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The research on conventional medicine: *Hamelia patens*

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Abstract
The medical component of traditional knowledge that developed in the folk beliefs of many civilizations, including indigenous peoples, prior to the advent of modern medicine is known as traditional medicine, indigenous medicine, or folk medicine. This research examines the effects of one plant species of the rubiaceae family using pharmacognostic, phytochemical, and pharmacological techniques.

Keywords: Medicines, Ayurveda, siddha, Unani, traditional, disciplines

Introductions

The WHO defines traditional medicine as "the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness". There is a tendency to group scientific medicine and traditional medicine together.

Traditional medicine accounts for the vast majority of health treatment in certain African and Asian nations, where the percentage is close to 80%. There is a distinct medical practice known as traditional medicine. Some examples of traditional medicines are Ayurveda, Siddha, Unani, mediaeval Islamic medicine, traditional Iranian medicine, traditional Chinese medicine, traditional Korean medicine, traditional African medicine, Muti, and Ifá. Indigenous medicine is studied by many scientific disciplines, including medical anthropology, ethnomedicine, ethnobotany, and herbalism.

Herbal medicine is a kind of indigenous medicine that involves making medicinal beverages, poultices, or tablets from plants. The indigenous inhabitants of Trinidad have received medical assistance from a small group of Spanish Catholics. Paramin is located in the northwest of Trinidad and is home to some of Trinidad's best culinary herbs. Legend has it that on Good Friday, if you were to dig up a bunch of fowl foot grass (*Eleusine indica*), you would discover a coal beneath the roots. On Good Friday, the blood of Jesus would be squeezed out of a red or white physic nut (Jatropha curcas or gossypifolia).

In a healing ritual known as Santosh, participants pray in a language called oracion (Bill Plander). Jharay is a similar religious healing rite in Hinduism; here is its Spanish translation. The oracion prayers were introduced to Trinidad by the conquistadors, according to Moodie (1982) [16]. The Santosh ritual calls for the use of a sweet broom, scientifically known as *Scoparia dulcis*, to sprinkle sacred water. This kind of healing ceremony is performed in Almería, Spain (Martínez-Lirola *et al*. 1996) [17]. Trinidad and Tobago's believe that draping red scarves over the necks of newborn animals wards off evil spirits. There are others that do this in Tuscany as well. The use of bee stings or poison as a treatment for inflammatory disorders, such as multiple sclerosis or arthritis, has a long history in traditional medicine, but it has only recently gained popularity in the US.

The "cures" that D. C. Jarvis claimed to have received from "Vermont indigenous medicine" was supposedly a kind of indigenous medicine practiced in the area. Dr. Jarvis recommended and detailed many mixtures in his 1958 book Folk Medicine, with apple cider vinegar playing a significant role. Many European-American Mennonites and Amish introduced their own narcotics to the United States in the 1800s and 1900s. They relied on oral histories, agricultural almanacks, manuals, and handwritten recipes to preserve their expertise.

It is fairly uncommon for indigenous medicines to be handed down orally until someone "collects" them. Even among citizens of the same nation, various branches of traditional medicine may be known and practiced by separate groups or by individuals with specific education and training. There are three components to a healer's legitimacy in traditional medicine: the healer's subjective reality, the healer's objective reality, and the community's beliefs (Laguerre, 1987) [18]. According to Laguerre (1987) [18], there are three categories of people that adhere to rejected knowledge. Indigenous or folk knowledge are examples of knowledge that has been discarded. Someone may have been born and brought up believing in it, someone may believe in it partially but not entirely, and someone may believe in it briefly when they are in need of assistance. Additionally, there are three channels by which traditional knowledge and medicine are transmitted: the group or society, the family, and the individual (dreams).

There are times when different parts of a society don't mesh well or even fight with one another. There are three main categories of Caribbean traditional medicines, according to Morton (1975) [19]: Those that originated with the first Spanish settlers and are still grown there, those that are native to the region and were used by the Amerindians, and those that are more recent arrivals, such as ornamental plants, which have been given medicinal uses without any historical basis. It would have been simpler to implement this discovery if Americans hadn't imported plant species from all over the globe for medicinal and aesthetic reasons.

Literature review

Maii Abdelnaby Ismail Maamoun *et al*. (2019) [1] The SRB assay was used to determine the cytotoxicity of several extracts from the Rubiaceae family, which includes *Hamelia patens* Jacq. Human cancer cell lines HepG-2 and MCF-7 were evaluated against crude fractions of several plant parts, including crude flowers (CF), crude leaves (CL), chloroform (Chl. L), and methanol (Me. L) collected from the leaves. The findings demonstrated that CF, Chl. L, and Me. L had a high cytotoxic impact on HEPG-2, with IC50 values of 47, 30, and 44.4 µg/mL, respectively. The IC50 values for CF, CL, Chl. L, and Me. L on MCF-7 were 23.8, 25.5, 17.7, and 64 µg/mL, respectively, indicating substantial effects. Chromatographic analysis of Me. L. allowed for the isolation and spectroscopic identification of three plant leaf components: Rutin (1), isoquercetin (2), and soyasaponins Bb (3). The latter was previously isolated and identified by UPLC/ITMS/MS analysis. Also evaluated was research that compared standard extraction methods to more eco-friendly ones.

The Lamiaceae family includes the ornamental plant *Clerodendrum thomsoniae*, which does well in damp conditions. Phytocompounds found in plants have anti-inflammatory, anti-ulcer, anti-free radical, and anti-depressive properties. Determining the physiological, pharmacognostic, and phytochemical properties of *Clerodendrum thomsoniae* leaf samples is the goal of this study. Under the microscope, *Clerodendrum thomsoniae* leaves showed trichomes and epidermis that cover the plant. The findings revealed that the *Clerodendrum thomsoniae* leaves contained 7.5% w/w ash, no more than 23.33% w/w alcohol extractive value in hot extraction, no more than 30.12% w/w water extractive value in hot extraction, 36.66% w/w cold maceration, and an overall moisture content of 8% w/w as estimated by light-depletion spectroscopy. The phytochemical study of the leaves of *Clerodendrum thomsoniae* revealed the presence of sterols, triterpenes, alkaloids, tannins, glycosides, proteins, and carbohydrates. It is possible to use the phytochemical and pharmacognostical markers found in this work as main standards for evaluating the authenticity, purity, and quality of crude extracts and medications.

