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# Characteristics of pharmacognostical significance of *Erythrina variegata* var. and *Ficus racemosa* Linn. bark

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**ABSTRACT**

*The traditional medicine involves the use of different plant extracts or the bioactive constituents. The study such as ethno medicine keenly represents one of the best avenues in searching new economic plants for medicine. This type of study provides the health application at affordable cost. The present study carried out to find out the phytochemical constituents in the Ficus racemosa bark and Erythrina variegata bark. The Ficus racemosa and Erythrina variegata was collected from the Presidency campus Chennai, Tamilnadu. The shadow dried bark materials were grained and extracted with benzene, ethanol, ethyl acetate, and methanol and petroleum ether. Photochemical analysis was carried out according to standard procedures. Sugar, protein, alkaloids, flavonoids, sterols and glycoside were found to be present in the extracts.*

**Key Words:** *Ficus racemosa* and *Erythrina variegata* bark phytochemical.

## INTRODUCTION

Since ancient times, plants have been an exemplary source of medicine. Ayurveda and other Indian literature mention the use of plants in treatment of various human ailments. Plants have been the major source of drugs in Indian system of medicine and other ancient systems in the world. Earliest description of curative properties of medicinal plants is found in Rig-Veda.Charaka Samhita and Sushrusha Samhita give extensive description on various medicinal herbs. Information on medicinal plants in India has-been systematically organized [1-4]. India has an ancient heritage of traditional medicine. The Materia Medica of India provides a great deal of information on the folklore practices and traditional aspects of therapeutically important

natural products. Indian traditional medicines based on various systems including Ayurveda, Siddha, Unani and Homeopathy.

The evaluation of these drugs is primarily based on photochemical, pharmacological and allied approaches including various instrumental techniques such as chromatography, microscopy and others. With the emerging worldwide interest in adopting and studying traditional systems and exploiting their potential based on different health care systems, the evaluation of the rich heritage of traditional medicine is essential.

Photochemicals may protect human from a host of diseases. Phytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties[5]. Plant produces these chemicals to protect itself but recent research demonstrates that many photochemicals can protect humans against diseases. There are many phytochemicals in fruits and herbs and each works differently. [6]*Ficus racemosa* Linn (Moraceae) is an evergreen, moderate to large sized spreading, lactiferous, deciduous tree, without much prominent aerial roots found throughout greater part of India in moist localities and is often cultivated in villages for its edible fruit [7]. Different parts of *F. racemosa* are traditionally used as fodder, edible and ceremonial [8]. All parts of this plant (leaves, fruits, bark, latex, and sap of the root) are medicinally important in the traditional system of medicine in India. The astringent nature of the bark has been employed as a mouth wash in spongy gum and also internally in dysentery, menorrhagia and haemoptysis [9].The bark is antiseptic, antipyretic and vermicidal, and the decoction of bark is used in the treatment of various skin diseases, ulcers and diabetes. It is also used as a poultice in inflammatory swellings/boils and regarded to be effective in the treatment of piles, dysentry, asthma, gonorrhea, gleet, menorrhagia, leucorrhea, hemoptysis and urinary diseases [10]. Apart from the usage in traditional medicine, scientific studies indicate *F. racemosa* to posses various biological effects Such as hepatoprotective[11]chemopreventive[12],antidiabetic[13]anti inflammatory[14], antipyretic[15], antitussive[16], and antidiuretic[17]effects of *ficus racemosa*.

*Erythrina variegata* (Fabaceae) is a medium-sized deciduous small tree with prickly stems and branches, leaves with triangular leaflets and large coral red flowersand grows all over Bangladesh. The bark of the plant is astringent, febrifuge, anti-bilious and anthelmentic. It is also useful in opthalmia and skin diseases. [18] Different parts of *E. Variegata* have used in traditional medicine as nervine sedative, febrifuge, anti-asthmatic and antiepileptic. [19] In the some experiments, it has potential effects for treatment of some diseases like convulsion, fever, inflammation, bacterial infection, in somnia, helminthiasis, cough, cuts and wounds. [20], [21], [22], [23] *Erythrina* has been used in folk medicine for treatment of in somnia malaria fever, venereal disease, asthma and toothache. South American Indians used *Erythrina* as a fish poison. In addition, there are reports of its use as a narcotic and antihelminthic.effects of *Ficus racemosa* and *Erythrina variegata* barks. Hence the present study has been made to investigate the phytochemical screening of the *Ficus racemosa* and *Erythrina variegate* barks. [24]

