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ORIGINAL RESEARCH ARTICLE

Pharmacognostical Study of *Ochrocarpus longifolius* Benth and Hook - A Substitute of *Mesua ferrea*

Kuntal Ghosh[*1], M.S.Baghel[2]

[1]*PhD Scholar, Department of Kayachikitsa, Institute of Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar – 361008, Gujarat, India*
[2]*Director and Professor, Institute of Post Graduate Teaching and Research in Ayurveda,Gujarat Ayurved University, Jamnagar – 361008, Gujarat ,India*

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ABSTRACT

Ochrocarpus longifolius Benth and Hook is commonly known as *Surapunnaga, Surangi, Lal Nagakeshar*. Proper description about *Surapunnaga* is not available in *Brihatrayee.*

The description of the plant as a substitute of *Mesua ferrea* is first time available in *Nighantu Adarsha* under *Nagapuspadi varga*. The properties (*Rasa, Guna, Virya, Vipaka*) of *Surapunnaga* are almost same as *Nagakeshara* and for this reason *Ochrocarpus longifolius* is used in various *Ayurvedic* preparatory medicines like *Sunthikhanda* and etc. The authentification & macroscopic study of the flower buds of *Surapunnaga* were done in the department of Pharmacognosy, I.P.G.T.& R.A., Gujarat Ayurveda University of Pharmacy, Jamnagar, Gujarat, India. Flowers have a very pleasant smell, which lasts even when the flowers dry up. *Ochrocarpus longifolius* exhibits antibacterial, antihelminthic, anti-inflammatory, anti-spasmodic & hypotensive activity.

Key words: *Ochrocarpus longifolius, Mesua ferrea, Surapunnaga, Surangi, Lal Nagakeshar, Nagakeshar.*

INTRODUCTION

Ochrocarpus longifolius[1] Benth and Hook & *Mammea longifolia*[2] Planch & Triana are commonly known as *Surapunnaga, Surangi, Lal Nagakeshar*. *Ochrocarpus longifolius* & *Mammea longifolia* are also sometimes referred to as *Nagakesara* and belongs to family Clusiaceae and Guttiferae respectively, found in the evergreen Western Ghats southwards from Konkan to Malabar and Coimbatore [3]. The plant is not described properly in *Brihatrayee* (*Charaka Samhita, Sushruta Samhita & Ashtanga Hridaya*). The description of the plant as a substitute of *Mesua ferrea* is first time available in *Nighantu Adarsha* under *Nagapuspadi varga*.

Ochrocarpus longifolius is a big tree with very pretty and glossy foliage. Tiny flowers are borne in clusters on the tree trunk and mature branches. Flowers have a very pleasant scent, which lasts even when the flowers dry up. The flowers appear in the hot weather and the fruits ripen during the rainy season. Fresh flowers of the tree are used for worship in temples and for personal adornment such as "*Gajara*". Dried flowers retain their fragrance for a long time, and could be extracted for perfume.

The properties (*Rasa, Guna, Virya, Vipaka*) of *Lala Nagkeshara* are almost same[3] as *Nagakeshara* but later is far better in quality. Now-a-days due to unavailability of *Mesua ferrea*, *Ochrocarpus longifolius* is going to be used in various *Ayurvedic* preparatory medicines.

AIMS & OBJECTIVES

1. Pharmacognostical Study of powered drug – Flower bud of *Surapunnaga*.
2. Review of *Surapunnaga* in *Ayurvedic* parlance.

MATERIALS & METHODS

The flower buds of *Surapunnaga* were collected in the month of July, 2011 from the Pharmacy of I.P.G.T. & R.A, Jamnagar, Gujarat Ayurved University. The authentification & macroscopic study of the plant were done in the department of Pharmacognosy, I.P.G.T.& R.A., Gujarat Ayurveda University of Pharmacy, Jamnagar, Gujarat, India. The flower buds were dried and fine powder was collected. The powder was subjected to powder microscopy.

