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## Anthelmintic Activity of Kadamba Plant Bark

Dr. Satish B. Nirmal\*

Assistant Prof., Kaumarbhritya-Balrog Department, Matoshri Asarabai Darade Ayurved College,  
Babhulgaon, Tal. Yeola, Dist. Nashik, Maharashtra, India.

### Abstract

Anthelmintic activity for the Kadamba (*Neolamarckia Cadamba*) Plant bark was studied with the aim to set a pharmacological standard for this species. The study also deals with the preliminary phytochemical investigation of the bark with various extracts such as petroleum ether to water. The anthelmintic property of the 70 % ethanolic extract of plant carried out using *Pheretima posthuma* as a test worm. Major observation in present bioassay was determination of time of paralysis and time of death. The preliminary phytochemical investigation results showed that the presence of carbohydrates, protein, glycosides- flavonoid, phenols, tannins, and keto-steroids. The tannins and glycosides may be responsible for anthelmintic activity. The presence study includes anthelmintic activity of Kadamba Plant bark first time.

**Key words** Kadamba, *Neolamarckia Cadamba*, Bark, Anthelmintic, tannins and glycosides.

**Corresponding author:** Dr. Satish B. Nirmal, Assistant Prof., Kaumarbhritya-Balrog Department, Matoshri Asarabai Darade Ayurved College, Babhulgaon, Tal. Yeola, Dist. Nashik, Maharashtra, India. Contact- +919552538383; e-mail: satish.nirmal2005@gmail.com

### Introduction

Many indigenous trees are designated as sacred trees as they are associated with mythology, religion and folklore. A few are symbolic of specific God(s). 'Kadamba' (*Neolamarckia Cadamba*) is one such tree associated with Lord Krishna. The flowers are offered in temples and used in tribal festivals. It lends its name to the 'Kadamba Dynasty' with Banavasi as capital, the first ruling Kingdom of

Karnataka. It was considered a holy tree by the dynasty. The spring festival, 'Kadambotsava' is celebrated in honour of Kadamba kingdom by the Government of Karnataka at Banavasi every year. Another interesting fact is that 'Kadamba' flower was the emblem of Athmallik State, an erstwhile princely state of India, now part of Odisha. The tree has immense medicinal values besides being a beautiful ornamental tree with scented golden

ball like floral heads. A postal stamp has also been issued by the Department of Posts to commemorate its importance. The scientific name is *Neolamarckia cadamba* of Rubiaceae family. The genus name is in honour of French naturalist Jean-Baptiste Lamarck. The common names are: Bur-flower tree, Laran (English); Kadamba, Kaduavalatige (Kannada); Kadam, Kadamb (Hindi); Kadambamu (Telugu); Kadambai, Vellaikadambu (Tamil); Attutek (Malayalam). The tree, native to South and Southeast Asia, is widely distributed in different parts of India, Bangladesh, Nepal, Myanmar and Sri Lanka (Anonymous 2020).

In the Ayurveda medicinal effect of Kadamba is described in the different Samhitas like Charaka Samhita, Sushruta Samhita, Astangahridaya, Harit Samhita, Chakaradatta etc. Kadamba is used as anti-hepatotoxic, antimalarial, antimicrobial, wound healing, antioxidant, anthelmintic, analgesic, anti-inflammatory, antipyretic, diuretic and laxative. The major constituents of the plant are triterpenes, triterpenoid glycosides, flavanoids, saponins, indole alkaloids; cadambine, cadamine, isocadambine, isodihydrocadambine (Kumar B., *et al* 2015; Dwevedi, A. 2015).

As the plant is very potential in pharmacological uses the hypothesis were made that its 70% ethanolic extract preparation may prepared and evaluated for anthelmintic activity.

### Materials and Methods

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### Procurement of Plant Material

Bark of plant Kadamba (*Neolamarckia Cadamba*) was collected from 'Matoshri Asarabai Darade Ayurved College Campus-Babhulgaon', Nashik; Maharashtra, India, in the month of September 2020. Botanical identification was carried out and voucher specimen of the plant material has been deposited at Institute level.

### Preparation of Plant Material

Fresh bark of plant Kadamba plant are shade dried and pulverized was prepared by passing through sieve No. 44, and kept in air tight polythene bags for further study.

### Collection of Worm

The Indian earthworms were collected from water logged area of soil. The collected earthworm authenticated as a *Pheretima posthuma* (Indian earthworm), is slight brownish color with long cylindrical shape (Fig. 1).



**Fig. 1: The Indian earthworm**

### Chemicals and Instruments

Solvents and reagents were procured from Pallav Chemicals and Solvents Pvt. Ltd., Mumbai, India. Other common glassware's and instrument's used for the study.

### Preparation of Extract

The dried bark plant material of Kadamba extracted using 70% ethanol as a solvent by simple maceration method. The extract concentrated and dried at room temperature accordingly to remove traces of solvent, finally stored in desiccators for further study (Khandelwal KR, 2005).

### Preliminary Phytochemical Investigation

The successive extractive values carry out ascending polarity of the solvent as per the procedure of C. K. Kokate, 1994.

### Anthelmintic Activity

The anthelmintic activity carried out as per procedure of Gururaja M.P. *et al.*, 2009. The different concentration for ethanolic extract of Kadamba plant bark (20, 40, 80 mg/ml) and piperazine citrate (10mg/ml) as a standard were prepared. Then formulations were prepared of all concentration of sample and Standard by triturating them with 50 ml 15% tween 80. After triturating the formulation mix well for 30 minute using a mechanical stirrer. The earthworms kept in petridish the sample and standard tested separately, 15% tween 80 with distilled water is a negative control. Observation was made for time of paralysis and time for death required for earthworm. When there is no movement after vigorous shaking of petridish with earthworm consider as a time of paralysis. Time for death also noted after ascertaining that worm neither

moved when shaken vigorously nor when dipped in warm water (50°C).

### Results and Discussion

#### Preliminary Phytochemical Investigation

The presence of primary and secondary metabolites as carbohydrates, protein, glycosides- flavonoid, phenols, tannins and keto-steroids (Table 1).

**Table 1: Phytochemical Investigation of Kadamba plant bark**

Phytoconstituents	Extract		
	Pet. ether	Ethanol	Water
Glycosides	-	+	-
Flavonoid	-	+	-
Steroids	+	-	-
Tannins	-	+	+
Phenolic Substances	-	+	+
Carbohydrates	-	-	+
Protein	-	-	+

+ present; - absent

**Table 2: Anthelmintic Activity of Kadamba plant bark**

Substance	Conc. (mg/ml)	Paralyzing time (min)	Death time (min)
Alcoholic Extract	20	45.20	66.05
	40	28.10	47.35
	80	15.20	24.10
Piperazine citrate	10	21.40	45.25
15% Tween	--	--	--

#### Anthelmintic Activity

In dose dependant manner the anthelmintic activity of 70% ethanolic extract of Kadamba plant bark observed. At 40mg/ml extract, the Kadamba plant bark showed paralysis in 28.10 mins and death in 47.35 mins compared to the

reference standard Piperazine citrate (10mg/ml) showed the paralysis at 21.40 minutes and death at 45.25 minutes (Table 2).

### Conclusion

These data and parameters have been investigated for Kadamba plant bark to set pharmacological and phytochemical standards which could be useful to find the authenticity of this traditional medicinal system plant. In conclusion the use of Kadamba plant bark as an anthelmintic has been confirmed and further studies are suggested to isolate the phytochemical responsible for the stated activity.

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