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Overview on Dendrocalamus Strictus

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Abstract: *Five age gradations of 7 Bamboo species viz., Bambusa bambos, Dendrocalamus strictus, Bambusa vulgaris var. vulgaris, Bambusa vulgaris var. striata, Bambusa balcooa, Bambusa tulda and Bambusa polymorpha have been subjected to bodily and chemical evaluation for you to advise appropriate species at affordable rotation age for pulp and paper production. All the 5 age gradations exhibited tremendous variations for bodily and chemical residences in Bamboo genetic assets. Considering bodily residences viz., bulk and primary density, all of the age gradation have been slight to excessive in variety which indicated their suitability as pulpwood. In proximate evaluation, characters viz., Ash content material, Hot water solubility, 1% NaOH Solubility, Alcohol benzene extractives, Acid insoluble lignin, Pentosans and Hollocellulose have been analysed. The extraordinary age gradations of numerous bamboo genetic assets fluctuate extensively for holocellulose, which constitutes the cellulose and hemi-cellulose (vital elements for paper production). Among the 5 age gradations, the prevalence of 5-year-antique Bambusa balcooa became obtrusive because of most holocellulose content material, low ash content material and slight the lignin content material. The consequences confirmed that the high-quality inhibition of the bacterial boom became proven with the aid of using ethanolic extract at each the concentrations 50 & a hundred ms The Phytochemical analyses of the plant life have been carried out. The microbial interest of the Dendrocals ictus became because of the presence of numerous secondary metabolites. Hence, those plant life may be used to find out bioactive herbal merchandise that could function leads withinside the improvement of recent prescription drugs studies activities..*

Keywords: Dendrocalamus richs, Phytochemical screening, Antibacterial and Antifungal

I. INTRODUCTION

For a protracted length of time, flora were a precious supply of herbal merchandise for keeping human health, specially withinside the final decade, with extra in depth research for herbal therapies. The use of plant compounds for pharmaceutical functions has regularly extended worldwide. According to World Health Organization, people from evolved international locations use conventional medicine, which has compounds derived from medicinal flora. Therefore, such flora need to be investigated to higher apprehend their properties, protection and efficiency.

The use of plant extracts and phytochemicals, each with acknowledged antimicrobial properties, may be of incredible importance in healing treatments. In the previous couple of years, some of research were carried out in special international locations to show such efficiency. Many flora were used due to their antimicrobial traits, which can be because of compounds synthesized withinside the secondary metabolism of the plant. These merchandise are acknowledged with the aid of using their energetic materials like Phenolic compounds, Tannins, Flavonoids, vital oils etc.

Dendrocalamus strictus plant in a own circle of relatives of Poaceae, is an amazing supply of many bioactive compounds which includes flavonoids, polysaccharides, phenolic acid, amino acid belonging additionally it incorporates special minerals which includes calcium, magnesium and iron. Different elements of this plant were investigated and showed to own numerous pharmacological sports which includes antibacterial, anti-inflammatory, anti-oxidative, anti-hyperglycemic hobby etc. Our literature survey ravels that no paintings has been carried out on wound recovery hobby of this plant. Therefore; it's miles determined to unveil the wound recovery capability of Dendrocalamus strictus with the aid of using screening leaves extract on appropriate animal model

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1.1 Introduction to Plant

India (inside its local distribution range), D.strictus grows in semi dry and dry deciduous forests, as an understory species immixed forests. It grows on hill slopes, ravines and alluvial plains from sea stage as much as 1200 m (Guadua-Bamboo, 2015). This species prefers to develop in regions with suggest annual temperatures among 20°C - 30°C and suggest annual rainfall among 1000 - 3000 mm. However, it is able to tolerate severe temperatures (as low as -5°C and as excessive as 45°C). It is a drought resistant species and may thrive in regions with 750 mm rainfall peryear. It does now no longer develop properly on waterlogged regions or heavy soils including natural clay or a combination of clay and lime. It does quality on properly-tired sandy loam soils with pH raging among 5.5 - 7.5 .