***Corresponding Author:** Dr. Kuntal Ghosh**, Email:** vaidyakuntal@gmail.com, **Phone No:** +91- 9727221291

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PHARMACOGNOSTICAL STUDY:-

A. **SCIENTIFIC CLASSIFICATION :**

Kingdom: Plantae
Family: Clusiaceae
Genus: *Ochrocarpus*
Species: *O. longifolius*
Binomial name : *Ochrocarpus longifolius* Benth and Hook

Vernacular name:

Sanskrit: *Surapunnaga, Nameru, Suresta, Suraparnika, Suratunga*
Hindi: Lal Nagakeshara
Marathi: Surangi
Telegu : Surapunna
Tamil: Nagappu, Nagesarpu

B. **PARTS USED[4] :** Flower bud

C. **HABITAT [3]**: The plant is distributed in the evergreen Western Ghats southwards from Konkan to Malabar and Coimbatore lower Himalayan range.

D. **BOTANICAL IDENTIFICATION -**

I. Macroscopic Study:

Ochrocarpus longifolius is a big tree with very pretty and glossy foliage. Leaves- thickly coriaceous, 16-20 cm. by 5-6.5 cm, oblong, obtuse, glabrous, petioles 6 mm. long. Fruit – 2.5 cm long, obliquely ovoid, single seed. Flowers- numerous, in short fascicles on tubercles from the axils of fallen leaves, orange red colored; stamens many, sterile & short in female flowers. Flower buds (**Fig 1**) contain a coloring matter which dyes silk red. The dried flower buds are light brown in color and round in shape. Tiny flowers are borne in clusters on the tree trunk and mature branches. Flowers have a very pleasant smell, which lasts even when the flowers dry up.

Fig 1: Flower bud of *Ochrocarpus Longifolius*

II. Microscopic Study:

Organoleptic characters –

1. Color : Reddish brown
2. Odor : Sweetish
3. Taste : Astringent
4. Texture: Fine

Powder microscopy – The Flower buds were dried, powdered and passed to 60 mesh to get fine powder. The dried powder was mounted in the distilled water to detect the Warty Trichome (**Fig 2**), Allurone grains (**Fig 3**), Simple parenchyma cells (**Fig 4**), loosely arranged Epidermal cells (**Fig 5**), Pollen grains with three protuberances of mature & immature cells (**Fig 6**), Simple Trichome (**Fig 7**), the special characteristic i.e. Simple fibre with Prismatic crystal (**Fig 8**) & Prismatic crystal (**Fig 9**).

Fig 2: Warty trichome

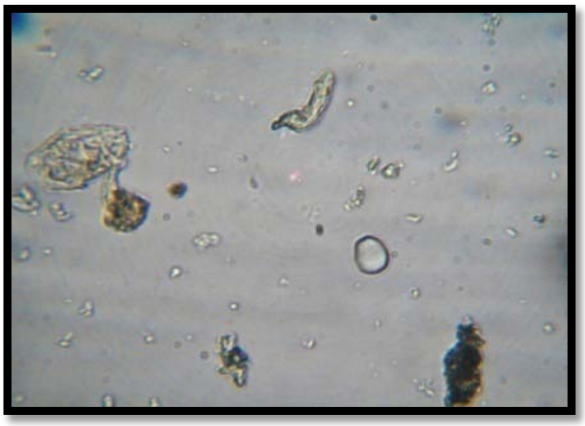

Fig 3. Allurone grains

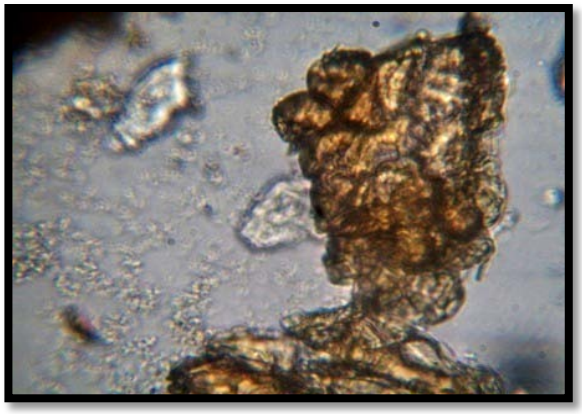

Fig 4: Simple parenchyma (petals)

