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## REVIEW ON STUDY OF VARIOUS EXTRACT OF PART OF *HOLOPTELEA INTEGRIFOLIA* AND ITS ACTIVITY.

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### ABSTRACT

*HOLOPTELEA INTEGRIFOLIA* also known as Indian elm .The study was to evaluate the potential of various extract of various part of *Holoptelea integrifolia*. Indian elm is very useful traditional plant in India .Various part of indian elm is useful in treatment of various diseases according to Ethno-medical studies like obesity and bronchitis. Whereas various extract, like methanolic, aqueous, petroleum ether, and ethanolic extract of leaves and bark of plant used as antiviral, antioxidant, antimicrobial, abortifacient, and in cancer. Traditionally leaves and bark used as bitter, astringent, anthelmintic, inflammation, acid gastritis, dyspepsia, colic, intestinal worms, vomiting, edema, piles, wound healing, leprosy, diabetes, haemorrhoids, dysmenorrhoea, diarrhoea, rheumatism, polyuria, helminthiasis, tuberculosis, and in skin diseases .And all these activities are mainly subjected to further studies .This review article highlights the plant and its biological/medicinal properties of various extract of various part of the *Holoptelea integrifolia*. Which might be useful to isolate the active principal responsible for various activity.

**Key words** *Holoptelea integrifolia*, Ethanolic, methanolic, petroleum ether ,aqueous extract

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### INTRODUCTION

Holoptelea integrifolia name can be simplified as Ho-loh-tee-lee-uh from greek holos (whole) and ptelea (elm) in-teg-ree-Foh-lee-uh or in-teg-rih-foh-lee-uh meaning, leaves entire. And it is commonly known as indian elm. *Holoptelea integrifolia* is medium sized large glabrous and deciduous tree about 18-25m in height. It mainly known as roadside tree and

belong to ulmaceae family, which have wide spectrum of biological activities .Natural herbs are used because safer to use than synthetic products. Until today, some research has been done on *holoptelea integrifolia* . The family ulmaceae have 15 genera and include, 200 species and distributed over tropical and temperate region of northern hemisphere<sup>[1,2]</sup> and it is distributed in Asia tropical region like India, Nepal, Indo China,

laos, Myanmar, Vietnam, srilanka, china<sup>[3]</sup>. Various extract of various part of plant use traditionally for treating many diseases like bronchitis and obesity,<sup>[4]</sup> and leaves and bark of plant use in treatment of various diseases like piles, leprosy, tuberculosis, intestinal worms, tuberculosis, diabetes, diarrhoeia, antiemetic, anthelmintic, wound healing, haemorrhoids, dysmenorrhoea, rheumatism, polyuria, fistula, vitiligo, helminthiasis, flatulence, and skin diseases. The phytochemical screening of the extracts also revealed the presence of sponins. Recent research addressed that the main biological activity are used for further investigation to improve medicinal value of herbal plant.

#### PLANT PROFILE :

Botanical Name: *Holoptelea integrifolia*

Family: Ulmaceae

Classical Name : Indian elm, chilbil, kanju.

Scientific Classification:

kingdom : Plantae

Domain : Eukaryota

Class : Magnoliopsida

Order : Urticales

Family : Ulmaceae

Phylum : Tracheophyta

Genus : *holoptelea*

Specific epithet : *integrifolia*- planch

Various common name of *holoptelea integrifolia* are given as :



**Figure: 1** *HOLOPTELEA INTEGRIFOLIA*

#### Vernacular Name :

- Eng: Indian elm, jungle tree, indian beech tree
- Hindi : Papri, chilbil, bawal, begana, kanju, poothigam.
- Bengali : Natakaranja.
- Gujarati : Charal, charel, kanjo, waola, chirmil.
- Kannada : Kaladri, nilavahi, rahubija, thavasai, rasbija.
- Malayalam : Aavil, njettaval, aval.
- Marathi : Ainasadada, vavala, vavali, papra, bawal.
- Tamil : Aya, ayil, kanci, vellaya, avil, pattai.
- Oriya : Dhauranjan, turuda, karanja.
- Konkani : Vamvlo.
- Nepali : Sano pangro.
- Punjabi : Rajain, khulen.
- Telgu : Nemilinara, nail, thapsai, nemali, pedanevili.