1.2 Pharmacological Actions

A. Antioxidant Activity

An antioxidant is extensively described as any substance that delays or inhibits oxidative harm to a goal molecule through trapping unfastened radicals . There is increment withinside the hobby and have a look at of antioxidant hobby of diverse bamboo leaves amongst pupils and researchers international despite the fact that antioxidative compounds in bamboo leaves aren't completely known. Many age associated human sicknesses also are the end result of mobile harm through unfastened radicals and antioxidants ought to play a critical function in stopping such sicknesses.

B. Antimicrobial Activity

In today's international, the invention and improvement of antibiotics is taken into consideration as one of the maximum a success and effective achievements of current technology and generation that's meant to manipulate infectious sicknesses. There is boom in resistance of pathogens to conventional antimicrobial dealers. This resistance has indicated in want for isolation of microbial dealers that's much less at risk of everyday antibiotics; additionally permitting the healing of resistant isolates all through antibacterial therapy. Although there's tons development in scientific international, there's nonetheless a essential want to manipulate antimicrobial resistance through upgraded antibiotic utilization on the way to lessen medical institution cross-infection . The medicinal flowers containing compounds with antimicrobial hobby are discovered all over the international and plenty of efforts were made to find out novel powerful antimicrobial compounds. Antimicrobial screening is carried out to specify the presence of antimicrobial hobby.

C. Antifungal Activity

Antifungal hobby become accomplished through poison plate method. The medium used become potato Dextrose Agar. The medium become organized and sterilized at10Psi in autoclave for 15 minutes. bial molecule withinside the plant in opposition to pathogen and microbes. Then the compounds to be examined have been brought to the sterile medium in aseptic situation a good way to get very last awareness as 1%. A plate with DMSO become organized as blank (negative) fashionable reference plate (advantageous control)

1.3 Plant Profile

Fig.1: Dendrocalamus strictus

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1.4 Taxanomical Classifications

Table 1: TAXANOMICAL CLASSIFICATIONS

Kingdom	**Plantae**
Division:	Angiospers
Class:	Monocots
Order:	Poales
Family:	Poaceae
Genus:	Dendrocalamus
Species:	*D.strictus*

Preferred Scientific Name
Dendrocalamus strictus

Preferred Common Name
Male bamboo

Taxonomic Tree

- Domain: Eukaryota
- Kingdom: Plantae
- Phylum: Spermatophyta
- Subphylum: Angiospermae
- Class: Monocotyledonae

Distribution
D. strictus is local to Asia inclusive of the Indian Subcontinent and Indo-China (Clayton et al., 2015). It is not unusualplace all through the plains and decrease hills of drier components of India. It is likewise not unusualplace inMyanmar and Thailand. It is now located in a good deal of tropical Asia, withinside the Caribbean, and withinside the Atlantic rain wooded area of Brazil.

1.5 Pharmacognostic Evaluations

A. Morphological evaluation
The Leaves were 25 cm long and 3 cm broad, and rounded at the base in to a short petiole, Margins irregularly entire.

- Color: Green
- Odour: Characteristic
- Taste: Bitter

B. Microscopic evaluation
The microscopic study of the fresh leaf section showed presence of upper and lower epidermis and vascular tissues i.e. xylem and phloem. Lignified pink colored components were clearly observed in the section. The powdered material showed presence of xylem vessels, covering trichomes and starch grains in it.

C. Physical evaluation of powder
The collected leaves were dried by using shade drying method for complete removal of moisture. It was further powdered by hand crushing and finally passed through sieve no 40 # size to obtain uniform sized powdered particles. Physical evaluation of this dry powder was done for following parameters.

1. Solubility
2. Melting point
3. Ash value
4. LOD
5. Extractive value

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II. MATERIAL AND METHODS

2.1 Morphological evaluation

The Leaves were 25 cm long and 3 cm broad, and rounded at the base in to a short petiole, Margins irregularly entire.

