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## A comprehensive review on *Ixora polyantha* Wight

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### Abstract

*Ixora polyantha* Wight belongs to the family Rubiaceae, it is an evergreen shrub which is habited in India. Traditionally *Ixora* is found to be used in indigenous medicine in ancient days. It acts as a cure for various ailments like hepatic disorder, microbial infection, cancer, inflammatory etc. Pharmacological studies of this plant show that, it possesses wound healing activity. Phyto constituents such as saponins, flavonoids, tannins and alkaloids are present in leaves of *Ixora polyantha* Wight. In the present review, for the first time, efforts are made in addressing its morphological and taxonomical characteristics, ethno medicinal uses and chemical constituents.

**Keywords:** *Ixora polyantha* Wight, folklore herb, rubiaceae, medicinal plant

### Introduction

Medicinal plants used in modern treatment are occupying a very significant place as raw materials for important drugs. India officially endorses over 3000 plants for their medicinal value. It is generally estimated that over 6000 plants in India are used in traditional, folk and herbal medicine [1]. Herbal medicine is fast emerging treatment as an alternative to available synthetic drugs for treatment of various diseases, possibly due to reduced side effects and lower costs. Several chemical compounds have been isolated from medicinal plants. More than 70% of the world's population now depends on the traditional medicinal system, otherwise known as complementary or alternative systems of medicine [2].

*Ixora* is a genus of flowering plants belongs to the family Rubiaceae. It consists of tropical evergreen shrubs and trees and holds around 500 species with its centre of diversity in Tropical Asia. *Ixora* also grows commonly in subtropical climates [1]. Traditionally *Ixora* is found to be useful for many ailments like hepatic disorder, anti-diabetic, cancer, microbial infection, antioxidant, pain, inflammation, etc. and has been documented for various medicinal properties. The genus *Ixora* has been reported to possess different classes of compounds mainly triterpenoids (Lupeol, oleanolic acid, urosilic acid, betunolic acid, amyryns, etc.), aromatic acrid oils, saponins, tannins, carbohydrate, fatty acids, flavanoids (rutin, formononetin,  $\beta$ -sitosterol, quercetin and kaempferol) and sterols [3]. Various species of *Ixora* are used as a medicine in Ayurveda, Folk, Siddha and Unani systems of medicine. Traditional uses of most of the species of *Ixora* are unproved scientifically [4].

*Ixora polyantha* Wight belongs to the family Rubiaceae, it is an evergreen shrub which is habited in India. *Ixora polyantha* Wight. is a folklore herb used in coastal regions of Karnataka for healing wounds [5].

### *Ixora polyantha* Wight

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**Fig 1:** *Ixora polyantha* Wight. plant

**Synonym -** *Ixora grandis* Miq.

**Vernacular Name**

Many-Flowered *Ixora*

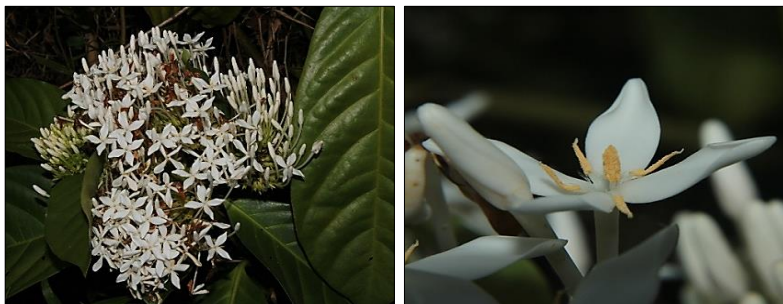
- **Malayalam:** kalinji, Kalingi, Kattuchethi
- **Marathi:** Ran kuda
- **Tamil:** Karun-culuntu vellai-k-koran

#### **Classification**

- Kingdom Plantae
- Phylum Tracheophyta
- Class Equisetopsida
- Subclass Magnoliidae
- Order Gentianales
- Family Rubiaceae
- Genus *Ixora*
- Species *ixora polyantha*

