



E-ISSN: 2278-4136  
P-ISSN: 2349-8234  
JPP 2015; 4(2): 241-243  
Received: 05-05-2015  
Accepted: 08-06-2015

#### Lisona Elias

PG scholar, Department of Dravyaguna, SDM College of Ayurveda, Tanniruhalla, BM road, Hassan, 573 201, Karnataka, India.

#### Pradeep

Associate professor, Department of Dravyaguna, SDM College of Ayurveda, Tanniruhalla, BM road, Hassan, 573 201, Karnataka, India.

#### Harini A

Associate professor, Department of Dravyaguna, SDM College of Ayurveda, Tanniruhalla, BM road, Hassan, 573 201, Karnataka, India.

#### Prakash L Hegde

Professor & Head, Department of Dravyaguna, SDM College of Ayurveda, Tanniruhalla, BM road, Hassan, 573 201, Karnataka, India.

#### Correspondence:

##### Lisona Elias

PG scholar, Department of Dravyaguna, SDM College of Ayurveda, Tanniruhalla, BM road, Hassan, 573201, Karnataka, India.

## *Curcuma angustifolia* Roxb (Tavaksheeri): A Review

**Lisona Elias, Pradeep, Harini A, Prakash L Hegde**

#### Abstract

*Curcuma angustifolia* Roxb is a fast growing annual herb. In India it is commonly known as Tikur or Tavaksheeri. Rhizome is the used part and it is demulcent, nutritious, contains starch which is used for children due to easily digestible. It is an excellent diet in the form of conjee in case of Dysentery, Dysuria, Gonorrhoea etc.

**Keywords:** *Curcuma angustifolia*, phytochemistry, research works.

#### Introduction

Medicinal plants have various metabolites in them. Because of these principles they are widely used in the entire world by the people to cure various ailments. India's use of plants for health care dates back close to 5000 years. About 8000 herbal remedies have been codified in the Ayurveda, which are still in use. Among them Tavaksheeri is a drug used in many disorders due to its various pharmacological activities.

Tavaksheeri is an herb belongs to Zingiberaceae family, found at 3000-4000 ft in the Himalayan ranges, it grows up to 90-180 cm in height. Tugakshiri is the name commonly used by brihatraye. Tavaksheeri is the starch obtained from the rhizomes of *Curcuma angustifolia*. Dalhana identified that tugakshiri is something which is quite similar to vamsalochana & now identified as *Curcuma angustifolia*. Vagbhata has mentioned it is a remedy for rakta pitta, tuberculosis, asthma, cough, burning sensation of the body. (A.Sa.Su.A-12/29)

#### Taxonomy

- Kingdom: Plantae
- Class: Liliopsida
- Subclass: Commelinidae
- Order: Zingiberales
- Suborder: Zingiberanae
- Family: Zingiberaceae
- Genus: *Curcuma*
- Species: *angustifolia*

#### Vernacular names <sup>[1-3]</sup>

- **Sanskrit** - Tavakshira, tavaksheera, payaksheera, tavakshiri, vamsalocana.
- **Hindi** - tekhur, tikhur, theksura, thavsasheera, thikora, thavakheera.
- **English** - East Indian arrow root, curcuma starch
- **Kannada** - Kaadu arrow root, kovegida, kove hitting gida, thavakeela.
- **Telugu** - gaddalu.
- **Tamil** - kisangu, araukizhangu, kooa, artimavu, kookai, kua.
- **Malayalam**-koova, kuva-kizhanna.
- **Tulu** - koove.
- **Konkani** - koovyajhaad.
- **Marathi** - tavakira, thavakheera, thavakil.
- **Gujarat** - tavkhir, tikhur
- **Bengali** - tikkur, keturihalodhi.

#### Habitat

A rhizomatous herb with small rootstock distributed mainly in the lower Himalayan ranges and in Kerala and to a small extent in the central and Eastern states <sup>[4]</sup>.

