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Pharmacognostic and Phytochemical Evaluation of Cynodon dactylon and Quisqualis indica Leaves: A Comprehensive Study

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Abstract: Cynodon dactylon and Quisqualis indica are esteemed for their medicinal properties in traditional medicine. This research presents a detailed pharmacognostic and phytochemical investigation of their aerial parts to ascertain their botanical characteristics and chemical constituents. The introduction outlines the traditional uses and significance of Cynodon dactylon and Quisqualis indica in herbal medicine. Macroscopic and microscopic examinations were conducted to delineate the structural attributes of the aerial parts, helping in their identification. Physiochemical properties such as total ash, acid-insoluble ash, and water-soluble ash were evaluated, revealing notable differences between the two species. Additionally, extractive values were determined for various solvents, including pet ether, 50% hydroalcoholic, and aqueous extracts, demonstrating distinct solvent-dependent extraction efficiencies. Phytochemical screening revealed the presence of flavonoids, suggesting the presence of bioactive compounds in the aerials part. Fluorescence analysis and thin-layer chromatography were employed to profile the chemical constituents further, confirming the presence of various secondary metabolites. High-performance thin-layer chromatography (HPTLC) fingerprinting profiles were established, showcasing the chemical diversity and complexity within the examined plant parts. The hydroalcoholic extracts displayed elevated levels of flavonoids, hinting at their potential pharmacological relevance. This comprehensive investigation offers valuable insights into the pharmacognostic characteristics and phytochemical composition of Cynodon dactylon and Quisqualis indica leaves, providing a basis for exploring their therapeutic applications in drug development and traditional medicine.

Keywords: Pharmacognosy, Physiochemical, Phytochemical, Cyanodon dactylon, Quisqualis indica,

Introduction

India has a rich tradition of indigenous systems of medicine, including Ayurveda, Yoga, Unani, Siddha, and Homeopathy (AYUSH) (***Ayurveda and Yoga in the Modern World*, 2023**). These systems have been practiced for thousands of years and are deeply ingrained in Indian culture and society (**Husain, 2022**). Pharmacognosy research identifies bioactive compounds in herbal materials and elucidates their mechanisms of action, establishing the efficacy and mode of action of traditional medicines. This scientific evidence validates traditional knowledge and practices, enhancing confidence in the therapeutic benefits of traditional medicines. (**Kinghorn, 2010**)

Pharmacognostical studies play a crucial role in determining the efficacy of medicinal plants by providing insights into their pharmacological properties and therapeutic potential. These studies involve the identification of bioactive compounds present in herbal drugs through phytochemical analysis (**Do & Bernard, 2004**). By doing so, pharmacognostic studies offer valuable information about the mechanisms of action and therapeutic effects of herbal medicines. This knowledge is essential for understanding how these plants can be utilized for various medical purposes and for developing new drugs derived from natural sources (**Egbuna et al., 2018**). Pharmacognostic studies are instrumental in uncovering the potential benefits and applications of medicinal plants in health care.

Bermuda grass, the scientific name ***Cyanodon dactylon***, is a slow-growing plant that grows in tropical and subtropical regions. It is resistant to drought and heavy spikes that bloom in late summer. This grass thrives in warm, mild, and moist environments and is grown worldwide for many purposes, including turf and grazing (**Reme et al., 2022**). In the Hindu tradition, Bermuda grass, also known as "durva" in India, is used in religious ceremonies and symbolizes life in Nepalese culture (**Virmani et al., 2018**). Despite its popularity, bermudagrass is still considered an invasive species in many areas outside its native habitat, including the island of Bermuda. ***Cynodon dactylon*** is distributed in many countries, starting from East Africa and spreading to North America, Europe, Australia, and parts of Asia. It is considered a common plant in tropical regions around the world. In the United States, Bermuda grass is found mostly in subtropical regions from southern California to the Gulf Coast, but can also be found in states such as Washington, Idaho, and New York. This grass grows in temperate to tropical climates, generally between 45 degrees north and south latitude, and can be found at elevations below 6,000 feet, especially in affected areas such as landfills, farms, and roads (**Shendye & Gurav, 2014**). Bermuda grass, known for its adaptability to different soil types and moisture levels, is a species that grows in ecosystems where light and temperature are high.

Quisqualis indica, also known as Rangoon creeper, is a climbing plant with pink flowers, native to Southeast Asia, and can be found worldwide as an ornamental plant or species. The plant is a vine that can reach 8 meters in height, with oval leaves like hawkmoth-like flowers and fragrant flowers that turn from white to pink and then red as they mature. Insects, bees, and birds (**Kulshreshtha et al., 2023**). The fruit of Junzi is dark brown, oval-shaped, with five hard wings, and its seeds contain Junzi acid. The vine is fast-growing with very fast root suckers and thrives in full sun to partial shade, well-drained soil, and regular watering(**Tang & Eisenbrand, 1992**). The range of ***Quisqualis indica*** includes tropical Africa, the Indian

subcontinent, China, Taiwan, and Southeast Asia, particularly Cambodia, Laos, Myanmar, Thailand, Vietnam, Malaysia, Papua New Guinea, and the Philippines. It is also common in parts of northern Australia, particularly coastal areas of northern Western Australia (**Patadiya et al., 2022**). The plant is thought to be a potential weed in northern Queensland and the Northern Territory of northern Australia, with the potential to invade other tropical regions and lands in the country. In addition, Quisqualis indica is resident in New Caledonia, the southeastern United States (Florida), and the Caribbean (including Puerto Rico and the Virgin Islands) (**Pandit Mahajan & Aher, 2017**).

