



Received on 17 August, 2014; received in revised form, 25 November, 2014; accepted, 06 April, 2015; published 01 May, 2015

PHARMACOGNOSTICAL STUDIES ON *MESUA FERREA*, *CARICA PAPAYA*, *ASIMUM SANCTUM* AND *TRIBULUS TERRESTRIS*. IN RAYALASEEMA, A.P.

N. Raja Naik and P. Indira

Department of Zoology, Sri Krishnadevaraya University, Anantapuramu, Andhra Pradesh, India

Keywords:

Mesua ferrea, *Carica papaya*, *Asimum sanctum* and *Tribulus terrestris*,
Pharmacognosy, Physicochemical
characters, phytochemical analysis

Correspondence to Author:

N. Raja Naik

Department of Zoology, Sri
Krishnadevaraya University,
Anantapuramu, Andhra Pradesh,
India.

E-mail: rajanaiknavath@gmail.com


ABSTRACT: The Present paper deals with the pharmacognostical studies on *Mesua ferrea* (Flowers), *Carica papaya* (Seeds), *Asimum sanctum* (Leaf) and *Tribulus terrestris* (Leaf). Fluorescence analysis has been performed and physicochemical characters such as ash values and extractive values have been performed. Preliminary phytochemical analysis also been performed for the various extracts.

INTRODUCTION: Ethan botany is the new branch which deals with the medicinal plants and their activities. The application of this field are enormous in regular life. Controlling the birth rate in India is the major problem, at the same time some parents are unable to have children's, for that they are preferring fertility centers¹. To cope up these two types of problems now natural medicine (Medicinal plants) had emerged so that there wouldn't be side effects and the cumbersome involvement of allopathic Techniques for the birth may the birth may children controlled through contraception (Herbal contraception) and also can have be through natural medicine intake². There voluminous literatures which have been discusses, about the fertility and anti-fertility activity individually of Medicinal plants.

Like *Abrus pictorial*, *Azadirachta indica*, *Gassypium herbaceum* and *Carica papaya* proved as having anti-fertility activities. Some plants like *Pongamia pinnata*, *Trachyspermum ammi* and *Mesua ferrea* are being used as to increase fertility activities.

The management options are available for the treatment of fertility and anti-fertility in females includes the use of drugs and a variety surgical procedures. The use of plants extracts as fertility enhancer and in the infertility treatment in animals is now on increase because of the shifting of attention from synthetic drugs to natural plant products³. Once the plants were considered of no value, but are now being investigated, evaluated and developed into drugs, with little or no side effects.

In the present study the emphasis has been laid on the fact that naturally available plants and their parts can be great use in acting as fertility and anti-fertility agents. In Andhra Pradesh Rayalaseema area including *Mesua ferrea* and *Carica papaya* plants has been used from long back for enhancing

<p>QUICK RESPONSE CODE</p> 	<p>DOI: 10.13040/IJPSR.0975-8232.6(5).2223-27</p> <hr/> <p>Article can be accessed online on: www.ijpsr.com</p>
<p>DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.6(5).2223-27</p>	

fertility and anti-fertility and as contraceptive measures. This present study has been designed to find out the traditionally used medicinal/ethanol botanical plants of Rayalaseema, in A.P., and their effects on the both enhancing fertility and anti fertility.

Fertility activity of Medicinal plant:-

Mesua ferrea Lin. Belonging to the family “Clusiaceae”. In Hindi it is known as “Nagakesara” and in English as “Ceylon iron wood”⁴. It is a medium to large evergreen tree with short trunk, often buttressed at the base, found in the seshachalam forest of Tirumala of Rayalaseema in A.P. The tree is cultivated in the gardens and avenues for its flowers and Leaves are used an antidote to snake bite, and paste of the flowers with butter and sugar is used in bleeding piles and burning of the feet. (Fig.1)

The plants contains glycosides, flavonoids, xanthones, Triglyce rides and resins, essential oils, fatty acids, steroids, reducing sugar, Tannin, saponin, proteins. The flowers contain alpha-Copaene and germacrene-D, and a new cyclohexadione compound named as Mesua ferrol and Mesuanic acid⁵.