Jafra Bano *et al*. (2018) [3]. The purpose of this study is to examine the bioactive molecule present in the stem, leaves, roots, and flowers by means of gas chromatography (GC) analysis. Novel pharmaceutical chemicals are derived from plants and used to treat human diseases. Method: To begin, we gathered, washed, shade dried, and powdered the several parts of the plant (leaves, stem, flower, and root). Then, we utilised the Soxhlet reflux method to extract methanol from each of these parts. The GC-mass spectrometry (MS) paired with the Willey 8 library and the National Institute of Standards and Technology-11 library was used to analyse the methanolic extracts of the plant sections of *Hamelia patens* for the identification of phytochemical compounds. Conclusion: The bioactive fraction generated the most intense peaks in the GC-MS chromatogram. Among the many aliphatic hydrocarbons and isomers found in methanol extracts of *H. patens* leaves are 2, 3-dihydro-3,5-dihydroxy-6-methyl4H-pyran (1.77%), 1,3-propanediol, 2-ethyl-2-(hydroxymethyl) (3.16%), mome inositol (18.22%), pentadecanoic acid (1.66%), and squalene (11.47%). Based on the GC-MS study's chromatogram, the most important components of the *H. patens* stem are methyl salicylate (3.41%), 2-amino-9-(3,4- dihydroxy-5- hydroxymethyl) (9.53%), mome inositol (63.73%), and squalene (1.07%). In conclusion, our research is focused on discovering novel bioactive chemicals that show promise as possible therapeutic targets.

Ashwathy G *et al*. (2022) [4] a member of the Rubiaceae family, *Hamelia patens* Jacq. is a popular plant for its medicinal and cosmetic uses. This research tried to find out if the ethanolic or water-based extracts of *H. patens* Jacq. had any antibacterial impact on four common human pathogens: Escherichia coli, *Vibrio harveyi*, Staphylococcus aureus, and Bacillus cereus. The Kirby-Bauer disc diffusion experiment was used for this purpose. It was also determined if the biosynthesized silver nanoparticles had any antibacterial properties. Preliminary phytochemical screening revealed the presence of glycosides, tannins, phenols, alkaloids, polysaccharides, flavonoids, and terpenoids in both the water and alcohol extracts. The round, greyish nanoparticles produced by the *H. patens* biosynthetic process were somewhat unusual. When tested against all four bacterial strains, both extracts performed similarly. The nanoparticle solution was very efficient against Escherichia coli, with an inhibitory zone of 11 mm. Amoxycillin, a traditional antibiotic, had the broadest zone of inhibition.

V. Kanchana *et al*. (2020) [5] this study examined the phytochemical profile and antibacterial activity of several extracts from the tropical plant *Hamelia patens* Jacq. (Rubiaceae). To test for antibacterial activity, the agar well diffusion method was used. After adding 100 µL of hexane, petroleum ether, ethanol, and chloroform stem extracts (50 mg/mL each), each well was left to incubate. Following the completion of the incubation period, the plates were analysed for inhibitory zones and compared with

ciprofloxacin, a positive control administered at a concentration of 30 µM. Now that we know the plant extracts, we looked at have antibacterial properties, we can go on with developing novel antimicrobial medications.

Pharmacognostic study of *Hamelia patens* stems

Macroscopic evaluation of *H. patens* stems

On a macro level, the size, shape, colour, aroma, flavour, and breaking point of herbal materials may be identified. Nevertheless, physical and microscopic examinations are often required to corroborate the findings due to the informal nature of these attributes' ratings and the similarity between the actual and false versions.

Color

The exterior has a verdant brown colour.
The inside is yellow.

Rank

Ruddy-brown.

Odour

None.

Taste

Astringent.

Size

Distance from node to node: 6,000 to 12,000 cm.

Radius

0.5 to 1.2 cm.

Shape

Long and narrow.

Fracture

Minor crack in the wood and bark.

