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Phytochemical Screening and GC-MS Profiling of the Methanolic Fraction of *Cryptocarya Wightiana* Thw

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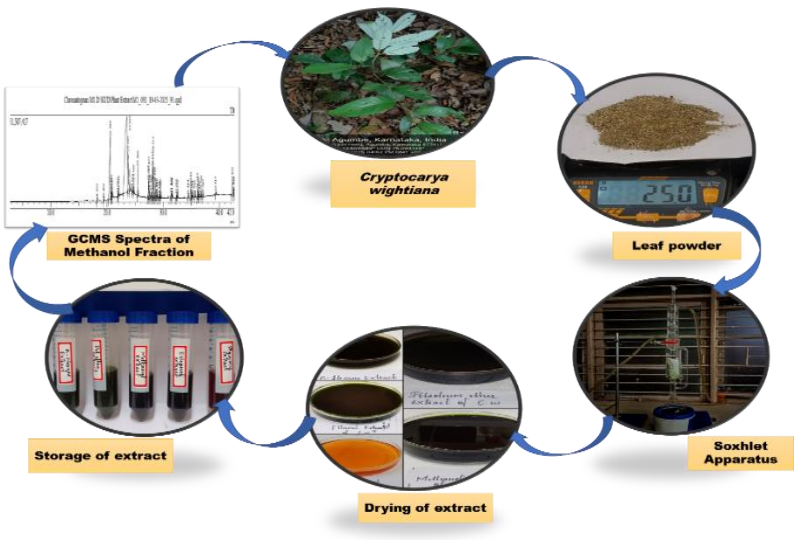
Abstract

Since ancient times, plants with medicinal value have been linked to traditional medicine, with plant-derived compounds providing various therapeutic potential. This study investigated the phytochemical composition of *Cryptocarya wightiana* Thw., a species belonging to the Lauraceae family, widely distributed in the Central Western Ghats of Karnataka, India. Fresh leaves were collected from Agumbe, Karnataka, and subjected to Soxhlet extraction using both polar and nonpolar solvents, based on their polarity. Among the tested solvents, the methanol extract had the greatest yield (29.2%) and was rich in secondary metabolites such as flavonoids, alkaloids, tannins, phenols, and saponins. Phytochemical screening confirmed that polar solvents extracted a broader range of bioactive compounds than nonpolar solvents did. Further analysis of the methanolic extract via gas chromatography-mass spectrometry (GC-MS) revealed 45 phytocompounds. The major constituents identified were cis-9-hexadecenal (45.51%), n-hexadecanoic acid (16.41%), octadecanoic acid (6.23%), 9-octadecenoic acid (Z)-, oxiranylmethyl ester (4.30%), and linoleyl acetate (2.88%), reported biological activities such as antioxidant, antimicrobial, and anti-inflammatory effects. These findings provide a baseline chemical profile of *C. wightiana*, supporting its traditional use in herbal medicine and facilitating future pharmacological validation and comparative studies with other solvent extracts.

Keywords: Medicinal plants, *Cryptocarya wightiana* Thw, Lauraceae, Methanol extract, Phytochemicals, Gas chromatography–mass spectrometry.

Graphical Abstract



1. INTRODUCTION

Plants have long been recognised as valuable sources of bioactive compounds, which include both primary and secondary metabolites with diverse biological activities such as antioxidant, antimicrobial, and anticancer effects (Alsultan et al., 2016). Secondary metabolites—such as alkaloids, flavonoids, terpenoids, phenolics, and steroids—are particularly important due to their potential therapeutic properties and contribution to human health. The exploration of these compounds is crucial for the discovery of novel drugs and for addressing emerging challenges such as antimicrobial resistance (Promprom et al., 2017; Swamy et al., 2015). In India, more than one thousand plant species have been traditionally utilised throughout diverse regions through medicinal systems such as Ayurveda, Siddha, and Unani, which have continued for more than 3000 years, predominantly employing plant-based medicines. Ancient texts such as the Rigveda (4500–1600 B.C.) and the Atharvaveda record the therapeutic applications of several plants. Classical Ayurvedic writings, which include Charaka Samhita and Sushruta Samhita, reference the utilisation of over 700 distinct plants (Padmashree et al. 2018).

The Lauraceae family is a prominent group of subtropical and tropical trees, comprising approximately 67 genera and over 2,500 species worldwide, many of which thrive in biodiversity hotspots (Custodio et al., 2014). Members of this family are known to produce a variety of bioactive metabolites with ethnomedicinal relevance. The genus *Cryptocarya* (R.Br.) comprises approximately 350 species of evergreen trees, distributed across tropical, subtropical, and temperate regions, with several species traditionally used in folk medicine (Manh et al., 2023; Rali et al., 2007). Previous studies have reported that species of *Cryptocarya* produce flavonoids, alkaloids, and other bioactive compounds with significant pharmacological potential (Chou et al., 2011; Toribio et al., 2006).

Cryptocarya wightiana Thw., an evergreen tree found in the Central Western Ghats of India, as well as Sri Lanka and Myanmar, remains underexplored for its phytochemical composition and biological activities. *Cryptocarya wightiana* Thw. is an evergreen tree reaching up to 18 m in height, characterised by reddish-brown bark (10–12 mm thick) and rusty-hairy young branches. The leaves are simple, alternate, leathery, and glabrous, with elliptic to elliptic-oblong blades measuring 6.5–20 × 2.5–10 cm. They possess entire margins, acute to tapering apices, and whitish-glaucous undersides with 7–12 pairs of prominent lateral veins.