FIG: 1 MESUA FERREA (PLANT & FLOWERS)

Anti-Fertility activity of Medicinal plant:

Carica papaya belongs to the family of Caricaceae. papaya is not a tree an herbaceous succulent plant. The plant is usually short-lived, but can produce fruit for more than 5 years. *Carica papaya* plants produce natural compounds in leaf bark and twing tissues that passes both highly antitumor and pesticide properties. *Carica papaya* leaf tea or extract has a reputation as tumour-destroying agent. The Juice has been in use on meat to make it tender.⁶ The seed is used for intestinal worms when chewed. The root is chewed and the juice swallowed for cough, bronchitis and other respiratory diseases. Chewing the seeds of ripe papaya fruit also helps to clear nasal congestion. The tea prepared with the green papaya leaf, promotes digestion and aids, in treatment of oilments such as chronic indigestion, obesity, high blood pressure and weakening of the heart⁷.

Carica papaya is a plant that needs to be elaborately researched on because of the reported anti-fertility and pharmaceutical potentials of the plant.⁸ The seeds contain novel biologically active compounds, which are potent as therapicutics. Recently discorved substances that have analgesic properties included those of alkaloids, flavonoids and terpenoids. (Fig.2)



FIG: 2 CARICA PAPAYA (PLANT & SEEDS)

MATERIALS AND METHOD:

Collection and identification of plant material:

The health plant of *Mesua ferrea* flower collected from Anantapuramu super market and Carica papaya seeds collected from Anantapuramu surrounding gardens of Rayalaseema in A.P. The identification of plants material have been done by plant Taxonomist, Department of Botany, S.K. University, ATP.

Processing of plant extraction:

The plant material was dried under room temperature without exposure to sunlight. The dried plant material was powdered in the grinder. 5gm of *Mesua ferrea* flower powdered was soaked in 50 ml of D.W for 24 h, and filtered through whatmann filter paper No: 1. Thus the filtrate was used as test solution for the following preliminary screening tests like alkaloids, flavonoids, glycosides, Lingnin, phenals, saponins, sterols and Tannins.

Identification Tests for active compounds in different plants sample:

The test was done to find the presence of the active chemical constituents such as alkaloids, glycogen, Terpenoids and steroids, flavonoids, Glycosides and Tannin by the following procedure

Test for Alkaloids:

Alkaloids are the basic nitrogenous compounds with definite physiological and pharmacological activity. Alkaloid solution produces white yellowish precipitate when a few drops of Mayer's reagent are added⁹.

The alcoholic extracts were evaporated to dryness and the residue was heated on a boiling water bath with 2% HCl. After cooling the mixture was filtered and treated with a few drops of Mayer's reagent. The sample was then observed for the presence of yellow precipitation

Test for Terpenoids and steroid:

4ml of extract was treated with 0.5ml of acetic anhydride and 0.5ml of chloroform. The con. Sulphuric acid was added slowly and red violet color was observed for terpenoids and green bluish color for steroids.⁹

Test for Glycoside: Glycosides are compounds which upon hydrolysis give rise to one or more sugars Compounds. To the solution of the extract few drops of ferric chloride and con. Sulphuric acid was added, and absorbed for a radish brown coloration at the junction of two layers and the bluish green color on the Upper layer⁹.

Test for flavonoids:

4ml of extract solution was treated with 1.5ml of 50% methanol. The solution was wormed and metal magnesium was added. To this solution 5-6drops of con. HCl was added and red color was observed for flavonoids⁹.

Test for Tannins:

To 0.5ml of extract solution, 1ml of water and 1-2drops of Ferric chloride solution was added. Green color was observed for catecholic Tannins.

Detection of carbohydrates:

The extract were dissolved in 5ml of D.w and filtered. The filtrate was subjected to the following tests.

Molish's Test:

To 2ml of filtrate and 2 drops of alcoholic solution of alpha-Naphthal were added. The mixture was shaken well and 1ml of con. Sulphuric acid was added slowly along the sides of the test tube and allowed to stand. A violet ring indicated the presence of carbohydrates^{10, 11}.

Fehling's Test:

1ml of filtrate was boiled in water bath with 1ml each of felling solutions A and B. A red Precipitate indicated the presence of sugar.

Benedicts Test:

To 0.5ml of filtrate and 0.5ml of Benedict's reagent was added. The mixture was heated on a boiling water bath for 2 min. A characteristic colored precipitate indicated the presence of sugar.

