STUDIES ON SOME PHARMACOGNOSTICAL PROFILE OF
FICUS RACEMOSA LINN (FAM. MORACEAE) LEAVES
Subhash C. Mandal Pulok K. Mukherjee, Kakali Saha,
M. Pal And B.P. Saha
Department of Pharmaceutical Technology, Faculty of Engineering and Technology Jadavpur University
Calcutta - 700032

Received: 26th January, 1997
Accepted 22nd June, 1999

Abstract: The Macroscopic character of the leaves ash values, extractive values, behaviors on
treatment with different chemical reagents, fluorescence characters under ultra violet light after
treatment with different chemical reagents of the powdered leaves of ficus racemosa Linn (fam.
Moraceae) were studied to fix some pharmacognostical parameters. Preliminary phytochemical
studies on different extractives of the leaves were also performed. These studies will help in
future for identifying this plant for further research.

INTRODUCTION:

Ficus racemosa Linn Syn Ficus glomerata
Roxb (fam Moraceae) is a well known
moderate sized to large spreading tree
distributed throughout the greater part of
India in most localities, also found on rocky
slopes, often cultivated in the villages of
west Bengal, India, for its edible fruits
(anonymous 1952). The leaves of Ficus
racemosa are used in dysentery, bilious
affection, and as a mouth wash in spongy
gum, roots are used in dysentery and
diabetes fruits are used as stomachic,
carmine and also used in dysentery,
menorrhagia as a mouth wash in spongy
gum and in haemoptysis, it’s milky juice is
used in piles and diarrhoea (Nadkarmi et al.,
1976; Chopra et al, 1958; Kirtikar and Basu
1975).

Considering its various therapeutic efficacy
and use in traditional practices in India it
was thought desirable to fix some
pharmacognostical parameters for further
identification on the plant material. That is
why the present study was undertaken which
deals with the studies on some important
pharmacognostical properties of the leaves
as a whole and its powdered form are being
reported hereunder.

MATERIAL AND METHODS

Plant Material: the leaves of Ficus
racemosa were collected from Hetyasole,
Bankura district of west Bengal India,
during the month of July and August.
Taxonomic identification of the plant
(reference No. CNH/ 7-3 (20)/ Tec.II/
995/239) was performed by central national
Herbarium, Botanical survey of India,
Shibpur, Howrah. The specimen sample as
been kept in our laboratory for future
reference. The leaves were shade dried,
pulverized by a mechanical grinder passed
through a 40 mesh sieve and stored in a well
closed container for further use.

Pharmacognostic study: In the
macroscopic studies the size shape,
margin, apex, venation, colour, odour, taste
and the texture of the leaves were observed
(Wallis 1985). The as values of leaves were
performed by pharmacopoeial methods
(Anonymous 1966). Extractive values
starting from petroleum ether (60-80°),

benzene, chloroform, acetone and methanol were successively determined by using, soxhlet extraction apparatus. The alcohol (90%) and we resoluble extractive were determined after evaporation of the solvent under reduced pressure. The behavior of the powdered leaves with different chemical reagents were studied and the fluorescence characters were also observed under ultra violet light at 254 nm (Raghunathan and Mitra 1982).

Preliminary phytochemical studies of different extractives were performed by specific reagents (Trease and Evans 1985, Tyler et al., 1988) and tin layer chromatographic study of t petroleum ether (60-80o) extract was performed (Stah 1 1969) as a white crystalline steroidal compound has been isolated from it.

RESULTS AND DISCUSSION

A twig showing macroscopical characters of leaves of *Ficus racemosa* Linn. Has been sown in fig 1 the macroscopic characters of the leaves has been sown in Table 1. The physical constant values like total ash, acid insoluble ash, alcohol (90%) and water soluble extractive are reported in Table 2. Te water soluble extractive is more as compared to alcohol (90%) soluble extractive. The extractive values obtained after successive extractive extraction has been reported in Table 3. The chloroform extract sown minimum extractive value.