The species bears small (3–4 mm), yellowish, bisexual flowers arranged in densely hairy axillary panicles. The perianth has six hairy lobes in two whorls, and the androecium comprises three whorls of stamens with distinct glandular and nonglandular filaments. The ovary is half-inferior with a short style and blunt stigma. The fruit is a smooth, hairless, black drupe (10–15 mm), enclosed within an expanding perianth tube (Gangopadhyay and Chakrabarty, 2005).

Distribution: Found in India, Sri Lanka, and Myanmar; within India, it occurs in the Central Western Ghats, specifically in the southern and central Sahyadri ranges.

Although ethnobotanical reports indicate the medicinal relevance of *Cryptocarya wightiana*, detailed chemical profiling and systematic bioactivity investigations of this species remain limited. Therefore, the present study aims to characterize the phytochemical constituents of the methanolic Soxhlet leaf extract of *C. wightiana* using GC–MS analysis and to explore their potential implications for future therapeutic applications. This work represents the first comprehensive GC–MS profiling of this species. The identified compounds, including phenolics, terpenoids, and fatty acid derivatives, are known for their biological activities and may also function as effective reducing and stabilizing agents during the green synthesis of

silver nanoparticles (AgNPs). Thus, this study bridges phytochemical profiling with nanomaterial formation, addressing a significant knowledge gap in the scientific literature.

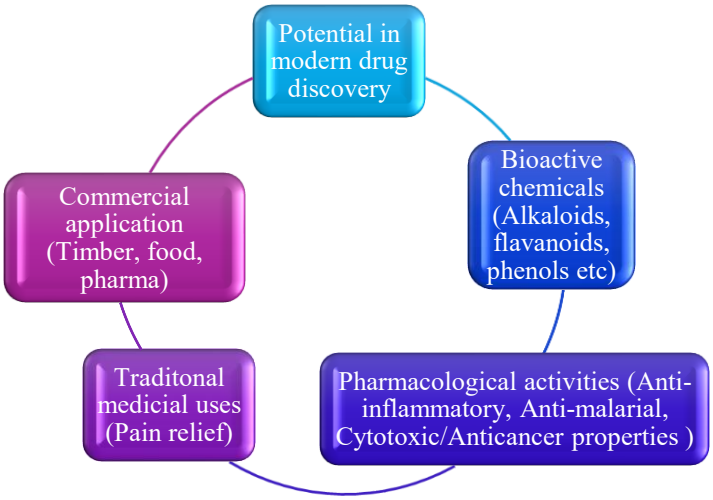


Fig. 1 Applications of the genus *Cryptocarya* (Lauraceae) (Manh et al., 2023; Rali et al., 2007; Chou et al., 2011; Toribio et al., 2006).

2. MATERIALS AND METHODS

2.1 Plant material

Cryptocarya wightiana Thw. was collected from the Central Western Ghats of Agumbe, Karnataka, India, near Someshwara Wildlife Sanctuary and Kudremukh National Park at 660 m above mean sea level. Agumbe is part of the Western Ghats, a UNESCO World Heritage Site. The plant was authenticated by Taxonomist Dr Haleshi C., DOS in Botany, Davangere University, Karnataka, India. Fresh samples were collected in sterile plastic bags, stored at −20 °C, and transported to the laboratory the following day. The voucher specimen (HDUD518) is preserved at the herbarium of DOS in Botany, Davangere University. Figure 2 shows the plant and its collection site.

2.2 Processing and preparation of the leaf extract from *C. wightiana*

Leaves were washed with tap water followed by distilled water to remove dust and impurities. They were shade-dried at 24 ± 4 °C for approximately 10 days to preserve phytochemicals. Once completely dry, leaves were ground into a fine powder using a mechanical grinder and sieved for uniform particle size. The powdered material was stored in an airtight container at 4 °C until extraction.

For extraction, 25 g of dried powdered leaves were subjected to Soxhlet extraction using 250 mL of each solvent, namely methanol, ethanol, distilled water, n-hexane, and petroleum ether. The extraction was continued until the siphon solvent became colourless, indicating exhaustive extraction of soluble phytoconstituents. The obtained extracts were concentrated using a rotary evaporator under reduced pressure at 40–45 °C with a rotation speed of 80–100 rpm to remove the solvents. The resulting concentrated extracts were weighed and stored in sterile vials at 4 °C for further analysis.

2.3 Preliminary phytochemical analysis

The preliminary phytochemical screening of plant extract was carried out using n-hexane, petroleum ether, methanol, ethanol, and distilled water extracts, respectively, to identify various phytochemicals present in the leaf extract based on qualitative and quantitative analysis methods.

2.3.1 Qualitative phytochemical evaluation of methanol extract

Several phytochemical tests were performed to determine the bioactive constituents present in the plant extract. The screening of phytochemicals for *Cryptocarya wightiana* Thw plants has been carried out using solvents such as methanol, distilled water, ethanol, n-hexane and petroleum ether. These tests were performed with the help of standardised methods (Harborne 1984; Shaikh and Patil 2020). Understanding phytochemicals will help us understand active phytoconstituents that would help in medicinal uses.