- Color: Green
- Odour: Characteristic
- Taste: Bitter

2.2 Microscopical Evaluation

The microscopic look at of the clean leaf segment confirmed presence of higher and decrease dermis and vascular tissues i.e. xylem and phloem. Lignified coloured additives had been truely discovered withinside the segment. The powdered cloth confirmed presence of xylem vessels, masking trichomes and starch grains in it.

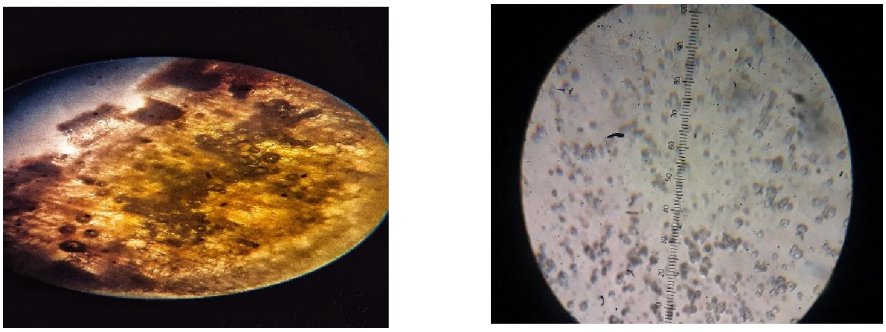

Fig. 2: Microscopical analysis of drug

2.3 Analytical Parameter

A. Ash Values

Theory

Used to decide first-rate and purity of a crude drug and to set up the identification of it.

Ash incorporates inorganic radicals like phosphates, carbonates and silicates of sodium, potassium, magnesium, calcium etc. These are found in specific quantity in a selected crude drug hence, quantitative dedication in phrases of numerous ash values allows of their standardization.

Sometimes, inorganic variables like calcium oxalate, silica, carbonate content material of the crude drug Total ash cost'. Such variables are eliminated through treating with acid (as they may be impacts soluble in hydrochloric acid) and acid insoluble ash cost is decided e.g. Rhubarb, Liquorice etc.

Used to decide overseas inorganic depend gift as an impurity.

Total Ash Value

Procedure

- Weigh and ignite flat, thin, porcelain dish or a tared silica crucible.
- Weigh approximately 2 g of the powdered drug into the dish/crucible.
- Support the dish on a pipe-clay triangle located on a hoop of retort stand.
- Heat with a burner, the usage of a flame approximately 2 cm excessive and assisting the dish approximately 7 cm above the flame, warmness until vapours nearly end to be advanced; then decrease the dish and warmth extra strongly till all of the carbon is burnt off.
- Cool in a desiccator.
- Weigh the ash and calculate the proportion of overall ash almost about the air dried pattern of the crude drug
- If a carbon unfastened ash can't be acquired on this manner then any individual of the following approach may be used.

1. Exhaust the charred mass with warm water, accumulate the residue on an ash much less clear out out paper incinerate the residue and clear out out paper, upload the filtrate, evaporate to dryness and ignite at a temperature

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now no longer exceeding 450°C.

2. Cool the crucible; upload 15 ml of alcohol, split the ash with glass-rod burn off the alcohol and once more warmness the entire to a stupid purple warmness. Cool, weigh the ash.

Acid Insoluble Ash Value

Procedure:

1. Using 25 ml of dilute hydrochloric acid, wash the ash from the dish used for overall ash into one hundred ml beaker and upload a crude drug. Further
2. Place a trifling gauze over a Bunsen burner and boil for 5 minutes.
3. Filter via an ash much less clear out out paper, wash the residue two times with warm water.
4. Ignite a crucible withinside the flame, cool and weigh.
5. Put the clear out out-paper and residue collectively into the crucible; warmness lightly till vapours end be advanced after which extra strongly till all carbon has been eliminated.
6. Cool in a desiccator.
7. Weigh the residue and calculate acid-insoluble ash of the crude drug almost about the air-dried pattern of the crude drug

