# An Extensive Review on Medicinal Uses of Haridru (*Adina cordifolia* (willd. ex roxb.) benth. & hook.f. Ex brandis )

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## *ABSTRACT*

***Background-****Adina cordifolia (Willd. ex Roxb.) Benth. & Hook.f. ex Brand is the Yellow Teak, Saffron Teak, belonging to Rubiaceae family has many medicinal uses. It is a large, deciduous tree, found scattered in deciduous forests throughout the greater part of India, ascending up to an altitude, 900 m in the sub-himalayan tract.*

***Aims and objectives-*** *Present review deals with botanical description and various pharmacological action, and medicinal uses of Adina cordifolia (Willd. ex Roxb.) Benth. & Hook.f. ex Brand (Haridru) according to ayurveda and modern science.*

***Material & Method-*** *The adinin and other alkaloids present are being used for different medicinal uses also. Pharmacological activity proved as studied in in-vitro and in-vivo models reports antimalarial, antimicrobial, anti-inflammatory, antifertility, insecticidal and focusing on treatment of chronic diseases. The Roots are astringent and constipating, and are useful in diarrhoea and dysentery. The bark is acrid, bitter, astringent, refrigerant, diuretic, demulcent, aphrodisiac and tonic. It is effective in vitiated conditions of pitta, wounds and ulcers, strangury, skin disease, gastropathy, fever and burning sensation.*

***Conclusion-*** *This article may open various directions to researcher so that therapeutic potential of this plants can be recognized and used for the public health.*

***Keywords:*** *Adina Cordifolia, Haridru, Medicinal uses, Pharmacological activity*

## INTRODUCTION

Based on the material of origin, *Ayurvedic* medicines are divided into three classes, namely herbal, mineral and animal. Among this, herbal formulation has acquired great importance and rising global awareness recently. This scenario is obvious as large scale increase in the herbal formulation usage has been observed throughout the last few years in developed world, where market expansion occurred in European countries and USA[1]. The World Health Organization (WHO) estimates that 80% of the world's inhabitants still rely mainly on traditional medicines for their health care[2]. The subcontinent of India is well-known to be one of the mega biodiversity centres with about 45,000 plant species[3]. This richness of flora has denoted to its status as a reservoir of herbal overall the history of mankind. In India, about 15,000 medicinal plants have been registered, in which the communities used 7,000-7,500 plants for curing different diseases. *Ayurveda* has about 700 type of plants listed in its medicinal systems[4].

In Rubiaceae family plants are used as medicinal use and contain the secondary metabolites. Rubiaceae is the largest family in the flowering plants order gentianales. It is also the oldest family that branched off on the gentianales family tree. The family Rubiaceae incorporated about 450 genera and 6500 species and includes trees, thousand infrequently herbs [5]. Among the many plants *Adina Cordifolia* is one from Rubiaceae family.

## DESCRIPTION

BOTANICAL DESCRIPTION

Botanical Name: *Adina cordifolia* (Willd. ex Roxb.) Benth. & Hook.f. ex Brandis

Family: Rubiaceae

Synonym: Pitadaru, Pitakashtha, Kadambabha-phala

Local name: Kadami, Haldu

English name: Yellow Teak, Saffron Teak.

A large, deciduous tree, found scattered in deciduous forests throughout the greater part of India, ascending up to an altitude, 900 m in the sub-Himalayan tract. it is common in the forests of south India, especially in the eastern Ghats and Karnataka.

The root is used as an astringent in dysentery. The bark is acrid and bitter and is used in biliousness. It is also regarded as febrifuge and antiseptic.

The bark is an antipyretic[6], used in skin diseases[7]; as febrifuge, antiseptic[8], wormicidal, in wounds[9], in rheumatoid arthritis, gout[10], irregular menstruation, dysmenorrhoea[11], malarial fever, stomach disorders and in fever. The buds are antidote to snake poison. The flowers are reported to be used in headache. The leaves are antiseptic used in dressing wounds. These are also used in cuts, boils and to cure hemicrania**.**

## CHEMICAL COMPOSTION

A yellow colouring matter adinin, belonging to naphthaquinone group of pigments, was isolated along with tannins from the heartwood[12].

In a detailed examination of the heartwood, confirmed the occurrence of a compound agreeing in physical properties with adinin which was however, shown to be an alkaloid of the B-carboline series and renamed the compound as adifoline. The other constituents identified were cordifoline[13]; benzoic acid, B- sitosterol and umbelliferone. The flavanones isolated from the heartwood were identified as 7,4-dimethoxy-5-hydroxyflavanone and 5,7-dimethoxy-4-hydroxyflavanone. The heartwood also yielded saturated aliphatic hydrocarbons viz. n-heneicosane, n-tricosane, n-pentacosane and n-pentatriacontane, besides b-sitosterol**.** The oleoresin obtained by the incision of the trunk yield 5.2-6.8 per cent of essential oil[14]. In a preliminary chemical study, the stem bark was found to contain alkaloids. The ethanolic extract

of the root bark was found to contain a new coumarin glycoside adicardin, characterized as 7-apiglucoside of umbelliferone.