2.3.2 Quantitative phytochemical evaluation of methanol extract

The phytochemicals present in the methanol leaf extract were determined and quantified by a standard procedure (Gracelin et al. 2013).

2.3.2.1 Total Phenol Content Estimation

The total phenolic contents of the extracts were estimated as per Singleton et al. (1999) method using FC reagent, where Gallic acid was used as a standard. The results were expressed in µg Gallic acid equivalent (GAE)/mg extract. To 200 µg of appropriately diluted extract, 0.5 mL of FC Reagent was added, followed by incubation at room temperature (10 min) and addition of 7% Na2CO3 (2 mL) solution. The mixture was heated in a boiling water bath (100 °C) for 1 minute, and the absorbance of the colour was recorded at 750 nm using a spectrophotometer (Slinkard et al., 1999).

2.3.2.2 Total Flavonoid Content Estimation

The flavonoid content was estimated according to the method of Delcour and Varebeke (1985). To 200 µg of sample, 5 mL of chromogen reagent (0.1% cinnamaldehyde solution in a cooled mixture of 75 mL methanol and 25 mL concentrated HCl) was added. After 10 min incubation, the absorbance was recorded at 640 nm. The total flavonoid content was expressed in µg catechin equivalents (CE)/mg of extracts. (Delcour et al., 1985).

2.4 GC-MS analysis of the methanolic extract of *Cryptocarya wightiana* Thw

Preliminary phytochemical screening indicated that the methanol extract contained the highest diversity and concentration of bioactive compounds among all tested solvents (Harborne, 1984; Shaikh and Patil, 2020). Therefore, the methanol extract was selected for detailed chemical profiling using GC-MS. Gas Chromatography–Mass Spectrometry (GC-MS) analysis was conducted via a Shimadzu GC-2030 system paired with a TQ8040NX mass spectrometer. The setup included an SH-I-5SiI MS fused silica column (5% diphenyl/95% dimethylpolysiloxane; 30.0 m length × 250 µm internal diameter, 0.25 µm film thickness) linked to a triple quadrupole mass selective detector (TQ8040NX Inert MSD). Helium was employed as the carrier gas at a constant flow rate of 1.0 mL/min. The ion source and interface temperatures were maintained at 230°C and 280°C, respectively. Sample injection was performed using 1 µl in split mode (1:30 split ratio) at an injector temperature of 300°C. The temperature program for the GC oven was as follows: the initial temperature was set to 50°C and held for 2 minutes, followed by a ramp to 200°C at 10°C per minute, held for 1 minute, then further increased to 300°C at 5°C per minute and maintained for 5 minutes. The total run time was 43 minutes. The relative abundance of each detected compound was calculated based on its peak area in relation to the total chromatographic area. System operation and data acquisition were managed via the MS solution software provided by the manufacturer. The identification of compounds, including their molecular weights and structures, was achieved by comparing their mass spectra with those of entries in the NIST23 (National Institute of Standards and Technology) library.

3 RESULTS AND DISCUSSION

3.1 Leaf extract yield in various solvents

Soxhlet extraction of *Cryptocarya wightiana* Thw. leaves using solvents of varying polarity resulted in differential extract yields: n-hexane (2.5 g, 10%), petroleum ether (1.8 g, 7.2%), methanol (7.3 g, 29.2%), ethanol (4.8 g, 19.2%), and distilled water (5.5 g, 22%) (Table 1). Among these, methanol exhibited the highest extraction yield, followed by distilled water, ethanol, n-hexane, and petroleum ether. This trend highlights the greater efficiency of polar solvents in extracting phytoconstituents, which can be attributed to the enhanced solubility of polar bioactive compounds in such solvents.

3.2 Phytochemical analysis

3.2.1 Qualitative evaluation

Qualitative screening revealed that methanol and ethanol extracts were rich in alkaloids, saponins, phenols, flavonoids, tannins, glycosides, and carbohydrates. Nonpolar solvents (n-hexane and petroleum ether) mainly extracted terpenoids and steroids. No proteins or amino acids were detected in any extract (Table 2). These results confirm that solvent polarity significantly influences the type and quantity of secondary metabolites extracted (Harborne, 1984; Shaikh and Patil, 2020).

3.2.2 Quantitative evaluation

Quantitative estimation of total phenolics and flavonoids was carried out for the methanol extract of *Cryptocarya wightiana* (CWM1). The results are presented in Table 3 (Fig. 3 and Fig. 4). The extract showed a high phenolic content of 838.78 ± 21.75 µg/mg GAE and a flavonoid content of 518.75 ± 23.73 µg/mg QE (Table 3), indicating that the methanol extract is rich in antioxidant phytochemicals. The elevated levels of phenolics and flavonoids suggest the potential of this extract for pharmacological and nutraceutical applications.

