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 MMHR) and also tested on nine clinical strains (Citrobacter freundii, Escherichia coli, Klebsiella oxytoca, Klebsiella pneumoniae, Klebsiella rhinoscleromatis, Pseudomonas aeruginosa, Pseudomonas ozginabitans, 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 activity.

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. Ethanolic extracts showed active against hair dressing isolates which include Staphylococcus aureus, Psedomonas aeruginosa, Streptococcus sp., Micrococcus sp. and Escherichia coli. Palm wine and ethanol leaves extract exhibited antimicrobial activity against the tested microorganisms (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 Salmonela typhi, Salmonella paratyphi A and Salmonella paratyphi B. Ethanol extracts showed highest zone of inhibition. 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 drugs.

Escherichia coli, Proteus mirabilis, Salmonella spp, Pseudomonas aeruginosa and Klebsiella pneumoniae 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 Pseudomoniae aeruginosa. Two varieties of Mango (Banganapalli and Ruman) 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, Epidermphyton floccosum and Candida albicans). Antibacterial activity of Mangifera indica leaves against bacterial strains such as B. subtilis and E. coli was tested and found that positive results.

4.4 ANTIPYRETIC ACTIVITY
Samples were tested and found that antipyretic activity in stem bark extract of Mangifera indica.

4.5 PHYTOCHEMICAL SCREENING
Phytochemical investigation revealed the presence of alkaloids, terpenoids, saponins, tannins, phenolics and flavonoids. Alkaloids, anthranol glycosides, cardiac glycosides, saponins, triterpenes, phenols and flavonoids were reported from leaf extract of mango. 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, caumrins, reducing compounds, free antrhacene derivatives etc. 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 fruits.

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 Mango. 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 phenols.

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 flavonoids. 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 etc. Phytochemical study revealed the presence of carbohydrates, amino acid, steroids, proteins, saponins, alkaloids, glycosides, tannin in aequous and alcoholic extracts. Phytochemical investigation of leaf extract of Mangifera indica confirmed the presence of some functional groups such as flavonoids, alkaloids, tannins, saponins, phenols and phytosterols. 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 tests.

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 Chromium.

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

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 fruits.

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 rats.

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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