Detection of Amino acids:

The extract was dissolved in 10ml of distilled water and filtrated through Whatman No.1 filter paper and the filtrate was subjected to test for amino acids.

Mellon's Test:

To 2ml of filtrate and few drops of million's reagent was added. A white precipitate indicates the presence of amino acids.

Biuret Test:

2ml of filtrate was treated with one drops of 2% copper sulphate solution. To this 1ml of Ethanol was added and followed by excess of potassium hydroxide pellets, pink color in the ethanolic Indicated the presence of amino acids.

Ninhydrin Test:

2 drops of Ninhydrin solution (10mg of Ninhydrin in 200ml of acetone) were added to 2ml of aqueous filtrate. Characteristic purple color indicated the presence of amino acids^{12, 13}.

RESULTS AND DISCUSSION: The above all tests were done in different types of solvents of samples. The result was appeared same in different type solvents of samples, and the result were shown in the following **Table1**.

TABLE 1: FLUORESCENCE ANALYSIS

Samples	Light	Powder as such	Name of the extract			
			Ethanol	Benzene	Chloroform	Water
<i>Mesua ferrea</i>	Ordinary	Dark brown	Brown	Pale brown	Pale brown	Brown
<i>Carica papaya</i>	Ordinary	Pale balck	Pale black	Pale black	Black	Pale black
<i>Asimum sanctum</i>	Ordinary	Green	Pale green	Pale green	Dark green	Green
<i>Tribulus terrestries</i>	Ordinary	Green	Pale green	Pale brown	Pale black	Dark yellow

The flowers of *Mesua ferrea* undergo fluorescence analysis; it shows pale and dark brown fluorescence noticed under ultraviolet light (400-700 nm). The crude drugs on treated with Ethanol, Benzene, Chloroform and D.W. show pale and dark brown fluorescence on treatment with the above solvents, when viewed under UV light (400-700 nm).

The Seeds of *Carica papaya* fluorescence analysis; it shows pale black and black fluorescence noticed under ultraviolet light (400-700 nm). The crude drugs on treated with Ethanol, Benzene, Chloroform and D.W. show pale black and black fluorescence on treatment with the above solvents, when viewed under UV light (400-700 nm).

TABLE 2: PHYSICO-CHEMICAL CHARACTERS

Particulars	<i>Mesua ferrea</i>	<i>Carica papaya</i>	<i>Asimum sanctum</i>	<i>Tribulus terrestries</i>
Loss of weight on drying	36.2%	35%	26.02%	30%
Moisture content	12.98%	10.5%	11.68%	7.05%
Total ash	11.54%	17.08%	13.67%	9.03%
Water soluble ash	15.00%	13.50%	13.00%	11.50%
Acid-insoluble ash	3.00%	4.00%	6.00%	4.00%
Residue on ignition	8.43%	6.97%	7.13%	5.99%

TABLE 3: EXTRACTIVE VALUES

Solvents	<i>Mesua ferrea</i>	<i>Carica papaya</i>	<i>Asimum sanctum</i>	<i>Tribulus terrestries</i>
Ethanol	6.18%	5.07%	5.18%	4.00%
Benzene	4.66%	6.12%	4.66%	6.10%
Chloroform	5.50%	7.96%	5.10%	6.99%
Water	11.52%	17.52%	10.12%	16.20%

The extractive values increase as the polarity of the solvent increases. Among the extractive values, the H₂O extract value is higher than others. In the preliminary phytochemical analysis of crude drugs, commonly both samples extracts shows the presence of reducing sugars, terpenoids, steroids,

tannins, alkaloids and Amino acids. The ethanol and chloroform extract of *Mesua ferrea* and *Tribulus terrestries* does not contains Amino acids. In all the extracts of *Mesua ferrea*, *Carica papaya*, *Asimum sanctum* and *Tribulus terrestries* contains the Alkaloids. The ethanol and D.W. extracts of

both sample shows maximum results in all the solvent system. All the pharmacognostical characters can be used as a diagnostic tool for the

correct identification of the drug and also to test adulteration if any (**Table 3**).