3.3 GC-MS Analysis

Due to its high yield and rich phytochemical profile, the methanol extract was selected for GC-MS analysis. The GC-MS chromatogram revealed 45 peaks, which were compared with the NIST23 spectral library for tentative identification (Fig 5). Among these, the 15 major compounds with the highest similarity indices and peak areas are presented in Table 4. The dominant compound was cis-9-Hexadecenal (peak area 45.51%, RT 23.545 min), indicating its prevalence in the extract. Other major compounds included hexadecanal (RT 18.232 min), n-hexadecanoic acid (RT 20.588 min), 9,17-octadecadienal (Z)- (RT 20.722 min), E, E, Z-1,3,12-nonadecatriene-5,14-diol (RT 20.827 min), octadecanoic acid (RT 23.765 min), 9,12-octadecadienoic acid (Z, Z)- (RT 23.990 min), hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester (RT 24.747 min), 9-octadecenoic acid (Z)-, 2,3-dihydroxypropyl ester (RT 27.467 min), linoleyl acetate (RT 28.113 min), 9-octadecenoic acid (Z)-, oxiranylmethyl ester (RT 28.215 min), E, Z-1,3,12-nonadecatriene (RT 28.807 min), (3S,8S,9S,10R,13R,14S,17R)-17-((2R,5R)-5,6-Dimethylheptan-2-yl)-10,13-dimethyl-..., Stigmast-5-en-3-ol, oleate (RT 36.746 min), and 16-Hentriacontanone (RT 39.317 min).

The Major components, such as cis-9 Hexadecanal, hexadecanal, and n-hexadecanoic acid (Table 5), have previously been reported in other *Cryptocarya* species, including *C. chinensis* and *C. obovata* (Chou et al. 2011; Kurniadevi et al. 2010). However, several compounds identified in *C. wightiana* have not been previously reported, suggesting novel chemical constituents in this species. While several identified compounds are known to possess biological activities such as antioxidant, anti-inflammatory, or

antimicrobial properties, genralized claims (e.g., "anticancer") were avoided unless supported by literature.

DISCUSSION

Previous phytochemical investigations on *Cryptocarya* species have predominantly reported terpenoids, alkaloids, and essential oil constituents as the major chemical components. For example, GC–MS analysis of *C. malabarica* revealed the predominance of linalool and β-caryophyllene, while *C. densiflora* exhibited a higher abundance of terpenoid derivatives. In contrast, the present study on *Cryptocarya wightiana* demonstrated a distinct phytochemical profile characterized mainly by fatty acid esters and phenolic derivatives. Notably, several compounds identified in this study, particularly long-chain fatty acid esters and specific phenolic constituents, have not been previously reported in other *Cryptocarya* species, suggesting species-specific phytochemical diversity and highlighting the novelty of the present findings.

A wide spectrum of secondary metabolites has been reported from the genus *Cryptocarya*, including alkaloids, α-pyrones, monoterpene–polyketide hybrids, arylalkyl and arylalkenyl derivatives, flavonoids, monophenols, lignans, terpenoids, aliphatic derivatives, sterols, stilbenes, coumarins, amines, megastigmanes, furanones, quinones, and xanthones. This remarkable chemical diversity supports the traditional medicinal relevance of the genus and reflects its extensive biosynthetic potential, offering a valuable reservoir of bioactive compounds for pharmacological and nanotechnological applications (Manh et al., 2023).

Earlier GC–MS investigations have consistently shown terpenoid constituents, particularly monoterpenes and sesquiterpenes such as limonene, linalool, and nerolidol, to dominate the chemical composition of *Cryptocarya* leaf extracts. These findings are in agreement with studies on the essential oils of *C. aschersoniana* and other *Cryptocarya* species, where similar chemical groups were prevalent. Comparable phytochemical profiles have also been reported in related Lauraceae members such as *Litsea* and *Persea*, suggesting a conserved terpenoid biosynthetic pattern within the family. The frequent detection of β-caryophyllene further supports this trend. Overall, earlier studies emphasize the characteristic terpenoid dominance across *Cryptocarya* species (Andrade et al., 2018).

Although several compounds identified in the present study have been reported in previous literature to exhibit antioxidant, antimicrobial, and anti-inflammatory activities, these biological properties were established using isolated pure compounds and were not directly evaluated in the current investigation. Therefore, the biological relevance of these phytochemicals in *C. wightiana* extracts remains preliminary and warrants further bioassay-guided validation.

Limitations: The study focused exclusively on chemical profiling via GC-MS. No quantitative bioassays or functional studies were performed to assess biological activity. Additionally, compound identification relied solely on NIST library matching without co-injection or authentic standards, limiting the reliability of assignments.

Overall, the results demonstrate that *C. wightiana* leaves are rich in secondary metabolites, particularly when extracted with polar solvents, and contain both common and potentially unique bioactive compounds. This chemical diversity provides a foundation for future pharmacological investigations and comparison with other members of the genus *Cryptocarya*.

4 CONCLUSION

Methanol proved to be the most effective solvent for extracting a wide range of phytoconstituents from

Cryptocarya wightiana Thw leaves were extracted using Soxhlet extraction, resulting in the highest yield and chemical diversity. Phytochemical screening and GC–MS analysis revealed the presence of numerous bioactive compounds, including phenolics, terpenoids, and fatty acid derivatives. Although several of these metabolites are known for their antioxidant and anticancer activities, their specific biological potential in *C. wightiana* remains largely unvalidated. This study provides the first comprehensive chemical profiling of this species and establishes a foundational framework for future bioassay-guided investigations aimed at exploring its antibacterial, antioxidant, and anticancer applications.