Cynodon dactylon

Quisqualis indica

Numerous ethnobotanical surveys have documented various biological activities for leaf parts of Cynodon dactylon and Quisqualis indica. According to current knowledge, the leaves of Cynodon dactylon are reputed for their efficacy in anti-bacterial (**Sharma, 2016**), anti-oxidant (**Garg & Paliwal, 2011**), wound healing (**Biswas et al., 2017**), analgesic and antipyretic, and reducing inflammation (**Garg & Paliwal, 2011**). On the other hand, leaves of Quisqualis indica are believed to be beneficial in fever management, anti-bacterial (**Jahan et al., 2008**), anti-oxidant (**Shah et al., 2019**), wound healing, analgesic and antipyretic, and reducing inflammation. Given the importance of scientific validation in traditional medicine, standardization of these medicinal plants is imperative. However, as there is currently a lack of scientifically validated data regarding their standardization, preliminary pharmacognostic and phytochemical screening of the leaves of Cynodon dactylon and Quisqualis indica has been undertaken as an initial step.

Identification and Authentication

The leaves of Cynodon dactylon and Quisqualis indica were collected from the local area of Lucknow. The collected plant materials were authenticated by the taxonomic division of Banaras Hindu University (BHU), Varanasi, with reference numbers provided as follows:

- ***Cynodon dactylon:*** Ref. No. Poace. 2022/1.
- ***Quisqualis indica:*** Ref. No. Combret. 2022/1.

The authentication process ensured the accurate identification of the plant specimens. Following authentication, the fresh aerial parts of the plants were carefully separated and set aside for shade drying. Once dried, the specimens were finely powdered using a mechanical grinder and passed through a 60-mesh sieve to achieve the desired coarseness. The powdered

material was then stored in air-tight containers to maintain its integrity for further analysis and experimentation.

Macroscopic Examination of Leaves of Quisqualis indica and Cynodon dactylon:

Fresh leaves of Quisqualis indica and aerials part of Cynodon dactylon were collected for macroscopic examination. The macroscopic examination of the leaves involved the evaluation of various morphological characteristics including color, odor, Taste, size, Texture, Venation, Apex, Shape of Lamina, Margin, Margin, and Leaf blade. The leaves were examined under a simple microscope to determine their shape and size. Any variations in leaf morphology were noted. The taste and odor of the leaves were assessed through sensory evaluation. Thin sections of the culm, sheathing leaf base, and lamina were prepared using a Rotary Microtome, with a thickness of 10-12mm. The thin sections were stained as per the standard protocol and then photographed using a Nikon Lab Photo 2 microscope. Detailed descriptions of the observed features were recorded. (**Textbook of Pharmacognosy - I, 2022**)

Microscopic Examination of Leaves of Cynodon dactylon and Quisqualis indica:

1. **Qualitative Microscopy:** a. Leaf Microscopy:
    - Examination of the cellular structure of the leaf tissues including epidermis, mesophyll, and vascular bundles to identify any distinct features.
2. **Quantitative Microscopy:** a. Determination of Stomatal Index:
    - Calculation of the stomatal index involves counting the number of stomata per unit area of leaf surface to assess the density of stomata present.
    - Determination of Palisade Ratio: Measurement of the palisade ratio entails determining the ratio of the length of palisade cells to the width of the leaf blade. This provides insights into the arrangement and density of palisade cells within the leaf tissue.
    - Determination of Vein islet number, Vein termination number (**Mauro, 2006**)

Preparation of powder:

Leaves of Quisqualis and aerial parts of Cyanodon dactylon were harvested and dried under shade. Subsequently, they were processed into coarse powder using a grinding mill and stored in an air-tight glass container.

Physicochemical parameters

Physicochemical parameters analysis of Leaves of Quisqualis and aerial parts of Cyanodon dactylon was conducted to evaluate their quality and authenticity. The analysis included total ash, water-soluble ash, acid-insoluble ash, and sulfated ash determination following Indian Pharmacopoeia methods. Extractive value assessment was done to determine the quantity of soluble constituents extracted from the plant material using various solvents. Fluorescence analysis of the powdered leaves and their extracts was also performed to identify certain chemical constituents. These analyses are crucial for assessing the chemical composition, purity, and quality of the leaves, ensuring their safety and efficacy in traditional medicine and pharmacological research. (**World Health Organization, 1998**)

Total Ash

Leaves of Quisqualis and aerial parts of Cyanodon dactylon crucible were weighed, then the sample was heated at 450 ^{0}C to a constant weight. After cooling, it was reweighed and ignited.

Upon cooling, it was reweighed again to determine the total ash content, calculated as ash weight divided by sample weight multiplied by 100%.

Acid Insoluble

The ash obtained was boiled with 25mL of weak hydrochloric acid for 5 minutes. Any materials that did not dissolve were gathered on filter paper that was free from ash. The remaining substance was washed with hot distilled water, burned, and measured, and the percentage was calculated.