## EXPERIMENTAL SECTION

### Plant Material

*Ficus racemosa* and *Erythrina variegata* barks are collected from Presidency college campus Chennai, Tamil Nadu. They were washed with tap water, rinsed with distilled water and cut in to

small fragments and shade dried until the fracture is uniform and smooth. Then the dried plant material was powdered. Then the final uniform powder was used for the extraction of active constituents of the plant.

**Preparation Extract**

The dried powder material was extracted and dematerialized water successively in a Soxhlet apparatus. The extracts were filtered while hot and concentrated under reduced pressure. The practical and % yields of the ex- tracts were calculated. Different types of polar solvents like Ethanol Methanol [High polar solvent], Ethyl acetate, and Petroleum ether [moderate], Benzene, [low polar solvent] were used for the extractions. These extracts were used for the detection of photochemical analysis and Thin layer Chromatography [TLC]

**Pharmacagnostic Evaluations**

**Ash value**

Weigh 2-4 g of the sample accurately in previously ignited and tarred silica dish. Spread the material evenly and ignite in a muff furnace at 600ºc until it is white, indicating absence of carbon. Cool the dish in desiccators and weigh. If carbon free ash cannot be obtained in this manner, cool the dish and moister then residue with about 2ml of water or a saturated solution of Ammonium nitrate. Dry on a water- bath, and then ignite in the muffle furnace to constant weigh. Calculate the percentage of total ash of air-dried material.

**Acid insoluble ash**

The ash obtained as described in the determination of total ash. To the dish containing the total ash, add 45ml of 1:5 HCL in three portions of 15ml each time, boil gently for 5minutes and filter. Collect the insoluble matter on an ash less filter paper [Whatman no.41] and wash with distilled water until the residue is free from acid. Transfer the filter paper containing the insoluble matter to the original dish, dry and ignite to constant weight. Cool the dish in a desicator, and then weigh. Calculate the percentage of Acid insoluble- ash of the air-dried material.

**Alcohol Soluble extract**

Weigh accurately 4g of the sample in a glass stoppered flask. Add 100ml of alcohol [approximately 95%] shake occasionally for 6hrs and then allow stand for 18hrs. It was then filter rapidly taking care not be lose any solvent and pipette out 25ml of the filtrate in pre-weighed 100ml beaker and evaporate to dryness on a water 105ºc for 6hrs, cool in a desiccators for 30minutes and weigh. Calculate the percentage of alcohol extractable matter of the sample.

**Water Soluble extract**

Weigh accurately 4g of the sample in a glass stoppered flask. Add 100ml of chloroform water [95ml of water+5ml of Chloroform] shake occasionally for 6hrs and then allow to stand for 18hrs. It was then filter rapidly taking care not be lose any solvent and pipette out 25ml of the filtrate ina pre-weighed 100ml beaker and evaporate to dryness on a water 105ºc for 6hrs, cool in a desiccators for 30minutes and weigh. Calculate the percentage of alcohol extractable matter of the sample.

**TLC [Thin layer Chromatography]**
4g of the samples were soaked in 40ml of alcohol and kept overnight. The solutions were boiled for 10minutes, filtered, concentrated and made up to 10ml in a standard flask. 5, 10, 15µlof these solutions were spotted on Merck Aluminum plate pre-coated with silica gel 60 F254 of 0.2mm thickness using Linomat IV applicator. The plates were developed in Toluene: Ethyl acetate 5:2. The plates were dried and viewed under UV 254 and 366 nm. The plates were then dipped in Vanillin- Sulphuric acid reagent and heated at 105º C till the colour of the spots appeared.