**PLANT DESCRIPTION:** *H. integrifolia* is a large deciduous tree that grows up to 15 to 25 meters in height. Its Bark : is whitish yellowish grey, and exfoliates with regular intervals and offensive smell when cut. Leaves: are simple alternates, elliptic, usually distichous , acuminate and the base is rounded or cordate. Leaf: margin is entire glabrous and leaf blade is pinnately veined with 3 to 7 veins on each sides<sup>[5]</sup>. Flower : are greenish yellow, usually male or hermaphrodite, monochlamydeous or rarely polygamous and flowering usually takes place in Jan to Feb. Fruits : are sub orbicular samara with membranous wings and usually seen in month of April and may .The shape of fruit is 2 cm in diameter and 0.6 to 1 inch broad and notched at the top.

**DISTRIBUTION:** The Ulmaceae having 15 genera and about 200 species is distributed over tropical and temperate regions of northern hemisphere .The native distribution of plant can be seen in Asia –tropical region including India, Nepal, Sri lanka ,Indo –China, Cambodia, Laos, Myanmar, Vietnam, Burma

#### PLANT PARTS USED:

Leaves, Seeds, Bark, Fruit

**ACTIVE CHEMICAL CONSTITUENTS:**

Phytochemical investigation shows the presence of chemical constituent such as terpenoids, alkaloids, glycoside, carbohydrates<sub>[6]</sub>, steroids, sterols, saponins, tannins, protein, and flavonoids. The isolated principle are Beta amyryin, Beta sitosterols, holopettelin-A, holopetelin-B, hederagenin, hexacosanol, Beta-D-glucose, fridelin, epifriedelin, 2-amino naphthaquinone, 1,4-naphthalenedione are considered as responsible for various activity<sub>[7]</sub>. The traditional uses, reported biological/pharmacological activity, isolated compounds and therapeutic application of holoptelea integrifolia which might be useful for scientific and researchers to find out new entities responsible for therapeutic activity.

**BIOLOGICAL ACTIVITY OF VARIOUS EXTRACT :**

**Ethanol extract of leaves :** The ethanol extract of leaves of *H. integrifolia* showed significant dose dependent inhibition of edema formation<sub>[8]</sub> as compared to standard drug (Indomethacin (10mg/kg) per oral and ethanol extract in dose of 250 and 500mg/kg given per oral that is also compared with reference drug<sub>[7]</sub>, the aqueous extract of leaves at dose of 250 and 500 mg/kg per oral which was given to observe percent inhibition of paw edema and compared with Indomethacin (10mg/kg per oral) used as reference drug. The result showed that leaves extract of *H. Integrifolia* is useful in acute and chronic inflammatory condition. The ethanol extract of leaves of *H. integrifolia* was used for its antidiarrhoeal activity. Diarrhoea, induced by castor oil and magnesium sulphate in mice. The ethanol extract of leaves at dose of 250 and 500mg/kg per oral given showed dose dependent antidiarrhoeal activity and this experiment also support the traditional uses in herbal medicine<sub>[9]</sub>.

The ethanol extract of leaves of Indian elm was traditionally used for curing tumors<sub>[10]</sub> and evaluated against Dalton's ascetic lymphoma (DAL) in Swiss mice. The parameters evaluated were tumor volume, tumor cell, viable tumor cell count, mean survival time, and increase in life span to assess antitumor activity. The ethanol extract was given in concentration of 250 and 500 mg/kg. The

extract showed significant decrease in tumor volume count in treated mice, and restored the mean survival time and restored hematological parameters compared with DAL bearing mice in dose dependent manner and increased life span<sub>[11]</sub> of DAL dependent mice. It showed Indian elm possess the antitumor activity.

The ethanol extract of *H. integrifolia* was used to study the adaptogenic activity which may be due to presence of phytochemicals like tannins, saponins, alkaloids, phenolics, and flavonoids. Extract was studied by using two tests i.e. using forced swimming endurance test and chronic cold restraint stress models. The ethanol extract of stem bark was given in dose of 250 and 500 mg/kg per oral which showed significant dose dependent adaptogenic activity<sub>[12]</sub> which was compared with activity of 100mg/kg of *Withania somnifera* which was found identical.

The ethanol extract of stem and bark of *H. integrifolia* was screened for antioxidant activity using alpha tocopherol as standard antioxidant. Ferric thiocyanate method and thiobarbituric acid method was used for evaluating free radical scavenging potential of antioxidant activity. The ethanol extract was found to be good antioxidant which was compared with vitamin E at specific concentration<sub>[13,14]</sub>.