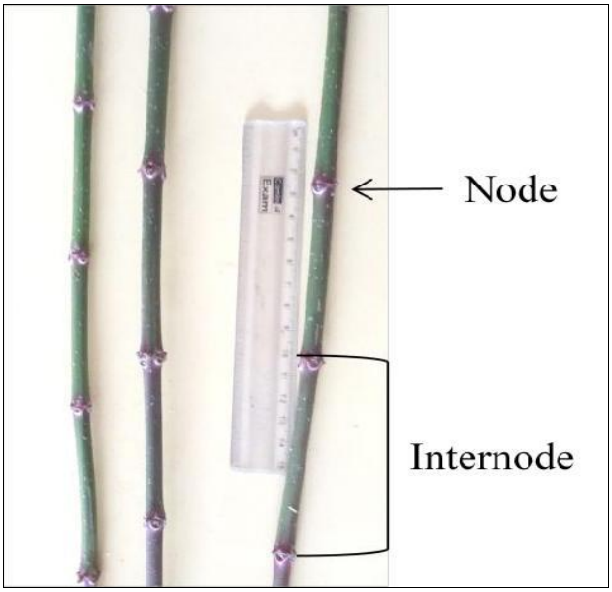


Fig 1: Stems of *H. patens*

Microscopic evaluation of *H. patens* stems

T.S. of young stem of *H. patens*

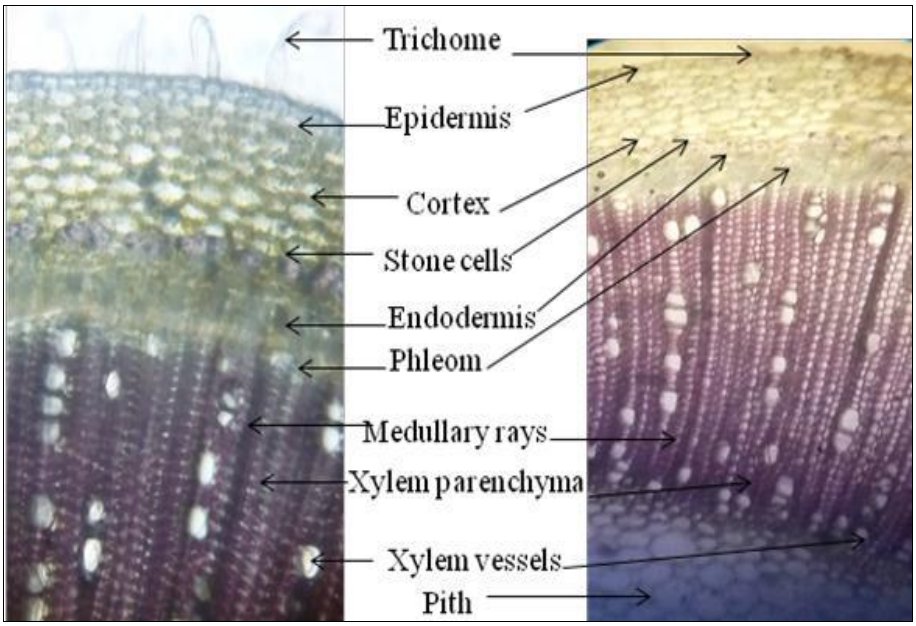


Fig 2: T.S. of Young stem of *H. patens*

Epidermis: Layers upon layers of uniformly structured cells encased in a coat. Countless multicellular, uniseriate covering trichomes, either hooked or tapering, cover the plant. The 12th to 15th layers of cortical tissue contains starch granules. The stone cells are arranged in a single layer with solid walls.
Endodermis is unique, devoid of starch granules.

The secondary phloem is composed of phloem tissue.
Divide into two halves. On the inside, the medullary rays are smaller, whereas at the beginning, they are broader.
A network of xylem arteries and xylem tissue lies between the medullary rays.
Additionally, there is the pulp.

T.S. of mature stems of *H. patens*

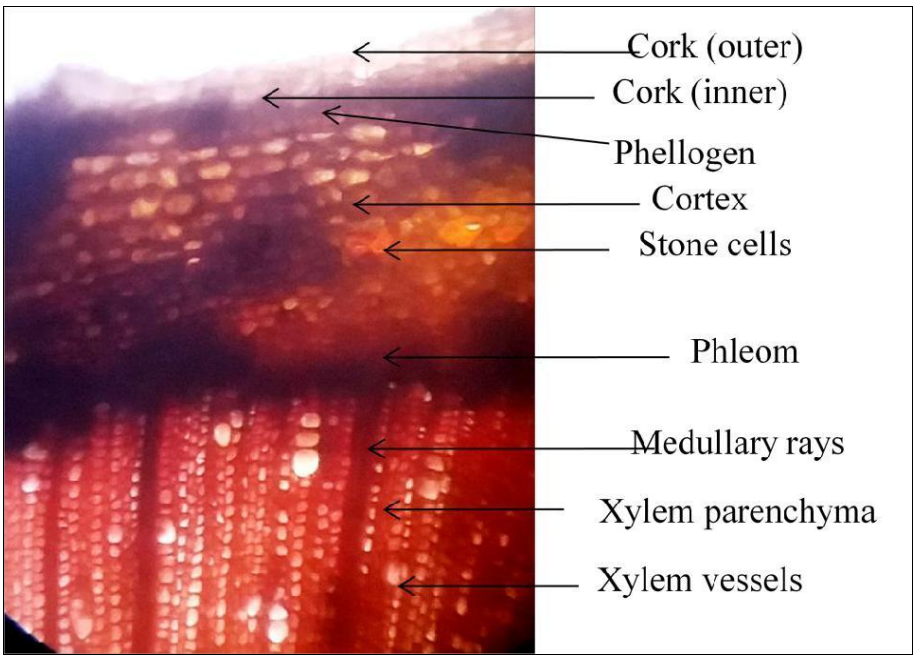


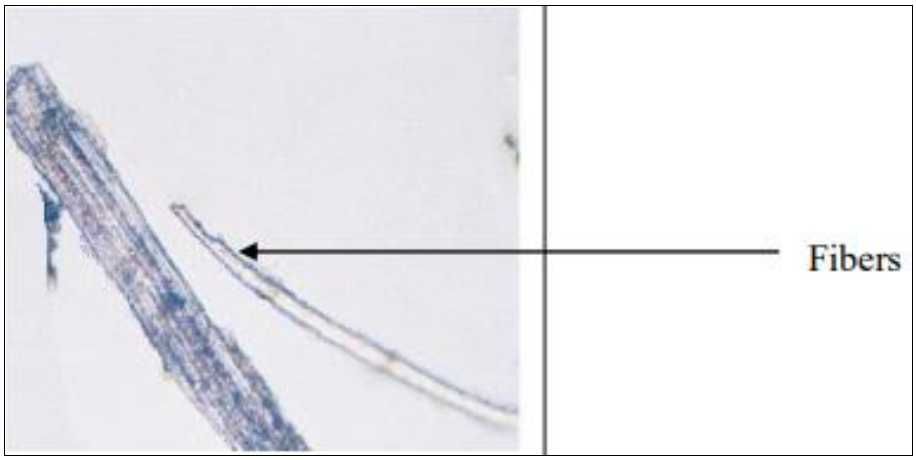
Fig 3: T.S. of mature stem of *H. patens*

Cork: Multiple tiers of thin-walled, hexagonal tabular cells.
The two terms, phellogen and phelloderm, are synonymous.

Cortex: There are starch granules in 12–15 layers of parenchyma.
One layer of stone cells.
Secondary phloem is composed of phloem parenchyma.

