



Comparitive Antimicrobial Evaluation And Phytochemical Screening Of *Mesua Ferrea* Bark Extract And Seed Extract

Bhatt S.P., Semwal Amit, Parashar Tarun, Semwal Praveen

Uttaranchal Institute Of Pharmaceutical Sciences, Uttaranchal University, Dehradun.

Abstract- *M. ferrea* is widely used in ayurvedic and unani preparation for its therapeutic value which is commonly known as parag nagkesar, cobra saffron. *Mesua ferrea* has various therapeutic values such as Antioxidant analgesic anti-inflammatory property anti-arthritis wound healing CNS depressant anticonvulsant. Various researches concluded that the plant parts such as flowers roots stem leaves seeds posse's antimicrobial activity. *Mesua ferrea* is an ornamental plant which has large number of therapeutic or medicinal value. The drug nagkesar is an important ingredient in many ayurvedic formulations. The presence of alkaloid along with other bioactive components such as xanthine triterpenoids coumarins. In siddha system of medicine flower bud of *M. ferrea* is used as carminative and astringent property.

Keywords: Anticonvulsant, Antioxidant, Xanthine, coumarins, carminative

Introduction-

Mesua Ferrea has antioxidant, anti-inflammatory property. It is used in the treatment of skin diseases and show limited side effects. Also, researches have established that the different part of plant like, root, stem, and flower has antimicrobial property. Due, to the presence of phytochemicals like alkaloids, saponins, tannins, flavonoids, and terpenoids have therapeutic values. *Mesua ferrea* is commonly termed as parag nagkesar, cobra saffron. It is commonly cultivated in Sri Lanka and also in states such as Assam, Nepal, India, and Indonesia. The flowers and leaves of *Mesua ferrea* is used as an antidote for snake poison. *Mesua ferrea* seeds is rich in phosphorus and nitrogen that's why the seed oil is considered to be useful in skin diseases and vata disorder.^[1] Recent research evaluated *Mesua ferrea* crude extract has phytochemicals and pharmacological properties. Its phytochemical and pharmacological profiling has recently advanced. *Mesua Ferrea* is commonly seen in a forest with large white blossom and lovely greyish-green foliage makes this a favourite ornamental. River valleys in Sri Lanka and India. In India, there are 1,000 m in the western Himalayas (3,300 ft.). The plant named *Mesua ferrea* can be significantly used in preventing gastrointestinal diseases, dysuria, dysentery and respiratory diseases. The flower is useful in itching, nausea, bleeding, piles, excessive thirst, sweating, sores and wound.^[2] The recent study aimed to compare the efficacy of *Mesua ferrea* bark extract and seed extract by using agar well diffusion method for the determination of zone of inhibition and minimal inhibitory concentration (MIC).^[3]

Taxonomical classification of *Mesua ferrea*-

Family- calophyllaceae

Species- *M. ferrea*

Kingdom- Plantae

Genus- *Mesua*

Order- Malpighiales



(A)



(B)

Figure 1: Mesua ferrea

The chemical constituents of *Mesua Ferrea* are coumarins, xanthon, flavonoids, terpenoids, pyranoxanthon and 1, 5-diahydroxanthon (II), euxanthon 7-methyl ether (IV) and beta-sitosterol^[4]

Material and methods-**Collection of samples –**

Nagacuram (*Mesua ferrea*) seeds bought from local herbal market, and *Mesua ferrea* bark collected from FRI, Dehradun for further comparative study.

Microbial stain-

A stain is a microbial genetic variety or subtype (example virus, bacterium fungus).

Identification test for active compounds-

The test used an active chemical found in *Mesua ferrae* seeds and bark (alkaloid, terpenoid, glycosides, and saponins).

Alkaloid test-

The extract was diluted with ammonia and chloroform (15ml). the chloroform residue was diluted with 15ml sulphuric acid (DSA) the rest was used for the experimentation. The residue was boiled with 2% HCL. The filtrate was then treated with Mayer's reagent onto yellow precipitate. ^[5]

Terpenoid and steroid test-

The extract treated with acidic anhydride and chloroform. Sulphuric acid was administered slowly and terpenoids turned red violet and steroids turned green blue.

Phenol test-The folin-ciocolteu technique was used. 1 ml of each extract was agitated with 90 min at room temperature with 7.5% sodium carbonate and 1:10 folin-ciocolteu reagent solution. The extract as much phenol as gallic acid.^[6]

Test for biuret-

2 ml filtrate was treated with 2% copper sulphate solution. The pink came from ethanol and additional potassium hydroxide pallets ammonia was detected.

Test for carbohydrate-

2 ml filtrate, 2 drops alpha-naphol alcoholic solution, 2ml filtration 1 ml of con. Slowly apply sulphuric acid to the test tube wall and let it stand. Carbs. Are visible as a violet ring.

