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Phytochemical profile of *Syzygium laetum* bark from Southern Western Ghats

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ABSTRACT

Phytochemicals from the Syzygium genus (Myrtaceae) have fascinated humans for thousands of years due to their numerous applications. The GC-MS analysis of the Southern Ghats endemic, Syzygium laetum bark chromatograms revealed the presence of six peaks. The major constituents are Methyl palmitate (33.66%) and Methyl Octadeca-9,12- Dienoate (22.85%). The result of the phytochemical screening showed the presence of tannin, alkaloids, glycosides, reducing sugar, carbohydrates, saponins, and phenolics. The presence of these biologically active compounds in Syzygium laetum plants may support their widespread therapeutic usage.

Keywords: Phytochemical, endemic, *Syzygium laetum*, GCMS

INTRODUCTION

Syzygium laetum is native to the Southern Western Ghats region of India. The Western Ghats is a biodiversity hotspot and is home to many unique and endemic plant species, including *S. laetum*. The tree is typically found in the moist evergreen forests of the Southern Western Ghats, at an altitude of up to 1,800 meters above sea level. In the Western Ghats, it is found in the states of Karnataka, Kerala, and Tamil Nadu (Shivanna 2015) The tree has been traditionally used for medicinal purposes. In general, phytochemical analysis of the leaves of the *Syzygium* genus has revealed the presence of flavonoids, tannins, phenols, and alkaloids. The leaves also contain high levels of antioxidants, such as vitamin C, which is beneficial for the body. The bark of this genus has been found to contain flavonoids and tannins. The fruit contains flavonoids, tannins, phenols, alkaloids, and saponins.

To properly comprehend the phytochemistry of *S. laetum* and to identify all the chemicals found in the plant, more research is required. The study of the pharmacological properties of *S. laetum* and determining its potential for use in treating various conditions were also needed. Thus, the present study focused on phytochemical profiling and the characterization of the bark of *S. laetum*.

METHODOLOGY

The bark of *S. laetum* was shade dried, powdered, and subjected to the soxhlet extraction method using distilled water and methanol. The solvents were evaporated using a rotary evaporator. The preliminary phytochemical profiling and GCMS analyses were carried out.

Phytochemical screening and characterization

The methanol and distilled water extracts of *S. laetum* were subjected to preliminary phytochemical screening, using standard methods (Tiwari et al. 2011). The phytoconstituents are further monitored using GCMS techniques (Gotmare and Tambe 2019).

RESULTS AND DISCUSSION

The *S. laetum* bark phytocomponents found in the distilled water and methanol extracts were listed in Table 1. The methanol extracts of the *S. laetum* bark have more phytocomponents than distilled water extracts. By ensuring their survival against microbes, insects, and herbivores, alkaloids are important for the defense and survival of plants. The other phytocomponents present in the bark of *S. laetum* also provide beneficial effects to the plant (Saxena et al. 2013).

Table 1: Phytocomponents in the *Syzygium laetum* bark

Phytocomponents	***Syzygium laetum* bark extracts**	
	Methanol	**Distilled water**
Tannins	+	+
Alkaloids	+	+
Glycosides	+	-
Reducing sugar	+	+
Carbohydrates	+	+
Saponins	-	+
Phenols	+	+

(+: Presence; -: Absence)

The phytochemical screening indicates that *S. laetum* bark has tannin, alkaloids, glycosides, reducing sugar, carbohydrates, saponins, and phenolics. This could be the reason for its diverse biological properties, such as anti-diabetic, anti-cancer, antioxidant, anti-inflammatory, anti-viral, cardiovascular, and anti-microbial potential. Other *Syzygium* species reported similar results (Mulkalwar et al. 2021).

The GC-MS profile of *S. laetum* bark chromatograms revealed the presence of six peaks (Table 2). To identify and describe the peaks, the mass-spectral databases of the peaks were put up against the Wiley 8 and NIST libraries. The compounds were identified by examining mass spectra and comparing the retention times and peak areas of the compounds to those noted in the literature.

The major constituents are Methyl palmitate (33.66%) and Methyl Octadeca-9,12- Dienoate (22.85%). These all have antioxidant, antidiabetic, antimicrobial, anti-inflammatory, and anticancer

properties. Similar studies were reported by various researchers Ramya et al. (2012) and Beulah et al. (2018).

Table 2: GC-MS result of *Syzygium laetum* bark

Compound name	Molecular formula	Retention time	Peak area (%)
Methyl palmitate	$C_{17}H_{34}O_2$	28.382	33.66
Dibutyl phthalate	$C_{16}H_{22}O_4$	29.222	11.79
Methyl Octadeca-9,12-Dienoate	$C_{19}H_{34}O_4$	31.605	22.85
9-Octadecenoic acid (Z)-	$C_{36}H_{68}O_4$	31.705	14.67
Methyl Ester	$C_{16}H_{32}O_2$	32.160	8.86
Stigmast-5-en-3-ol, oleat	$C_{47}H_{82}O_2$	47.644	8.18

CONCLUSION

The conceivable origins of bioactive chemicals were uncovered by utilizing qualitative and GCMS analyses. The methanol extracts of *S. laetum* bark contained phenols, saponins, alkaloids, glycosides, reducing sugar, carbohydrates, and glycosides. Methyl palmitate (33.66%) and Methyl Octadeca-9,12- Dienoate (22.85%) were the two main phytoconstituents from the GCMS analysis of *S. laetum* bark. According to the results of the current study, *S. laetum* may possess considerable biological properties.

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