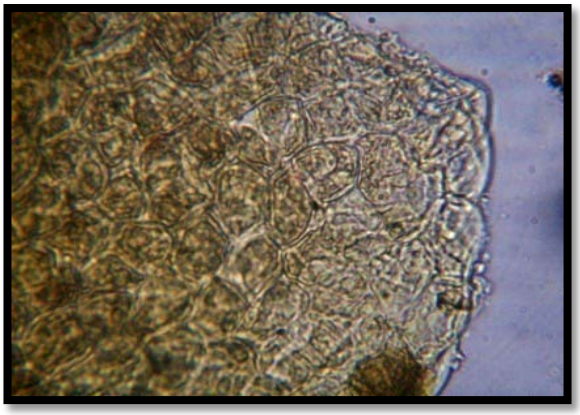

Fig 5: Epidermal cells

Fig 6: Pollen grains with three Protuberances

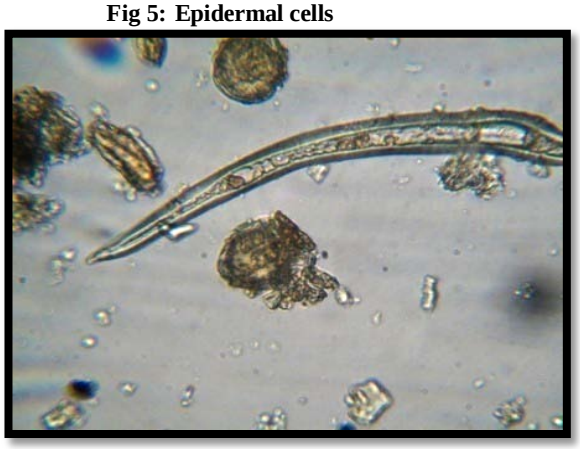

Fig 7: Simple trichome

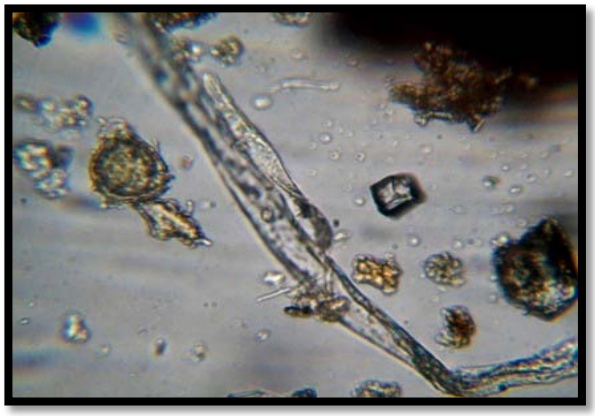

Fig 8: Simple fibre with Prismatic Crystal

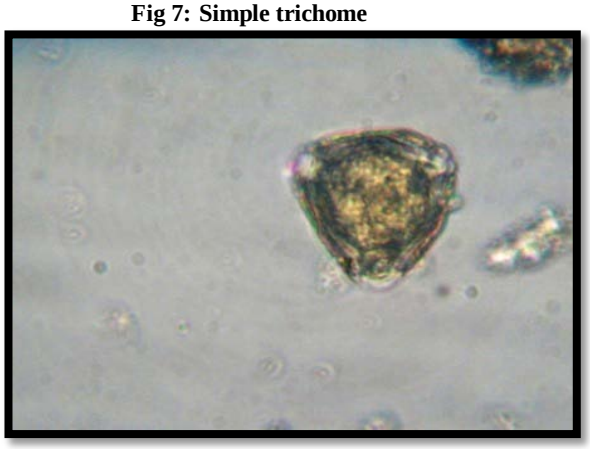

Fig 9: Prismatic Crystal

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Phytochemistry:

