

A Review on *Ixora Coccinea*: Traditional Use, Phytochemical and Pharmacological Studies

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ABSTRACT

Ixora Coccinea Linn., belongs to the family Rubiaceae, which is typically known as Red *Ixora* or jungle of geranium, it is an evergreen shrub which is habited in India. Traditionally *Ixora* is found to be used in indigenous medicine in ancient days. It act as a cure for various ailments like hepatic disorder, cancer, microbial infection, inflammatory etc. Pharmacological studies of this plant shows that, it possess antioxidant, antibacterial, gastro protective, hepato protective, anti-diarrhoeal, anti-nociceptive, anti-mutagenic and chemo preventive effects. In this review studies the traditional and Pharmacological uses of *Ixora Coccinea*.

KEY WORDS: *Ixora Coccinea*, red *Ixora*, jungle of geranium, traditional, pharmacology.

1. INTRODUCTION

India is country which is considered as one of the world biodiversity hotspots. Many plants are habited for the dietary and medicinal uses. *Ixora Coccinea* Linn, (Rubiaceae), a common flowering shrub indigenous breed to Southern part of India, Bangladesh and Sri Lanka. This plant is generally known as jungle of geranium, flame of the woods or jungle flame. It is one of the most notorious flowering shrubs in South Florida and landscapes. It is the national flower of Suriname. *Ixora coccinea* is used as barriers and screens in warm climate, house-hugging plants, massed in flowering beds or grown as shrub or small tree. It is cultivated in a greenhouse or as a potted house with bright light in cooler climatic conditions. There are plenty of names are available among the cultivars based upon colour difference in flower (Yellow, Pink, and Orange) and plant size. All parts of this plant are used to treat various ailments in Indian indigenous medicines. The fully ripened fruits are used as a dietary source. The word *Ixora* is originated from Portuguese translation of Isvara. *Coccinea* is originated from Latin word meaning of scarlet and refer to bloom.

Botanical details: *I. Coccinea* is abundantly grown in dry lands where the soil is slightly acidic. The wild varieties of this plant produce flowers in red or reddish-orange colour. Plants with white, yellow, salmon or pink flower also prevalent and cultivated and marketed in horticultural outlets. Fruits are fleshy, spherical berries, dark blood red or purplish black colour when ripen. The fruit berries contain 1-2 seeds.

Scientific classification	
Kingdom	Plantae
Division	Angiosperms
Class	Eudicots
Sub Class	Asterids
Order	Gentianales
Family	Rubiaceae
Tribe	Ixoreae
Genus	<i>Ixora</i>
Species	<i>Coccinea, chinensis, parviflora, javanica, finlaysoniana</i>

Traditional uses: *Ixora Coccinea* used in Ayurveda and in distinct traditional folks to treat numerous ailments. The roots, leaves, flower and barks are widely used in the traditional folks. It is practiced for treating diarrhoea, dysentery, bronchitis, colic, eczema etc. It also has several properties like antidiarrheal, anti-dysenteric, anti-cancer, antifertility and anti-inflammatory. It is used together with cumin, Indian rose chestnut and sugarcane.

Traditional uses of <i>Ixora Coccinea</i>	
Parts	Health Benefits
Leaves	Wounds, Skin ulcer, hiccups, Nausea, Anorexia, Sore throat, Bronchitis cough, Asthma
Flowers	Hypertension, Irregular menstruation, Female reproduction organ infection, haemoptysis, Skin diseases
Roots	Dysentery, Diarrhoea, Sores, Ulcer
Poultice of Leaves and Flowers	Sprains, Eczema, Boils, Contusion

Phytochemical constituents: The phytochemical studies of this plant hinted that the plant retains ursolic acid, lupeol, sitosterol, fatty acids, glycoside of kaempferol, flavonoids, rutin, ferulic acid, quercetin, cyanidin, flavanoids, tannins, phenolic acid, oleanolic acid, rutin, leucocyanadin, anthocyanins and proanthocyanins etc.

Different parts of <i>Ixora coccinea</i> & Phytochemical constituent (Sunitha, 2015)	
Parts	Constituents
Roots	Fatty acids, Essential oil
Leaves	Triterpenoid, Flavonoids, Alkaloids, Proanthocyanidins
Flowers	Triterpenoids, Sterol, Flavonoids

Pharmacological properties: *Ixora coccinea* is an indigenous plant which has minimal scientific studies, especially on the pharmacological properties. Several pharmacological properties of this stated as follows.

Antioxidant effect: Antioxidants are the compounds which inhibit Oxidation. Oxidation is the process which can produce free radicals through chemical reactions. The excessive production of free radicals of oxygen species includes hydroxyl radicals, superoxide anion radicals, hydrogen peroxide etc. Some of the nitrogen species includes nitric oxide radicals and peroxy nitrite radicals had been associated with pathogenesis of diseases. As far as *Ixora* studies shows that flower has scavenging activity under vitro conditions (Saha, 2008). The 50% inhibitory concentration of the hydromethanolic extract was 100.53 µg/mL. Other than that ascorbic acid extract was contain 58.92 µg/mL.

Anti-inflammatory effect: Anti-inflammatory is the property of a substance or treatment which is used to reduce inflammation or swelling. Surplus production of oxygen and nitrogen species activates inflammatory leukocytes under conditions of chronic inflammation. Concentration dependent decrease in inflammation was caused due to the oral administration of aqueous and methanolic extract of the leaves.

