



**IDENTIFICATION OF PHYTOCONSTITUENTS IN *MANGIFERA INDICA*
AND *SYZYGIUM CUMINI* SEED EXTRACT**

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ABSTRACT

Fruits contain a diverse assortment of bioactive compounds such as alkaloids, tannins, glycosides, flavonoids, saponins, that possess many functional properties such as anti-inflammatory, anti-diabetic, antioxidant, anti-carcinogenic properties and also prevent against various degenerative and chronic diseases. Due to the presence of these compounds variety of fruits are known to exhibit many health benefits and disease-preventive characteristics. The isolation of these phytochemicals from plant involves the use of various extraction techniques. *Mangifera indica* (Mango) and *Syzygium cumini* (*Jamun*) are known to possess diverse phytochemicals, most of which are observed to be of health benefits. So, the present study aims to identify the presence of various phytochemicals that are present inherently in seed which is the base of generation of fruit.

Keywords: Alkaloids; flavonoids; tannins; *Mangifera indica*; *Syzygium cumini*

INTRODUCTION

The word “herb” has been derived from the Latin word, “*herba*” and an old French word “*herbe*”. Nowadays, herb can be any form of a plant or plant product, including leaves, stems, flowers, roots, and seeds, as well as a non-

woody plant. These medicinal plants are also used as food, flavour, color, perfume, and also as medicine for therapeutic use.

Medicinal use of plants have been used from long before the prehistoric period. Ancient

writings described the use of herbs providing evidence that Unani Hakims, Indian Vaid and European and Mediterranean cultures were using herbs for over 4000 years as medicine. Rome, Egypt, Iran, Africa and American indigenous cultures used herbs in their healing rituals, while other developed traditional medical systems such as Unani, Ayurveda and Chinese Medicine in which herbal therapies were used systematically.

Medicinal plant treatment is considered safe as there is no or minimal side effects. These remedies are in sync with nature, which is the biggest advantage; use of herbal treatments is independent of any age groups and the sexes.

These plants can either be used as raw or as extracts, where the plant is macerated with water, alcohol, or other solvents to extract some of the chemicals. The resulting products contain dozens of chemicals, including fatty acids, sterols, alkaloids, flavonoids, glycosides, saponins, and others. Because any given herb contains multiple ingredients, some researchers attempt to create standardized herbal products by identifying an active ingredient and varying the manufacturing process to obtain a constant amount of this chemical.

So, the present study deals with the identification of such various phytoconstituents present in *Mangifera indica* (Mango) seeds and *Syzygium cumini* (Jamun).

MATERIALS AND METHODS

Materials:

Mango and Jamun were collected from the local market, Latur, Maharashtra, India; ethanol, Mayer's reagent, Dragendroff's reagent, chloroform, dil. HCl, sodium hydroxide, ferric chloride, glacial acetic acid, sodium nitroprusside, and pyridine used are of analytical grade "A" quality.

METHODS:

A. Pre-extraction preparation: Fruits of *Mangifera indica* (Mango) and *Syzygium cumini* (Jamun) were collected from the local market. These are further subjected to remove pulp of fruits to get seeds in between; dried and crushed in mortar-pestle as well as in grinder to get powder of individual seed.

B. Extraction procedures: Prepared powder was then subjected to Soxhlet extraction using ethanol. Almost 5 cycles of extraction were done to get ethanolic seed extract of *Mangifera indica* (Mango) and *Syzygium cumini* (Jamun).

C. Identification of phytoconstituents: Dried ethanolic seed extract of *Mangifera indica* (Mango) and *Syzygium cumini* (Jamun) were used as is to detect various phytoconstituents such as alkaloids, glycosides, tannins, proteins and saponins, volatile oil, fats, carbohydrate, etc using standard procedures as below:

1. **Alkaloids:** Alkaloids are naturally occurring compounds which contain nitrogen and carbon atoms. To detect the alkaloid in a medicinal plant:

1. Dissolved the each seed extract in chloroform
2. Evaporate the chloroform and added acid to the residue
3. Upon addition of following reagents got different colour precipitates:
 - Mayer's reagent gives a creamy white precipitate
 - Dragendroff's reagent gives an orange-red precipitate

2. Lactones

Following test were used to detect lactones in a seed extract:

1) Legal's test

- Mixture of pyridine and sodium nitroprusside were added to the seed extract.
- Then, upon adding sodium hydroxide. The solution will turn deep red in colour.