Water Soluble Ash Value

Procedure:

Proceed as consistent with the stairs noted withinside the system for dedication of overall ash cost of a crude drug

1. Using 25 ml of water, wash the ash from the dish used for overall ash into one hundred ml beaker .a crude drug. Further
2. Place a trifling gauze over a Bunsen burner and boil for 5 minutes.
3. Filter via an ash much less clear out out paper, wash the residue two times with warm water.
4. Ignite a crucible withinside the flame, cool and weigh.
5. Put the clear out out-paper and residue collectively into the crucible; warmness lightly till vapours end be advanced after which extra strongly till all carbon has been eliminated.
6. Cool in a desiccator.
7. Weigh the residue and calculate acid-insoluble ash of the crude drug almost about the air-dried pattern of the crude drug.

Alcohol Soluble Ash Value

Use of alcohol rather than water as equal water soluble as cost.

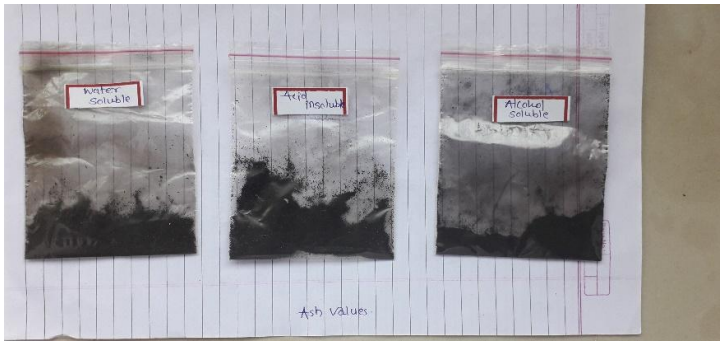

Fig 3: Ash Value

Extractive Values

Theory

These are beneficial for the assessment of a crude drug. Gives an concept approximately the character of the chemical components gift withinside the crude drug. Useful for the estimation of components extracted with the solvent used for

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extraction. Employed for cloth for which as but no appropriate chemical or organic assay exists. Extractive values are normally beneficial for the willpower of exhausted or adulterated drugs. The extractive fee of the crude drug determines the first-rate in addition to purity of the drug. Thus, alcohol and water soluble extractive values have been determined.

Alcohol Soluble Extraction

Procedure:

1. Weigh approximately four g of the coarsely powdered drug in a weighing bottle and switch it to a dry 250 ml conical flask.
2. Fill a a hundred ml graduated flask to the shipping mark with the solvent (90% alcohol). Wash out the weighing bottle and pour the washings, collectively with the the rest of the solvent into the conical flask.
3. Cork the flask and set apart for twenty-four hours, shaking frequently. (Maceration).
4. Filter right into a 50 ml cylinder. When enough filtrate has collected, switch 25 ml. of the filtrate to a weighed, skinny porcelain dish, as used for the ash values determinations.
5. Evaporate to dryness on a water-tubtub and whole the drying in an oven at 105° C for six hrs.
6. Cool in a desiccator for half-hour and weigh immediately.
7. Calculate the share w/w of extractive almost about the air-dried drug

Water Soluble Extraction

Steps are much like the ones referred to withinside the preceding experiment.

Use chloroform water as opposed to alcohol (Chloroform acts as a preservative).

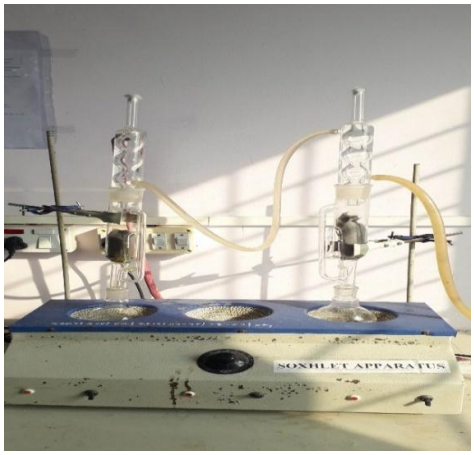

Fig 4: Water and Alcohol Extraction

Loss on Drying

Theory - Loss on drying is the lack of weight expressed as percent w/w as a result of water and unstable rely of any type that may be pushed off beneathneath distinct conditions. The check is accomplished on a well-combined pattern of the substance. If the substance is withinside the shape of massive crystals, lessen the dimensions with the aid of using speedy crushing to a powder.