Water Soluble Ash

The entire ash was mixed with 25mL of distilled water and heated for 5 minutes. Any materials that did not dissolve were filtered out and washed with hot water using filter paper that did not contain any ash. The filter paper and the remaining material were burned in a furnace at a temperature lower than 45°C. The weight of the ash that did not dissolve in water was subtracted from the total ash weight, revealing the amount of ash that did dissolve in water, from which the percentage was calculated.

Extractive Values

The process of extracting phytoconstituents from Cynodon dactylon included the use of different solvents such as petroleum ether, 50% hydroalcoholic solution, and water. Initially, 10 grams of the sample were mixed with 250 mL of petroleum ether and vigorously stirred at room temperature for 48 hours before being filtered. The remaining solid was then re-extracted with another 250 mL of petroleum ether. The resulting extracts were combined and evaporated to dryness at 40°C under reduced pressure. Subsequent extractions were then carried out using 50% hydroalcoholic solution and water to obtain a diverse range of phytoconstituents for further medicinal analysis. (**Kokate, 1986**)

Phytochemical Screening

Leaves of Quisqualis and aerial parts of Cyanodon were dried under shade and powdered. Alcoholic and aqueous extracts of the leaves were prepared separately and subjected to preliminary phytochemical screening to determine the presence of various phytoconstituents. The screening involved performing chemical tests to detect the following classes of phytochemicals such as alkaloid, flavonoid, tannin, volatile oil, carbohydrate, and phenolic. (**Evans, 2009**)

Fluorescence analysis

The powdered drug underwent fluorescence analysis following the procedures outlined in Chase and Kokoski's methods. Color changes were observed under UV light at wavelengths of 254 nm and 366 nm, as well as under daylight. (**Kokoski et al., 1958**)

Thin Layer Chromatography

The 50% hydroalcoholic extract of ***Cynodon dactylon*** and ***Quisqualis indica*** underwent Thin Layer Chromatography (TLC) analysis using analytical plates coated with 0.2 mm thickness of silica gel-G. TLC is a widely used method for separating and analyzing compounds in a mixture based on their affinity for the stationary phase (silica gel) and the mobile phase (solvent system).

For ***Cynodon dactylon*** and **Quisqualis indica**, two different solvent systems were utilized:

1. Chloroform: Methanol (10:1)
2. Toluene: Ethyl acetate: Formaldehyde (5:5:1)

The solvent mixture moves on the silica-coated plates through capillary action, allowing the compounds in the extract to separate based on their polarity and interactions with the stationary and mobile phases. Once the chromatogram was developed, the fully coated plate was air-dried and then heated for 20-25 minutes to eliminate any remaining solvent and moisture. (**Singh & Kumar, 2017**)

To visualize the separated compounds, the dried plate was sprayed with a 0.2% freshly prepared ninhydrin solution. This reaction aids in identifying the spots corresponding to the separated compounds on the TLC plate.

The movement of the spots on the TLC plate was indicated by their retention factor (Rf), which is determined by the ratio of the distance traveled by the compound from the point of application to the distance traveled by the solvent front. Rf values are distinct for each compound and can be utilized for identification purposes by comparing them with known standards or literature values.

HPTLC fingerprinting profile Test solution preparation

A CAMAG TLC scanner III in reflectance-absorption mode was used to scan the plates developed at a wavelength of 365 nm employing a tungsten (W) lamp for both sample and standard. Scanning parameters were scanning speed 20 mms−1, slit dimension 6.0 × 0.45 mm, and data resolution 100 µm per step. The HPTLC chromatograms of the extracted sample with the standard Quercetin. The HPTLC chromatograms of the extracted sample with the standard Quercetin.

The marker compounds were identified by matching the UV spectra and Rf of bands in the plant sample with marker compounds with a range of 365nm. (**Pandey & Tripathi, 2014**)

Procedure for TLC Analysis of Methanolic Plant Root Extract:

Dissolve 15 mg of the hydroalcoholic plant root extract in 1 mL of methanol.

Spotting on TLC Plate:

Use a Hamilton syringe and LINOMAT 5 equipment to spot different concentrations (5, 7, 9, and 12 µL) of the leaf (L1, L2, L3, L4) on a silica gel 60 GF254 plate as 5 mm bands.

Mobile Phase Saturation:

After 20 minutes, saturate the mobile phase Toluene: Ethyl acetate: Formaldehyde (5:5:1) before transferring the loaded plate into the TLC twin trough development chamber.

Development of TLC Plate:

Allow the loaded plate to develop in the mobile phase up to 70 mm in the TLC twin trough development chamber.

Drying:

Air-dry the developed plate to eliminate solvents.

Visualization:

Photograph the dried plate in natural daylight, UV-visible, and fluorescent light.

Densitometric Scanning:

To analyze the separated compounds, perform densitometric scanning at 254 nm and 366 nm.

Anisaldehyde Sulphuric Acid Treatment:

Treat the developed plate with anisaldehyde sulphuric acid spraying reagent and heat for five minutes at 100°C in a hot air oven. Photograph the plate in daylight after treatment to observe any additional reactions or color changes induced by the spraying reagent.

