

**A REVIEW ON DIFFERENT ACTIVITIES OF MEDICINAL PLANT OF  
*PLUMBAGO INDICA.L***

**Porandla Ravali\* and Dr. CH. Pradeep Kumar**

\*M.Pharmacy (Pharmacology), Vaageswari College of Pharmacy, Karimnagar, India,  
505001.

Department of Pharmacology (H.O.D), Vaageswari College of pharmacy, Karimnagar, India,  
505001.

Article Received on  
27 May 2018,

Revised on 17 June 2018,  
Accepted on 07 July 2018

DOI: 10.20959/wjpr201814-12911

**\*Corresponding Author**

**Porandla Ravali**

M.Pharmacy

(Pharmacology),

Vaageswari College of

Pharmacy, Karimnagar,

India, 505001.

**ABSTRACT**

*Plumbago indica* is a plant species in the genus of plumbago described by Linnaeus edition of species of plantarum. It can be used as a medicinal plant. The plant contain a variety of phytoconstituents includes Reducing sugars, Alkaloids, Flavanoids, Steroids, Phenols and gums. Many researches considered these compounds for screening of different activities like, Anti-Bacterial<sup>[7]</sup>, Anti-Oxidant<sup>[8,9]</sup>, Anti-Fertility<sup>[10]</sup>, Hepatoprotective<sup>[11,12]</sup>, Wound healing<sup>[8]</sup>, Anti-Helicobacter Pylori and Cytotoxic activity.<sup>[13]</sup>

**KEYWORDS:** *Plumbago indica*, *plumbago rosea*, anti-bacterial, anti-oxidant, anti-fertility, hepatoprotective, wound healing, anti-helicobacter pylori, cytotoxic activity.

**INTRODUCTION**

*Plumbago indica L.* which was known *P. rosea* before is a species of flowering plant in the family Plumbaginaceae. This medicinal plant grows in different regions of south-east asia regions, Arabian peninsula, Europe, Malaysia, Indonesia, Africa, China and India.<sup>[1]</sup>



*Plumbago Indica.L*<sup>[2]</sup>

### Taxonomic Profile

- Kingdom : Plantae  
Division : Magnoliophyta  
Class : Magnoliopsida  
Order : Caryophyllales  
Family : Plumbaginaceae  
Genus : Plumbago  
Species : Plumbago indica.<sup>[3]</sup>

### Distribution

It is distributed in Chittagong, Chittagong hills tracts and Dhaka.<sup>[4]</sup>

### Morphological Characteristics

Plumbago indica is a ayurvedic plant and it is evergreen perennial shrub grows upto a height 1.5meters. It remains branched from the base.<sup>[1]</sup> leaves of plumbago indica are ovate to oblong-ovate, 8-13cm long, smooth with wavy margins and have pointed base.<sup>[5]</sup> Flowers are bisexual, bright red, 3-5cm long, forming very long terminal, lax spikes and axillary slender reaching upto 60cm. Calyx red, short, cylindric along with ribs covered by stipulate glands.

### Chemical Constituents

Plumbagin, sitosterol glycoside, tannins, hydroxy plumbagin, stigmasterol, campesterol, roseanone, naphthaquinones, droserone, elliptinone, zucylanone and physcion  $-\beta$ -D-glucopyranoside.<sup>[4]</sup>

## Uses

The root of *Plumbago indica* act as abortifacient, acrid and vesicant. The oil is used to treat paralysis, joint pains and rheumatism. It is also used to treat liver disorders, fever, worms, skin disorders, piles, indigestion, syphilis and leucoderma.<sup>[3]</sup>

## Phytochemical Evaluation

*Plumbago indica* contains reducing sugars, alkaloids, flavanoids, steroids, phenols and gums.<sup>[6]</sup>