The results of preliminary phytochemical tests for the presence of active metabolites has been reported in Table 4. The presence of steroid, saponin, tannin, flavonoid and reducing sugar has been confirmed in the extractives of the leaves of *Ficus racemosa*.

Thin – layer chromatographic study on the petroleum ether extract sowed the presence of steroids (Table 5). White crystalline storidal compound has been isolated from it and characterization of the same is under process in our laboratory. The behavior of the powdered leaves on treatment with different chemical regent and the fluorescence characters of the same ultra violet light has been shown in table 6 and table 7 respectively.

All these facts conclusively proves the presence of steroidal compound in petroleum ether extract and fixes some parameter for pharmacognostical identification of the leaves for further studies.

ACKNOWLEDGEMENT

The authors wish to thank west Bengal state Government for financial help to subhash C. Mandal for this work (Ref. No P-1/RS/165/95) and authority of Jadavpur University for providing all facilities. The authors also thank to Mr. K.C. Malick (Dy. Director) central national Herbarium, Botanical Survey of India, Shibpur, Howrah, for identification of the plant specimen.

| Table 1: Macroscopic character of *Ficus racemosa* Linn. Leaves. |
|---------------------------------------------------------------|
| **Description**                                              |
| **Size**                                                      |
| Lamina: Length 7-17cm, Breadth 3-7 cm, Petiole: 3.2-8 cm     |
| **Shape**                                                     |
| Ovate, Ovate- Lanceolate                                     |
| **Margin**                                                    |
| Entire                                                       |
### Apex
- Venation: Acute
- Colour: Reticulate
- Odour: Green (fresh), greenish brown (dried)
- Taste: Not significant
- Texture: Slightly acrid, Smooth, papery, glaucous

### Table 2: Physical constant values of *Ficus racemosa* Linn. Leaves

|                          | Percentage* |
|--------------------------|-------------|
| Total ash                | 11.863      |
| Acid insoluble ash       | 1.508       |
| Alcohol (90%) soluble extractive | 16.572   |
| Water Soluble extractive | 19.107      |

* Each value is an average of three determinations.

### Table 3: Extractive values of the *Ficus racemosa* Linn. Leaves

| Solvent                | Percentage of extractive Values* | Colour of extractive |
|------------------------|---------------------------------|----------------------|
| Petroleum ether (60-80o) | 6.433                           | Greenish             |
| Benzene                | 1.091                           | Green                |
| Chloroform             | 1.776                           | Brownish             |
| Acetone                | 8.451                           | Brown                |
| Methanol               | 12.925                          | Brown                |

* Each value is an average of three determinations.

### Table 4: Preliminary phytochemical tests for the presence of active metabolites in the *ficus racemosa* Linn leaves. All extractive were negative for alkaloid and anthraquinone.

| Extractive              | Reducing sugar | Flavonoid | Tannin | Steroid | Saponin |
|-------------------------|----------------|-----------|--------|---------|---------|
| Petroleum ether (60-80o) | -              | -         | -      | +       | -       |
| Benzene                 | -              | -         | -      | +       | -       |
| Chloroform              | -              | -         | -      | +       | -       |
| Acetone                 | +              | +         | +      | +       | +       |
| Solvent system                  | No of spots | Rf values | Colour in naked eyes | Colour under UV light | Colour after spray and heat |
|--------------------------------|-------------|-----------|----------------------|-----------------------|-----------------------------|
| Methanol + Alcohol + Water +   | 1           | 10.58     | Yellowish            | Pink                  | Violet<sup>a</sup>           |
|                                | 2           | 0.73      | Yellow               | Pink                  | Violet<sup>a</sup>           |
|                                | 3           | 0.86      | Light green          | Pink                  | Violet<sup>a</sup>           |
|                                | 4           | 0.93      | Yellow               | Pink                  | Violet<sup>a</sup>           |
| Toluene: ethyl acetate (9:1)   | 1           | 0.12      | Yellow               | Pink                  | Blue<sup>b</sup>            |
|                                | 2           | 0.19      | Yellow               | Pink                  | Blue<sup>b</sup>            |
|                                | 3           | 0.47      | Greenish             | Pink                  | Blue<sup>b</sup>            |
|                                | 4           | 0.58      | Greenish             | Pink                  | Blue<sup>b</sup>            |
|                                | 5           | 0.91      | Yellow               | Pink                  | Blue<sup>b</sup>            |
| Chloroform: Acetone (19:1)     | 1           | 0.37      | Yellow               | Pink                  | Violet<sup>c</sup>          |
|                                | 2           | 0.48      | Yellow               | Pink                  | Violet<sup>c</sup>          |
|                                | 3           | 0.73      | Greenish             | Pink                  | Violet<sup>c</sup>          |
|                                | 4           | 0.79      | Greenish             | Pink                  | Violet<sup>c</sup>          |
|                                | 5           | 0.87      | Yellow               | Pink                  | Violet<sup>c</sup>          |

