



## Pharmacognostical investigation and phytochemical screening of the leaves of *Malvastrum coromandelianum* (L.) Garcke

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ARTICLE DETAILS	ABSTRACT
<p><i>Article history:</i> Received on 18 February 2021 Modified on 23 March 2021 Accepted on 30 March 2021</p> <hr/> <p><i>Keywords:</i> <i>Malvastrum Coromandelianum</i>, Macroscopic, Microscopic Studies, Phytochemical Screening.</p>	<p>In current research, <i>Malvastrum Coromandelianum</i> plants have been subjected to macroscopic and microscopic studies. Microscopic features revealed that the leaf was dorsiventral. Two types of trichomes were observed: sessile, unicellular, uniserated, and bi-cellular glandular head covering. The vascular bundle was coated with spongy parenchyma. Alkaloids, tannins, flavonoids, carbohydrates, and saponins were detected by phytochemical screening.</p>

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### INTRODUCTION

A source of raw materials for both traditional systems of medicine (eg Ayurvedic, Chinese, Unani, Homeopathy and Siddha) and modern medicine are medicinal plants. Plant products are now used as home remedies, and ingredients for the pharmaceutical industry in both developed and developing nations [1]. This is a big part of global medicines market. Most rural populations rely mainly on medicinal herbs as a source of primary health care, especially in the developing world [2]. Although most medicinal herbs, in their natural state, cannot be used for administration, pharmacopoeia-oriented preparations are prepared. Whether a plant is components, or simple extracts, or isolated active constituents, depends on its type of therapeutic potential of a herbal medicine. Herbal remedies consist of plant portions or unpurified plant extracts with multiple components that often work in synergy [3-4]. *Malvastrum coromandelianum* (L.) Garcke (Malvaceae family), commonly referred to as false mallow, broom weed and the plant clock [5]. Many indigenous groups around the world are used for different parts of this herb. The indigenous Mexican Kickapoo use the crushed herb leaves along with salt or alcohol to treat infections with ringworms. The Rajasthan Bhil

tribes use this plant to treat jaundice, in the form of decoction. This plant is used to treat diabetes with Mexico leaf infusion. The plant is reported as an anti-inflammatory, analgesic, and antidiarrheal in the traditional Indian system of medicine. Different activities such as anti-social, anti-inflammatory, analgesic, and antimicrobial activity for the plant have been shown in pharmacological review.

Since no data have been given on the pharmacognostic and phytochemical aspects of this research, the standardization parameters for *M. coromandelianum* were defined [6-7]. The Microwave extraction process than Soxhlet has proven more effective and efficient than its traditional counterpart. The standard technique of Soxhlet extraction is a continuous method of solvent extraction. Silk, sediments, sludges, polymers and plastics, pulp, pulp and paper, biological tissues, fabrics and samples of food are exhaust systems [8]. Experiments have shown that microwaves use less solvent and sample volumes than Soxhlet extraction and extract at much faster rate [9]. Supported Synthesis from Microwave is a new approach that helps to build property by applying and broadening the concepts of novice chemistry [10].

Many innovations already exist that fulfil green chemical goals and provide immediate opportunities to reduce environmental impacts and increase economic efficiency [11, 12].

## MATERIALS AND METHOD

### Plant Material

*M. Coromandelianum* was collected from Maharashtra, India, Kasegaon, Sangli. The plant was described and authenticated by the Yashwantrao Chavan College of Science, Karad Department of Botany. For the microscopic analysis, fresh plant material was used, while some portions of the leaves were dried and subjected to #60.

### Pharmacognostical Studies

Thin transverse sections moving through the midrib were taken free-hand for detailed microscopic observations. Sections were washed with chloral hydrate, followed by phloroglucinol and hydrochloric acid stain, and examined for the presence of any crystals. It observes slides under a Motic Microscope.

### Phytochemical Screening

100g of powdered leaf was successively extracted for phytochemical screening using a microwave extraction process with analytical grade ethyl acetate, chloroform, acetone, and

methanol. Following each solvent extraction, the plant material was dried at 45°C. After methanol extraction, the remaining mark was macerated with water for 24 h.

## RESULTS AND DISCUSSION

### Macroscopic Characters of Leaf

*M. Coromandelianum* is a woody herb growing up to 1 meter above ground. The leaves are ovate or ovate-elliptic, 4.5 cm long, 3.5 cm wide, sharp or blunt apex; the margins are prominent, twisted and the base has a 3 nerves.

### Microscopical Characters

The transverse section of the sheet lamina is dorsiventrally arranged and tightly cuticulated, with one layer of the lower and upper epidermis. There are two types of changes in the epidermis: trichomes and stomatas. The two types of unicellular, uniserial, and lignified trichome are more on the lower than the upper epidermis, while the bi-cellular, non-linear, non-linear trichomes are present in both epidermis. In the lamina region, the three unequal anisocytic stomata are well distributed. The spongy parenchyma of Mesophyll indicates lack of an ergastic cell content. The midrib area has a similar kind of stomach-free epidermis. The midrib has a concentric outline on its dorsal surface.

**Table 1:** Preliminary Phytochemical Screening

Sr. No.	Plant Constituent	Test /Reagent	Ethyl acetate Extract	Chloroform Extract	Ethanollic Extract	Methanolic Extract
1	Steroid	a. Salkowski reaction	-	+	-	-
		b. Liebermann-Burchard test	-	+	+	-
2	Alkaloid	a. Drangendroff's reagent	-	+	-	+
		b. Mayer's reagent	+	+	-	+
		c. Hager's reagent	+	+	-	+
		d. Wagner's reagent	+	+	-	+
3	Tannin	a. Ferric chloride test	+	-	-	+
		b. Lead acetate test	-	-	-	-
		c. Potassium dichromate	+	-	-	+
4	Flavonoid	Shinodatetst	+	-	+	+
5	Carbohydrate	a. Molisch's test	+	+	+	+
		b. Barfoed's test	-	-	-	-
6	Protein	a. Biuret test	+	-	-	+
		b. Xanthoproteic test	-	+	-	-
7	Saponin	Foam test	+	-	+	+

(+): Found to be present, (-) : Found to be absent

Below and above the upper and lower epidermis is a dense cellulose walled cell that is compactly arranged with two to three layers of collenchyma, which protects and extends the laminates mechanically. The vascular bundle is situated on the center of the middle breast which leads to food and nutrient conduction. The vascular bundle is of an arc-shaped two-colateral type; the flower is circling the xylem. The phenomenon shows sieve tubes and pipes; there are no phloem fibers. The xylem shows well-formed xylem spiral vessels which conduct water.

### Powder Microscopy

The presence of unicellular, lignified trichome covered with smooth cuticles, slightly lignified spiral xylem vessels, and anisocytic stomata were revealed by powder microscopy of the leaf.

### Phytochemical Screening

The dried leaf powder of *Malvastrum coromandelianum* was successively extracted by microwave extraction with solvents such as ethyl acetate, chloroform, ethanol and methanol, accompanied by water maceration. In ethyl acetate and methanolic extracts, the percentage yield of the extract was found to be higher and a minimum in ethanol extracts. The existence of numerous secondary metabolites such as alkaloids, tannins, flavonoids, carbohydrates, proteins and saponins is shown by the results of chemical tests. The results are shown in Table 1.

### CONCLUSION

Macroscopic and microscopic examination is an important criterion for accessing the identity of the herbal raw material. In conclusion, in the present analysis, different macroscopic, microscopic, physical and phytochemical aspects/parameters listed here for *Malvastrum coromandelianum* may be used with regard to its identification and authentication.

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