### Habit

*Curcuma angustifolia* Roxb. is a slender branched herb grows 90-180 cm in height with fleshy cylindrical rhizome [5].

**Stems-** Stems usually short, replaced by pseudostems formed by leaf sheaths.

**Leaves:** distichous, simple, those toward base of plant usually bladeless and reduced to sheaths; leaf sheath open; ligule usually present; petiole present or not, located between leaf blade and sheath, cushion like in *Zingiber*; leaf blade suborbicular or lanceolate to narrowly strap-shaped, glabrous or hairy, midvein prominent, lateral veins usually numerous, pinnate, parallel, margin-entire.<sup>6</sup> Inflorescence terminal on pseudostems or on separate, short, sheath-covered shoots arising from rhizomes, cylindrical or fusiform, sometimes globose, lax to dense, few to many flowered, sometimes a raceme or spike.

**Flowers:** bisexual, epigenous, zygomorphic. Calyx usually tubular, thin, split on 1 side, sometimes spathe like, Apex 3-toothed or lobed. Corolla proximally tubular, distally 3-lobed; lobes varying in size and shape, Stamens or staminodes 6, into whorls. Lateral 2 staminodes of outer whorl petaloid, or forming small teeth at base of labellum, Ovary inferior, 3-loculed initially, 1- or 3-loculed when mature; ovules ± numerous perlocule. Developed style 1, very thin, placed in a furrow in filament and between anther locules [7].

**Fruit**—capsule, fleshy or dry, dehiscent or indehiscent, sometimes berrylike [8].

**Seed**—small, arillate [9].

### Cultivation

This is cultivated from its tubers containing starch. Moist and cool situation at altitudes of 450m are suitable for the crop. Planted in late autumn and watered occasionally during the dry period. Harvesting done in January month. Tubers are washed and pulped and the starch separated from the fibre and other impurities by repeated washing and straining through a muslin cloth. The pure starch is then sun dried and ground into flour [10].

### Adulterants

It is often adulterated with other starches from tapioca, sweet potato and rice flour [11].

### Guna karma

Tavaksheeri is madhura rasa, laghu and snigdha guna and has sitavirya. It alleviates vata and pittadoshas. It is useful in shwasa, kasa, kushta, raktapitta, jwara, kamala, pandu, trishna, daha, kshaya, vana, aruchi and many other diseases [12-18]

### Phytochemistry

The plant *curcuma angustifolia* contains A & B -pinenes, (-) ar-curcumene, Zingiberol, (+) camphor. Plants rhizome contains chiefly starch, sugar, fat, resins, glucose & gum, (+) x-terpineol, (+) borheol, Zingiberol in rhizome oil.

**Root contains:** - D - cymarose, B -D- glucosyl 1- L-thebotose, cinnamic acid & acetic acid.

**Stem contains:** - Glycosides tenacissosidas A-E, Feronic acid – polyoxytregnanes, Marstenacigenins A & B dresgenin.

**Seeds contains:-** Dreboegenin, polyhydroxy, pregnanecissogenin, tenasogenin.

**Rhizomes contains:** - Sesquiterpenoids, curcumol, Zederone, Fyranodiene, Pyrocurzerenone, Procurcumenol, Curcumanolide A & B [19-21].

### Therapeutic uses

Being snehana and laghu, used as pathyaahara in koshthagatavata, athisara, pravahika & grahni. Rhizome – demulcent, nutritious, contains starch which is used for children due to easily digestible.

**External uses:** Stomatitis- the powder of rhizomes with honey applied on the mucous membrane of the oral cavity in stomatitis. It also promotes the healing of stomach ulcers.