* Stationary phase – Silic gel G; room temperature 310°C

a= Colour after spraying with vanillin – phosphoric acid
b= Colour after spraying with Phosphomolybdic acid
c= Colour after spraying with Libermann-burcard reagent

**Table 5:** Thin-layer chromatographic characterization of petroleum ether (60-800) extract of ficus racemosa leaves *

| Reagent                          | Behaviour of powder |
|----------------------------------|---------------------|
| Picric acid (saturated aqueous solution) | Yellowish           |
| Nitric acid (specific gravity 1.42)       | Brick red           |
| Hydrochloric acid (specific gravity 1.16)     | Brownish            |
| Sulphuric acid (80%)                | Greenish            |
| Glacial acetic acid               | Yellowish           |
| Treatment                                           | Fluorescence   |
|----------------------------------------------------|----------------|
| Powder mounted with nitrocellulose                 | Bluish         |
| Powder treated with sodium hydroxide in methanol   | Greenish       |
| Powder treated with sodium hydroxide in methanol – dried and mounted with nitrocellulose | Greyish         |
| Powder treated with hydrochloric acid              | Reddish        |
| Powder treated with hydrochloric acid - dried and mounted with nitrocellulose | Greyish |
| Powder treated with sodium hydroxide in water      | Blackish       |
| Powder treated with sodium hydroxide in water- dried and mounted with nitrocellulose | Blackish |
| Powder treated with nitric acid diluted with equal volume of water | Bluish         |
| Powder treated with sulphuric acid diluted with equal volume of water | Brownish |
| Powder treated with antimony trichloride           | Bluish         |
| Powder as such                                      | Greyish        |

**Table 7:** Fluorescence characters of the powdered leaves of *Ficus racemosa* Linn under ultra violet light.

**REFERENCE:**

Anonymous, pharmacopoeia of India, manager of publication, ministry of health, Government of India, Delhi, 2nd ed. 947 – 948 (1966)

Anonymous, the wealth of India, raw materials, council of scientific and industrial research, New Delhi, vol IV 35- 36 (1952)
Chopra R.N., chopra I.C., Handa K.L. and kapur, L.D Indigenous drugs of India, academic publisher, Calcutta, 2nd ed., 508, 674 (1958).

Kirtikar, K.R. and Basu B.D. Indian medicinal planets, Bishen singh mahendra Pal singh dehra dun, 2nd ed vol III 2327, 2329 (1975).

Nadkarni, K.M. Nadkarni, A.K and chopra. R.N. Indian material medica pollular prakashan Bombay, Vol I, 548 – 550 (1976).

Raghunathan, K and mitra R., Pharmacognosy of indigenous drugs, central council for research in Ayurveda and siddha, New Delhi Vol II 752-754 (1982).

Stahl, E. Thin-layer chromatography springer-vierlag, New York, 329 – 334 (1969).

Trease, GE. And evans, W.C., Pharmacognosy, ELBS Publication, 12th ED., 344, 539-540 (1985)

Tyler, V.E., Brady, L.R. and Robbers J.E., Pharmacognosy, Lea & febiger publication, Philadelphia, 9th ed. 77-78 (1988).

Wallis, T.E. Textbook of pharmacognosy, CBS Publication 5th Ed., Delhi, 104 -105 (1985) Table 1.