Pharmacognostical studies on *Vata shrung,* (**Ficus benghalensis** Linn. leaf primordium)

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Received 29 June 2004; revised 17 March 2006

The present communication deals with pharmacognostical and preliminary phytochemical studies on the leaf primordium of *Ficus benghalensis,* which is used in *Pumsavana Samskar* of Ayurvedic System of Medicine. Different plants parts are used to cure number of diseases in indigenous system of medicine. No reports are available on microscopical and phytochemical studies, hence, the present attempt was undertaken to investigate the microscopical and preliminary phytochemical studies. The study revealed the presence of simple starch grains, clustered calcium oxalate crystals, patches of rounded to polygonal stone cells with lignified cell walls, broad and narrow lumen, thick walled cells, abundant unicellular trichomes and brown tannin content.

**Keywords:** *Ficus benghalensis,* Indigenous medicine, Karnataka, Leaf primordium, Medicinal plants, Pharmacognostical characters, Phytochemical studies, *Vata shrunga*


*Vata* is a large semi deciduous tree reaching a height of 21m or more with a stout girth attaining 7-9m. Tender shoots are pubescent, large number of aerial roots develops from the branches. Leaves are in clusters, alternate, stipulate and rounded or subcordate at the base. *Ficus benghalensis* is commonly found throughout India, grows wild on the sub Himalayan tracts, Circar Mountains, lower slopes of the deccan hills and Malabar coasts in deciduous and semi evergreen forests. It is grown in gardens and roadsides for shade (Fig. 1).

*Ficus benghalensis* Linn. known as *Vata* in Sanskrit, is one of the reputed *Panchavalkala* drugs of Ayurveda. Different parts of the plant are used for various medicinal purposes. The leaf primordium (leaf bud) is known as *Vata shrunga* in Ayurvedic System of Medicine (Fig. 2). As per Ayurveda *Nighantus,* *Vata shrunga* has the property of curing *daha* (burns), *thrishna* (thirst), *moorcha* (faintness), *raktapitta* (haemorrhage), *kapha* and *pitta.* According to Charaka, the tender leaf buds and shoots of *vata* (*Ficus benghalensis,* and *kasamari* (*Gmelina arborea* Roxb.) are prescribed in haemorrhage. Infusion of young buds is useful in dysentery and diarrhoea. Concentrated juice of young leaf buds and fruits is an aphrodisiac and of much value in spermattorohoea and gonorrhea.

The leaf primordium of *vata* is used in traditional healthcare system of medicine for many diseases like diarrhoea, vomiting, thirst, *pumsavana samskara* conception and *pradara.* In case of diarrhoea, leaf buds of *vata* (*Ficus benghalensis,* *udumbara* (*Ficus glomerata* Roxb.) and *vattha* (*Ficus religiosa* Linn.) are crushed and kept in hot water for a day. The extract added with ghee and cooked with half part of sugar and quarter part of honey checks bleeding (*raktha stambana*). During vomiting, decoction made from the tender leaves of *jambu* (*Syzygium cumini* Skeels) and *Amra* (*Mangifera indica* Linn.), *Usira* leaf bud (*Vetiveria zizanoides* Nash) and prop roots of *Vata* (*Ficus benghalensis*) mixed with honey is taken internally to alleviate vomiting, fever, diarrhoea, fainting and thirst.

In case of *pumsavana samskar,* two intact healthy tender leaf- buds of *vata* (*vata shrunga*) plucked from two eastern or northeren branches of banyan tree grown in cow shed, along with two healthy seeds of *dhanya masa* (*Vigna mungo* Hepper) and *gaura sarsapa* (*Brassica campestris* Hook. f. & Thoms.) is taken with curd during *pushya naksatra.* The woman is administered before the manifestation of sex in the foetus in the third month after conception. Another method of drug 3–4 drops of expressed juice of *Laksmana* (*Ipomoea maxima* G. Don), *vata shrunga*
leaf buds of *Ficus benghalensis*, *Sahadeva* (*Vernonia cinerea* Less.), *viswadeva* (*Sida alba* Linn.) pelsted with cow milk should be instilled in right nostril by the woman.