### Internal uses

Good for Diarrhea, Dysentery and colitis as it is astringent. Raktapitta: - It alleviates the pitta dosha and has astringent property, helps to arrest bleeding. Oedema: - an effective remedy in oedema due to cardiac debility as it accords diuretic action. Rhizome is stimulant, carminative and stomachic. It is highly valued as an article of diet. It is an excellent diet in the form of conjee in case of Dysentery, Dysuria, Gonorrhoea etc. Useful in typhoid fevers, ulceration of the bowels & bladder. In case of difficult and painful micturition it can be used in the form of thin conjee prepared like barley water with milk & sugar added. It is nutritive and is used as an agreeable non irritating diet in certain chronic diseases during convalescence from fevers [22].

### Pharmacological activities

#### 1) Amlapitta

Starch obtained from the rhizomes of two plants viz., *Curcuma angustifolia* Roxb. (Fam. *Zingiberaceae*) and *Maranta arundinacea* Linn. (Fam. *Marantaceae*) are used as *Tugaksheeree*. The efficacy of *Tugaksheeree* was studied on 67 patients of *Amlapitta*. A total of 84 patients suffering from *Amlapitta* were selected from the O.P.D. and I.P.D. sections in the department of Dravyaguna, I.P.G.T. and R.A., Hospital, Jamnagar, and were randomly divided into two groups. Thirty four patients completed the treatment course in Group I, and 33 patients completed the treatment course in Group II. The efficacy of drug *Tugaksheeree* was studied through internal administration of the starches of *C. angustifolia* Roxb. (Fam. *Zingiberaceae*) in Group I and *M. arundinacea* Linn. (Fam. *Marantaceae*) in Group II with the dose of 4 g TID with water for 30 days. Both the drugs were found highly effective in treating *Amlapitta*. They significantly relieved the cardinal symptoms viz., *Avipaka*, *Tikta-amlodgara*, *Daha*, *Shoola*, *Chhardi* and the associated symptoms viz., *Aruchi*, *Gaurava*, *Udaradhmana*, *Antrakujana*, *Vitbheda*, *Shiroruja*, *Angasada*, and *Trit*. Statistically significant increase in body weight was

noticed in both the groups. This may be because the drugs corrected the *Agni* and acted as *Brihmana* and *Dhatupushtikara*. Both the drugs did not produce any side effects. Therefore, both these drugs (*C. angustifolia* Roxb. and *M. arundinacea* Linn.) can be used as substitutes for each other [23].

## 2) Cervical carcinoma

Anticancerous activity of plant extract was tested on cervical cancer cell line (HeLa). At a concentration of 694.20 µg/ml, the extracts exhibited effective anticancer activity towards HeLa cells, at this concentration the extract of *Curcuma angustifolia* exhibit cell viability 65.55%. Moreover, towards HeLa treated with paclitaxel (positive control) showed 44.44% viability at same concentration (694.20 µg/ml). The IC50 values for HeLa cells are calculated was 78.47 µg/ml. Conclusion: The study reveal that the methanolic rhizome extract of *Curcuma angustifolia* showed potential antioxidant, antimicrobial and anticancerous properties which could be exploited in preparation of herbal drugs with modern standard and safety [24].

## 3) Hepatoprotective activity

The hepatoprotective activity of *Tavaksheeri* (*Curcuma angustifolia* Roxb.) *kandachurnawas* tested against paracetamol induced hepatotoxicity in albino rats. The analysis of serum biochemical parameters shows that administration of paracetamol leads to significant change in majority of the parameters. The overall activity profile indicated reversal of important parameters like SGOT, SGPT, ALP, serum total cholesterol and serum triglycerides. The overall activity profile of *Tavaksheeri kanda churna* at therapeutic dose shows moderate to good protection and presence of good cytoprotective effect.

## Conclusion

Tavaksheeri (*Curcuma angustifolia* Roxb.) is a drug of choice to cure various ailments especially swasa, kasa, kamala, raktapitta, kushta, jwara, pandu, trishna, daha, kshaya, vrana, aruchi and many other diseases. Chemical constituents like alkaloids, tannins, steroids, saponinsetc were reported in *Curcuma angustifolia* Roxb. Various experiments proved its anti-cancerous, hepatoprotective etc.

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