chhattisgarh.

Keywords: *A. marmelos, A. racemosus, C. alata, K. monocephala, M. dioica*, Folin-Ciocalteu reagent, Total Phenolic compound (TPC), Total flavonoid compound (TFC)

1. Introduction

It is well known fact that drugs obtained from plants don't show any side effects. So that herbal drugs are used in large proportion in world [1]. Most of the plants having medicinal use as well as traditional use. This plants *Aegle* marmelos, *Asparagus racemosus, cassia alata, Kyllinga monocephala* and *Momordica dioica* belongs to family Rutaceae, Asparagaceae, Fabaceae, Cyperaceae and Cucurbitaceae. These plants are very easily available in Chhattisgarh region. They are containing very important chemical constituents like alkaloids, glycosides, phenol, and flavonoid [2]. One of them chemical constituents phenolics are the largest group of phytochemicals that account for most of the antioxidant activity in plants or plant products. Flavonoids are the naturally occurring phenolic compounds, which occurs in different plant parts both in Free State and as glycosides. They are found to have many biological activities including antimicrobial, mitochondrial adhesion inhibition, antiulcer, antiarthritic, antiangiogenic, anticancer, protein kinase inhibition etc. The Flavonoids have two benzene rings separated by a propane unit. The flavones and flavonols are the most widely distributed of all the phenolics [3]. A variety of dietary plant Flavonoids inhibits tumour development in experimental animal models. The biflavonoids have the pharmacological effects like their ability to inhibit the release of histamines, the adhesion of blood platelets and the action of lens aldose reductase, to block the inflammatory effects of hepatotoxins, and to act as a heart stimulant [4]. These plants have an important source of therapeutic drugs and the ethnopharmacological knowledge of this family requires urgent documentation as several of its sps. are near extinction [5]. Based on the strong evidence of biological activities of phenolic compounds, the study was focused on determination of total phenolics and flavonoids indifferent parts of selected species.

2. Materials and Methods

2.1 Plant material

The plant materials used in this study were originally collected from various regions of Durg Chhattisgarh and authentified by the Agriculture division of Raipur, Chhattisgarh.

2.2 Sample Preparation

2.2.1 Preparation of standard solution

3 mg of Gallic acid dissolved in 3 ml of distilled water. Dilutions of this solution with distilled water were prepared to give the concentration of 20, 60 and 100 µg/ml [6].

2.2.2 Preparation of test sample

Stock solutions of samples were prepared by dissolving 10 mg of dried methanolic extract in 10 ml of methanol &water extract in 10 ml of dist. water to give concentration of 1mg/ml. Then prepares sample concentrations 20, 60 and 100 µg/ml [6].

2.3 Total Phenolic assay

The total phenolics content were determined using the Folin-Ciocalteu assay [7]. An aliquot (1 ml) of extracts or standard solution of Gallic acid (20, 60and 100 µg/ml) was added to 25 ml of volumetric flask, containing 9 ml of distilled water. A reagent blank using distilled water was prepared. 1 ml of Folin-Ciocalteu phenol reagent was added to the mixture and shaken. After 5 minutes 10 ml of 7 % Na2CO3 solution was added to the mixture. The volume was then made up to the mark. After incubation for 90 minutes at room temperature, the absorbance against the reagent blank was determined at 550 nm with an UV Visible (double beam, 1800 Shimadzu, Japan) spectrophotometer. Total phenolics content was expressed as mg Gallic Acid Equivalents (GAE).

2.4 Total Flavonoid Assay

Total flavonoid content was measured by the aluminium chloride colorimetric assay [8]. An aliquot (1ml) of extracts or standard solutions of quercetin (20, 60 and 100 µg/ml) was added to10 ml volumetric flask containing 4 ml of distilled water. To the flask was added 0.30 ml 5 % $NaNO_2$, after five minutes 0.3 ml 10% $AlCl_3$ was added. After five minutes, 2 ml IM NaOH was added and the volume was made up to 10 ml with distilled water. The solution was mixed and absorbance was measured against the blank at 510 nm. The total flavonoid content was expressed as mg Quercetin Equivalents (QE).

3. Results and Discussion

Since the antioxidant compounds found in plants have different polarities, different solvents are used to isolate antioxidants. Water, methanol, ethanol, and acetone are solvents commonly used in extraction processes [9]. The TPC & TFC presence in the extract and the yield depends on the selected solvent. The results for total phenolic and total flavonoid content are presented in Table 1. The results showed that the all plants species are rich sources of phenolics. The TPC was observed (highest to lowest) of alcoholic & water extract of plant of *K. monocephala* (38.89 mg & 40.13 mgGAE), *C. alata* (33.65 mg & 36.23 mg GAE), *A. racemosus* (18.84 mg & 20.03 mg GAE), *M. dioica* (16.98 mg & 20.78 mg GAE), *A. Marmelos* (13.55 mg & 15.69 mg GAE) & TFC was observed (highest to lowest) of alcoholic *K. monocephala* (4.15 mg & 4.75 mg QE), *C. alata* (3.97 mg & 4.25 mg QE), *A. racemosus* (2.02 mg & 2.49 mg QE), *M. dioica* (2.45 mg & 2.89 mg QE), *A. Marmelos* (1.59 mg & 1.96 mg QE)

Table 1: Total contents of phenolics and flavonoids in various plant parts of different plants