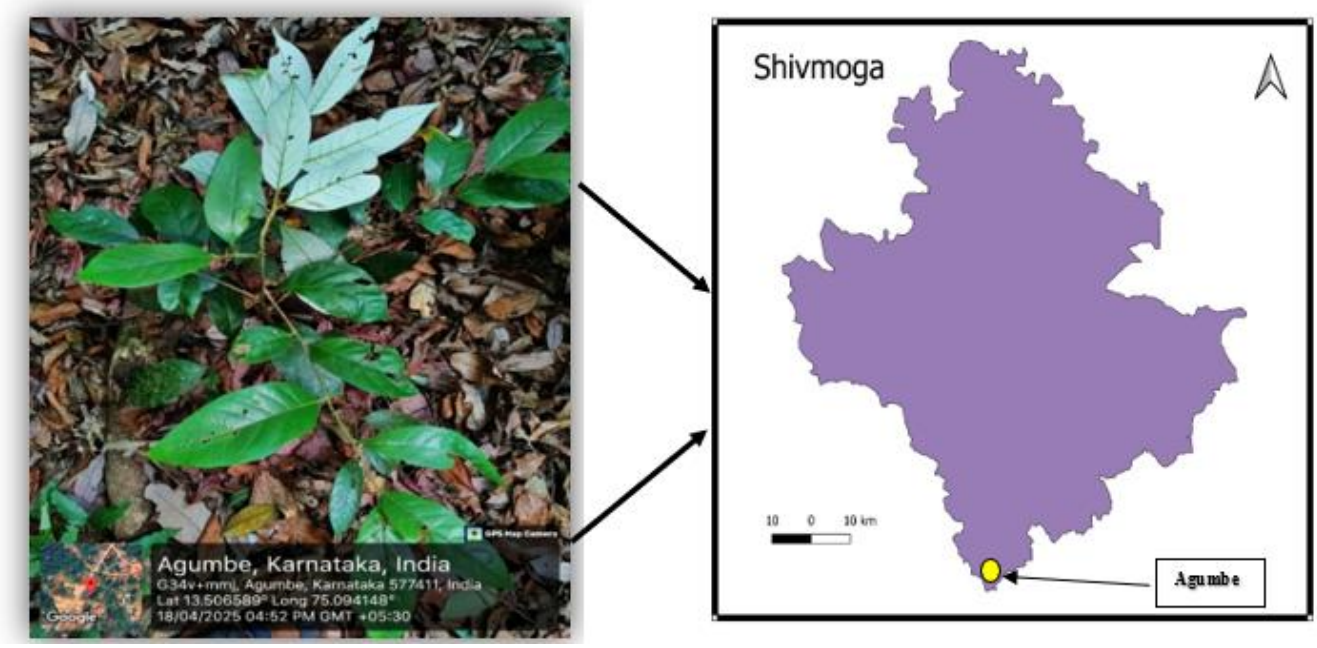


Fig. 2 Morphology and natural habitat of *Cryptocarya wightiana* from Agumbe, Karnataka

Table 1: Total crude leaf extract obtained via Soxhlet extraction in different solvents

Solvent used	Yield of extract in Grams(g)	Yield of extract in percentage (%)
n-Hexane	2.5 g	10%
Petroleum ether	1.8 g	7.2%
Ethanol	4.8 g	19.2%
Methanol	7.3 g	29.2%
Distilled water	5.5 g	22%

Table 2: Phytochemical analysis of the leaf extracts of *Cryptocarya wightiana* Thw using different solvents

Phytochemicals	Test Performed	Distilled Water	Methanol	Ethanol	n-Hexane	Petroleum Ether
Alkaloids	Mayer's	+	+++	++	+	+
	Dragendorff's test	+	+++		+	+
Flavonoids	Lead acetate	+	+++	++	+	+
	Alkaline Reagent	+	+++	++	+	+
Phenols	Ferric Chloride test	+	+++	++	–	–
Tannins	Lead Acetate test	+	+++	++	–	–
Saponins	Foam Test	+	++	+	–	–
Terpenoids	Salkowski Test	–	++	++	+	+
Steroids	Liebermann–Burchard Test	–	+	+	+	+
Glycosides	Keller-Killiani	+	++	++	–	–
	Borntrager's test	+	+	+	–	–
Carbohydrates	Molisch's	+	++	++	+	+
	Benedict's test (Reducing sugar)	+	++	++		
Proteins	Biuret test	–	–	–	–	–
Amino acids	Ninhydrin test	–	–	–	–	–

"+: positive" and "–: negative"

'+++: strongly present, ++: moderately present and +: trace present.

Table 3: Total phenolics and flavonoids contents of samples CWM1

Sl. No.	Samples	Polyphenols (µg/mg GAE)	Flavonoids (µg/mg CE)
1	CWM1	838.78 ± 21.75	518.75 ± 23.73

