

## *Memecylon malabaricum* Cogn.: Plant profile, Pharmacology and Phytochemistry - A Review

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### ABSTRACT:

*Memecylon malabaricum* is an endemic plant belongs to the family Melastomaceae, widely distributed in Western Ghats. The present review article is a comprehensive account of all the phytochemicals and pharmacological investigation of the plant. The plant is traditionally used to treat various ailments like diabetes, bacterial infections, inflammatory and skin disorders including herpes, chicken pox and psoriasis. *M. malabaricum* shown to possess several biological activities such as antimicrobial, antipsoriatic, anthelmintic, antidiabetic, anti-inflammatory, antioxidant and clastogenic activity. Several phytochemicals identified from the plant like steroids, saponins, flavonoids, tannins, and alkaloids and a novel compound namely Memecylaene isolated from the leaves which have immense potential as an anti-inflammatory agent. Further, there is a need to validate pharmacological properties of this plant and isolate the compound behind it. If future studies throw a light on these aspects, definitely it will help in developing a potential biopharmaceutical product.

**Key words:** *Memecylon malabaricum*, Melastomaceae, phytochemistry, pharmacology

### INTRODUCTION

*Memecylon malabaricum* is a tree up to 5 m tall, widely distributed in Western Ghats. It is an indigenous medicinal plant used in ethno medicine.

### TAXONOMIC HIERARCHY OF *M. MALABARICUM*

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Myrtales

Family: Melastomaceae

Genus: *Memecylon*

Species: *malabaricum*



Fig 1. Habit of *Memecylon malabaricum*

## VERNACULAR NAME

Table 1. Vernacular names of *Memecylon malabaricum*

Common names		
Sl.No.	Language	Names
1.	Malayalam	Kayampoo Kasaavu
2.	Tamil	Perungaca Mulamthetti
3.	Kannada	Doddanekkare
4.	Tulu	Ollekodi

## BOTANICAL DESCRIPTION OF *M. MALABARICUM*

Table 2. Botanical description of *Memecylon malabaricum*

Plant	<i>M. malabaricum</i> is an endemic plant. Wood grayish brown, very hard and close grained and it is a good fuel.
Leaves	Leaves sessile and opposite, ovate-oblong, up to 10 x 5 cm, semi amplexicaul or subcordate at base, acute or subobtuse at apex.
Flower	Flowers in subsessile clusters, purplish blue.
Calyx	Calyx campanulate above the ovary.
Corolla	Corolla lobes 4, suborbicular.
Androecium	Stamens 8; anthers opening by slits; connective ending in a spur.
Gynoecium	Ovary 1-celled.
Fruit	Berries spherical, up to 6 mm across, crowned by the calyx limbs, blackish.
Seeds	Seed solitary.

## MEDICINAL USE OF *MEMECYLON MALABARICUM* ACCORDING TO ITS PARTS

Table 3. Medicinal use of *Memecylon malabaricum*

Sl No	Parts Used	Medicinal properties	References
1.	Leaves	• Leaves are used in the treatment of diabetes, various bacterial infections, inflammatory and skin disorders including herpes, chicken pox.	[1]
		• Leaves are also used in the treatment of Psoriasis.	[2]
2.	Roots	• Roots are ecbolic (an agent that induces contractions of the uterus.)	[3]

## PHARMACOLOGICAL STUDIES

*M. malabaricum* shown to possess several biological activities such as antimicrobial, antipsoriatic, anthelmintic, antidiabetic, anti-inflammatory, antioxidant and clastogenic activity.

### Antimicrobial activity

Antimicrobial activity of methanol extract of *M. malabaricum* leaves were investigated by a number of workers and their investigation showed that methanol extract of *M. malabaricum* leaves have antibacterial activity against both gram positive and gram negative bacteria such as *Bacillus subtilis*, *Staphylococcus aureus*, *Enterococcus faecalis*, *Salmonella typhi*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Klebsiella pneumonia* [1], [4], [5], [6].