3. Glycosides

Glycosides are compounds formed from a simple sugar and another non-sugar compound. Glycosides was detected in extract by following method:

1) Keller-Killani test

- Addition of a few drops of ferric chloride and 1 ml of glacial acetic acid to the seed extract.
- Slowly addition of concentrated sulphuric acid to the above mixture.

4. Tannins

Tannin was detected with these two tests:

a) Ferric Chloride test

- 2 ml of the seed extract was taken in a test tube.
- Adding a solution of ferric chloride drop by drop.

b) Gelatine test

- 1% of the gelatine solution containing 10% sodium chloride was prepared.
- Added a few drops of it to the seed extract.

5. Proteins

Proteins are usually present in several medicinal plants and confirm their presence with the Biuret test. In which, addition of 40% sodium hydroxide and dilute copper sulphate solution to the extract changes to pink, blue or violet in colour of the solution signify the presence of proteins.

6. Flavonoids

Flavonoids are detected with these two tests:

a) Ferric Chloride test

- To the alcoholic solution of extract added some drops of neutral ferric chloride solution.

b) Shinoda test

- To the alcoholic solution of extract added concentrated hydrochloric acid drop by drop and some pieces of magnesium ribbon.

Triterpenes

Triterpenes were detected by the Salkowski test. Additions of concentrated sulphuric acid in drops to the chloroform solution of the extract were done. Shaken well and allowed to stand.

Saponins

Saponins are the chemical compounds with soap-like qualities and are identified by adding plenty of water to the plant extract and shaking it thoroughly, saponins produce foam which remains for about ten minutes.

Volatile Oils, Fixed oils, Fats

Prepared a solution of the plant extract. A drop of this solution was spotted on the filter paper. Lack of permanent stain shows the existence of volatile oil.

In between two filter papers extract was crushed. A permanent stain shows the presence of fixed oils.

Extract was treated with a few drops of phenolphthalein and 0.5N potassium hydroxide and heated the mixture. Resulting soap formation shows the existence of fats and fixed oil.

RESULTS AND DISCUSSION:

Dried ethanolic seed extract of *Mangifera indica* (Mango) and *Syzygium cumini* (Jamun) shows the presence of various phytoconstituents. Results were summarized in **Table 1**.

Table 1: Results of phytochemical identification

| Phytoconstituent | <i>Mangifera indica</i> | <i>Syzygium cumini</i> |
|---------------------------------|--|--|
| Alkaloids | Formation of white precipitate in extract by Mayer's reagent and orange red color change by Dragendroff's reagent; indicating the presence of alkaloids. | Formation of orange red color in extract, indicating the presence of alkaloids. |
| Lactones | Extract change into dark red color, showing the presence of lactones. | Extract change into dark red color, showing the presence of lactones. |
| Glycosides | Rreddish brown ring appeared at the intersection point of the two liquids, showed glycoside presence. | Rreddish brown ring appeared at the intersection point of the two liquids, showed glycoside presence. |
| Tannins | A white precipitate at the bottom of the test tube confirms the presence of tannins. | A blue-black precipitate indicates the presence of tannins A white precipitate at the bottom of the test tube confirms the presence of tannins. |
| Proteins | Extract solution change into light pink color, indicating presence of proteins. | Violet color of extract shows presence of proteins. |
| Flavonoids | Development of light green color, showing the presence of flavonoids. | Shinoda test develops purple color, showing the presence of flavonoids. |
| Triterpenes | Extract color changes to yellow which indicated triterpenes presence. | Extract color changes to bluish violet which indicated triterpenes presence. |
| Saponins | Formation of frothing is an indication of the presence of saponins; | Formation of foam is an indication of the presence of Saponins. |
| Volatile Oils, Fixed oils, Fats | Soap formation shows presence of fats in mango seed extract. | No change in appearance showed absence of volatile oils, fixed oils and fats. |

CONCLUSION

The *Mangifera indica* and *Syzygium cumini* viz. mango and jamun plant contains a diverse

mixture of various phytoconstituents i.e. alkaloids, flavonoids, terpenoids, steroids, tannins, saponins and reducing sugars that

play a vital role in preventing various diseases. The antidiabetic, anti-inflammatory, antiviral, anti-bacterial, antianalgesia, anti-oxidant, anti-abortion of the various parts of plants is due to the presence of these various phytoconstituents. Before separation of phytoconstituents, to check the presence of various phytoconstituents; use of identification tests is needed. The present study concludes that presence of phytoconstituents can be assured using phytochemical detection and can use the as prior information for isolating it.

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