Divided lengthwise, medullary rays are narrower at the base and broader at the tip.
A network of xylem arteries and xylem tissue lies between the medullary rays.
Pith is another component.

C) Powder characteristics of *H. patens* stems



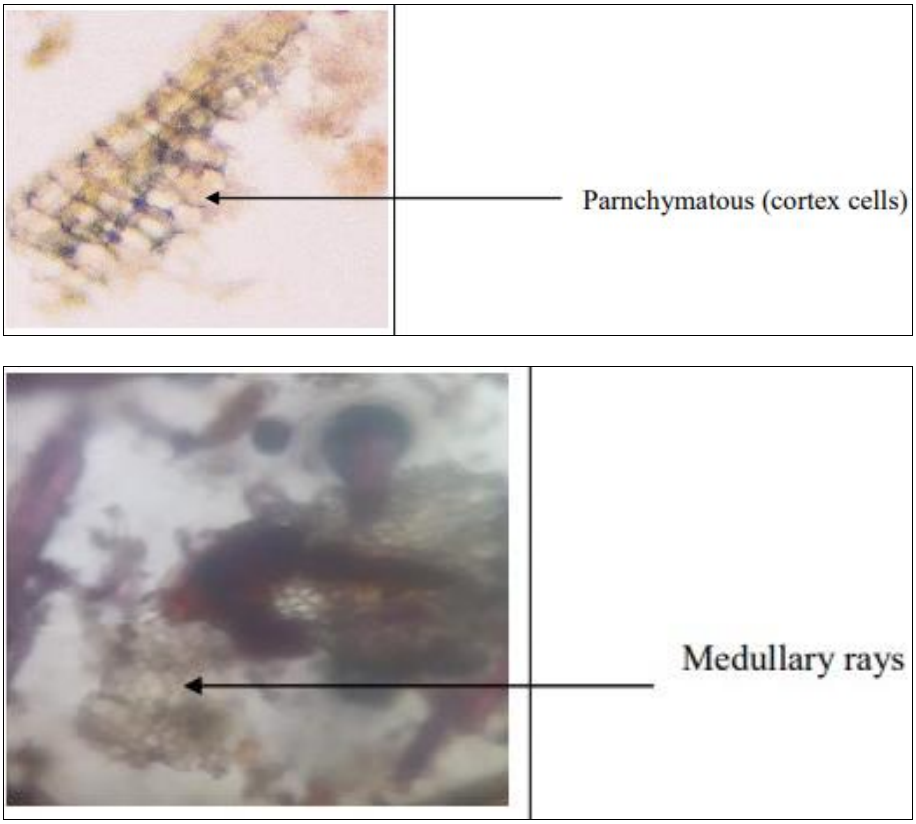


Fig 4: Powder characteristic of *H. patens* stems powder

Phytochemical investigation of *Hamelia patens* stems

Extraction: All of the components were extracted using the Soxhlet extractor and the continuous hot extraction technique. The spot was considered fully extracted when it did not produce any colour when subjected to iodine fumes on a TLC plate. In Table, the proportion and the colour of the extract. Table displays the extractive values that resulted from the continual extraction of *H. patens* stems.

Table 1: Extractive values after continuous extraction of *H. patens* stems

Extract	Colour of Extract	% (w/w) of Extract obtained
Petroleum ether	Yellowish green	1.13±0.13
Chloroform	Dark brown	2.67±0.28
Methanol	Dark Brown	4.26±0.43

Characterization of *H. patens* extracts by chemical test

Table 2: Observation table of preliminary phytochemical test of extracts of *H. patens*

Sr. No.	TEST	Pet. ETHE r	Extracts Chloroform	Methanol
1.	Test for alkaloids	-	+	+
2.	Test for glycosides	-	+	+
3.	Test for naphthoquinones	-	-	-
4.	Test for anthraquinones	-	-	-
5.	Test For iridoids glycosides	-	-	-
6.	Test for coumarin glycosides	-	-	-
7.	Test for cyanogenetic glycosides	-	-	-
8.	Test for sterols	+	+	+
9.	Test for triterpenoids	+	+	-
10.	Test for flavonoids	-	-	+
11.	Test for tannins	-	-	+
12.	Tests for carotenoids	-	-	-
13.	Test for proteins	-	-	+
14.	Test for carbohydrates	-	-	+

The pet-ether extract included sterols and triterpenoids.

The chloroform sample indicated the presence of alkaloids, glycosides, sterols, and triterpenoids.

Proteins, sugars, tannins, glycosides, alkaloids, and flavonoids were all present in the methanol solution.