The flower buds of *Ochrocarpus longifolius* have been reported to contain 0.50–1.5% volatile oil and 5–6% oleoresins. Thirty-five chemical constituents of the oil have already been identified by gas chromatography (GC) and GC-mass spectrometry. Sesquiterpenes are the predominant constituents of the oil, while major compounds are b-caryophyllene (28.25%), d-cadinene (14.22%), a-copaene (5.24%), linalool (3.46%), a-humulene (4.63%), and a-muurolene (3.35%). Phytochemical screening of the methanolic extract of the crude drug (flower buds) identified presence of glycosides, reducing sugars, phenolics, tannins, four alkylated coumarins - Surangin A and B, Squalene, Cycloartenol; campesterol, stigmasterol and bsitosterol, flavanoids, saponins and volatile oil. Leaves gave amentoflavone, quercetin and vitexin as major constituents [5].

Pharmacology:

1. *Ochrocarpus longifolius* exhibits antibacterial activity against both Gram-positive and Gram-negative organisms [6].
2. Vitexin (8-í-D-glucopyranosyl-apigenin) [VT], isolated from *Ochrocarpus longifolius* is known to have potent hypotensive, anti-inflammatory and anti-spasmodic (nonspecific) properties. The hypotensive effect of VT was attributed to its ganglion-blocking properties, and anti-inflammatory effects to its anti-histaminic, anti-bradykinin and anti-serotonin properties [7].
3. Vitexin and Meso-inositol exhibited positive effect on treatment of leprosy [8].

4. Surangin B, a coumarin isolated from *Ochrocarpus longifolius* was shown to have antifungal and antihelminthic activity [9].

Physicochemical Parameters:

The crude drugs were evaluated for physicochemical parameters like Total Ash Value, loss on drying, pH value, Acid soluble and water-soluble extractive values. The results were placed at (**Table 1**)[10].

On its basis the parameters like total ash content, water and methanol soluble extractives etc., were selected. Presence of more moisture content in a sample can create preservation problem. Hence loss on drying was also selected as one of parameters. The water-soluble extractive and methanol soluble extractive values were found to be 12.57 % and 16.03% respectively, indicating considerable amount of polar compounds in the sample.

Table 1: Physicochemical parameters

S No.	Parameters	Sample – Surapunnaga powder
1	Foreign matter	0.29% w/w
2	Loss on drying	13.16% w/w
3	Total ash	6.30% w/w
4	Acid-insoluble ash	0.43% w/w
5	Water-soluble ash	1.97% w/w
6	Alcohol-soluble extractive	16.03% w/w
7	Water-soluble extractive	12.57% w/w
8	Volatile oil	0.10% w/w
9	Total phenolics	(138.30 ± 4.58) mg/g of plant extract
10	Total tannins	(133.0 ± 1.52) mg/g of plant extract
11	Total flavonoids	(41 ± 1.28) mg/g of plant extract
12	Total flavonol	(0.56 ± 0.04) mg/g of plant extract

***Ayurvedic* Pharmacology:**

As per *Nighantu Adarsha, rasa, guna virya, vipaka* all are same as *Mesua ferrea*[1] and according to *Dravya Guna Vigyana* of P.V. Sharma the properties of *Mammea longifolia*[2] are same as *Mesua ferrea.* In this present study all information about *Surapunnaga* in *Ayurvedic* parlance are given according to *Nighantu Adarsha*.

Rasa (Taste) : *Kashaya, Tikta*
Guna (Quality) : *Laghu, Ruksha*
Virya (Potency) : *Ushna*
Vipaka (Post Digestion Effect) : *Katu*

CONCLUSION

The plant *Mesua ferrea* is used from the ancient time for its medicinal values and most of the *Ayurvedic* formulations prescribed for various diseases have *Nagakeshara* as one of the ingredients. But sometime due to huge demand & unavailability of any medicinal plant there is a common trend to use substitute herb of the real one. Now-a-days *Surapunnaga* is one of the renowned herbs used as substitute of *Nagakeshara.* The plant *Ochrocarpus longifolius* was identified and authenticated phamacognostically and observing its pharmacological properties it may be declared that *Surapunnaga* is a unique ingredient should be used in the replacement of *Mesua ferrea.*

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