## Pharmacological Activities

### Antibacterial activity

DIBYAJYOTI SAHA ET AL. IN 2014 was done anti-bacterial activity of *Plumbago indica*.L methanolic extract was evaluated against eleven pathogenic bacteria. By following the method Disc diffusion method. From the study, it suggested that methanolic extracts shows the zone of inhibition ranging from 7.0- 25.0 mm and minimum inhibitory concentrations is found to be 31.25-125µg/ml for bacteria species. The highest bacterial activity was showed against with salmonella typhi, salmonella paratyphi and staphylococcus aureus. By performing this assay they concluded the methanolic extracts of *Plumbago indica* exhibited anti-bacterial activity in presence of ciprofloxacin.<sup>[7]</sup>

### Anti-Oxidant activity

1. SUJIN JEBA KUMAR ET AL. IN 2013 worked on anti oxidant activity of different root extract of *Plumbago indica* by using different methods like Scavenging activity of H<sub>2</sub>O<sub>2</sub>, DPPH and Free radicals of superoxide anion In-vitro. In this study they used ethanolic, chloroform, and hexane extracts. The results revealed that the ethanolic extract has powerful antioxidant potential than hexane and chloroform.<sup>[8]</sup>

2. GAYATRI NAYAK ET AL. IN 2011 demonstrated the anti-oxidant activity and Phenol content in the root extract between *Plumbago zeylanica* and *Plumbago rosea* by using methods like DPPH, and OH<sup>-</sup> radical scavenging assay. In this study they used extracts of ethanol, methanol and water. In both the assay ethanolic solvent gave maximum crude, phenol content and anti-oxidant activity. In DPPH assay and OH<sup>-</sup> radical scavenging assay showed highest anti-oxidant activity was demonstrated in *Plumbago rosea* (82.34%) is compared to *Plumbago zeylanica* (74.65%) at 200µg/ml. The total phenolic content of

Plumbago rosea extract is 235µg/gm in comparison to 204µg/gm in Plumbago zeylanica which indicates the higher antioxidant in Plumbago rosea.<sup>[9]</sup>

### **Anti-Fertility activity**

E.SHEEJA ET AL. IN 2008 worked on anti – fertility activity of stems of Plumbago rosea in female albino rats by using different solvent extracts like petroleum ether, chloroform, acetone, ethanol and water extracts were studied on estrous cycle at the doses of 200 and 400 mg/kg. From the study, it suggested acetone extracts showed significant estrogenic and anti-estrogenic activity ( $P<0.05$ ) ( $P<0.001$ ) and it is confirmed by histopathological studies of the uterus were carried out to confirm their estrogenic activity.<sup>[10]</sup>

### **Hepatoprotective activity**

1. ELDHOSE BINIL ET AL. IN 2017 was done by the Curative effect of Plumbago indica roots using its methanolic extracts at different doses (100 and 200 mg/kg bw) on thioacetamide induced liver damage in wistar albino rats. From the study, it suggested that the possible mechanism by which the root extract decreases the liver function marker enzymes. So, this study concluded the histopathological findings confirmed the curative effect of Plumbago indica in a dose dependent manner.<sup>[11]</sup>

2. AIYALU RAJASEKAN ET AL. IN 2011 They investigated on protective effect of ethanolic root extract of Plumbago indica.L on paracetamol induced liver damage. Silymarin is used as a reference drug. Results of this study revealed blood samples from the animals treated with 200mg/kg and 400mg/kg b.w of ethanolic root extract of Plumbago indica showed significant reduction in liver biomarkers and it is confirmed by histopathological studies. So, Plumbago indica could afford a significant protection against paracetamol induced liver toxicity.<sup>[12]</sup>

### **Wound healing activity**

SUJIN JEBA KUMAR.T ET AL. IN 2013 was done wound healing activity of Plumbago indica by using different root extracts such as ethanolic, chloroform and hexane followed by Excision wound model. In this study the animals were received extract which is prepared by normal saline with 0.1% propylene glycol. Ethanolic extract of Plumbago indica were found to possess better wound healing activity than the chloroform and hexane extract it was more effective than burnol. biochemical analysis post wound healing showed normal counts while the differential WBC counts was higher in mice when compared to untreated mice.<sup>[8]</sup>

