



Physiological, Phytochemical and Antimicrobial Properties of Five Medicinal Plants from Mangaon Tahsil, Raigad District

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Abstract

This study investigates the physiological, biochemical, and antimicrobial properties of five medicinal plants—*Carissa congesta*, *Ricinus communis*, *Tridax procumbens*, *Blumea lacera*, and *Lagerstroemia indica*—collected from forest area of Mangaon Tahsil, Raigad District. Physiological parameters such as leaf area and chlorophyll content were measured. Biochemical constituents including phenolics, flavonoids, and alkaloids were quantified. Antimicrobial activity was assessed against *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Candida albicans* using the agar well diffusion method. Results indicate significant variation among the plants, with *Ricinus communis* exhibiting the highest antimicrobial activity. These findings support the traditional medicinal use of these plants and highlight their potential for pharmaceutical applications.

INTRODUCTION

Medicinal plants have been a cornerstone of traditional medicine for centuries due to their diverse bioactive compounds (Kumar et al., 2018). The western coastal region of Maharashtra, including Mangaon Tahsil in Raigad District, hosts a variety of medicinal flora used by local communities (Sharma & Patel, 2017). Characterization of physiological and biochemical parameters alongside antimicrobial evaluation provides insights into their therapeutic potential (Gupta et al., 2020).

This study focuses on five medicinal plants

1. '*Carissa spinarum L.*' syn. *Carissa Congesta* Wight' family *Apocynaceae*. Accession no. – **01227**.

2. '*Ricinus communis L.*' family *Euphorbiaceae*. Accession no. - **01225**

3. '*Tridax procumbens L.*' family *Asteraceae*. Accession no. – **01226**

4. '*Blumea lacera* (Burm. f.) DC' family *Asteraceae* Accession no. – **01228** and

5. '*Lagerstroemia indica L.*' family *Lythraceae*. Accession no. – **01229**

These species are widely used in ethnomedicine for treating infections and inflammation (Joshi et al., 2019). The objective is to evaluate physiological traits, quantify key biochemical compounds, and assess antimicrobial efficacy against common pathogens.

Materials and Methods

Collection of experimental plants

Fresh leaves of the five selected plants were collected from forest and hilly areas of Mangaon Tahsil during March–April. Voucher specimens were deposited and authenticated from BAMU

herbarium, Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhaji Nagar,

Maharashtra following Arnon (1949), using spectrophotometric readings at 645 nm and 663 nm.

Table 1. Physiological Parameters of Selected Medicinal Plants

Plant Name	Leaf Area (cm ²)	Total Chlorophyll (mg/g FW)
<i>Carissa congesta</i>	12.5	2.85
<i>Ricinus communis</i>	15.3	3.24
<i>Tridax procumbens</i>	8.1	1.70
<i>Blumea lacera</i>	9.7	2.66
<i>Lagerstroemia indica</i>	11.9	2.87

Table-2. Biochemical Constituents of Selected Medicinal Plants

Plant Name	Phenolics (mg GAE/ g)	Flavonoids (mg QE/g)	Alkaloids (%)
<i>Carissa congesta</i>	52.4	27.8	1.35
<i>Ricinus communis</i>	61.7	32.6	1.48
<i>Tridax procumbens</i>	45.2	21.4	1.05
<i>Blumea lacera</i>	50.9	25.7	1.20
<i>Lagerstroemia indica</i>	54.1	28.4	1.30

Table 3. Antimicrobial Activity - Zones of inhibition were observed for all extracts, with *Ricinus communis* showing the strongest activity against *S. aureus* and *E. coli*.

Plant Name	<i>S. aureus</i> (mm)	<i>E. coli</i> (mm)	<i>P. aeruginosa</i> (mm)	<i>C. albicans</i> (mm)	Control (mm)
<i>Carissa congesta</i>	16.5	14.2	13.0	12.1	0
<i>Ricinus communis</i>	18.3	15.8	14.5	13.7	0
<i>Tridax procumbens</i>	14.0	12.5	11.7	10.5	0
<i>Blumea lacera</i>	15.2	13.8	12.6	11.7	0
<i>Lagerstroemia indica</i>	16.8	14.5	13.2	12.5	0

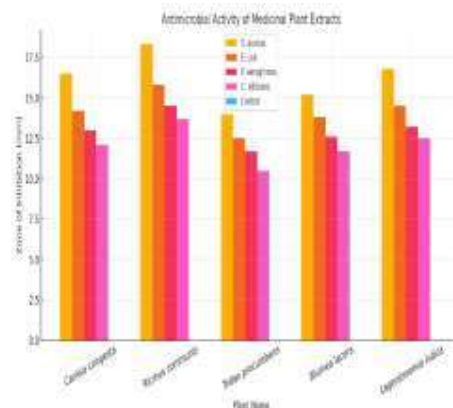


Fig. Studied plants

Conclusion

The study confirmed that all five medicinal plants from Mangaon Tahsil—*Carissa congesta*, *Ricinus communis*, *Tridax procumbens*, *Blumea lacera*, and

Lagerstroemia indica—possess significant antimicrobial activity and contain key bioactive compounds such as flavonoids, tannins, and phenolics. These findings support their traditional medicinal use and highlight their potential for development into natural antimicrobial agents.

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