



## Pharmacognostic and preliminary phytochemical analysis of *Aegle marmelos* L. and *Centella asiatica* L.

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### Abstract

The present work is focused to evaluate the pharmacognostic features and preliminary phytochemical profile of the *Aegle marmelos* (Rutaceae) and *Centella asiatica* (Apiaceae) leaves. In the investigation the leaves are extracted with different solvents and resulted extracts were evaluated for preliminary phytochemical investigation. They revealed the presence and absence of alkaloids, flavonoids, terpenoids, quinones, oil&fat, sterols, phenol, starch, anthocyanin, protein, carbohydrate, cellulose, coumarin in different leaf extracts of the selected plant. Further studies on isolation of the bioactive compounds are in progress.

**Key words:** *Aegle marmelos*, *Centella asiatica*, preliminary phytochemical and bioactive compounds.

### I. INTRODUCTION

Medicinal plants are richest bio-resources of folk medicines and traditional systems of medicine. Out of the estimated 25000-50000 plants on earth, only a small proportion has been investigated both phytochemically and pharmacologically. This is the background for the selecting the following medicinal plants *Aegle marmelos* L. and *Centella asiatica* L.

Figure 1 *Aegle marmelos* L.



*Aegle marmelos* L. is commonly called as bael. It is a medium sized, armed, deciduous tree from the family Rutaceae. This tree was originated in India. *Aegle marmelos* L. is specially worshipped as a 'sacred grove'. *Aegle marmelos* is an important medicinal plant with several ethnomedicinal applications in traditional and folk medicine systems. Leaves, fruits, stem and roots of this tree at all stages of maturity are used as ethnomedicines against various human ailments [1]

Figure 2 *Centella asiatica* (L.) Urb.



*Centella asiatica* L. (also known as gotu kola and *Hydrocotyle asiatica*) belongs to the family Apiaceae. *Centella asiatica* L. is one of the miracles elixirs of life because it is used for more than 200 years by ancient Chinese herbalist. The plant has been exploited for several hundred years by traditional medicine dealers for the treatment of wounds, mental fatigue and skin diseases. It mainly lowers high blood pressure, it boosts up of memory and intelligence. So the present study focuses on the organoleptic, fluorescence analysis and preliminary screening of the phytochemicals present in various leaf extracts of the *Aegle marmelos* L. and *Centella asiatica* L.

## II MATERIALS AND METHODS

### 2.1 Pharmacognostic study

The pharmacognostic studies of *Aegle marmelos* L. and *Centella asiatica* L. leaves were evaluated using the following organoleptic study and fluorescence analysis. These studies were done according to the standard procedure [2, 3, 4]

### 2.2 Preliminary Phytochemical Analysis

Qualitative chemical tests were carried out on the petroleum ether, methanol and acetone extracts of the leaves of *Aegle marmelos* L. and *Centella asiatica* L. using standard procedures to identify the primary and secondary plant metabolites as described by [5]

## III RESULTS AND DISCUSSION

### 3.1 Organoleptic Study (Table I)

The investigation on organoleptic study on the characters like colour, odour and taste of the powder of *Aegle marmelos* L. and *Centella asiatica* L. were presented in Table-1. The colour of the dried leaf powder of *Aegle marmelos* L. and *Centella asiatica* L. was dark green and light green respectively. The taste and the odour of the leaf powder of *Aegle marmelos* L. was sour in taste and *Centella asiatica* L. was bitter in taste whereas leaf powder of *Aegle marmelos* L. and *Centella asiatica* L. showed the same pleasant odour.

**Table I ORGANOLEPTIC ANALYSIS OF THE AEGLE MARMELOS AND CENTELLA ASIATICA POWDER**

Leaf	Colour	Odour	Taste
<i>Aegle marmelos</i>	Dark green	Pleasant	Sour
<i>Centella asiatica</i>	Light green	Pleasant	Bitter

### 3.2 Fluorescence Analysis (Table II)

The fluorescence properties are found to be a valuable aid in the identification of the powder drug. Many substances both plant and animal origin exhibit fluorescence when exposed to UV radiation. Since the solvent and pH are capable of modifying the fluorescence of many substances the above powders were exposed to visible and UV light rays. In the present study the fluorescence properties were studied visible and UV light. Various shades of green, brown, pink, purple, blue colour were observed. The fluorescence analysis was observed day/visible light and UV light when treated with different chemical reagents was recorded and given in Table II

**Table- II FLUORSCENCE NATURE OF SAMPLE POWDER**

Treatment	<i>Aegle marmelos</i>		<i>Centella asiatica</i>	
	visible	UV light	visible	UV light
1 Powder as such	Pale green	Pale green	Green	Pale green
2 Powder + 1N HCl	Pink	Colourless	Brown	Blue
3 Powder + Acetic acid	Pale green	Pink	Light green	Pale green
4 Powder + Picric acid	Greenish yellow	Light green	Fluorescent yellow	Greenish yellow
5 Powder + FeCl <sub>3</sub>	Yellowish brown	Light green	Green	Green
6 Powder + 1N NaOH	Light green	Light blue	Green	Dark green
7 Powder + Concent H <sub>2</sub> SO <sub>4</sub>	Purple	Violet	Brown greenish	Pale green
8 Powder + Aqueous	Light green	Blue	Dark green	Dark blue
9 Powder + HNO <sub>3</sub> + Ammonia solution	Brownish orange	Colourless	Light brown	Colourless

### 3.3 Phytochemical analysis (Table III)

The powder was used for the analysis of secondary metabolites by qualitative tests. The alkaloids, flavonoids, terpenoids, oil and fats, sterols, phenols, starch, protein, carbohydrate, cellulose and coumarin were analysed. Quinones, oil and fats, sterols and phenol absent in acetone and methanol extract, only present in petroleum ether. The results were given in Table III. The efficacy of plants depends on the use of plant parts and its bioactive potency in turn depends upon the presence of secondary metabolite in a raw drug. Similar findings were reported by [6]. The preliminary phytochemical screening of acetone, ethanol, methanol, petroleum ether, chloroform extracts of *Andrographis lineata* leaves were carried out by [7] from their study it is confirmed that all the extracts showed the presence of flavonoids, saponins, gums and mucilages, triterpenoids, steroids, glycosides, phenolic compounds and tannins which are similar to the present study.

**Table – II**  
**Preliminary Phytochemical analysis**

Test For	Methanol		Acetone		Petroleum ether	
	A.M	C.A	A M	C. A	A M	C.A
Alkaloids Wagner test	+	+	+	+	+	+
Flavonoids	+	+	+	+	-	-
Terpenoids	-	+	+	+	+	+
Quinones	-	-	-	-	-	-
Oil&fat	-	-	-	-	+	+
Sterols	-	-	-	-	+	-
Phenol	-	-	-	-	+	+
Strach	+	+	+	+	+	+
Anthocyanin	-	-	-	-	-	-
Protein	+	+	+	+	+	+
Carbohydrate	+	+	+	+	+	+
Cellulose	+	+	+	+	+	+
Coumarin	-	-	+	+	+	+

‘+’ – Present ‘-’ – Absent, A.M – *Aegle marmelos*, C.A – *Centella asiatica*

#### IV CONCLUSION

The results revealed the presence of medicinally important constituents in the plants. The traditional medicine practice is recommended strongly for this plant as well as it is suggested that further work should be carried out to isolate, purify, and characterize the active constituents responsible for the activities.

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