**Anti-Helicobacter pylori and cytotoxic activity**

ANN SHINE PAUL ET AL.2013 did anti-helicobacter pylori and cytotoxic activity of detoxified root ethanolic extract of three *Plumbago* species such as *P. Auriculata*, *P. Indica* & *P. Zeylanica*. The root extracts are detoxified with lime water and prepared ethanolic extract. The activity is done by using MTT assay in HGE-17 cell lines. Results of the study show *Plumbago indica* have more significant activity when compared to other two plants and this detoxified plant roots are used for *H.Pylori* induced gastric ulcer.<sup>[13]</sup>

**CONCLUSION**

*Plumbago indica*.L is reported to possess a variety of active ingredients includes reducing sugars, alkaloids, flavanoids, steroids, phenols and gums which is used for screening of different pharmacological activities. Further investigations should be carried out to recognize and establish other potential phytoconstituents and pharmacological activities.

**REFERENCES**

1. <https://www.medicinalplantsanduses.com/plumbago-indica-plant-medicinal-uses>.
2. [https://en.wikipedia.org/wiki/Plumbago\\_indica#/media/File:Plumbago\\_rosea01.jpg](https://en.wikipedia.org/wiki/Plumbago_indica#/media/File:Plumbago_rosea01.jpg).
3. <http://www.spicesmedicinalherbs.com/plumbago-indica.html>
4. <http://www.mpbdb.info/plants/plumbago-indica.php>.
5. <http://www.flowersofindia.net/catalog/slides/lal%20chitrak.html>.
6. Zarrin Tasnim Raza, Ashrafudoulla, Farhan fuad, Rafiqul islam, Mehede Hasan, Md. Abdullah Hil Kafi, Md. Siddiquil Islam, Salma Parvin. Phytochemical and pharmacological investigation of *Plumbago indica*.L. journal of medicinal plants studies, 2016; 4(2): 115-118.
7. Diabyajyoti SAHA, Swati PAUL. Antibacterial activity of *plumbago indica*. Turk, J Pharm Sci, 2014; 11(2): 217-222.
8. Sujin Jeba Kumar T. Balavigneswaran C.K., Prakash S., Nather Hassan Y, Srinivasa Kumar K.P. Excision wound healing and antioxidant activity of different root extract of *Plumbago indica*. Medicinal plant research, 2013; 3(3): 13-19.
9. Gayatri Nayak, Rajani Kanta Sahu. Antioxidant activity of *Plumbago Zeylanica* and *Plumbago rosea* belonging to family *Plumbaginaceae*. Natural products an Indian journal, 2011; 7(2): 51-56.
10. E.Sheeja, S.B.Joshi and D.C. Jain. Anti-fertility activity of stems of *Plumbago rosea* in female albino rats. Pharmaceutical biology, 2008; 46(12): 920-927.

11. Eldhose Binil, Kuria Kose Jayesh, Latha Mukalel Sankunni. Curative effect of *Plumbago indica* root extract on thioacetamide induced hepatotoxicity in experimental rats. *International journal of phytomedicine*, 2017; 9: 138-143.
12. Aiyalu Rajasekaran and Muthusamy periasamy. Protective effect of ethanolic root extract of *Plumbago indica*.L on paracetamol induced hepatotoxicity in rats. *African Journal of Pharmacy and pharmacology*, 29 November 2011; 5(20): 2330-2334.
13. Ann Shine Paul, Aneesul Islam, P.Yuvaraj. Anti-helicobacter pylori and cytotoxic activity of detoxified root of *Plumbago auriculata*, *Plumbago indica*, *Plumbago zeylanica*. *The journal of phytopharmacology*, 2013; 2(3): 4-8.