Procedure

- Take a dry LOD bottle as distinct as in keeping with popular working procedure (SOP).
- Place the empty LOD bottle withinside the oven at a given temperature for 30 minutes or laid out in standsrd trying out procedure...
- Cool the empty LOD bottle withinside the desiccator at room temperature for 30min.
- Take a weight of empty LOD bottle (W1).
- Add frivolously distrubuted 1 to two gm of the pattern or distinct as in keeping with STP and weigh the LOD bottle (W2).

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Determination of Foreign Matter

Foreign Matter

- Organic(Moulds, insects, animal excreta etc.)
- Inorganic(Stone, soil, dust, sand etc.)

Procedure

1. Take weighed amount of crude drug 1500 Groot stemdark, 250 G leaves plant life seed fruit, 50 G reduce plant cloth 1 Spread it in a skinny layer and type the overseas cloth with the aid of using the use of magnifying lens (10 x) or appropriate sieve or with the aid of using visible inspection.
2. Pass the closing pattern via a sieve no. 250 to get rid of dust (mineral and mixture).
3. Weigh the part of taken care of overseas rely and determine % w/w of it. If overseas rely resembles plant cloth, take pooled pattern and follow physical/chemical check or microscopy.
4. Determine the percentage of overseas rely from the sum of the percentage fail

Fig 5: Determination of foreign matter

Determination of Foreign Organic Matter In Whole Drug

Foreign natural remember manner the cloth together with anyone or

1. Material now no longer accumulated Substances all the following from the authentic plant source.
2. Insects, moulds or different animal contamination.
3. Parts of the organ or organs from which the drug is derived aside from the components named withinside the definition and description.
4. Any different organ than the ones named withinside the definition and description.

Procedure:

1. Weigh one hundred to 500 g of the pattern (or the amount exact withinside the monograph of the drug).
2. Spread the pattern on a white tile or a tumbler plate uniformly with out overlapping.
3. Inspect the pattern with bare eyes or with the aid of a lens (5x or above).
4. Separate the overseas natural remember (cited above) manually.
5. After whole separation, weigh the problem and determine % w/w gift withinside the pattern.

Fractionation

The solvent used for the extraction of medicinal flora is likewise called the menstruum. The desire of solvent relies upon at the form of plant, a part of plant to be extracted, nature of the bioactive compounds, and the provision of solvent. In

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general, polar solvents along with water, methanol, and ethanol are utilized in extraction of polar compound, while nonpolar solvents along with hexane and dichloromethane are utilized in extraction of nonpolar compounds. During liquid–liquid extraction, the traditional manner is to pick out miscible solvents along with water–dichloromethane, water–ether, and water–hexane. In all of the combinations, water is gift due to its excessive polarity and miscibility with natural solvent. The compound to be extracted the usage of liquid–liquid extraction need to be soluble in natural solvent however now no longer in water to ease separation. Furthermore, solvent utilized in extraction is assessed in step with their polarity, from n-hexane that is the least polar to water the maximum polar. The following are diverse solvents of extractions organized in step with the order of growing polarity