NAME OF TEST	<i>MESUA FERREA</i> SEEDS	<i>MESUA FERREA</i> BARKS
Alkaloid	+	+
Flavonoids	+	+
Glycosides	+	+
Tannins	+	+
Molish test	+	+
Biuret test	-	-

Table:1 phytochemical screening test^[7]**Anti- microbial activity:**

It was used to investigate antibacterial activity. A sterile petri received it. Using sterile filter paper discs, each dried extract was impregnated with 20L of extract solution. Their agar plates were then seeded with bacteria.^[8] Consecutive positive controls were piperacillin 9100g/disc), Gentamicin (100g/disc), and Amphotericin B (100units/ it was DMSO in paper discs (20ml). 370c cultivated fungi for 48 hours and bacteria for 24 hours.^[9] Three approaches to reduce error. The inhibitory zones were then tested for antibacterial activity. Microbes were inhibited by zones 14 mm or larger. ^[10]

Solvents	<i>Mesua ferrea</i> seeds	<i>Mesua ferrea</i> barks
Ethanol	5.18%	4.62%
Benzene	3.66%	3.10%
Chloroform	5.50%	5.10%
Water	11.52%	11.39%

Table 2: Comparative study between *Mesua ferrea* extractive values

Result and Discussion: We tested numerous solvents. The outcome was the same in all the sample of the solvent. In *M. ferrea* seeds and bark, where the total lipid (55.91-60.23%), moisture (2.98-3.12%) starch (4.41-2.89%), crude fibre (1.22-1.98) and carbohydrate (15.88-18.68%) was detected.

Particulars	<i>Mesua ferrea</i> seeds	<i>Mesua ferrea</i> barks
LOD	35.2%	38.6%
Moisture content	13.58%	11.40%
Total Ash	15.44%	15.00%
Water soluble Ash	3.47%	3.04%
Acid insoluble Ash	8.88%	8.50%

Table 3: Comparative study between *Mesua ferrea* seeds and barks

In seeds and wood were both tested for pharmacological characteristics. Air-dried material was utilised to determine ash, sugar, tannins, alcohols and water-soluble extractive values. In addition to the Simonyimicro methods, the authors employed Anonymous recommended protocols to determine ash value, soluble in water, alcohol extractive percent.

Reference:

1. Chaitanya Krishna. K, Rao kamalakara.k, sastry Y.N, Padals.b, Lakshmi Rajya A, Rao Govinda D, Anti- inflammatory, Antioxidant and phytochemical Analysis of *Mesua ferrea* Bark extracts, International journal of current trends in pharmaceuticals Research, 2015,3 (3):891-902.
2. Rawat Vandana, Upadhyaya kumud, Evaluation of antimicrobial activity and preliminary phytochemical screening of *Meseu ferrea* seeds extract, Journal of natural products Vol.6 (2013):17-26.
3. Aswar, P.B., Khadabadi, S.S., kuchekar, B.S., Saboo, S.S., Javarkar, R.D., (2009): In vitro evaluation of anti bacterial and anti-fungal activity of *Vitex negundo*. Ethanobotanical leaflets, 13:962-67.
4. Bibi, S.F.B., Mehrangizk, K., Hamid, and R.S., (2005): In vitro antibacterial activity of *Rheum ribes* extract obtained from various plant parts against clinical isolates of Gram negative pathogens Iranian J of Pharmaceutical research, 2:87-91.
5. The Wealth of India; A Dictionary of Indian Raw materials and Industrial products-Raw materials series (Publication and information Directorate, Council of Scientific and Industrial Research, New Delhi), Vol. VI (1992):349-352.
6. Tanaka, J.C.A.,da Silva, C.C., de Oliveira, A.J.B., Nakaraura, C.V., Dias Filho, B.P.,(2006):Antibacterial activity of indole alkaloids from *Aspidospermamiflorum*.Braz.J. Med. Biol. Res.,39(30):387-391.
7. Varaprasad, B., Prasanth, K.K., Somasekhar, P.,(2009):Antifungal activity of selected plant extract plant extract against phytopathogenic fungi *Aspergillus niger*. Indian journal of Science and technology,2(4):87-90.
8. Muhammad Asif, Seyedeh Fatemeh Jafari, Zafar Iqbal., et al, Ethanobotanical and phytopharmacological attributes of *Mesua ferrea*: A mini review, Journal of applied Pharmaceutical Science Vol. 7(04), pp. 242-25.
9. Mithum.V, Babu K.P, N.S Pradeep and Krishnan P.N, phenology and seed development in *Mesua ferrea* L., a rare medicinal tropical tree species, the journal of the society for tropical Plant Research 7(2):406-414.
10. Jennifer, M Andrews, (2001): Determination of minimum inhibitory concentrations, Journal of Antimicrobial chemotherapy, 48:5-16.