TLC profile of *H. patens* extracts

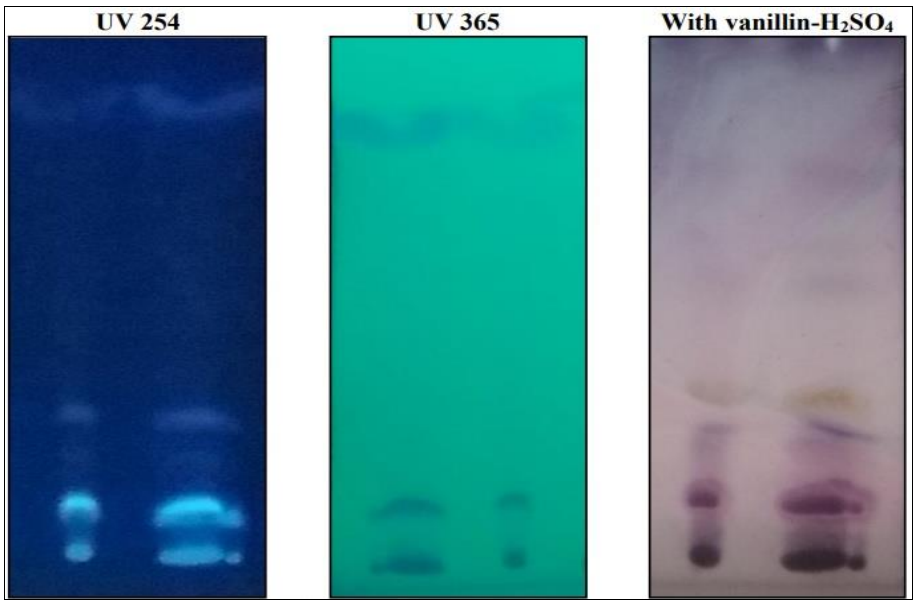


Fig 5: TLC of petroleum ether extract of *H. patens*

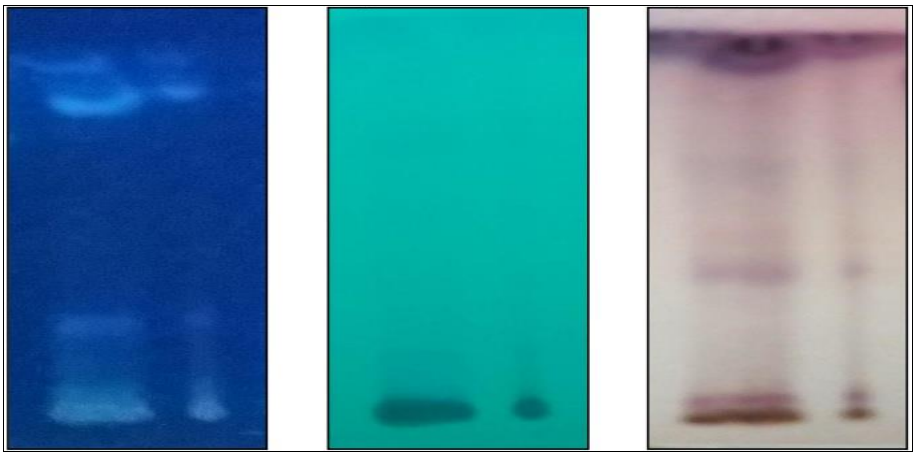


Fig 6: TLC of chloroform extract of *H. patens*

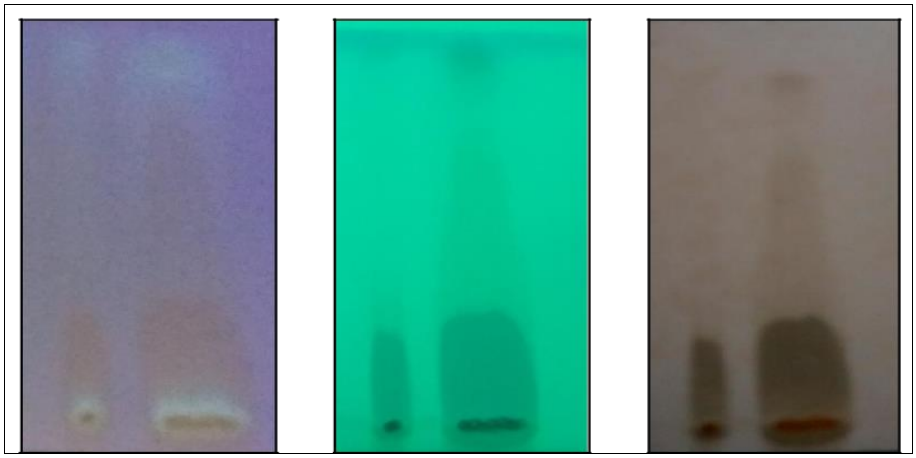


Fig 7: TLC of methanol extract of *H. patens*

Characterization of isolated phytoconstituents by spectroscopic study from *H. patens* stems

PHP-1: Isolated from unsaponifiable matter of petroleum ether extract *H. patens* stems

Description: Translucent crystal material

Solubility: Hydrogen peroxide, chloroform, and methanol are all solvents.

Melting point: 148-154°C.

UV spectra: Between 210 and 650 nanometers, there is no λmax.