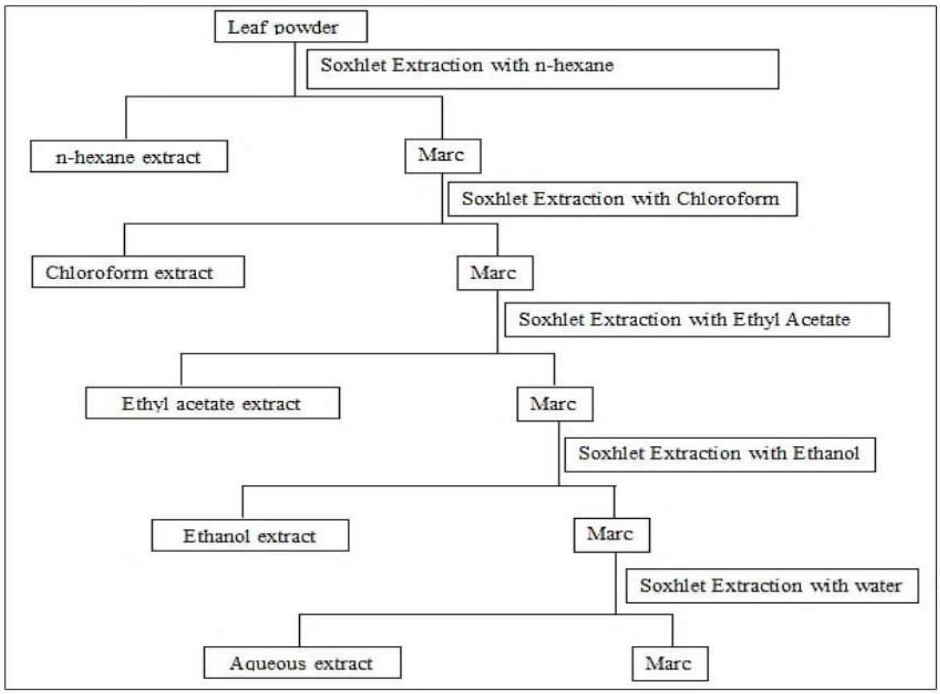

Table 2: Polarity of sovent

	Solvent	Polarity
1.	n-Hexane	0.009
2.	Petroleum ether	0.117
3.	Diethyl ether	0.117
4.	Ethyl acetate	0.228
5.	Chloroform	0.259
6.	Dichloromethane	0.309
7.	Acetone	0.355
8.	n-Butanol	0.586
9.	Ethanol	0.654
10.	Methanol	0.762
11.	Water	1.000

Soxhlet Extraction

A Soxhlet extractor is a chunk of laboratory equipment invented in 1879 through Franz von Soxhlet. It changed into at the beginning designed for the extraction of a lipid from a stable cloth. However, a Soxhlet extractor isn't always confined to the extraction of lipids. Typically, a Soxhlet extraction is simplest required in which the preferred compound has a confined solubility in a solvent, and the impurity is insoluble in that solvent. If the preferred compound has a huge

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solubility in a solvent then a easy filtration may be used to split the compound from the insoluble substance.Soxhlet extractor/ equipment includes a spherical increase flask keeping the menstrum, the extractor of a cylindrical percolator (frame) withinside the center supplied with an connected siphon and a reflux condenser, geared up on the top.