TABLE 4: QUALITATIVE ANALYSIS OF ETHANOL, CHLOROFORM, BENZENE AND DISTILLED WATER EXTRACTS OF CERTAIN MEDICINAL PLANTS: (PRELIMINARY PHYTOCHEMICAL SCREENING TESTS)

S.No	Name of the Test	Name of the phytochemical compound	Name of the plant			
			<i>O.sanctum</i>	<i>C.papaya</i>	<i>T.terrestries</i>	<i>M.ferrea</i>
1	Mayer's Test	Alkaloids	+ve	+ve	+ve	+ve
2	Terpenoids and Steroid test	Terpenoids and steroids	+ve	+ve	-ve	+ve
3	Glycoside test	Glycosides	+ve	-ve	+ve	-ve
4	Flavonoids test	Flavonoids	-ve	+ve	-ve	+ve
5	Tannin test	Tannins	+ve	+ve	+ve	+ve
6	Molish's test Fehling's test Benedict's test	Carbohydrates (Reducing sugar)	-ve	+ve	+ve	+ve
7	Millon's test Biuret test Ninhydrin test	Amino acids	-ve	+ve	-ve	-ve

- = Negative + = Positive

CONCLUSION: The various diagnostically, physicochemical and phytochemical standards developed in this study will help for botanical identification, quality control and standardization of the drug in crude form. Further, the authentic plant material can be explored for phytochemical potential.

ACKNOWLEDGEMENT: The authors sincerely acknowledge UGC, New Delhi for their financial support for the above research work.

REFERENCES:

- Thakur DS, Kumar P, Kujur A, Kumar P, Kumar R: Contribution of Male Contraception in World Population. *J Pharm Sci & Res*, 2010; 2(7): 384-93.
- Amit Agarwal and Joshua J Allan Anti fertility Effects of Herbs Need for Responsible Reporting" *Journal of Ayurveda and Integrative Medicine*, 2010; 1(2):129-131.9.
- Andush Raj et al.: Anti fertility activity of Medicinal Plants on Reproductive system of Female Rat", *International Journal of Bio-Engineering Sciences & Technology*, 2011; 2(3):
- Kritikar K R, Basu B D: *Indian Medicinal Plants*. Edn 2, Vol I, Allahabad 1956; 171267- 270.
- Choudhury S, Ahmed R, Barthel A, Leclercq PA: Volatile oils of *Mesua ferrea* (L.). *Journal of Essential Oil Research* 1998; 10(5): 497- 501.
- Hayes, S.C., & Wilson, K.G: Acceptance and Commitment Therapy: Altering the verbal support for experiential avoidance. *The Behavior Analyst*, 1994; 17: 289-303.
- Mantok, C: Multiple usage of green papaya in healing at Tao garden, Tao garden Health spa and resort Thailand. Retrieved from: 2005;www.tao.garden.com.
- Udoh P, Kehinde A. Studies on anti fertility effect of pawpaw seeds (*Carica papaya*) on the gonads of male albino rats. *Phytother Res*. 1999; 13:226–228.
- Siddiqui AA, Ali M: *Practical Pharmaceutical chemistry*. Ist ed., CBS Publishers and Distributors, New Delhi, 1997; pp. 126-131.
- Khandelwal KR: *Practical Pharmacognosy*. Edn 14, Nirali Prakashan, Pune, 2005; 146– 156.
- Chase CR, Pratt RJ: Fluorescence of powdered vegetable drugs with particular reference to development of a system of identification. *J Am Pharmacol Assoc* 1949; 38: 32.
- Gledhil. D.N: "*Carica papaya*", *Journal of West African Tress*, (2009), Vol.10, No, 3.P.45.
- Nordin .K, Ahmad F.BH, Taufiq Y.YH.: Volatile components of methanol extract from the flower of Malaysian *Mesua ferrea* Linn. *Oriental Journal of Chemistry* 2004; 20(1): 69-72.

How to cite this article:

Naik NR and Indira P: Pharmacognostical Studies on *Mesua Ferrea*, *Carica Papaya*, *Asimum Sanctum* and *Tribulus Terrestris*. In *Royalaseema, A.P.. Int J Pharm Sci Res* 2015; 6(5): 2223-27.doi: 10.13040/IJPSR.0975-8232.6(5).2223-27.

All © 2013 are reserved by International Journal of Pharmaceutical Sciences and Research. This Journal licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

This article can be downloaded to **ANDROID OS** based mobile. Scan QR Code using Code/Bar Scanner from your mobile. (Scanners are available on Google Playstore)