Similarly, *vata shrunga* helps in the achievement of conception. In case of conception, leaf buds should be collected in bright fortnight and in pushya constellation, the women should instill herself in right or left nostril root juice of *swetabrhata* (*Solanum melongena* Linn.), leaves of *utpala* (*Nymphaea nouchali* Burm.f.) and *kumuda* (*Nymphaea alba* Linn.), root of *laksmana* (*Ipomoea sepiaria*) and 8 *vata shrunga* (*Ficus benghalensis*). After instilling it in to nostril the woman should take rice and milk for five days before the marital relations. In another method, root of *Laksmana* (*Ipomoea maxima*) pelsted with cows milk should be taken orally or through nostrils. Leaf buds of *vata* are also used in case of *pradara* (excessive discharge of menstrual blood), where leaf buds of *kasmarya* (*Gmelina arborea*), *vata* (*Ficus benghalensis*) and *danti* (*Baliospermum montanum* Muell.-Arg.) cooked in ghee separately is administered. Since, the leaf buds are having medicinal values, an attempt was made to investigate the pharmacognosy of the leaf buds of *Ficus benghalensis*.

**Methodology**

Fresh materials of leaf primordia of *Ficus benghalensis* Linn. were collected from the surroundings of Bangalore in the month of July to August. For microscopical studies, free hand sections of fresh leaf primordium were cut, cleared with chloral hydrate solution and water, and stained with safranin according to the prescribed methods. A drop of HCl and phloroglucinol were used to detect the lignified cells in the cut sections and in the powder drug. Photomicrographs were taken. Powder of the dried leaf primordia was used for chemical analysis. Physicochemical studies and preliminary phytochemical screening of the drug were carried out. The fluorescence behaviour of the powdered drug in different solutions towards the ordinary and ultraviolet lights was carried out. TLC studies of the petroleum ether at 60-80°C, and benzene, chloroform and ethanol extracts were carried out in various solvents at 30°C using silica gel G as adsorbant.

**Results and discussion**

Macroscopically, fresh leaf primordium shows a thick outer covering, which is light green in colour and small leaf primordia arranged alternatively. In general, leaf primordia occur in predictable positions with the site of the next primordia being specified by the location of the most recently appearing primordial like. The arrangement of LPS around the circumference of shoot apical meristem is as phyllotaxy. Shoot apical meristem is the site of small cellular out growth, called leaf primordial that develops into leaves. Leaf primordium measures 2-4 cm in length with 0.4-0.6 mm in width. In dry conditions, it is dark brown in colour with abundant trichomes on outer surface. Odour is agreeable and taste is slightly bitter. In transverse section, it shows different sequence of arrangements in concentric rings with the increase in the number of leaf primordia and with almost similar to microcellular details (Figs. 2-15).

Epidermis is single layered with abundant uniseriate trichomes. Ground tissues are multilayered with thin walled, elongated, compactly arranged parenchymatous cells, and small, compactly arranged or loosely arranged rounded parenchymatous cells with chloroplast. Simple starch grains are clustered with crystals of calcium oxalate. Later, these cells develop into palisade and spongy parenchymatous tissues. In between the rounded parenchymatous cells, continuously arranged small rounded vascular bundles with poorly developed xylem and phloem is present (Figs. 4-23). Different types of stone cells with thick walled are also present. Stone cells are elongated and rectangular with broad and narrow lumen along with lignified walls (Figs. 5, 8 10 & 17). TS of the middle and basal region show almost similar structures except in the development of leaf structures with the differentiation of midrib and laminar region. Chemical and organic analysis (Table 1), fluorescence studies (Table 2) and chromatographic studies (Table 3) of leaf primordium have been discussed (Fig. 3)

**Diagnostic characters of leaf primordium**

1. Presence of alternate arrangement of leaf primordia in different stages.
2. Presence of abundant and clustered crystals of calcium oxalate in the parenchymatous cells.
3. Presence of thick walled, rounded to polygonal stone cells (55-80-95x 25-45-50µ) with heavily lignified cell wall with broad and narrow lumen.

Presence of rounded to elongated parenchymatous cells with simple starch grains (15-25-40µ) and brown content of tannin.
Presence of abundant uniseriate trichomes on upper side of the epidermis.

**Conclusion**

The pharmacognostical and phytochemical studies carried out on the leaf primordium of *Ficus benghalensis* (*vata shringa*), used in the traditional system of medicine for *garbha sthambana* and *pumsavana samskar* will be of immense use in carrying out further research and revalidation of its use in Ayurvedic System of Medicine.

**Acknowledgement**

The authors are thankful to the Director, CCRAS, New Delhi for encouragement and facilities; Assistant Director, Ayurveda R R I Bangalore for encouragement, and Smt Azra Yasmin, R A (Botany) for the photographs.

**References**