IR Spectra of PHP-1

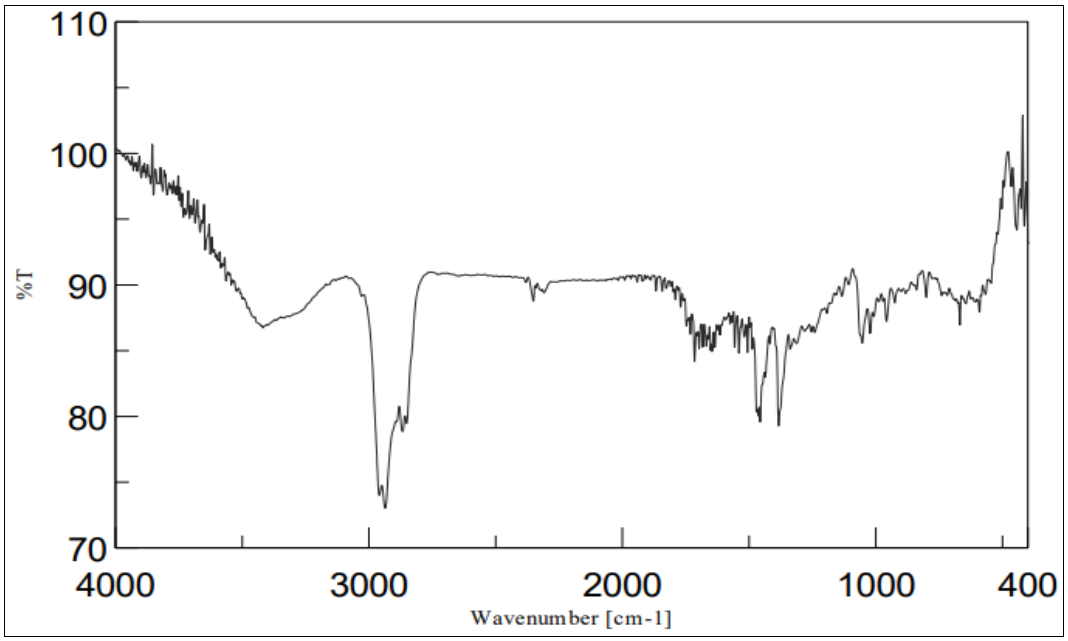


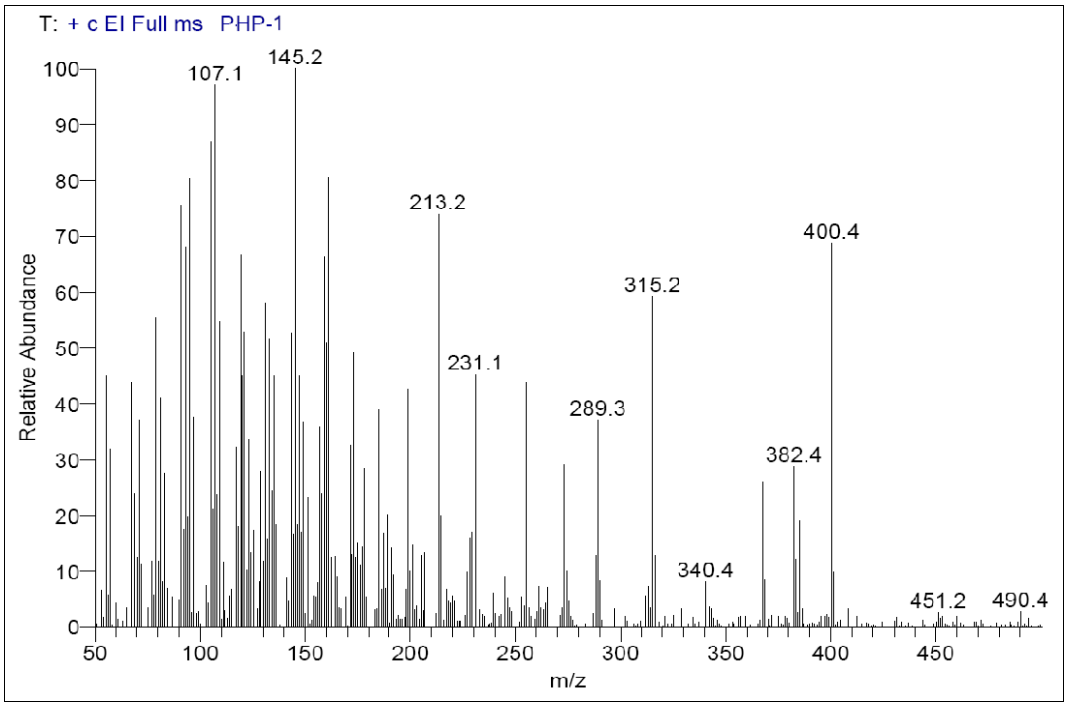
Fig 8: FTIR spectra of PHP^{-1}

Mass spectra of PHP-1

Table 3: Interpretation of FTIR spectra of PHP-1

Frequency (Cm^{-1})	Assignment
3480	O - H stretch
2925, 3068	C-H stretch alkane
1690	C = C stretch. Non-conjugated
1443	CH3, C – H bending
1265	O – H bending
1230	C–O stretch
1179	C – C stretching

Mass spectra of PHP-1



Molecular ion peak: 400

Fig 9: Mass spectra of PHP-1

H NMR Spectra PHP-1

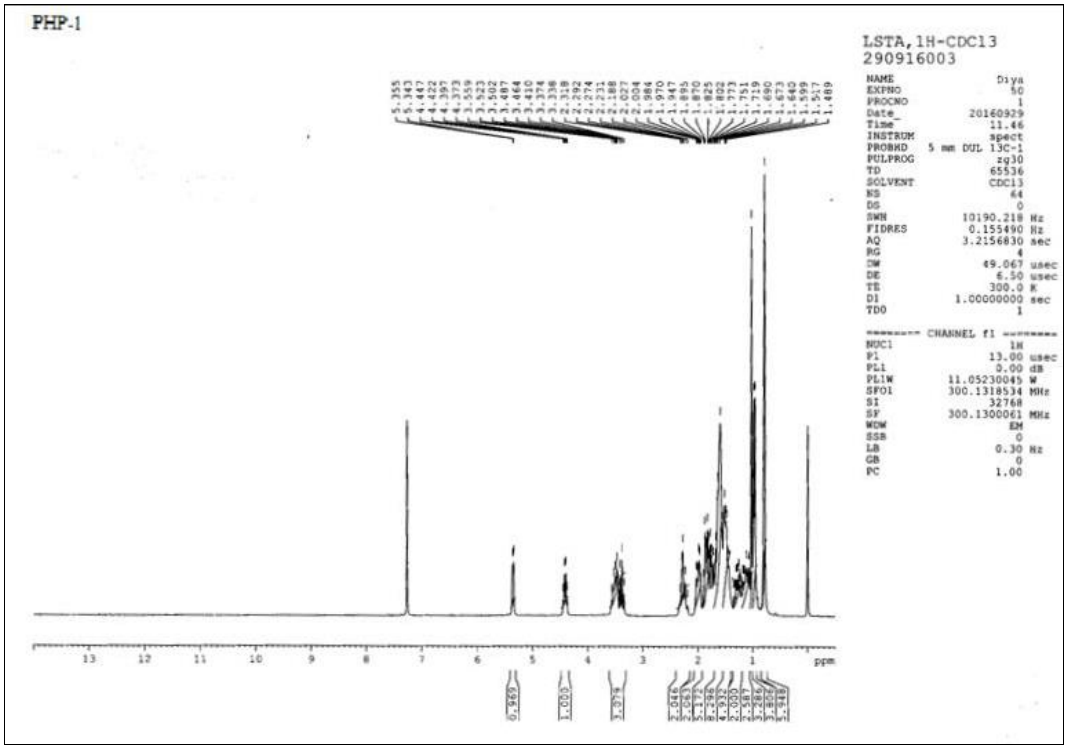


Fig 10: NMR spectra PHP-1

CHP^{-1}: Isolated from chloroform extract of *H. patens*
Description: Beads of crystal white

Solubility: Chloroform and methanol are solvents for it.