RESULTS AND DISCUSSION

Macroscopic Evaluation Results (Fig 2)

Macroscopic evaluation is a fundamental method in the standardization of medicinal plants after their identification and authentication. The macroscopic evaluation of ***Cynodon dactylon*** and **Quisqualis indica** yielded the following results, as summarized in Table 1.

Microscopic evaluation.

Transverse section of leaf of ***Cynodon dactylon*** and **Quisqualis Indica.**

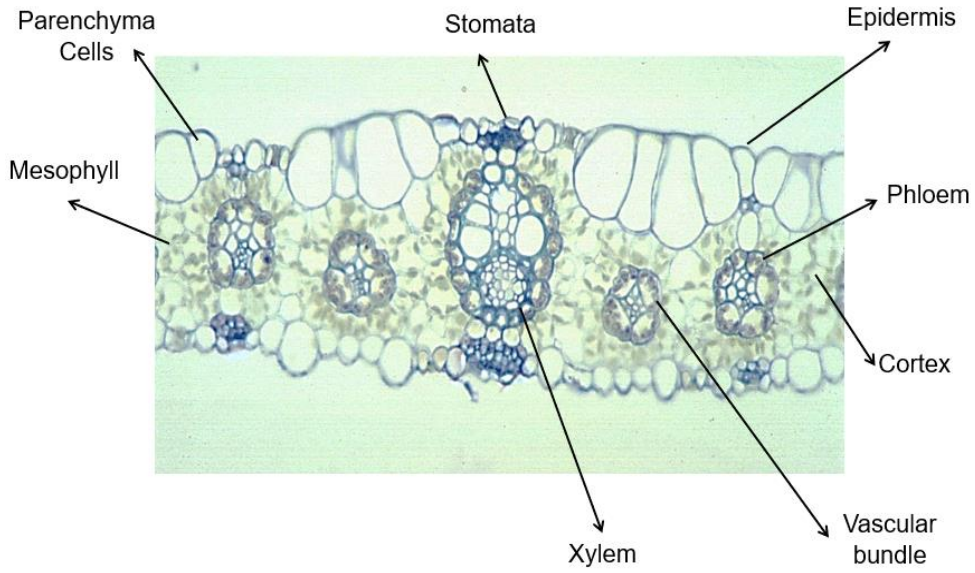
The transverse section of the leaf of CR was taken. The findings are described under 3 headings

Table.01 Macroscopical study

Parameters	**Description**	
	***Cynodon dactylon* leaves**	***Quisqualis indica* leaves**
Color	Green	Bright Green
Odor	Odorless	Odorless
Taste	Tasteless	Bitter
Size	2.5-6 X 1.5-5 Cm	Variable
Texture	Smooth	Smooth
Venation	parallel	Reticulated
Apex	Obtuse	Elliptic
Shape of lamina	Thin and shiny green	Oblong
Margin	Entire	Entire
Leaf blade	Flatted	Oval

Leaf Anatomy of Cynodon dactylon:

In a transverse section of a Cynodon dactylon (Bermuda grass) leaf, the sheath is folded adaxially along the median line, exhibiting a thicker structure that gradually tapers along the wings. Both adaxial and abaxial surfaces appear smooth and even. The abaxial epidermal layer comprises oblong cells with dumbbell-shaped stomata, accompanied by a thin cuticle and parallel subsidiaries. Conversely, the adaxial epidermal cells are small, featuring thick radial walls and a thick cuticle. The ground tissue is primarily composed of parenchyma cells, containing two or more air chambers near the midrib. Furthermore, 12 to 20 collateral vascular strands are distributed more or less equidistantly along the leaf sheath.



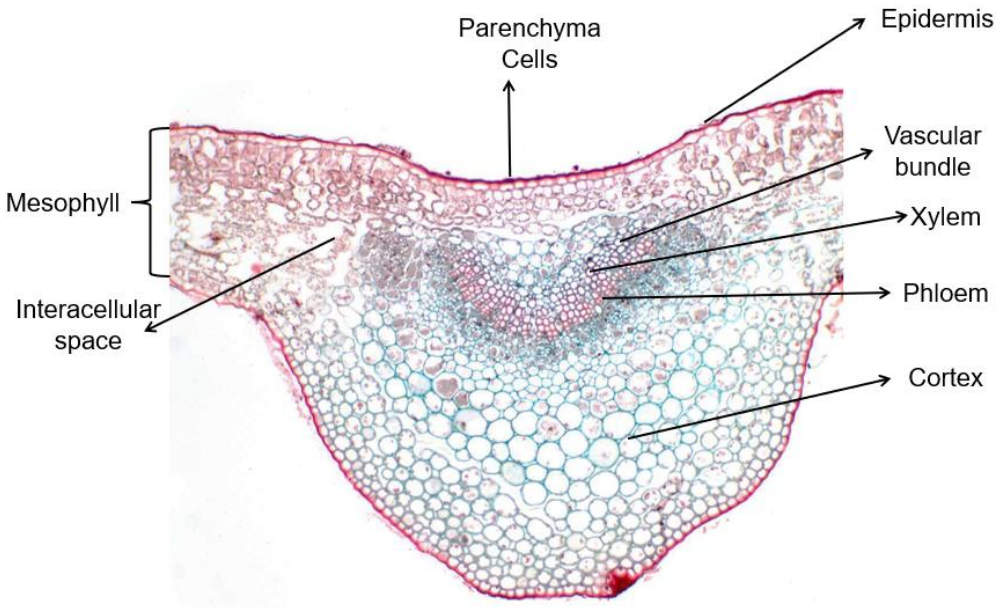
***Cynodon dactylon* leaves : Transverse Section**