Antimicrobial effect: Antimicrobial is the property which eradicate microorganism or inhibit their growth. The methanolic and ether extract from leaves of *Ixora coccinea* has possess antibacterial properties against *Arthrobacter citreus*, *Bacillus cereus*, *B. licheniformis*, *B. polymixa*, *B. subtilis*, *Clostridium sp.*, *Staphylococcus aureus*, *Streptococcus sp.*, *Escherichia coli*, *Klebsiella aerogenes*, *Pseudomonas aeruginosa*, *P. putida*, *Salmonella typhimurium*, *Sarcina lutea*, *Nocardia sp* etc. (Annapurna, 2003).

Chemo preventive effect: Chemo preventive is an effects that emphasises which prevent cancer at earlier stage by blocking, reversing or delaying the onset with the use of Pharmacological or nutritional agent at nontoxic concentrations and an alternative practice to lessen cancer related death rate. The haemopoietic system and the halted the decrease in the cyclophosphamide and cisplatin which decline in leucocytes level and haemoglobin levels (Latha, 2001).

Anti-nociceptive effect: Anti-nociceptive is the effect is a process which belittle a painful or injurious stimulus in the sensory nervous system. The leaves of *Ixora coccinea* were studied and show the anti-nociceptive action was mediated centrally via dopaminergic mechanism (Sunitha Dontha, 2015).

Anti-mutagenicity effect: The continuous exposure of diverse categories of xenobiotics-physical and biological agents leads to mutation in human body. Carcinogenesis is a process which was originated by the damaged DNA and its prevention is very important. The component which is present in the *Ixora* flower namely ursolic acid reduce the potassium dichromate- induced genotoxicity (Latha, 2001).

2. CONCLUSION

Studies undertaken in recent past shows that *Ixora coccinea* possess wide range of chemical constituents that are used to treat various ailments. *Ixora coccinea* possess numerous benefits to pharmacological and in traditional folks. The *Ixora coccinea* leaves, flower and roots possess antioxidant, antimicrobial, anti-nociceptive, hepato protective, anti-diarrhoeal, anti-mutagenic, anti-neoplastic, gastro protective and chemo preventive effects. In accordance with recent survey there was a lack of studies undergone in the fruits and seeds of *Ixora coccinea* were performed.

REFERENCES

Annapurna J, Amarnath PV, Amar Kumar D, Ramakrishna SV, Raghavan KV, Antimicrobial activity of *Ixora Coccinea* leaves, *Fitoterapia*, 74, 2003, 291-293.

Azazieh H, Saad B, Cooper E and Said O, Traditional Arabic and Islamic Medicine, *Remerging Health Aid, Evid based Complement Alternative Medicine*, 7 (4), 2010, 419-424.

Elumalai A, Chinna Eswaraiah, Yetcharla Venkatesh, Burle Shiva Kumar and Chava Narendar, Phytochemical and pharmacological profile of *Ixora Coccinea* Linn., *International Journal of Pharmacology and Life Sciences*, 3 (3), 2012, 1563-1567.

Handunetti SM, Kumara RR, Deraniyagala SA and Ratnasooriya WD, Anti-inflammatory activity of *Ixora Coccinea* methanolic extract, *Pharmacogn Research*, 1, 2009, 80-90.

Kharat AR, Nambiar VV, Tarkasband YS, Pujari RR, A review on Phytochemical and Pharmacological activity of genus *Ixora*, International Journal of Research in Pharmacy and Chemistry, 3 (3), 2013, 628-635.

Latha LY and Ibrahim D, Pharmacological screening of methanolic extract of *Ixora* species, Asian Pacific Journal of Tropical Biomedicine, 2 (2), 2012, 149-151.

Latha PG, Panikkar KR, Chemoprotective effect of *Ixora Coccinea* L. flowers on cisplatin induced toxicity in mice, Phytother Research, 15, 2001, 364-366.

Latha PG, Panikkar KR, Modulatory effects of *Ixora Coccinea* flower on cyclophosphamide-induced toxicity in mice, Phytother Research, 13, 1999, 517-520.

Latha PG, Suja SR, Abraham A, Rajashekhar S and Panikkar KR, Hepato protective effects of *Ixora Coccinea* flower extracts on rats, Journal of Tropical Medicinal Plants, 4, 2003, 33-38.

Manjeshwar Shrinath Baliga, Poruthukaran John Kurian, *Ixora Coccinea* Linn.: Traditional uses, Phyto chemistry and Pharmacology, China Journal of Integrated Medicine, 18 (1), 2012, 72-79.

Nazarudeen A, Nutritional composition of some lesser known fruits used by the ethnic communities and local folks of Kerala, Indian Journal of Traditional Knowledge, 9, 2010, 398-402.

Ratnasooriya WD, Deraniyagala SA, Galhena G, Liyanage SSP, Bathige SDNK, Jayakody JRAC, Anti-inflammatory activity of the aqueous leaf extract of *Ixora Coccinea*, Pharmacology and Biology, 432, 2005, 147-152.

Saha MR, Alam MA, Akter R, Jahangir R, *In-vitro* free radical scavenging activity of *Ixora Coccinea* L., Bangladesh Journal of Pharmacology, 3, 2008, 90-96.

Sunitha Dontha, Hemalatha Kamurthy, Bhagavanraju Mantripragada, Phytochemical and Pharmacological profile of *Ixora*: A review, International Journal of Pharmaceutical Sciences and Research, 6 (2), 2015, 567-584.