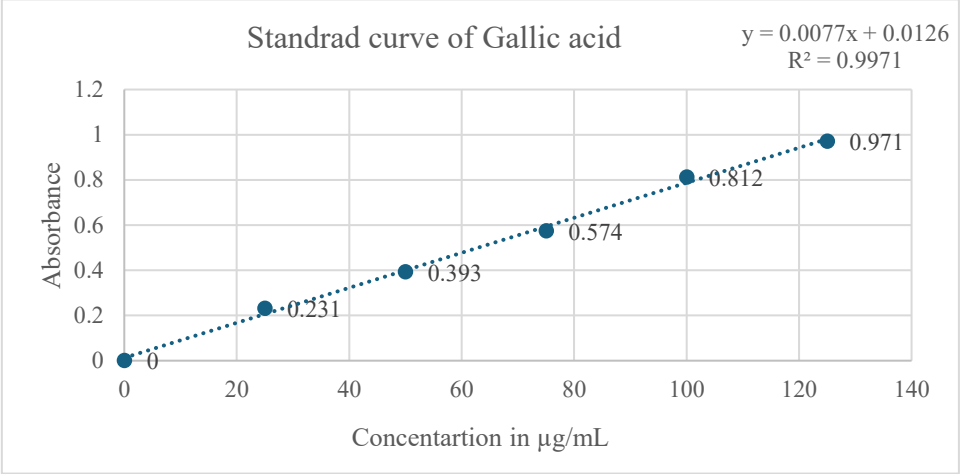


Fig. 3 Standard curve of Gallic acid for estimation of total phenolic content

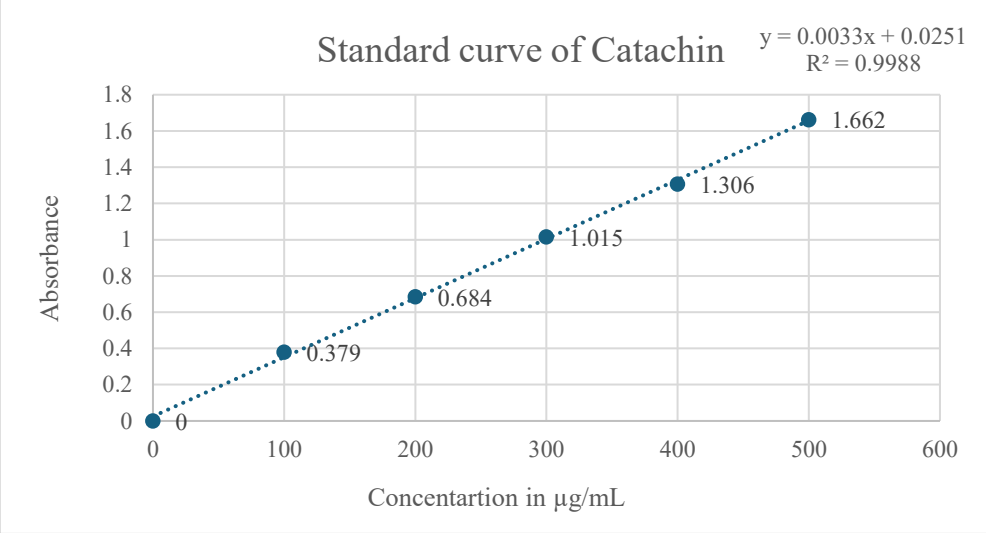


Fig. 4 Standard curve of Catachin for estimation of total flavonoid content

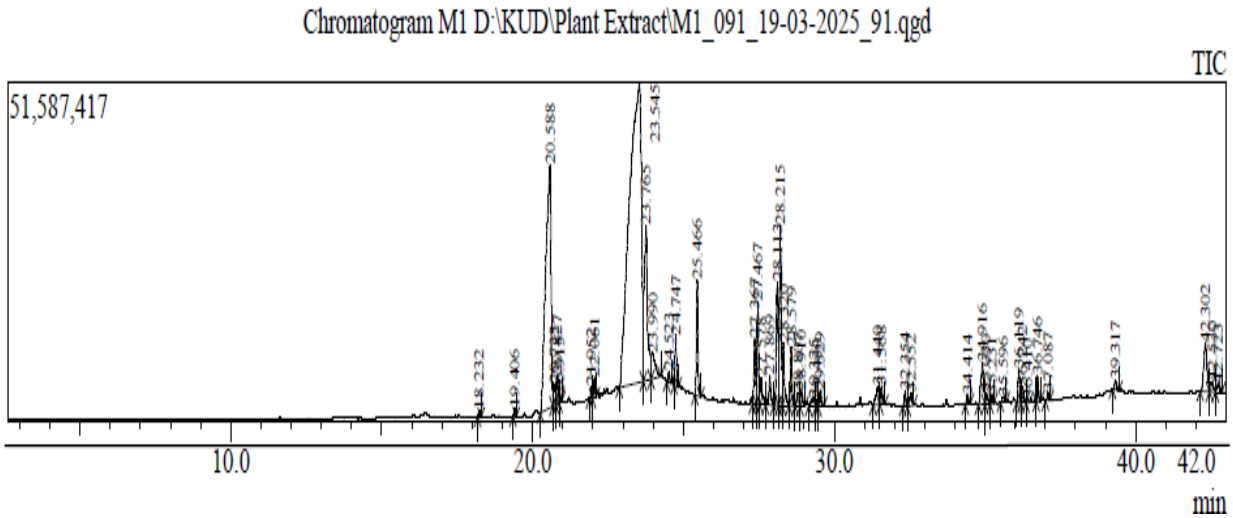
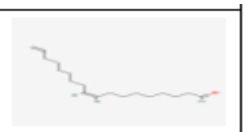
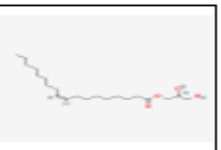
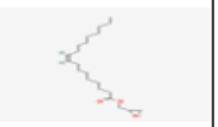
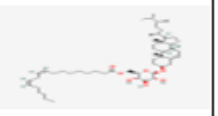


Fig. 5 Chromatogram of the methanolic extract of *Cryptocarya wightiana* Thw

Table 4 GC-MS results of the methanolic fraction of *Cryptocarya wightiana* showing the potent compounds and their structures