**Qualitative Phytochemical Analysis**
**Test for Alkaloid**
Five ml of extract was taken in acetic acid and 2ml of freshly prepared Dragendroff's reagent to be added. An n orange or red precipitate shows the presence of alkaloids.

**Test for triterpenoids [Noller's Test]**
One ml of extract with tin and thionyl Chloride[1ml] were added. Heat in a water- bath. Purple colour shows the presence of triterpenoids.

**Test for Steroids [Liebermann – Bur chard's Test]**
One ml of extract 0.5ml of Chloroform, 5ml of acetic acid, heat, add 5ml of acetic anhydride and add conc. Sulphuric acid. Green Colour shows the presence of Steroids.

**Test for Flavonoids [ Shinadow's Test]**
One ml of extract, 5-10drops of dilute HCL was added followed by a small amount Mg and the solution was boiled in a water- Bath for a few minutes. Mejanta colour shows the presence of Flavonoids.

**Test for Carbohydrates [sugar]**
Extract was treated with anthrone and Conc. Sulphuric acid. Heat ina water- bath. Green colour shows the presence of sugar.

**Test for Quinones**
One ml of extract 1ml of Conc. Sulphuric acid was added. Formation of red colour shows the presence of Quinones.

**Test for Phenols**
One ml of the extract, 2ml of distilled water was added followed by few drops of 10% aqueous ferric chloride. Appearance of blue or green colour indicates the presence of phenols.

**Test for Saponin**
One ml of extract was diluted to 5ml of water was added and the tube was shaken vigorously. Formation of honey comb, like froth indicates the presence of saponins.

**Test for Tannin**
One ml of extract was diluted to 5mlwith distilled water in a tube and to this a few drops of led acetate solution (1%) was added. A white precipitate indicates the presence of tannin.

**Table 1 - The analysis of Standardization in the *Ficus racemosa* and *Erythrina variegata* Bark**

| S.No | Parameters | *Ficus racemosa* | *Erythrina variegata* |
|---|---|---|---|
| 1. | Ash(%w/w) | 10.43 | 9.38 |
| 2. | Acid insoluble ash (%W/W) | 0.33 | 0.50 |
| 3. | Water –soluble extractive (% w/w) | 8.52 | 8.10 |
| 4. | Alcohol–soluble extractive (% w/w) | 10.01 | 2.74 |
| 5. | Loss on drying at 105ºc(%w/w) | 10.45 | 9.82 |

**Table 2 - The analysis of phytochemicals in the different organic extracts of *Ficus racemosa* and *Erythrina variegatea* Bark**

| Phytochemicals | Bark | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Ficus racemosa* | | | | | *Erythrina variegata* | | | | |
| | B | E | EA | M | PE | B | E | EA | M | PE |
| Alkaloid | + | - | + | - | + | + | - | + | + | + |
| Triterpenoids | - | + | - | + | + | - | + | - | + | + |
| Flavonoids | + | + | + | + | + | + | + | + | + | + |
| Carbohydrates | - | + | - | + | - | - | + | - | + | - |
| Quinones | - | + | + | + | + | - | + | - | + | + |
| Phenols | + | + | + | + | + | + | + | + | + | + |
| Saponin | - | + | - | + | + | - | + | - | + | + |
| Tannin | - | + | - | + | - | - | + | + | + | - |
| Steroid | + | + | + | - | + | + | + | + | + | + |
| Saponins | - | + | - | + | + | + | - | - | + | + |

*+ = presence; - = Absence; B = Benzene; E = Ethanol; EA = Ethyl acetate; M = Methanol; PE = Petroleum ether.*

**Table 3a TLC of *Ficus racemosa* bark**

| S.No | 254 nm | | 366nm | | With spray reagent | |
|---|---|---|---|---|---|---|
| | Colour | Rf | Colour | Rf | Colour | Rf |
| 1. | - | - | Blue | 0.07 | - | - |
| 2. | Green | 0.42 | Blue | 0.14 | Bluish grey | 0.42 |
| 3. | Green | 0.51 | Pink | 0.68 | Bluish grey | 0.54 |
| 4. | Green | 0.61 | Blue | 0.78 | Pale violet | 0.59 |
| 5. | Green | 0.80 | Pink | 0.80 | Pale violet | 0.71 |
| 6. | - | - | Pink | 0.85 | Pale violet | 0.75 |
| 7. | Green | 0.92 | Pink | 0.90 | violet | 0. 92 |

