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

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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 Sunthikhand 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, Nagakeshara.

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 Nagakeshara 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 Nagakeshara are almost same3 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

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.
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
- Telugu: Surapunna
- Tamil: Nagappu, Nagesarp

B. PARTS USED:
- Flower bud

C. HABITAT:
- 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 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.

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 1: Flower bud of *Ochrocarpus Longifolius*

Fig 2: Warty trichome

Fig 3. Allurone grains
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.

Pharmacology:
1. *Ochrocarpus longifolius* exhibits antibacterial activity against both Gram-positive and Gram-negative organisms.
2. Vitexin (8-β-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.
3. Vitexin and Meso-inositol exhibited positive effect on treatment of leprosy.
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].

**Table 1: Physicochemical parameters**

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

**Ayurvedic Pharmacology:**
As per *Nighantu Adarsha*, rasa, guna virya, vipaka all are same as *Mesua ferrea* and according to *Dravya Guna Vigna* of P.V. Sharma the properties of *Mammea longifolia* 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 pharmacognostically and observing its pharmacological properties it may be declared that *Surapunnaga* is a unique ingredient should be used in the replacement of *Mesua ferrea*.

**REFERENCE**

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