Sl No	Retention time	Compound name	MW	Peak Area %	Similarity	Structure of the compounds
1	18.232	Hexadecanal	240.42 g/mol	0.13	96	
2	20.588	n-Hexadecanoic acid	256.42 g/mol	16.41	94	
3	20.722	9,17-Octadecadienal, (Z)-	264.4 g/mol	0.48	89	
4	20.827	E, E, Z-1,3,12-Nonadecatriene-5,14-diol	294.5 g/mol	0.59	89	
5	23.545	cis-9-Hexadecenal	238.41 g/mol	45.51	89	
6	23.765	Octadecanoic acid	284.5 g/mol	6.23	89	
7	23.990	9,12-Octadecadienoic acid (Z,Z)-	280.4 g/mol	1.29	89	
8	24.747	Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester	330.5 g/mol	0.89	82	

9	27.467	9-Octadecenoic acid (Z)-, 2,3-dihydroxypropyl ester	356.5 g/mol	2.00	91	
10	28.113	Linoleyl acetate	308.5 g/mol	2.88	86	
11	28.215	9-Octadecenoic acid (Z)-, oxiranylmethyl ester	338.5 g/mol	4.30	92	
12	28.807	E,Z-1,3,12-Nonadecatriene	262.5 g/mol	0.46	82	
13	35.596	(3S,8S,9S,10R,13R,14S,17R)-17-((2R,5R)-5,6-Dimethylheptan-	825.2 g/mol	0.14	80	

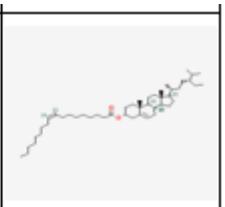
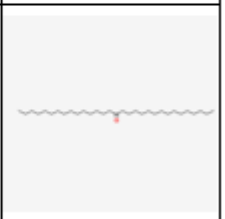
14	36.746	Stigmast-5-en-3-ol, oleate	679.2 g/mol	0.47	85	
15	39.317	16-Hentriacontanone	450.8 g/mol	0.20	92	

Table 5 Names, compound natures and biological activities of phytoconstituents identified from methanol extracts of *Cryptocarya wightiana* Thw via GC-MS analysis

Sl No	Compound	Type of Compounds	Bioactivity
1	Hexadecanal	Aliphatic aldehyde	Cytotoxicity, Antioxidant and Antimicrobial Activities
2	n-Hexadecanoic acid	Saturated fatty acid	Anti-inflammatory, Cytotoxic, Antibacterial and Antioxidant activity
3	9,17-Octadecadienal, (Z)-	Unsaturated aliphatic aldehyde	Antioxidant activity
4	E, E, Z-1,3,12-Nonadecatriene-5,14-diol	Aliphatic polyunsaturated diol	Antibacterial and Antibiofilm Effects
5	cis-9-Hexadecenal	Unsaturated aliphatic aldehyde	Cytotoxicity, Antioxidant and Antibacterial Potentials
6	Octadecanoic acid	Saturated Fatty acid	Antibacterial, Inhibitory, allelopathic effects, anti-inflammatory activity
7	9,12-Octadecadienoic acid (Z,Z)-	Polyunsaturated aliphatic carboxylic acid	Antimicrobial activity, anticancer, Hepatoprotective, anti-arthritic, anti-asthma, diuretic
8	Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester	Saturated aliphatic fatty acid ester	Antibacterial and anti-fungal properties

9	9-Octadecenoic acid (Z)-, 2,3-dihydroxypropyl ester	Monoester of unsaturated fatty acid and glycerol	Anti-inflammatory, Anti-proliferative, NF-κb-inhibitory potential, Antifungal, Antibacterial, Antioxidant and Antitumour potential
10	Linoleyl acetate	Acetate ester of polyunsaturated fatty alcohol	Cytotoxicity
11	9-Octadecenoic acid (Z)-, oxiranylmethyl ester	Epoxy (oxirane) ester of monounsaturated fatty acid	Antimicrobial, Hepatoprotective, Antioxidant and Antidiabetic property
12	E,Z-1,3,12-Nonadecatriene	Aliphatic polyunsaturated hydrocarbon (triene)	Antibacterial, Antibiofilm Effects, Antifungal and Cytotoxic potential
13	(3S,8S,9S,10R,13R,14S,17R)-17-((2R,5R)-5,6-Dimethylheptan-	Steroidal triterpenoid derivative with a branched alkyl side chain	Antioxidant, Anti-hyperlipidemic, Cardioprotective, Antifungal and Anti-inflammatory potential
14	Stigmast-5-en-3-ol, oleate	Steroid ester (phytosterol ester)	Anti-obesity, Phytotoxicity, Cytotoxicity, Antibacterial, Antidepressant, Antifungal and Antiproliferative activity
15	16-Hentriacontanone	Long-chain aliphatic ketone	Antimicrobial Anticonvulsant, Anticancer and Insecticidal property

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Declarations

Ethical Approval

This study does not involve any human participants or animals. Therefore, ethical approval was not required.

Data availability statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Plant Reproducibility

Cryptocarya wightiana Thw is a wild plant species that was collected from its natural habitat in Agumbe, Central Western Ghats, Karnataka, India. The plant material was identified by Dr Haleshi C, Taxonomist at the Department of Studies in Botany, and a voucher specimen (Voucher No: [HDUD518]) was deposited at the Herbarium of the Department of Studies in Botany, Davangere University, Shivagangotri, Davangere, 577007.