The transverse section of Quisqualis indica leaves exhibits distinctive anatomical features. The upper and lower cuticles are relatively thin. The upper epidermis comprises a single row of large epidermal cells, which are rectangular, squared, or polygonal, occasionally oval, with straight to undulating periclinal walls. These upper epidermal cells have a unique arrangement. In contrast, the lower epidermal cells are rectangular, oval, or squared. The palisade mesophyll is composed of a single layer of cylindrical, compact, and highly pigmented cells. The spongy mesophyll cells are irregular, parenchymatous, and fairly compact, with moderate intercellular airspaces.

The midrib of Quisqualis indica shows a thick and darkly stained cuticle, followed by a uniseriate row of epidermis and 5 to 7 layers of thin-walled parenchyma. The vascular bundle is collateral and arc-shaped, resembling similar features observed in some

The adaxial outline of the petiole (median) is arched and furrowed, with a thick epidermis containing a uniseriate row of cells. The hypodermis also consists of a single row of cells. The vascular bundle in the petiole is collateral, and its architecture is lunar-shaped. Outside the vascular area, thin-walled parenchyma cells, approximately 6 to 7 layers thick, contain sparsely distributed starch grains. Below the hypodermis, 2 to 3 layers of angular collenchyma cells are observed.

Overall, the anatomical characteristics described provide valuable insights into the leaf and petiole structure of Quisqualis indica, aiding in its taxonomic classification and understanding of its physiological adaptations.



***Quisqualis indica* leaves: Transverse Section**

Physicochemical Property

The powdered drug was evaluated for its physicochemical parameters like total ash values, acid insoluble ash, water soluble ash, and loss on drying, and the results were tabulated (Table 2)

Parameters	***Cynodon dactylon* leaves (% w/w)**	***Quisqualis indica* leaves (% w/w)**
Loss on Drying	10.36	8.55
Ash value • ***Total Ash*** • ***Acid-insoluble*** • ***Water soluble***	9.006	11.63
	2.0833	4.2
	5.582	2.92
Extractive value • ***Pet ether soluble*** • ***50% Hydroalcoholic soluble*** • ***Aqueous soluble***	1.2	0.6
	4.44	6.9
	7.25	8.1
Foaming index	height of foam in every tube is more than 1cm (1000)	height of foam in every tube is less than 1cm (100)

Fluorescence analysis

Table3. Fluorescence analysis of powder *Cynodon dactylon* leaves

S. No.	**Powder treatment**	**UV at long 364nm**	**Under ordinary light**	**Short Wave light**

1.	Only powder	Buff Green	Light green	Light yellow
2.	Powder + Con. HNO_3	Light Green	Yellowish green	Pale brown
3.	Powder + Con. H_2SO_4	Dark green	Black	Light Brown
4.	Powder +5% Iodine Solution	Dark green	Dark Brown	Buff color
5.	Powder +1 N NaOH Solution in water	Light Brown	Green	Dark Brown
6.	Powder +1 N NaOH Solution in Methanol	Green	Dark green	Light green

Fluorescence analysis

Table 4. Fluorescence analysis of powder *Quisqualis indica* leaves

S. No.	Powder treatment	UV at long 364nm	Under ordinary light	Short Wave light
1.	Only powder	Light Brown	Brown	Purplish brown
2.	Powder + Con. HNO_3	Light Red	Yellowish Brown	Blood Red
3.	Powder + Con. H_2SO_4	Dark Brown	Black	Brown
4.	Powder +5 % Iodine Solution	Brown	Dark Brown	Yellowish brown
5.	Powder +1 N NaOH Solution in water	Reddish Brown	Reddish green	Green
6.	Powder +1 N NaOH Solution in Methanol	Yellowish Brown	Yellowish green	Buff color

Phytochemical Screening

Leaves of Quisqualis and aerial parts of Cyanodon dactylon extracts of petroleum ether, 50 % hydroalcoholic, and aqueous extract underwent preliminary phytochemical screening for their presence of constituents and the results were tabulated.

Test	Pet ether	50% Hydroalcoholic	Aqueous
Flavonoid	-	+	+
Alkaloids	-	+	+
Tannin	-	+	+
Glycosides	-	+	+

Table 05 Phytochemical Screening of leaves of Quisqualis indicasn

Test	Pet ether	50% Hydroalcoholic	Aqueous
Flavonoid	-	+	+
Alkaloids	-	+	+
Tannin	-	+	+
Glycosides	-	+	+

Table.06 Phytochemical Screening of aerials parts of Cyanodon indica

Thin Layer Chromatography (TLC)

The maximum spots were found in Chloroform (10): Methanol (1) Spots were then recognized under daylight, short-wavelength, and long-wavelength ultraviolet light.