## PHARMACOLOGICAL AND BIOLOGICAL STUDIES

**Antifertility-**The ethanolic extract of the dried leaves administered to female rats for 5d after mating did not reveal antifertility activity (anti-implantation and abortifacient) as observed on the 10 d of pregnancy[15].

The extract of the stem bark was reported to have semen coagulating activity.

**Antimalarial-**The alcoholic extract of the stem bark screened for in vivo and in vitro antimalarial activity against the NK 65 strain of plasmodium Bergheim was found inactive[16].

**Antimicrobial -**The crude extract of the bark showed antibacterial activity against Bacillus anthracis, Bac mycoides, Bac subtilis, Pseudomonas sp., Salmonella paratyphi, staphylococcus albus, Xanthomonas campestris and Xanth malvacearum[17].

Flavone isolated from the heartwood exhibited broad spectrum antibacterial activity against Vibrio cholerae, Neisseria gonorrhoea, mild activity against Escherichia coli and moderate antifungal activity against Aspergillus fumigatus and Cryptococcus neoformans[18].

**Antidiabetic -** The hydro-alcoholic extract of *Adina cordifolia*(Roxb.) leaves (HAEACL) in alloxan induced diabetic rats at 250 and 500 mg/kg doses showed antidiabetic activity. Glibenclamide (10 mg/kg, s.c.) was used as the standard which produced a notable decrease in blood glucose levels. The blood glucose levels of experimental animals were examine at 0, 2, 4 and 6 h after giving plant extract by using glu-oxidase peroxidise reactive strips and glucometer.

Treatment with HAEACL at 500 mg/kg dose reduced the blood glucose level significantly. However, the lower doses (250 mg/kg) of HAEACL produced a little decrease in blood glucose level. It was demonstrated that there was a dose dependent decrease in blood glucose level in the alloxan induced diabetic rats as compared to the control group. This study revealed that HAEACL possessed significant antidiabetic activity[19].

**Hepato-protective Action-**The acetone (*AEAC*) and aqueous extracts (*AQEAC*) of *Adina cordifolia* were studied for hepatoprotective activity against Wister rats with liver damage induced by ethanol. It was found that *AEAC* and *AQEAC*, at a dose of 500 mg/kg body weight revealed hepatoprotective effect by diminishing the Serum Glutamate Pyruvate Transaminase (SGPT), Serum Glutamate Oxaloacetate Transaminase (SGOT), alkaline phosphate and total bilirubin to a remarkable extent and also significantly increased the levels of total protein. The hepatoprotective activity was also mounted by histopathological studies of liver tissue. The effects of *AEAC* and *AQEAC* were comparable with standard drug silymarin[20].

**Anti-oxidant Property**- Percentage of DPPH radicals' inhibition and IC50 values (µg/ml) was expressed as antioxidant activity of extracts. IC50 values ranged from 20.39 to 38.96 µg/ml. The total phenolic content ranged from 17.48 to 20.83 mg/g of dry weight of extract,

expressed as gallic acid equivalents. The total flavonoid concentrations varied from 17.49 to 22.48 mg/g, expressed as quercetin equivalents. The significant linear correlation was confirmed between the values for the total phenolic content and antioxidant activity of plant extracts. *Adina cordifolia* (Roxb.) can be estimated as auspicious candidates for natural plant sources of antioxidants with high value[21].

## CONCLUSION

The present review was carried out on plant *Adina Cordifolia*, here more emphasis was given on literature review, chemical composition, pharmacological and biological studies on *Adina Cordifolia* Plants. After thorough examination and literature search it was observed that less work has been performed on this plant. In traditionally the plant *Adina cordifolia* has a large demand due to its treatment of many chronic and acute diseases with great advantage. This study attempts to high lighten the Therapeutic potential of *Adina Cordifolia* and their constituents in the prevention or treatment of disease. From this review we can conclude that reviewed study are aimed at attracting the attention of researchers seeking new drugs from *Adina cordifolia* and its chemical compounds. The isolated compounds can expectantly be scaned in future for more clinical evaluations and possible utilization and as adjuvant to current medications. We should maintain our endeavour in considering and valorising our natural patrimony as well as conducting more research in *Adina Cordifolia* and its Pharmacological aspects.

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