**Methanolic extract:** The methanolic extract and aqueous extract of stem bark of *H. integrifolia* were found to possess anthelmintic activity which was compared to piperazine citrate against adult earthworm *Pheretima posthuma*. The extract was given in concentration of 10, 25, 50, and 100mg/ml of methanolic and aqueous extract. The extract causes paralysis and death<sub>[15]</sub> of worms especially at higher concentration<sub>[16]</sub>. This showed that constituents of bark could be potent anthelmintic agent for next generation.

The methanolic extract of both stem and bark and leaves of *H. integrifolia* possess wound healing potentials. About 90 % wound healing was recorded in treated groups by 14 days of post-surgery, where 62.99 % was observed in control groups. Whereas in incision model, higher breaking strengths and higher

hydroxyproline content in treated groups suggested higher collagen re-decomposition than control group. finally conformed the wound healing property of Indian elm.<sup>[14]</sup>

The petroleum ether extract and methanolic extract: Of *H.integrifolia* leaves showed antidiabetic effect induced by alloxan and standard drug used for comparison is glibenclamide. In which petroleum ether extract given at concentration of 100 and 200 mg/kg whereas methanolic extract given at concentration of 200 mg/kg showed positive Antidiabetic potentials<sup>[17]</sup>.

The chloroform extract of stem and bark of *H.integrifolia* was tested for antibacterial activity and found to be very effective against microorganism like *staphylococcus aureus*, *bacillus subtilis*, *escherichia coli*, and *pseudomonas aeruginosa* at concentration of 50, 30, 25 and 100mg/ml respectively. Disc diffusion method employed where zone of inhibition was compared to standard drug, ampicillin. The diethyl ether extract of leaves has shown maximum activity against beta-lactam resistant strain of *staphylococcus aureus*. 1,4-naphthalenedione is antibacterial principle present in leaves of

*H.integrifolia*. Whereas isolated structurally similar compound i.e 1,4-naphthalenedione with beta lactamase as functional group as resistant antibiotic act as an inhibitor to beta lactamase. Modeling and molecular studies indicated that compound can fit into active site of beta lactamase. The result suggests that this compound can serve as potential lead compound for development of effective beta lactamase inhibitor<sup>[18,14]</sup>.

#### MEDICINAL USES OF HOLOPTELEA INTEGRIFOLIA IN TRADITIONAL AYURVEDIC SYSTEM :

The bark and leaves are used as bitter, astringents, anthelmintic, and used in treatment of diabetes, skin disease, intestinal disorder, leprosy, rheumatism and wound healing in the form of paste. It is an important pollen allergent plant of India. Plant is useful in treatment of obesity, edema, and bronchitis. Mucilage and juice obtained from boiled bark has been reported to be useful in rheumatism intestinal tumor when applied externally. Paste of stem bark is applied externally to treat inflammation of lymph gland and common fever, scabies and ring worm. Whereas paste of bark and leaf is applied externally for treatment of leucoderma.

**TABLE :1, PHARMACOLOGICAL ACTIVITY OF VARIOUS EXTRACT:**

| S.No. | EXTRACT         | PART USED | ACTIVITY         | STANDARD USED      | REMARKS  | REFERENCE |
|-------|-----------------|-----------|------------------|--------------------|----------|-----------|
| 1.    | Ethanollic      | Leaf      | Antiinflammatory | Indomethacin       | Positive | 7,8       |
| 2.    | Ethanollic      | Leaf      | Antidiarrheal    | Loperamide         | Positive | 9         |
| 3.    | Ethanollic      | Leaf      | Antitumour       | DAL                | Positive | 10,11     |
| 4.    | Ethanollic      | Stem bark | Antioxidant      | Alpha-tocopherol   | Positive | 13,14     |
| 5.    | Methanollic     | Leaf      | Antidiabetic     | Glibenclamide      | Positive | 17        |
|       | Petroleum ether | Leaf      | Antidiabetic     | Glibenclamide      | Positive | 17        |
| 6.    | Chloroform      | Stem bark | Antibacterial    | Ampicillin         | Positive | 14,18     |
| 7.    | Methanollic     | Stem bark | Anthelmintic     | Piperazine citrate | Positive | 15,16     |

**CONCLUSION:**

Holoptelea integrifolia, the versatile medicinal plant is the unique source of various types of compounds having diverse chemical structure. A very little work has been done on the biological activity and plausible medicinal applications of its phytochemical. It is very useful traditional plant, crude extract from various part have a therapeutic

uses from time immemorial, so that some active constituent can developed for future studies. The global scenario is changing their face towards herbal medicinal due to less side effect , And emphasis given to develop a modern drug to cure many acute diseases. Therefore this review given to find out new activity or new entity responsible for various therapeutic activity.

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