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EFFECT OF SEASONAL VARIATION ON THE PHYTOCHEMICAL CONSTITUENTS OF AEGLE MARMELOS (L.) AND MURRAYA KOENIGII L. SPRENG

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ABSTRACT Aegle marmelos and Murraya koenigii are commonly occurring plants in Maharashtra belonging to family Rutaceae .Members of Rutaceae are rich in vitamin C content. Murraya koenigii locally known as curry patta and Aegle marmelos locally known as bael/ kawath is edible and used in various food preparations. They are known to have anti-inflammatory, anti-oxidant, anticancer and antimicrobial properties and It was thought necessary to find out if there was any variation in the phytochemical content ie mainly Vit C and antioxidant activity of these two plants especially in the leaves . It was observed that phytochemical content was higher during monsoon season.

KEYWORDS : Aegle marmelos, Murraya koenigii, Vitamin C ,Anti oxidant, Phytochemical analysis

Introduction

Aegle marmelos and *Murraya koenigii* belonging to family Rutaceae (Citraceae) are tropical xerophytic plants commonly occurring in Maharashtra. According to Ayurveda, *Aegle marmelos* is a healing tree due to its diverse medicinal properties as all parts of this tree, namely, root, leaf, trunk, fruit, and seed, are used to cure various human ailments and diseases (Kritikar and Basu, 1984) *Murraya koenigii is also a medicinally important plant which contains many active phytoconstituents such as tannins,flavonoids vit c etc.*. The aim of project was to analyse the phytoconstituents and antioxidant activity during two season that is monsoon and winter season.

Material and methods

The study sample of *Murraya koenigii* and *Aegle marmelos* leaves were collected from Borivali Mumbai, Maharashtra. The leaves were cleaned and brought to the laboratory and analysed for various parameters.

Morphological Parameters

The morphology of Leaves was studied by measuring the length and breadth using a measuring scale. Leaf colour and margin apex was also observed.

Phytochemical Properties

Chlorophyll content using Arnon's method (1949)
Protein Content using Lowry's method (1951)
Vitamin C using DCPIP method
Antioxidant using DPPH method

a. CHLOROPHYLL CONTENT:

Chlorophyll was estimated by using (Arnon,1949) One gram of leaf was measured and ground in motar & pestle with 80% acetone and pinch of $MgCO_3$. Centrifuged and final volume was made up to 100 ml. Absorbance was read on 663nm and 645nm.

$$\text{Total chlorophyll (mg/g)} = \frac{20.2 \times A_{645} + 8.02 \times A_{663} \times V}{1000 \times \text{wt of sample}}$$

b. PROTEIN CONTENT

As per Lowry et al (1951) fresh plant material was used to estimate protein by using Bovine albumin serum as standard. Various concentrations of BSA was made and absorbance was taken at 660 nm. A standard graph was plotted and unknown concentration was calculated using graph.

c. VITAMIN C :

Vitamin C estimation was carried out by 2,6-dichlorophenolindophenol. sample was extracted in 4% oxalic acid and titrated against dye. The amount of ascorbic acid in mg/100g Calculation = $0.5mg/V_1ml \times V_2/5 \times 100/weight\ of\ the\ sample \times 100$, when V_1 is the standard ascorbic acid consumed against dye.

d. ANTIOXIDANT ASSAY:

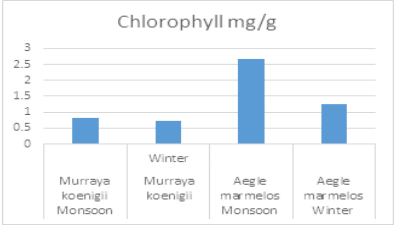
By free radical scavenging activity (Chan et al. 2007) & (Jain *et al* . 2019). It is a DPPH method estimation of methanolic extract was done by colorimetric. 1 ml of extract was added in 2ml DPPH solution incubated for 30 min and OD was taken at 517 nm. Activity was calculated in %

Scavenging activity = absorbance of control- absorbance of sample/ absorbance of control x 100