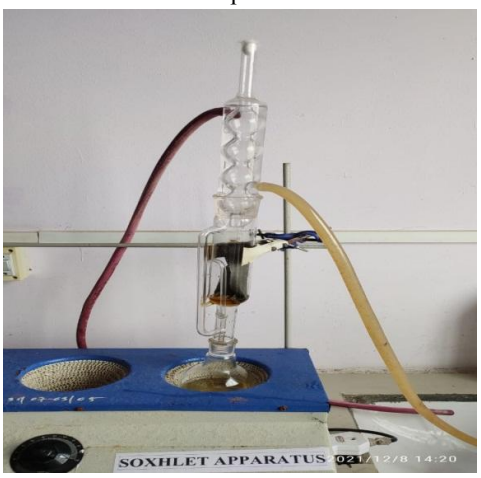

Fig 6: Fractionation

The cloth to be extracted (uncooked cloth) in crushed/ powdered shape is generally positioned in a thimble (fabricated from clear out out paper) after which inserted into the extractor. The menstrum is positioned withinside the spherical backside flask and boiled. The vapours bobbing up from the flask byskip through the facet tube into condenser. The vapours are condensed and drips into frame of the extractor as natural menstrum. It percolates thru the drug to be extracted dissolving the soluble components. As quickly as the extent of menstrum withinside the foremost extractor rises above the siphon bend, the extract is tired out. flowing thru the siphon into the flask. A confined quantity of warm solvent is for that reason made to percolate again and again thru the uncooked cloth solute from which it's far transferred to the flask. The manner is non-stop and may be persevered as preferred. Materials to be extracted may be extracted with numerous solvents withinside the identical equipment in a warm atmosphere,

During every cycle, a part of the non-risky compound dissolves withinside the solvent. After many cycles the preferred compound is focused withinside the distillation flask. The gain of this device is that rather than many quantities of heat solvent being handed aleven though the sample, simply ane batch of solvent is recycled. After extraction the solvent is removed, generally by using a rotary evaporator, yielding the extracted compound. The non-soluble part of the extracted stable stays withinside the thimble, and is generally discarded.

Procedure

- Solid matrix is positioned in SOX thimble.
- Solvent is heated below reflux.
- Condensation and extraction with “fresh” solvent. Solutes are transferred from the extraction chamber into the reservoir.
- Continuous repetition of the extraction.
- Exhaustive extraction is complete.

Phytochemical Analysis

Phytochemical Screening or Preliminary Test is the primary aspect to be finished earlier than foremost discoveries of molecules or drug entities are known. It is used to offer concrete information and studies to what plant lively components have ability to advantage mankind.

Preliminary Phytochemical Screening of the Extracts:

The qualitative chemical take a look at of Pet. ether extract and ethanolic extract of D.strictus leaves changed into achieved the use of preferred procedure.

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Tests for Carbohydrates and Reducing Sugars

The extracts had been dissolved in water and filtered. The filtrates had been divided into numerous quantities and had been examined as follows:

1. **Molisch's take a look at**: A small amount of aqueous extract changed into subjected to Molisch's reagent (naphthol in alcohol). Shake and upload conc. H2SO4 from aspects of the take a look at tube.A violet ring is shaped on the junction of liquids. This suggests the presence of carbohydrates.
2. **Fehling's take a look at:** A small amount of aqueous extract changed into subjected to Fehling's A and B reagents (CuSO4 answer), boil on water tubtub. A brick pink precipitate is shaped. This suggests the presence of lowering sugars.
3. **Benedict's take a look at**: To a hard and fast of filtrates of numerous extracts, introduced identical volumes of Benedict's reagent and heated in boiling water tubtub for 5min. The look of inexperienced yellow or pink shadeation indicated the presence of lowering sugars.

Test for amino acids:

1. **Biuret take a look at**: To the extracts, 4% sodium hydroxide and 1% copper sulphate answer had been introduced and formation of violet or red shadeation indicated the presence of proteins.
2. **Million's take a look at**: To the extracts, Million's reagent (mercury in nitric acid) changed into introduced. Formation of white precipitate which became pink on heating indicated the presence of proteins.
3. **Ninhydrin take a look at**: Aqueous or alcoholic extract changed into subjected to ninhydrin answer and boil. A crimson or bluish shadeation is appeared. This suggests the presence of amino acids.

Test for Proteins

a) Xanthoproteic take a look at: Test answer changed into introduced to conc. HNO3boil the mixture, cool and upload sodium hydroxide (NaOH) answer. A yellow precipitate is shaped and once more addition of alkali, orange shadeation is shaped. This suggests the presence of proteins.