**Table -3b TLC of *Erythrina variegata* bark**

| S.No | 254nm | | 366nm | | With spray reagent | |
|---|---|---|---|---|---|---|
| | Colour | Rf | Colour | Rf | Colour | Rf |
| 1. | Green | 0.28 | Pink | 0.07 | Grey | 0.26 |
| 2. | Green | 0.32 | Blue | 0.11 | Grey | 0.35 |
| 3. | - | - | Blue | 0.28 | Grey | 0.39 |
| 4. | Dark green | 0.42 | Blue | 0.37 | Grey | 0.44 |
| 5. | - | -- | Pink | 0.53 | Grey | 0.51 |
| 6. | Dark green | 0.60 | - | - | Grey | 0.56 |
| 7. | Dark green | 0.63 | - | - | Blue | 0.61 |
| 8. | Green | 0.75 | Blue | 0.74 | Blue | 0.67 |
| 9. | - | - | Pink | 0.79 | Grey | 0.70 |
| 10. | - | - | Pink | 0.82 | Grey | 0.77 |
| 11. | Green | 0.88 | Pink | 0.90 | Grey | 0.95 |

## RESULTS AND DISCUSSION

Characteristics of pharmacogonstical significance *Ficus racemosa* and *Erythrina variegata* barks shows, total ash, acid insoluble ash, loss on drying, Alcohol soluble extractive value, water soluble extractive value, determined. The standardization values of *Ficus racemosa* bark was had higher values than *Erythrina variegata* are given in Table-1. Different parts of *Erythrina* species havebeen used in traditional medicine in the treatmentof some pathologies due to their analgesic,diuretic, sedative or antiviral properties [25]. Flavonoids and pterocarpans have been isolated from *E. glauca* Willd. and *E. lysistemon* Hutch. These compounds inhibited the cytopathic effects of *in vitro* Human ImmunodeficiencyVirus type 1 infection in a human T-lymphoblastoidcell line [26, 27] *Ficus racemosa* roots are frequently used as a herbal remedy for an array of human disorders including used in Ayurveda for the treatment of diarrhea, dysentery piles, rheumatism,skin disorders like sores, teeth disorders, to boost immune system and as a hypoglycemic agent. Literature reports that the number of uses likes anthelmentic, astringent, antidiabetic and anti-inflammatory activity of this plant. [28] Roots of Ficus bengalensis show anthelmintic activity. The extracts also reported to inhibit insulinase activity from liver and kidney. Fruit extracts exhibits anti-tumour activity [29]. The fruit extracts *of F. sycomorous* L., *F. benjamina* L., *F.bengalensis* L. *and F.religiosa* L. exhibit antitumour activity [30].The various extracts of *Ficus racemosa* and *Erythrina variegata* barks showed the presence of Phytochemical constituents namely alkaloids, flavonoids, saponins, tannins have hypoglycemic activities; anti-inflammatory activies. [31] Previous reports revealed that saponins possess shypocholestreolemic and antidiabetic properties [32]. Steroids, triterpenoids and Saponins of *F. racemosa* showed the analgesic properties and central nervous system activities [33, 34, and 35]. The present study exhibited that the about said organic compounds were identified in different solvent extracts of *Ficus racemosa* and *Erythrina variegata* are shown in table -2. TLC of *Ficus racemosa* and *Erythrina variegata* barks are shown in Plate – I and Table – 3a&b.

## CONCLUSION

Since the study was conducted in a controlled manner, the phytochemical results can be used for the standardization of the above mentioned drugs. A preliminary screening and more research has to be undertaken to explore the wonderful therapeutic properties of these medicines. To conclude the presence study, we have found that most of the biologically active phytochemicals were present in the ethanolic extract of the *Ficus racemosa* and *Erythrina variegata* barks.

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