### Antipsoriatic activity

*M. malabaricum* leaves were evaluated for in-vivo antipsoriatic activity by mouse tail test and for in-vitro antipsoriatic activity using HaCaT cells, lipoxigenase inhibition and thymidine phosphorylase inhibition assays. Hydroalcoholic extract and water fraction produced significant percent orthokeratosis in the mouse tail test. The results indicated that the plant have good antipsoriatic potential, which provides scope for further detailed research in to this plant for psoriasis [2].

### Anthelmintic activity

Aqueous and ethanol extracts from the leaves of *Memecylon malabaricum* were investigated for their anthelmintic activity against *Pheritima posthuma*. Three concentrations (20, 40, 60 mg/ml) of each extracts were studied in activity, which involved the determination of time of paralysis and time of death of the worms. Both the extracts exhibited highly significant anthelmintic activity at highest concentration of 60 mg/ml. Piperazine citrate was included as standard reference and normal saline as control [7].

### Antidiabetic activity

The methanolic extract of *Memecylon malabaricum* leaves is subjected to antidiabetic activity using experimental model of alloxan induced diabetes. The results showed that the methanolic extract at

the dose of 400 mg/kg body weight showed significantly decreased of the raised blood glucose level, comparable to reference standard, gliclazide. The results of this study explicate justification of the use of this plant in the treatment of diabetes [8].

### Anti-Inflammatory activity

Memecylaene, isolated from the plant *Memecylon malabaricum* exhibited significant anti-inflammatory activity in acute and sub-acute models of inflammation with significant reduction of paw edema and granuloma tissue compared to treatment with standard drug diclofenac sodium. Acute oral toxicity study indicates that the molecule is safe as drug [9].

### Radical Scavenging activity

Antioxident activity of methanolic extract of *M. malabaricum* were studied by different methods. In DPPH assay *M. malabaricum* extract exhibiting IC<sub>50</sub> of 0.11 ± 0.5 mg/mL. Antioxidant activity measured by ABTS method indicated that methanolic extract of *M. malabaricum* had IC<sub>50</sub> of 2.1 ± 0.21 mg/mL. The amount of total phenolic content was estimated by Folin-Ciocalteu spectrophotometric method and reported as gallic acid equivalent/100 g dry weight (g GAE/100g DW). The *M. malabaricum* leaves had 1.96 ± 0.49 g GAE/100g DW of phenolic content [4].

Radical scavenging activity of methanol extract of *Memecylon malabaricum* was determined by performing DPPH free radical scavenging activity. Total phenolic content of extracts was estimated by Folin-Ciocalteu reagent method. Extract of *M. malabaricum* scavenged DPPH radicals efficiently (IC<sub>50</sub> 6.26µg/ml). The content of total phenolics was also high in leaf extract of *M. malabaricum* (112µg GAE/mg) [5].

There is a conflict, Sivu's study revealed that DPPH free radical scavenging activities of methanolic extract was negligible (IC<sub>50</sub> 207. 24 µg/mL) and the amount of total phenolic content was 25.76 ± 0.03 [10].

### Clastogenic activity

Micronucleus test, one of the most popular and promising tests on ecotoxicology, represents a cytogenetic indicator of DNA damage for over 30 years. The test procedure used in this study was

described in the French Standard and evaluated the number of micro nucleated red blood cells in *Zekarana keralensis* larvae treated with the petroleum ether and ethanolic extracts of *Memecylon malabaricum* for 24 and 48h. The results indicated that the plant had significant genotoxic effect [11].

### PHYTOCHEMICAL STUDIES

Preliminary phytochemical analysis of methanolic extracts of *M. malabaricum* leaves revealed the presence of steroids, saponins, flavonoids, tannins, and alkaloids [8]. A novel compound Memecylaene isolated from *M. malabaricum* leaves and it is responsible for anti-inflammatory property of the plant [9]. There is no other report for the previously isolated classes of constituents from *M. malabaricum*.

### CONCLUSION

Natural product market is growing tremendously in last few years. *Memecylon malabaricum* had a long history of traditional uses for wide range of diseases. It has been proved that various parts of the plants were used in traditional to treat various ailments. In recent years it has been experimentally proved that these plants possess a number of biological activities. However, scientific validation of the plant as a modern medicine is lacking. Further studies need to be carried out to explore its potential in curing disease by using isolated compound.

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