#### **Morphological characteristics**

- **Habit:** Shrub or under shrub
- **Leaves:** Dark or Light green in colour.
- **Flower:** Flowers are white, in terminal corymbose cymes, sweet fragrant
- **Fruit:** Drupe is about a cm across, yellowish to red when ripe.
- **Stem:** Woody, green to brown



**Fig 2:** Flower of *Ixora polyantha* Wight



**Fig 3:** Fruit



**Fig 4:** Leaf



**Fig 5:** Stem of *Ixora polyantha* Wight.

### Taxonomic characters

An evergreen shrub or undershrub up to 2m tall. Branches woody, glabrous, round; internodes 3.5-4.5 cm long. Leaves large, opposite-decussate, 20-30x13-17 cm, ovate to obovate, elliptic, coriaceous, glabrous on both sides, apex acute or acuminate, base acute; margins entire; petiole c. 5mm long, fleshy; stipule c. 1cm long, interpetiolar, broad at base and tapering upwards to end, glandular and hairy.

Inflorescences in terminal, corymbiform cymes, subcapitate, head 18-20 cm across, sub sessile to peduncle; peduncle 0.5-1.2 cm, stout, glabrous; bracts 4-13 x 0.5-1.2 mm, narrowly lanceolate, glabrous; bracteoles 2 or 4 at base of hypanthium, 2-5 x 0.3-0.5 mm, and narrowly lanceolate, glabrous, apex acuminate. Young inflorescence covered with a pair of persistent involucre, light green in colour. Flowers 80-200 per head, sweet fragrant, white, each flower 5.5-5.7 cm; pedicellate, pedicel stout, tetramerous; glabrous. Calyx red, c. 1cm long, longer than ovary; tube c. 0.4 mm with a few scattered hairs; lobes c. 0.6 mm elliptic-lanceolate, glabrous, apex acute. corolla white, tubular, c. 5.2 cm long, slender, glabrous or sparsely pubescent at throat and terminated into four broadly elliptic lobes; each lobe c. 5 mm long, glabrous, apex obtuse or rounded at apex. Epipetalous, 4-6 mm long, extrorse; stamens 4, anther yellow, 4-5 mm long, dorsifixed, apex acute; filament 1-2 mm long, dehiscing longitudinally. Style 5-6.5 cm exerted; stigma pale yellow, 2-3 mm long; bifid, stigmatic arms recurved; ovary inferior, 1-1.5 mm long, Fruit round, 2-2.5 mm hairy, red.

**Flowering:** April-June

**Fruiting:** July-October

**Elevation:** 100-200 m<sup>[6]</sup>.

**Table 1:** Macroscopic evaluation of *Ixora polyantha* Wight.

Habit	Shrub or under shrub, 2m height
Branches	Round, glabrous
Leaves	20-30x13-17cm, ovate to obovate, glabrous, acute leaf base
Petiole	0.5cm long
Corymbs	Subsessile to peduncled, glabrous, peduncle 0.5-1.2cm long
Calyx	Calyx tube ca. 0.4mm with spreading hairs, red, lobes ca. 0.6mm long
Corolla	Corolla tube ca.5.2cm long, lobes ca.5mm long
fruit	Ovoid, 2-2.5mm in diam, hairy, red

**Phyto constituents:** Phyto constituents such as Saponins, Flavonoids, Tannins and alkaloids are present in leaves of *Ixora polyantha* Wight.

