

# Evaluation of Phytochemical Activity of *Aloe Barbadensis*, *Embllica Officinalis*, *Sesamum Indicum* and *Cocos Nucifera*

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**Abstract:** - The usage of medicinal plants is practiced for very long period of time around various parts of the world. Using the plants and its components over chemical drugs reduces the side effects caused by those drugs. Plant materials are safe to use and are very effective. Each part of the plant has specific pharmacological activity and most of the plant parts have wound healing property. Widely used 4 plants, which includes *Aloe barbadensis*, *Embllica officinalis*, *Sesamum indicum* and *Cocos nucifera*, in various region of India were selected for studying their phytochemical activity. These plants possess antimicrobial activity, antioxidant activity, flavonoids, tannins, steroids, saponins, terpenoids, phenols and other phytochemical components as bioactive agents.

**Key Words:** — *Phytochemical activity, Aloe barbadensis, Embllica officinalis, Sesamum indicum, Cocos nucifera.*

## I. INTRODUCTION

Medicinal plants have bioactive compounds which are used for curing various human diseases and also play an important role in healing. Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defense mechanism and protect from various diseases. Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds. [1] The objective of the research work was to analyze the presence or absence of different phytochemicals present in the selected plant species, that is, *Aloe barbadensis*, *Embllica officinalis*, *Sesamum indicum* and *Cocos nucifera*. Now-a-days these phytochemicals become more popular due to their countless medicinal uses. Phytochemicals play a vital role against number of diseases such as asthma, arthritis, cancer etc. Unlike pharmaceutical chemicals these phytochemicals do not have any side effects. Since the phytochemicals cure diseases without causing any harm to human beings these can also be considered as “man friendly medicines”. [2] Phytochemicals act in numerous ways to assist the human body in combating disease and health problems.

They combine with numerous vitamins to boost antioxidants activity of scavenging free radicals before they can cause damage within the body. These phytochemicals boost enzyme activity and increase the benefits of the various protective enzymes consumed with in the diet. Non-nutrients (phytochemicals) often help to fight the malignant changes within the cells that have already been penetrated by carcinogens. The consumption of phytochemicals enhances reduction in the emergence of degenerating diseases following a typical western diet. [3]

*Aloe Barbadensis* Miller, better known as Aloe vera, is a succulent, perennial plant belonging to the Liliaceae family. The leaves of the plant consist of two portions: a green peripheral portion corresponding to the lymphatic vascularization, and a central portion including the parenchyma containing the pulp or gel. Over the past 15 years, many studies have verified the use of Aloe vera as an accelerator and as an adjunct in the healing and recovery process by both topical and oral administration. It has been reported that Anthraquinone activate macrophages, stimulate T lymphocytes and have antiviral effects. [4]

*Embllica Officinalis*: is a small to medium sized deciduous tree belonging to family Euphorbiaceae and 8-18 meters height with thin light grey bark exfoliating in small thin irregular flakes. It is commonly known as amla or Indian Goose berry. Number of scientific studies were conducted to validate the traditional and ethno-medical uses of *E. officinalis*. It has been proved to be an

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effective medicinal remedy to treat and prevent wide range of disorders. Due to various beneficial medicinal actions, amla is one plant of interest for botanists, biotechnologists and Phytochemists. Researchers around the globe are working to explore newer medicinal activities and validate the claimed ethnomedicinal properties of amla and its constituents. [5]

*Sesamum Indicum L.*: is one of the oldest oilseeds considered to have nutritional and medicinal properties belongs to the Family Pedaliaceae. It has been employed in ancient Chinese medicine to prevent aging. Traditionally, sesame (*Sesamum indicum L.*) seed paste (upon topical application) and its oil (orally and topically) have been used for promoting healing in burns and other wounds. The oil is reported to have the following constituents – sesamol, sesamolin and sesaminol. Sesame is known as the king of oil seeds due to the high oil content (50–60%) of its seed. The seeds of sesame contain a number of important phytochemicals which includes alkaloids, flavonoids, glycosides, phenols, anthraquinones, tannins, carbohydrates and proteins. Sesame reveals the truth that it is a more beneficial plant with anti-pyretic, anti-inflammatory, antioxidant, anti-microbial, anti-hypertensive, anti-cancer, wound healing activity and other properties. Wound healing activity is influenced by several antioxidants in a positive manner [6].

*Cocos Nucifera*: Linn. (Coconut) belongs to the family Aracaceae. The plant is mainly used as a staple food crop, and is thought by many to be the world's most useful plant and medicinal plant in tropical and subtropical countries. *C. nucifera* is found throughout the tropics, where it is interwoven into the lives of the local people. It has a fibre husk rich in polyphenolic compounds, whose decoction has been used against arthritis and diarrhoea in them popular medicine of Northeast Brazil. Catechins are polyphenols that are a form of flavonoids with several phenol groups. Catechin, epicatechin and epicatechin-phloroglucinol units are present in high amounts in the polyphenolic molecules found in *C. nucifera*. These groups can capture prooxidants and free radicals, which confer upon them potent antioxidant characteristics. Recent studies reported that catechins are a powerful inhibitor of cellular growth, presenting anticancer, antimutagenic, antibacterial, antiviral and anti-inflammatory activities [7].

