

PHYTOCHEMICAL INVESTIGATION OF MANGIFERA INDICA L.

¹Sandip Bhiwagade, ²Chandrakumar Patle

¹Dept of Chemistry, ²Dept of Botany
Dharampeth M P Deo Memorial Science College
Nagpur, M.S. India.

Abstract- *Mangifera indica* L. (Mango) has important role in traditional medicine. The plant parts used to control the many types of diseases such as diabetes, anxiety, dermal diseases, diarrhea etc. Leaves, fruit, seeds, bark etc used in healthcare systems. Literature survey indicates that Leaf extract mainly used to study the phytochemical screening, anti diarrheal, anticancer and antipyretic activity. The present review gives the information about phytochemical investigation of *Mangifera indica*.

Key Words: *Mangifera indica*, Phytochemical screening, antimicrobial activity.

1. INTRODUCTION

Mangifera indica L. is tropical deciduous tree belonging to family Anacardiaceae. The plant is commonly called as Mango. In Hindi it is known as Aam. This tree has important role in Hindu culture and festivals. Mango has tremendous medicinal properties. It is important in Ayurveda and traditional medical systems. Fruits are edible. Fruits are used for the preparation of vegetable, chutney, pickle etc. The immature fruit cut into small pieces, sun dried and conserved for future use¹.

Mango is popular for juice and pickle. Various parts such as seed, fruit, bark, inflorescence, leaves, roots etc. are used for the treatment of various diseases. It is large tree, growing height up to 100 feet. Leaf simple, spirally arranged, linear oblong, lanceolate, leaf about 25 cm long and 8 cm wide and evergreen, Flowering and fruiting: December to May.

Mango tree used to fulfill the demands of human population since long decades. Diabetes, anxiety, dermal diseases controlled by using this plant. The present review provides, the data such as phytochemical screening, antimicrobial activity etc.



2. TAXONOMIC POSITION

Kingdom: Plantae
Class: Magnoliopsida
Order: Sapindales
Family: Anacardiaceae
Genus: *Mangifera*
Species: *indica*

3. MATERIALS AND METHODS

The published research papers downloaded from Google search engine. The related research papers screened and selected for this study. Papers were read several times and studied to write the present review.

4. RESULTS AND DISCUSSION

The details of the anti diarrheal activity against microbes, antioxidant and anticancer activity, antimicrobial activity, phytochemical screening, vitamin content and toxicity are reviewed in the following paragraphs.

4.1 ANTI DIARRHEAL ACTIVITY

Leaf extracts (aqueous and alcoholic) were tested by ten reference strains (*Escherichia coli* ATCC 25922, *Escherichia coli* O157, *Proteus mirabilis* A24974, *Pseudomonas aeruginosa* ATCC 27853, *Enterococcus faecalis* ATCC 29212, *Micrococcus luteus* ATCC 10240, *Staphylococcus aureus* ATCC 29213, *Staphylococcus epidermidis* T22695, *Streptococcus oralis*, *Candida albicans* MHMR) and also tested on nine clinical strains² (*Citrobacter freundii*, *Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, *Klebsiella rhinoscleromatis*, *Pseudomonas aeruginosa*, *Pseudomonas ogzinabitans*, *Salmonella choleraesuis* and *Shigella flexneri*).

4.2 ANTIOXIDANT AND ANTICANCER ACTIVITY

Leaves were extracted using methanol and tested for antioxidant and anticancer activity. Increase the level of flavonoids and terpenoids exhibited significant antioxidant and anticancer activity³.

4.3 ANTI MICROBIAL ACTIVITY

The leaf extracts reported tannins, saponins, flavonoids and cardiac glycosides. The crude extracts from leaves on bacterial isolates from hair dressing tools were tested. Ethanol extracts showed active against hair dressing isolates which include *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Streptococcus* sp., *Micrococcus* sp. and *Escherichia coli*⁴. Palm wine and ethanol leaves extract exhibited antimicrobial activity against the tested microorganisms⁵ (*Shigella flexneri*, *Pseudomonas fluorescens*, *Escherichia coli*, *Staphylococcus aureus* and *Bacillus* spp).

Mangifera indica leaf powder extracted with water, ethanol and chloroform solvents and extracts were tested for antimicrobial activity against clinical isolates of *Salmonella typhi*, *Salmonella paratyphi A* and *Salmonella paratyphi B*. Ethanol extracts showed highest zone of inhibition⁹. Leaf extract of Mango inhibit the growth of *E. coli*, *K. Pneumoniae* and *S. aureus*. Mango leaf might be potential source of developing pharmaceutical formulations and drugs¹³.

Escherichia coli, *Proteus mirabilis*, *Salmonella* spp, *Pseudomonas aeruginosa* and *Klebsiella pneumonia* were isolated from waste water samples. Leaf extract of *Mangifera indica* exerted high antimicrobial activity against *Salmonella* spp while bark extracts exerted high antimicrobial activity against *Pneumoniae aeruginosa*¹⁵. Two varieties of Mango (**Banganapalli and Rumani**) kernels screened and tested and examined the potentiality of Mango kernel as antimicrobial against four bacterial strains and three fungal strains (*Staphylococcus aureus* and *Enterococcus faecalis* (Gram positive); *Escherichia coli* and *Klebsiella pneumonia* (Gram negative); and fungi such as *Aspergillus niger*, *Epidermophyton floccosum* and *Candida albicans*)¹⁹. Antibacterial activity of *Mangifera indica* leaves against bacterial strains such as *B. subtilis* and *E. coli* was tested and found that positive results²¹.