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REFERENCES

1. Alsultan QMN, Sijam K, Rashid TS, Ahmad KB. GC-MS analysis and antibacterial activity of mangosteen leaf extracts against plant pathogenic bacteria. Am J Plant Sci. 2016;7:1013–1024. https://doi.org/10.4236/ajps.2016.77100
2. Andrade PMD, Melo DCD, Alcoba AET, Ferreira WG, Pagotti MC, Magalhães LG, Miranda ML. Chemical composition and antileishmanial and cytotoxic activities of essential oil from *Cryptocarya aschersoniana*. An Acad Bras Cienc. 2018;90:2671–2678.
3. Cave A, Leboeuf M, Moskowitz H, Ranaivo A, Bick IRC, Sinchai W, Nieto M, Sévenet T, Cabalion P. Alkaloids of *Cryptocarya phyllostemon*. Aust J Chem. 1989;42:2243–2263. https://doi.org/10.1071/CH9892243
4. Chou TH, Chen JJ, Peng CF, Cheng MJ, Chen IS. New flavanones from *Cryptocarya chinensis* and antituberculosis activity. Chem Biodivers. 2011;8:2015–2024. https://doi.org/10.1002/cbdv.201000378
5. Custodio DL, Veiga Junior VF. Lauraceae alkaloids. RSC Adv. 2014;4:21864–21890. https://doi.org/10.1039/C4RA02066C
6. Delcour JA, Varebeke DJD. Colourimetric assay for flavonoids in pilsner beers. J Inst Brew. 1985;91:37–40.
7. Dumontet V, Van Hung N, Adeline MT, Riche C, Chiaroni A, Sévenet T, Guéritte F. Cytotoxic flavonoids and α-pyrones from *Cryptocarya obovata*. J Nat Prod. 2004;67:858–862. https://doi.org/10.1021/np030510h
8. Gangopadhyay M, Chakrabarty T. The genus Cryptocarya in the Indian subcontinent. J Econ Taxon Bot. 2005;29:274–293.
9. Gracelin DHS, Britto A, Kumar BJR. Phytochemical analysis of five *Pteris* species. Int J Pharm Pharm Sci. 2013;5:105–107.

10. Harborne JB. Phytochemical methods. 2nd ed. London: Chapman and Hall; 1984. p. 54–84.
11. Juliawaty LD, Rahidah PN, Abdurrahman S, Hermawati E, Alni A, Tan MI, Ishikawa H, Syah YM. Dihydro-α-pyrones from *Cryptocarya pulchrinervia*. J Nat Med. 2020;74:584–590. https://doi.org/10.1007/s11418-020-01392-5
12. Kurniadewi F, Juliawaty LD, Syah YM, Achmad SA, Hakim EH, Koyama K, Kinoshita K, Takahashi K. Phenolics from *Cryptocarya konishii*. J Nat Med. 2010;64:121–125. https://doi.org/10.1007/s11418-009-0370-x
13. Liu Y, Rakotondraibe LH, Brodie PJ, Wiley JD, Cassera MB, Miller JS, Ratovoson F, Rakotobe E, Rasamison VE, Kingston DGI. Antimalarial dihydro-α-pyrones from *Cryptocarya rigidifolia*. J Nat Prod. 2015;78:1330–1338. https://doi.org/10.1021/acs.jnatprod.5b00130
14. Manh Ha N, The Son N. Phytochemistry and pharmacology of *Cryptocarya*. Chem Biodivers. 2023;20:e202201102. https://doi.org/10.1002/cbdv.202201102
15. Manjamalai A, Narala Y, Haridas A, Grace VMB. GC-MS analysis of *Plectranthus amboinicus*. Int J Curr Pharm Res. 2011;2:129–136.
16. Padmashree MS, Ashwathanarayana R, Raja Naika RB. Antioxidant and GC-MS study of *Ipomoea staphylina*. Asian J Pharm Pharmacol. 2018;4:473–492. https://doi.org/10.31024/ajpp.2018.4.4.16
17. Promprom W, Chatan W. GC-MS and antioxidant activity of *Bauhinia nakhonphanomensis*. Pharmacogn J. 2017;9:691–695. https://doi.org/10.5530/pj.2017.5.109
18. Rali T, Wossa SW, Leach DN. Traditional uses of *Cryptocarya*. J Nat Med. 2007;61:1–10.
19. Shaikh JR, Patil M. Preliminary phytochemical screening tests. Int J Chem Stud. 2020;8:603–608.
20. Swamy MK, Sinniah UR, Akhtar MS. GC-MS analysis of *Lantana camara* extracts. Evid Based Complement Alternat Med. 2015;2015:506413. https://doi.org/10.1155/2015/506413
21. Toribio A, Bonfils A, Delannay E, Prost E, Harakat D, Henon E, Richard B, Litaudon M, Nuzillard JM, Renault JH. Novel alkaloid from *Cryptocarya oubatchensis*. Org Lett. 2006;8:3825–3828. https://doi.org/10.1021/ol0614173
22. Slinkard K, Singleton VL. Total phenols by Folin–Ciocalteu method. Methods Enzymol. 1999;299:152–178.
23. Wu TS, Lin FW. Alkaloids of *Cryptocarya chinensis*. J Nat Prod. 2001;64:1404–1407. https://doi.org/10.1021/np010141h