## II. METHODOLOGY

### A. Preparation of Plant Extract

The aqueous extraction of the plant was obtained by washing and air drying the required part of the plants selected for the study. (Table. 1). The dried parts were then added to grinding jar and 25 mL of water was added and grinded using Mixer grinder. The grinded mixture was allowed to soak for 12 h and then filtered to get the extract.

Table. 1. Plant parts used for study

Sl.no.	Plant	Part used
1.	<i>Aloe barbadensis</i>	Leaves
2.	<i>Emblica officinalis</i>	Fruit
3.	<i>Sesamum indicum</i>	Seed
4.	<i>Cocos nucifera</i>	Endosperm

### B. Phytochemical Analysis

The plant extracts were assessed for the existence of the phytochemical analysis by using the following standard methods. [8-10]

#### Test for Anthraquinones:

10 mL of Benzene was added to 6g of plant sample. It was soaked for 10 min and filtered. 10 mL of 10% ammonium was added and shaken for 30 sec. Pink, violet or red colour indicates the presence of anthraquinone.

#### Test for Tannins:

10mLof bromine water was added to the 0.5 g aqueous extract. Decolouration of bromine water shows the presence of tannins

#### Test for Saponins:

5.0mLof distilled water was mixed with aqueous crude plant extract in a test tube and it was mixed vigorously. The frothing was mixed with few drops of olive oil and mixed vigorously and the foam appearance shows the presence of saponins.

#### Test for Flavonoid:

2mLof 2.0% NaOH mixture was mixed with aqueous plant crude extract. Concentrated yellow colour was produced, which became colourless when 2 drops of diluted acid was added to mixture. This result shows the presence of flavonoids

#### Test for Glycosides:

A solution of glacial acetic acid (4.0mL) with 1 drop of 2.0% FeCl<sub>3</sub> mixture was mixed with the 10mL aqueous plant extract

and 1mL H<sub>2</sub>SO<sub>4</sub> concentrated. A brown ring formed between the layers which shows the entity of glycosides

#### Test for Terpenoids:

2.0mL of chloroform was added with the 5 mL aqueous plant extract and evaporated on the water bath and then boiled with 3mL of H<sub>2</sub>SO<sub>4</sub> concentrated. A grey colour formed which shows the entity of terpenoids.

#### Test for Steroids:

2mL of chloroform and concentrated H<sub>2</sub>SO<sub>4</sub> were added with the 5mL aqueous plant crude extract. In the lower chloroform layer red colour appears that indicates the presence of steroids

#### Test for Alkaloids:

2 mL of extracts treated with 2-3 drops of Wagner's reagent. Formation of brown or reddish precipitate indicate the presence of Alkaloids

#### Test for Carbohydrate:

2 mL of sample was added to 2 drops of alcoholic  $\alpha$ -naphthol and shaken well. Few drops of concentrated H<sub>2</sub>SO<sub>4</sub> were added along the walls of test tube. Formation of violet ring indicates the presence of carbohydrates.

#### Test for Amino Acid

Few drops of Ninhydrin solution were added to 2 mL of plant extract. Appearance of purple colour indicates the presence of Amino acid.

Table.2. Results for Phytochemical analysis

S. No	PHYTOCHEMICAL	PLANT			
		<i>Aloe barbadensis</i>	<i>Emblia officinalis</i>	<i>Sesamum indicum</i>	<i>Cocos nucifera</i>
1.	Anthraquinone	+	+	-	-
2.	Tannins	+	+	-	+
3.	Saponins	+	+	-	+
4.	Flavonoids	+	+	-	-
5.	Glycosides	+	+	+	+
6.	Terpenoids	+	+	-	+
7.	Steroids	-	-	-	+
8.	Alkaloids	+	-	+	+
9.	Carbohydrates	+	+	+	+
10.	Amino acids	+	+	+	+

'+' indicates presence of a component; '-' indicates absence of a component

### III. RESULTS AND DISCUSSION

A. *barbadensis* consists of the phytochemical components Anthraquinone, tannins, saponins, flavonoids, glycosides, terpenoids, alkaloids, carbohydrates and amino acids and has no steroids. E. *officinalis* consists of Anthraquinone, tannins, saponins, flavonoid, glycosides, terpenoids, carbohydrates and amino acids and has no traces of steroids and alkaloids. S. *indicum* showed positive results for glycosides, alkaloids, amino acids and carbohydrate. It showed negative results for anthraquinone, tannins, saponins, flavonoids, terpenoids, steroids. C. *nucifera* showed positive results for tannins, saponins, glycosides, terpenoids, steroids, alkaloids, carbohydrates and amino acids. It showed negative results for anthraquinone and steroids.

### IV. CONCLUSION

The current study about the Phytochemical activity of the selected four Medicinal Plant such as *Aloe barbadensis*, *Emblia officinalis*, *Sesamum indicum* and *Cocos nucifera*, shows significant results, that contributes to the process of wound healing along with curing various other diseases. All the selected plant species showed significant results for the presence of phytochemical substances such as Anthraquinone, Tannins, Saponins, Flavonoids, Glycosides, Terpenoids, Steroids, Alkaloids, Carbohydrates and Amino acids. The variations in the presence of phytochemical components among each plant species were responsible for the different medicinal uses and defence mechanism of plants against disease and infections. Each plant possesses different bioactive component that can be extracted from the plant and concentrated to a significant amount to act as a suitable remedy for various pharmacological purposes.

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