4.4 ANTIPYRETIC ACTIVITY

Samples were tested and found that antipyretic activity in stem bark extract of *Mangifera indica*²².

4.5 PHYTOCHEMICAL SCREENING

Phytochemical investigation revealed the presence of alkaloids, terpenoids, saponins, tannins, phenolics and flavonoids⁵. Alkaloids, anthranol glycosides, cardiac glycosides, saponins, triterpenes, phenols and flavonoids were reported from leaf extract of mango⁶. Aqueous and ethanolic leaf extracts of *Mangifera indica* used for the phytochemical screening and obtained alkaloids, cathetic tannins, gallic tannins, flavonoids, anthocyanins, leucoanthocyanins, quinone derivatives, saponins, Mucilage, coumarins, reducing compounds, free anthracene derivatives etc⁷. Phytochemical investigation was conducted from ripe and unripe fruits for *Mangifera indica*. Carotenoids, phenols and terpenes were significantly found in naturally ripe fruits. Alkaloids, tannins, phytosterol, flavonoids and glycosides were found higher in the unripe fruits⁸.

Total phenolics and total flavonoids studied in ethyl acetate fraction prepared from Mango leaves, 386.3 mg galic acid 127.3 mg rutin equivalents per gram of extract were measured. Eight acidic nature compounds were detected such as benzoic acid, pyrogallol, *p*-hydrobenzoic acid, vanillic acid, syringic acid, ferulic acid, ethyl galate, gallic acid from leaves of Mango⁹. The water, ethanol and chloroform solvents used for the preparation of leaf extract of *Mangifera indica* and tested for phytochemical investigation. The results were showed the alkaloids, flavonoids, steroids, tannins and phenols¹⁰.

Fresh root of *Mangifera indica* and shed dried, powdered and sieved through the mesh 40. Phytochemical investigation carried out and found that presence of alkaloids, glycosides, tannins, triterpenoids, carbohydrates and flavonoids¹¹.

Methanolic extract of *Mangifera indica* possess various classes of phytochemical constituents such as flavonoids, phenols, tannins, terpenoids, alkaloids, reducing sugar, steroids, saponins, coumarin and quinones etc¹². Phytochemical study revealed the presence of carbohydrates, amino acid, steroids, proteins, saponins, alkaloids, glycosides, tannin in aqueous and alcoholic extracts¹³. Phtochemical investigation of leaf extract of *Mangifera indica* confirmed the presence of some functional groups such as flavonoids, alkaloids, tannins, saponins, phenols and phytosterols¹⁵. Leaf sample powder was boiled in distilled water, FeCl₃ added to the samples and observed brownish green or blue black color indicates the presence of tannins. Powdered sample was boiled in a water bath, filtered, filtrate mixed with distilled water, shaken vigorously to as table persistent froth. Frothing was mixed with three drops

of olive oil and the formation of emulsion which shows the presence of saponins. One percent NH₃ solution was added to the plant samples. Yellow color indicates the flavonoids present. Also, the presence of glycosides and alkaloids were confirmed by with respective tests¹⁶.

Seed kernel samples were screened for phytochemical analysis, results obtained that seed kernel is rich in phytonutrients and contains alkaloids, tannins, phenols, saponins, glycosides, flavonoids and steroids. Also found Potassium, Sodium, Magnesium, Calcium, Manganese, Iron, Zinc, Copper, Cobalt and Chromium¹⁸.

Mango leaves are good source for alkaloids, flavonoids, tannins, steroids and cardiac glycosides while saponin glycosides are absent²⁰.

4.6 Vitamin contents

The vitamins contents are found vary from different ripening methods. Vitamins A, B1, B2, B3 and B6 were observed ripe and unripe fruits⁸.

4.7 Toxicity

Orally given a single dose of extracts at 5000mg/Kg of *Mangifera indica*, no death of rat was observed as well as any behavioral changes and lethargy was not observed in treated groups. No significant change in weight was found in tested rats⁷.

CONCLUSION

Mangifera indica (Mango) shows anti diarrheal, antioxidant, anticancer, anti microbial and antipyretic activity. Phytochemical screening proved the importance of Mango tree in the life of human being. Present review provides data to research communities as well as those pharmaceutical companies are involved in the production of various types of drugs.

ACKNOWLEDGEMENTS

Authors are thankful to Dr Akhilesh V Peshwe, Principal, Dharampeth M P Deo Memorial Science College, Nagpur for providing facilities and inspiration during the research work. Authors are thankful to Prof. Pitambar Humane, Head dept of Botany, M. P. Deo Memorial Science College, Nagpur for constant encouragement, valuable guidance and suggestions time to time. Authors are thankful to Dr. (Mrs.) Vaishali Meshram, Head dept of Chemistry, M. P. Deo Memorial Science College, Nagpur for moral support and help.

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