Table 1. TLC profile of 50% Alcoholic extract of *Cynodon dactylon* with various mobile phase

S.NO.	Name of Metabolites	Mobile Phase	Visualizing agent	R_f Value
3.	**Flavanoids**	Chloroform (10): Methanol (1)	Anisaldehyde Sulphuric Acid	0.45, 0.59, 0.67,

Chloroform: Methanol (10:1)

Fig. 1 Optimization of mobile phase by TLC

TLC profile

The maximum spots were found in the Toluene: EA: Formaldehyde (5:5:1) Spots were then recognized under daylight, short-wavelength, and long-wavelength ultraviolet light.

Table 1. TLC profile of 50% Alcoholic extract of *Quisqualis indica* with various mobile phase

S.NO.	Name of Metabolites	Mobile Phase	Visualizing agent	R_f Value
3.	**Flavonoids**	Toluene: EA: Formaldehyde (5:5:1)	Anisaldehyde Sulphuric Acid	0.43, 0.55, 0.65, 0.84

Toluene: EA: Formaldehyde (5:5:1)

Fig. 1 Optimization of mobile phase by TLC

HPTLC Quantitative Fingerprinting Analysis

The easiest and quickest separation technique now available is HPTLC, which offers the highest level of precision and accuracy while also opening an array of application possibilities. The *Cynodon dactylon* leaves showed 07 peaks in the 200-800 nm spectral range. The R_f value is found as 0.19, 0.29, 0.36, 0.43, 0.43, 0.54, and 0.63. In a 50% 50 % hydroalcoholic extract of *Cynodon dactylon* leaves**,** the maximum percentage area of 51.95% was covered by peak No. 7 (R_f value, 0.63). For the detection and quality assessment of prepared leaves from *Cynodon dactylon,* such an HPTLC approach may be helpful. Marker compound quercetin was used as a reference standard.

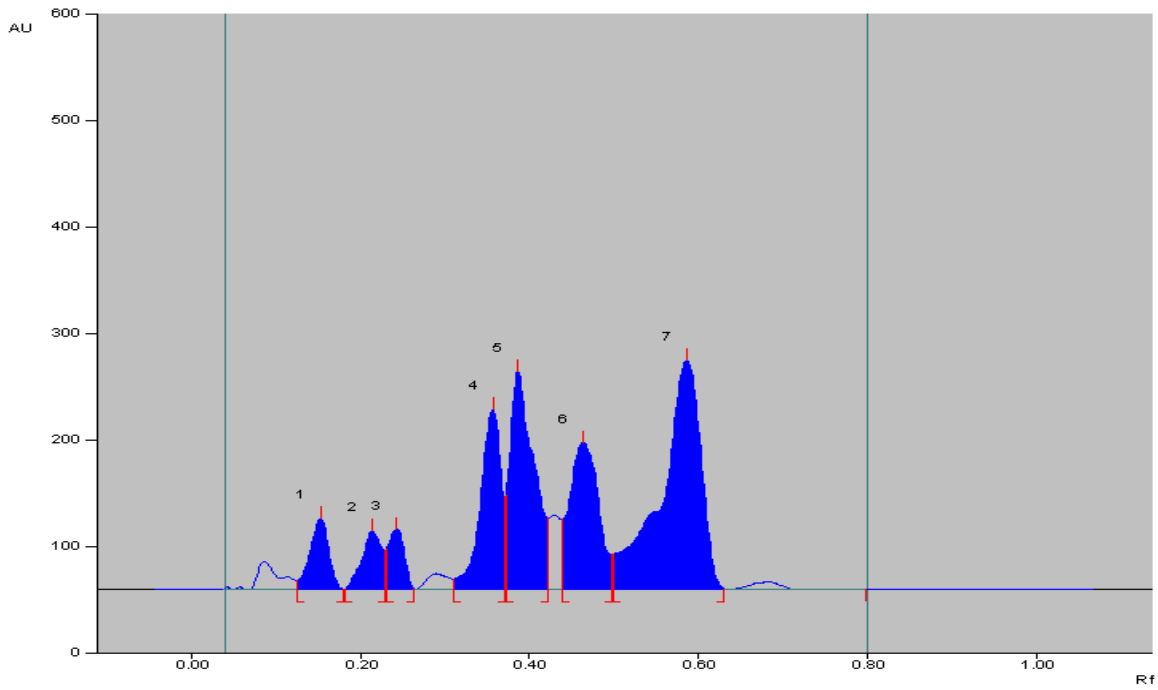


Fig. 2 HPTLC chromatogram of 50% Alcoholic extract of *Cynodon dactylon* leaves visualized at length 365nm