Melting point: 198-204 °C

Spectral Data of CHP^{-1}

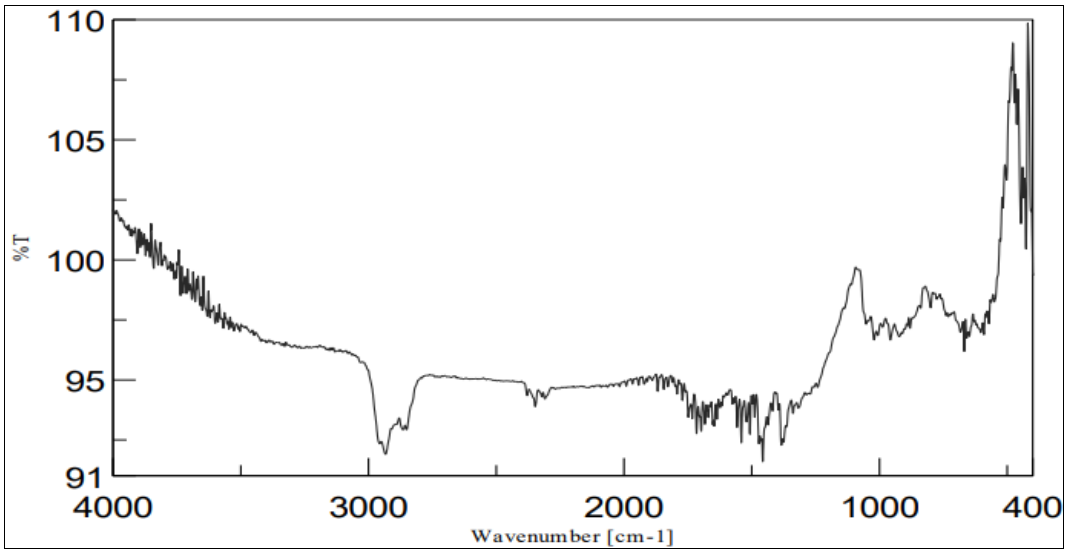
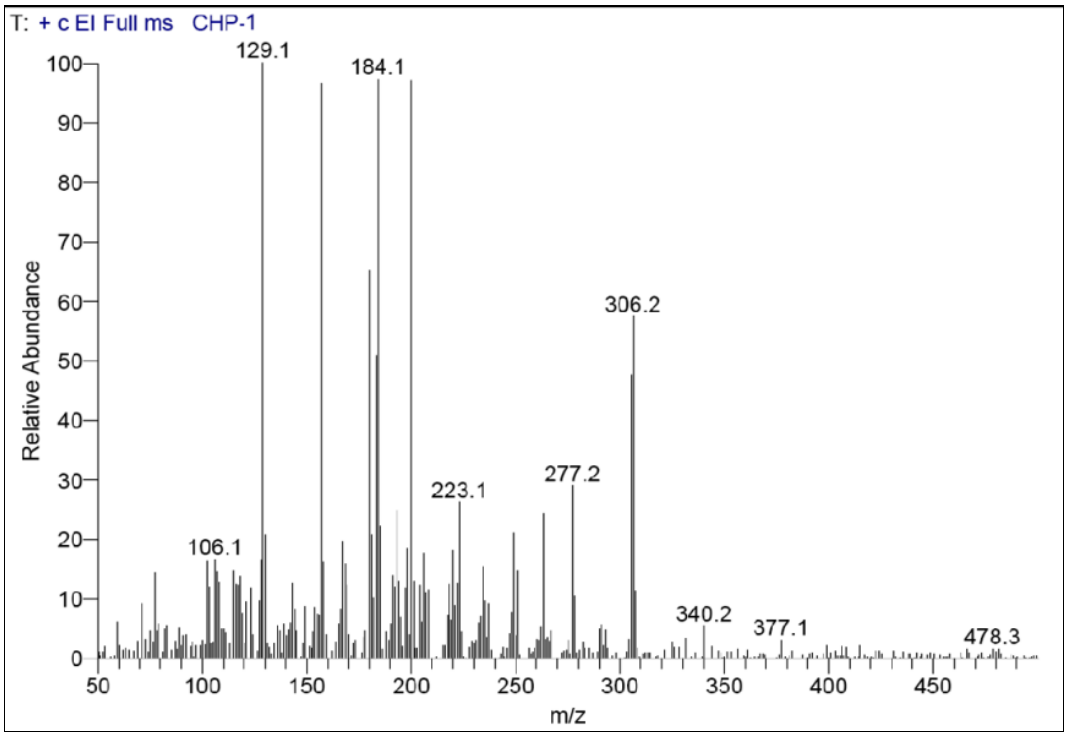


Fig 11: IR Spectra of CHP^{-1}

Table 4: Interpretation of FTIR data of CHP^{-1}

Frequency (Cm-1)	Assignment
2935	C-H stretch alkane
2359	C-H stretch alkane
1696	C = C stretch. Non-conjugated
1600	C = C stretch. Aromatic
1456	C – N (ter.)
1179	C – C stretching