S. No.	Name of Plant	Total phenolic compound (TPC) mg GAE/100 g		Total Flavonoids compound (TFC)mg QE/100 g	
		Alcoholic extract	Water extract	Alcoholic extract	Water extract
1	*A. marmelos*	13.55 mg	15.69 mg	1.59 mg	1.96 mg
2	*A. racemosus*	18.84 mg	20.03 mg	2.02 mg	2.49 mg
3	*C. alata*	33.65 mg	36.23 mg	3.97 mg	4.25 mg
4	*K. monocephala*	38.89 mg	40.13 mg	4.15 mg	4.75 mg
5	*M. dioica*	16.98 mg	20.78 mg	2.45 mg	2.89 mg

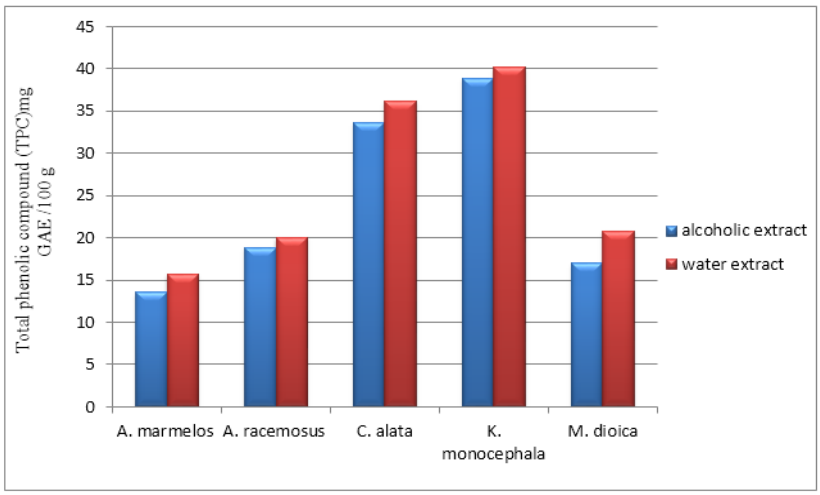

Fig 1: Comparative analysis of total phenolic compound of different plant extracts.

The variation of phenolic and flavonoid content may be due to various reasons. There is a positive correlation between phenolic content and free radical scavenging activity [10]. The present investigation showed that the selected six species are rich source of naturally occurring antioxidant phenolic compounds. Comparative analysis of total phenolic compound & total flavonoids compound of plant extracts are showed figure 1 & figure 2.

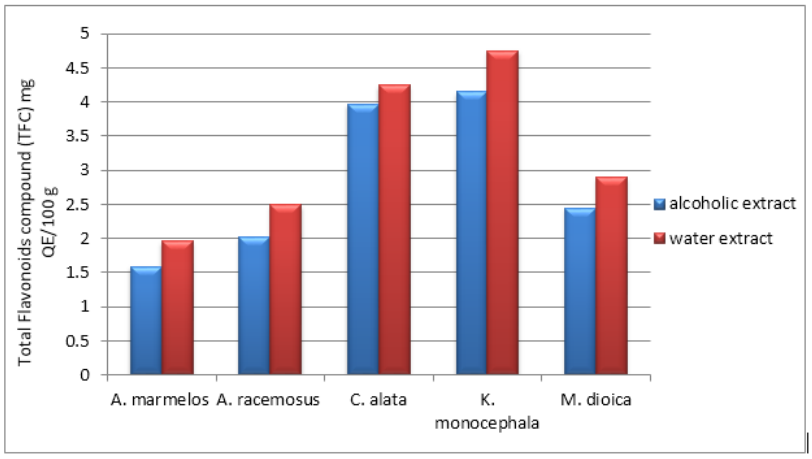

Fig 2: Comparative analysis of total flavonoid compound of different plant extracts.

4. References:

1. Kokate CK, Purohit AP, Gokhale SB. A text book of pharmacognosy. Nirali Prakashan, New Delhi, 2003.
2. Rai R, Nath V. Some lesser known oral herbal contraceptives in folk claims as anti-fertility and fertility induced plants in Bastar region of Chhattisgarh. Journal of Natural Remedies 2005; 5(2):153–159.
3. Sulaiman CT, Indira B. Total phenolics and total flavonoids in selected Indian medicinal plants. Indian J Pharm Sci 2012; 74(3):258-260.
4. Jeffrey BH, Herbert B. Phytochemical Dictionary, Taylor & Francis London, 1993, 324.
5. Aiyer KN, Kolammal M. Pharmacognosy of Ayurvedic drugs, Department of Pharmacognosy, University of Kerala, Trivandrum, 1963
6. Nayan RB, Pankaj BN, Acharya RN, Shukla VJ. Evaluation of in vitro Antioxidant activity of Flowers of *Cassia fistula* Linn. International Journal of Pharm Tech Research 2011; 3(1):589-599.
7. Marchioli R, Schweiger C, Levantesi G, Tavazzi L, Valagussa F. Antioxidant vitamisn and prevention of cardiovascular disease: epidemiological and clinical trial data. Lipid 2001; 36:53-63.
8. Zhishen J, Mengcheng T, Jianming W. The determination of flavonoid contents in mulberry and their scavenging effects on. Superoxide radicals Food chem 1999; 64:555-559.
9. Gong Y, Liu X, He WH, Xu HG, Yuan F, Gao YX. Investigation into the antioxidant activity and chemical composition of alcoholic extracts from defatted marigold (Tageteserecta L.) residue. Fitoterapia 2012; 83:481–489.
10. Aksoy L, Kolay E, Agilonu Y, Aslan Z, Kargioglu M. Free radical scavenging activity, total phenolic content, total antioxidant status, and total oxidant status of endemic *Thermopsis turcica.* Saudi J Biol Sci July2013; 20(3):235–239.