**Chemical compounds:** 7-Hydroxy-6-methoxy- 2H-1-benzopyran-2-one (Scopoletin), Bis (2-ethyl hexyl) 1, 2-benzene dicarboxylate, n-tetradecanoic acid, n-eicosane, n-hexadecane, and methyl octadecanoate, Isovanillic acid, phthalic acid, butyl ester, ester with butyl glycolat, 1-Methyl-4-isopropyl-bicyclo [2.2.2] octa-5-ene-2, 3-dicarboxylic anhydride, 4-Methyl undecane, 4, 7-Dimethyl undecane, 3, 8-Dimethyl decane, 2, 5-Dimethyl tridecane, 2, 5-Dimethyl tetradecane, 2, 6, 10, 14-Tetramethyl hexadecane, 2, 6, 10, 15-Tetramethyl heptadecane, Isopropyl palmitate, 3-Methyl-5-propyl nonane, 6, 10, 14-Trimethyl 2-pentadecanone, 1-(2-Methylene-3-butenyl)-1-(1methylene propyl) cyclopropane, n-Tetradecanoic acid, n-Octadecanoic acid, 2-Fluoro-3, 3-dimethylbutanal, n-Tridecan, n-Hexadecane, n-Eicosane, n-Tricosane, n-Nonacosane, Methyl octadecanoate, Methyl eicosanoate, Methyl 9, 12, 15-octadecatrienoate, 2-Ethylhexyl tridecyl sulfite, Methyl docosanoate, Methyl hexadecanoate<sup>[7]</sup>.

### Uses

- **Wound healing activity:** Aqueous leaf extract of *Ixora polyantha* wight having wound healing activity<sup>[5]</sup>.
- **Cytotoxic activity:** Chloroform flowers extracts of *Ixora polyantha* wight possess cytotoxic effect on three different human cancer cell lines named as, uterine cervical (HeLa), lung (NCI H-460) and breast (MCF-7) cancer cell lines
- **Anti-microbial activity:** Aerial portion of *Ixora polyantha* wight possess Interferon like activity against Vaccinea virus.
- Whole plant of *Ixora polyantha* wight excluding root having the Effect on isolated guinea pig ileum, CVS and CNS in albino mice<sup>[4]</sup>.

### Other *Ixora* species

Other common varieties in Evaluation of pharmacological activities of methanol extract of *Ixora cuneifolia* leaves India such, as *Ixora coccinea*, *Ixora javanica*, *Ixora finlaysoniana*, *Ixora chinensis*, *Ixora pavettain*, *Ixora brachiate Roxb*, *Ixora cuneifolia* and others. These are remarkable varieties present in the colors red, yellow, white, pink, and orange.

**Table 2:** Pharamacological activity of *Ixora* species

Species name	Uses
<i>Ixora coccinea</i>	Anti-oxidant activity, Anti-inflammatory activity, Anthelmintic activity, Antileishmanial activity, Anti-asthmatic activity, Anti-diarrhoeal Activity, Antimicrobial activity, Hepatoprotective activity, Wound healing activity, Analgesic, Anti-inflammatory and Anti-pyretic activities Antinociceptive activity, cytotoxic anti-tumor activity, Cardioprotective activity, anti-ulcer activity, Hypoglycaemic and Hypolipidaemic activity <sup>[1]</sup> .
<i>Ixora javanica</i>	Anti-diabetic activity <sup>[8]</sup> cytotoxic activity, hepatoprotective <sup>[1]</sup> .
<i>Ixora finlaysoniana</i>	Anti-diabetic activity, estrogenic, abortifacient and anti-implantation effects <sup>[9]</sup> .
<i>Ixora chinensis</i>	Anti-microbial, anti-diabetic activity <sup>[10]</sup> .
<i>Ixora pavettain</i>	Anti-diabetic activity <sup>[11]</sup> .
<i>Ixora brachiata Roxb</i>	Cytotoxic, antioxidant, antimicrobial and anti-inflammatory activity <sup>[12]</sup> .
<i>Ixora cuneifolia</i>	Anti-diabetic, antioxidant, thrombolytic, analgesic, anti-inflammatory and anti-diarrheal <sup>[13]</sup> .

### Conclusion

Studies carried out in the recent past shows that the *Ixora polyantha* Wight contains wide range of chemical constituents which are used to treat various ailments. The *Ixora polyantha* possess numerous benefits to pharmacological and traditional folks. The *Ixora polyantha* plant shows wound healing, cytotoxic activity, anti-microbial, CVS and CNS effect.

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### Conflict of Interests

Declare none

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