Mass Spectra of CHP^{-1}



Peak for molecular ions: 306

Fig 12: Mass spectra of CHP^{-1}

H NMR Spectra of CHP^{-1}

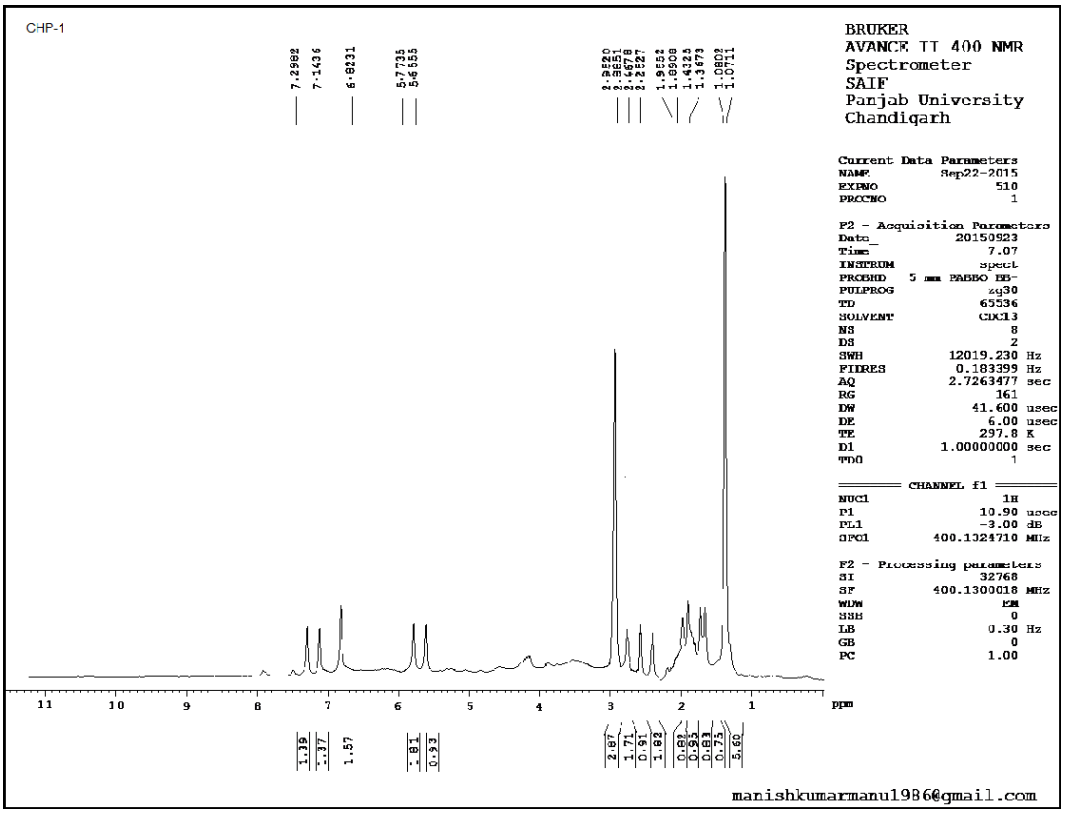


Fig 13: H NMR spectra of CHP^{-1}

C NMR Spectra of CHP^{-1}

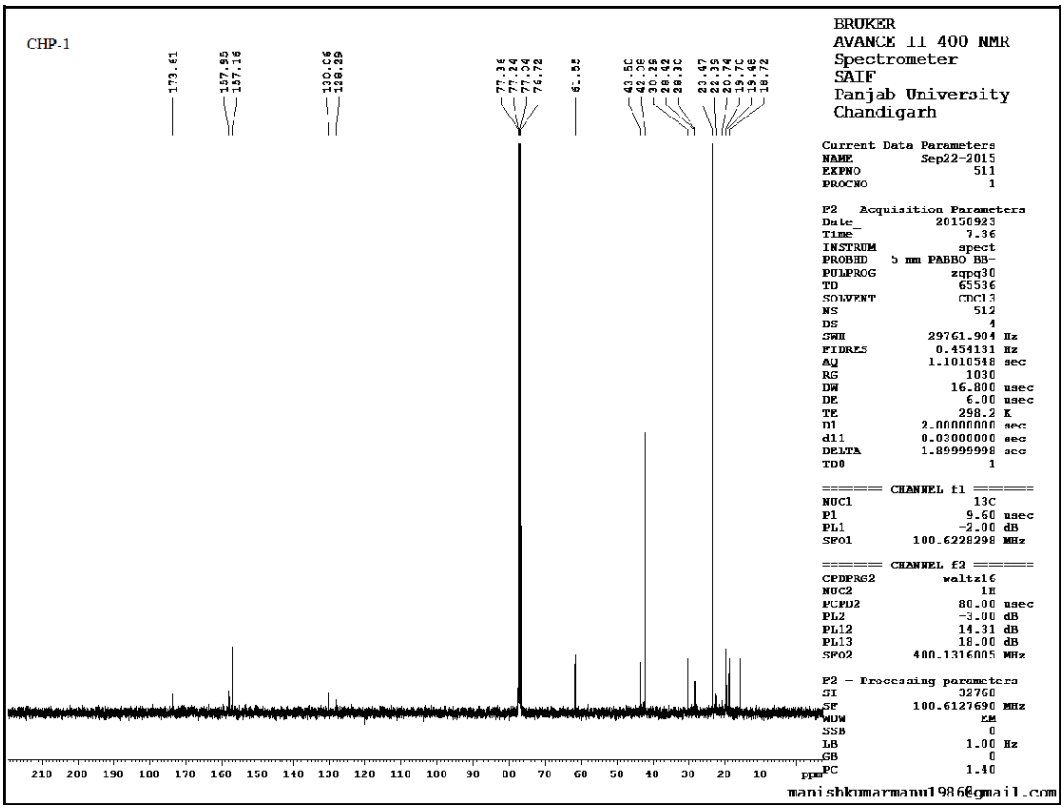


Fig 14: C NMR spectra of CHP^{-1}

Conclusion

Microscopic examination of young stems of *Hamelia patens* revealed epidermis and covering trichomes, among other characteristics. In contrast, mature stems had cork, phellogen, stone cells, medullary rays, xylem vessel, xylem parenchyma, phellogen fibres, cortex, colouring matter, flour grains, and starch. *Hamelia patens* stems contained a total of 2.182% w/w ash, with no more than 1.067 w/w water-soluble ash and no more than 0.217% acid-insoluble ash. During hot extraction, the alcohol extractive value did not surpass 5.324% w/w, while cold maceration had a value of 4.283% w/w. Similarly, during cold maceration, the water extractive value did not exceed 8.323% w/w, and total moisture content was 5.26% w/w according to LOD.

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