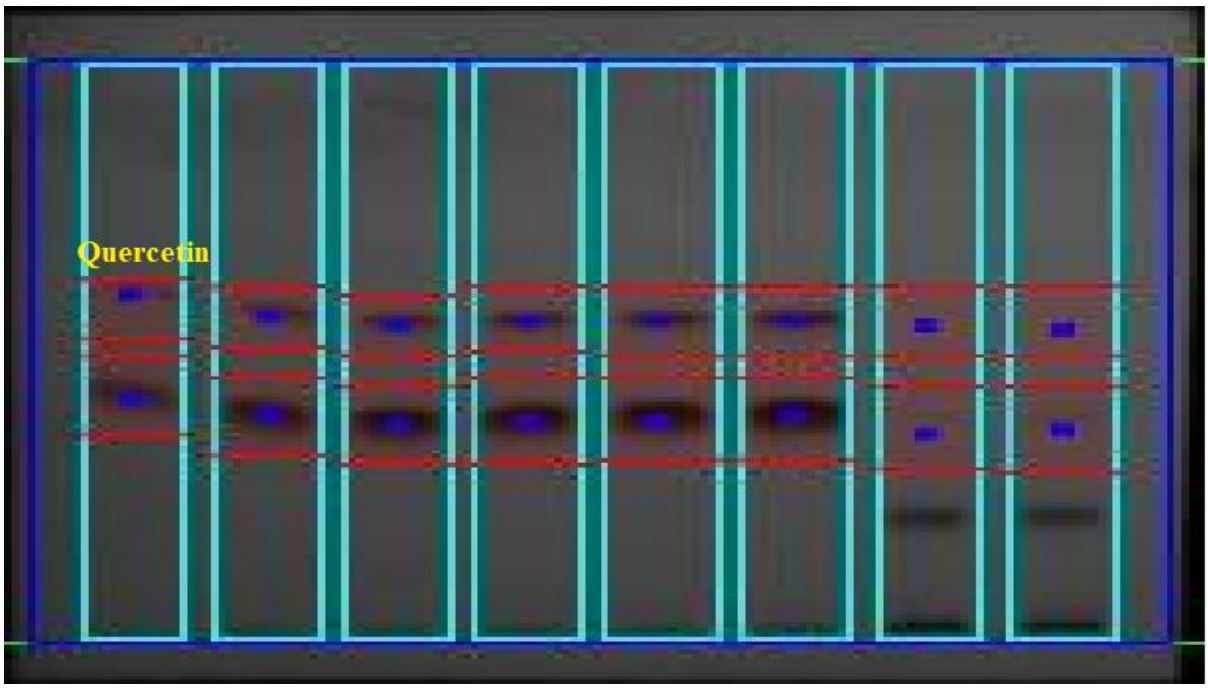


Fig. 3 HPTLC chromatogram of 50%Alcoholic extract of *Cynodon dactylon leaves*

HPTLC Quantitative Fingerprinting Analysis

The **Quisqualis indica** 50 % hydroalcoholic extract of leaves showed 10 peaks in the 200-800 nm spectral range. The R_f value is found as 0.11, 0.12, 0.15, 0.19, 0.52, 0.58, 0.6.7, 0.69, 0.81

and 0.89. In a 50 % hydroalcoholic extract of *Quisqualis indica* leaves**,** the maximum percentage area of 61.89% was covered by peak No. 7 (R_f value, 0.69). For the detection and quality assessment of prepared leaves from *Quisqualis indica,* such an HPTLC approach may be helpful. Marker compound Rutin was used as a reference standard.

The HPTLC chromatograms of the extracted sample with the standard Rutin. The marker compounds were identified by matching the UV spectra and R_f of bands in the plant sample with marker compounds with a range of 365nm.