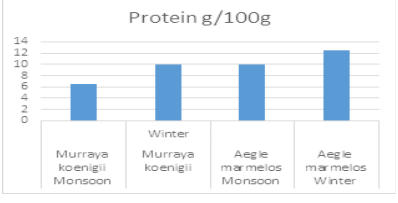
Table. No. 1 Phytochemical analysis of *Murraya koenigii &Aegle marmelos*

	Murraya koenigii Monsoon	Murraya koenigii Winter	Aegle marmelos Monsoon	Aegle marmelos Winter
Chlorophyllmg/g	0.82 ±0.3	0.73 ±0.3	2.68 ±0.66	1.25 ±0.3
Protein g/100g	6.5 ±0.7	10±1.5	10±0.7	12.5±1.2
Vitamin c mg/100g	623 ± 2.5	518±3.5	406 ±3.5	392±4.5
Antioxidant activity (%)	53 ± 2.4	50± 2.5	34±1.5	31± 2.5

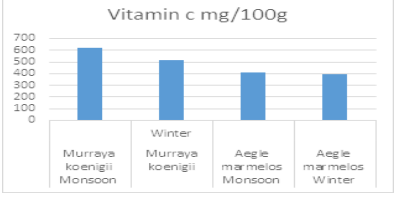
Graph No. 1 Chlorophyll content



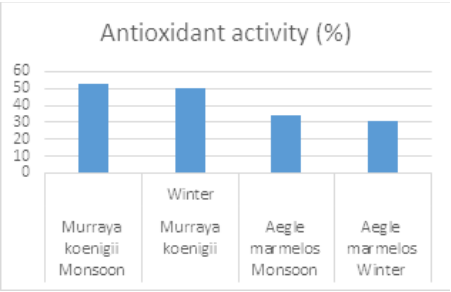
Graph No. 2: Protein content



Graph No. 3: Vitamin C content



Graph No. 4 : Antioxidant activity



Observation:

The morphological analysis shows Murraya koenigii leaf length during monsoon was about 4.5 cm while in winter it was 4.2cm colour does not show much change during monsoon and winter. The leaves were dark green in colour, margin entire lanceolate with acute apex. Aegle marmelos shows average length of 5.2 cm in monsoon while in winter it shows 5.5 cm. Chlorophyll content was observed to be higher during monsoon (0.82 mg/g) in Murraya koenigii and 2.68 mg/g in Aegle marmelos ,while protein content was observed during winter i.e 10g/100g in curry leaves and 12.5g/10g in bael leaves. Aegle marmelos Vitamin C content was found 406 mg/100g during monsoon while during winter it was observed 392mg/100g while in Murraya koenigii shows vitamin C content 623mg/100g while during winter it was observed 518mg/100g during winter. Antioxidant activity was observed 53% during monsoon and 50% during winter in Murraya koenigii while in Aegle marmelos antioxidant activity was observed to be 34% during monsoon and 31% in winter.

Results And Discussion:

From Above analysis,it was observed that Vitamin C and antioxidant activity was more during monsoon season as compared to winter season .This could be due to the availability of water and moisture in environment during the monsoon season. During winter season the moisture content in air is reduced , this leads to slight reduction in antioxidant property also. The protein content was observed slightly higher during winter season. Similar results were reported by Khairnar and Kadam(2017) in Aegle marmelos. Lakht-e-Zehra (2015) analysed similar parameter and discussed the medicinal properties of Aegle plants. Parnami and Varma (2019) discussed nutritional composition of dried curry leaf powder (Murraya koenigii) and reported similar results. Singh et. al. (2014) analysed similar parameter and discussed the medicinal properties of Murraya plants .

Conclusion

After observing the morphology and phytochemical parameters, we can conclude that distinct variation is seen in the morphology and phyto constituents of these plants within seasons. Seasons affect the phytochemical content of the leaves. The leaves are economical and widely available in all season and are good source of Vitamin C.All the parameters studied showed variation in the content in the plants collected in the two different seasons. Such data will be useful for nutraceutical industry to create products to fulfill the needs of the society by selecting plants during the best season so as to get the maximum nutraceutical value.

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