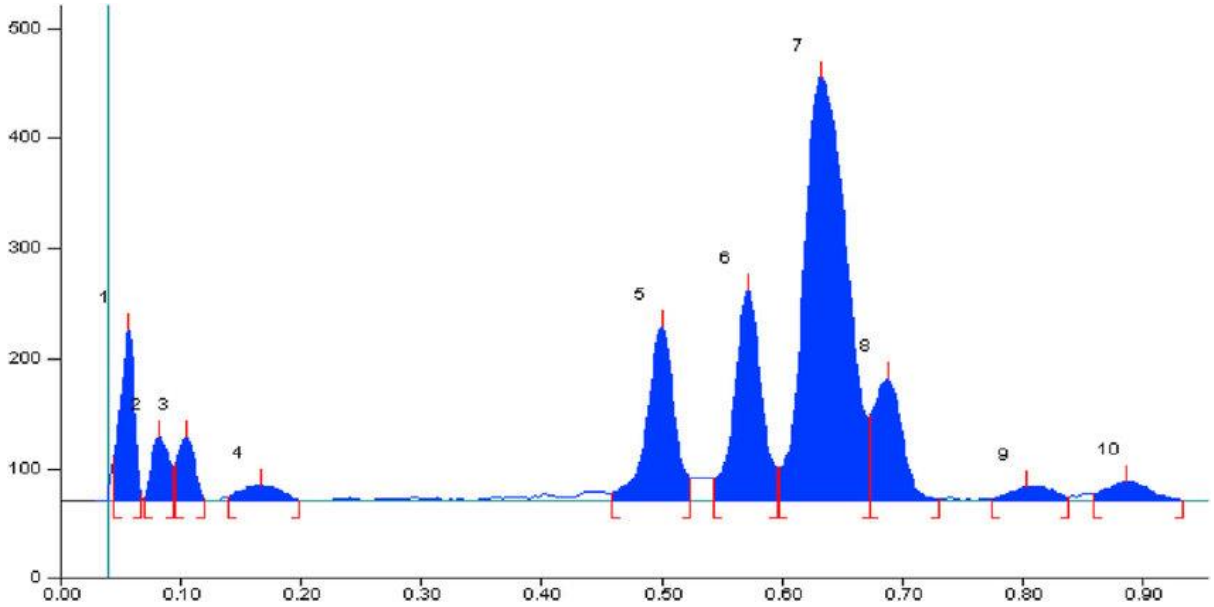
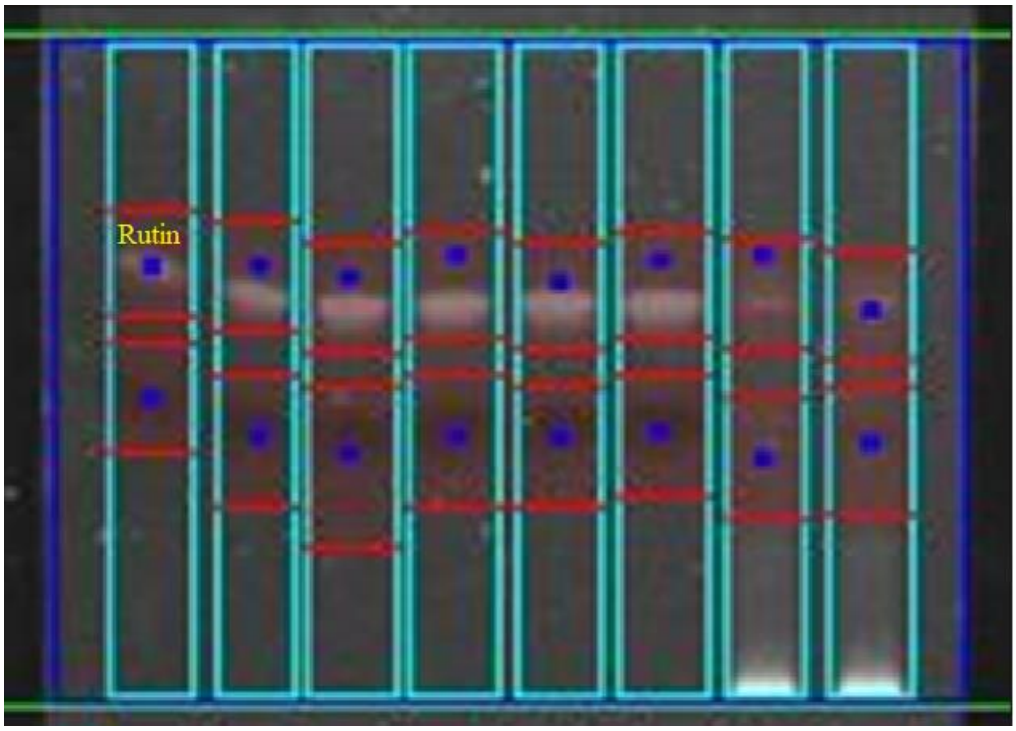


Fig.4 HPTLC chromatogram of 50% alcoholic extract of *Quisqualis indica* leaves visualized at length 365nm



CONCLUSION

The quality of natural products and their preparations is crucial. This holds for medicinal plants, where maintaining consistent quality and purity is essential. Pharmacognostic standardization plays a pivotal role in identifying and maintaining the quality of medicinal plants. Organoleptic and microscopical features play a vital role in identifying plants and detecting their source material. During a pharmacognostic study of the plants, it was observed that they exhibited parenchyma, palisade, and covering trichomes, as well as multiple vascular bundles and stomata in the leaf. Quantitative microscopy of the leaf involved determining vein islet and vein termination numbers, stomatal number, and stomatal index, which are valuable for crude drug identification. These characters are valuable in crude drug identification. Physico-chemical parameters are highly significant for detecting adulteration and ensuring the purity of crude drugs. These parameters like moisture content, ash value, and extractive value were determined for the plant parts. Detection of moisture present in the crude drug is very significant in preventing the growth of microbes. A low amount of moisture ensures better stability. The amount of soluble phytoconstituents in a particular solvent is established with the help of extractive value. Determination of extractive value helps in the estimation of phytoconstituents soluble in specific solvents. Phytochemical screening demonstrates the existence of plant secondary metabolites. The qualitative phytochemical screening reveals the presence of tannins, flavonoids, steroids triterpenoids, in the extract of Cynodon dactylon and Quisqualis indica. HPTLC Fingerprinting is an image captured at white light, 365nm that indicates the phytochemical profile of a plant extract based on Rf, color, and relative intensity of bands. The fingerprinting suggests that hydroalcoholic extracts contain similar phytoconstituent resolved at Rf with 0.19, 0.29, 0.36, 0.43, 0.43, 0.54, and 0.63 for Cynodon dactylon and rf values for Quisqualis indica are 0.11, 0.12, 0.15, 0.19, 0.52, 0.58, 0.6.7, 0.69, 0.81 and 0.89. So HPTLC assists in identifying phytochemical compounds and secondary metabolites of a plant. Hence the technique plays an important role in the quality control of herbal medicine and is valuable in indicating drug discovery and development.

CONCLUSION

The pharmacognostic and preliminary phytochemical studies are reported for the plant Cynodon dactylon and Quisqualis indica. Pharmacognostic evaluation of the plant can form a basis for the correct identification and standardization of the plant or plant parts. The findings of macroscopical, microscopical, and physicochemical parameters like ash value, extractive value, and leaf constants, HPTLC figure print will aid the standards which will be valuable for detecting its identity and authenticity.

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