Test for Alkaloids

Small portions of extracts had been dealt with with few drops of diluted hydrochloric acid and filtered. The filtrates of every extract had been divided into 4 quantities and the subsequent checks had been achieved

1. **Dragendroff's take a look at:** With Dragendroff's reagent (answer of potassium bismuth iodide) shaped orange brown precipitate.
2. **Mayer's take a look** at: With Mayer's reagent (potassium mercuric iodide answer) shaped creamy precipitate.
3. **Hager's take a look at:** With Hager's reagent (saturated picric acid answer) shaped yellow precipitate
4. **Wagner's take a look at**: With Wagner's reagent (answer of iodine in potassium iodide) shaped reddish-brown precipitate. The formation of respective precipitates indicated the presence of alkaloids.

Tests for Glycosides

The following checks had been achieved to hit upon the presence of various sorts of glycosides.

a. Legal's take a look at: To the extracts, introduced pyridine and sodium nitroprusside and improvement of red or pink shadeation indicated the presence of cardiac glycosides.
b. Borntrager's take a look at: The extracts had been boiled with dilute sulphuric acid and filtered. To the bloodless filtrates identical volumes of chloroform had been introduced. After thorough shaking the natural solvent layers had been separated and ammonia answer changed into introduced. ninety six The extrade of ammonia layer to red or pink shadeation indicated the presence of Anthraquinone glycosides.
c. Foam take a look at: Small portions of medication had been shaken vigorously with water. Formation of continual foam indicated the presence of saponin glycosides.
d. Guignard response or sodium picrate take a look at: Soaked clear out out paper strips first in 10% picric acid after which in 10% sodium carbonate and dried. Drugs had been taken in small bottles and the strips had been suspended from the mouth of the field and the lids had been tightly closed with part of the strip caught withinside the lid.

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The strips did now no longer flip brick pink or maroon indicating the absence of cyano genetic glycosides. Extracts whilst made alkaline did now no longer display blue or inexperienced fluorescence indicating the absence of coumarin glycosides

Test for Steroids and Triterpenoids

a. Salkowski response: To the extracts, chloroform and focused sulphuric acid had been introduced and shook well. The look of reddish-blue shadeation withinside the chloroform layer and inexperienced fluorescence in acid layer indicated the presence of steroids.
b. Liebermann-Burchard response: To the extracts introduced chloroform, combined after which introduced acetic anhydride observed through focused sulphuric acid from the facet of the tubes. Appearance of first pink, then blue and eventually inexperienced shadeation indicated the presence of steroids and triterpenoids.

Test for Flavonoids

1. Sulphuric acid take a look at: extract changed into introduced to 66% or 80% of sulphuric acid. Deep yellow answer is shaped which suggests the presence of flavones and flavonols. Orange to pink shadeation answer is shaped which suggests the presence of flavones. Red or reddish blue answer isformed which suggests the presence of aurones and chalcones.
2. Shinoda take a look at: Extract + 95% ethanol + conc. Hydrochloric acid + Mg turnings. Orange, red, pink to crimson shadeation is observed. This suggests the presence of flavonols, dihydro derivatives and xanthenes.
3. Test for lead acetate: Test residue changed into subjected to steer acetate answer. A yellow shadeation precipitate is shaped. This suggests the presence of Flavonoids.

Tests for Phenolic compounds and Tannins:

Small portions of the extracts had been dealt with with the subsequent reagents and the look of corresponding endpoints indicated the presence of phenolic compounds and tannins.

a) With fiverric chloride answer: Deep blue-black shadeation.

b) With 10% lead acetate answer: White precipitate.

.

a) Salkowski take a look at: Extract + chloroform + conc. H_2SO_4, shake well. $CHCl_3$ layer indicates pink shadeation which suggests the presence of steroids, acid layer indicates greenish yellow shadeation which suggests the presence of triterpenoids.

b) Liebermann's take a look at: Extract + acetic anhydride, heat, cool and upload conc. H_2SO_4. Blue shadeation is appeared. This suggests the presence of steroids.

Determination of Total Alkaloids

Theory

Alkaloids are fundamental nitrogen containing compounds received from plants, animals and microorganism having a marked physiological movement. Alkaloids have various and critical physiological results on human beings and different animals. The time period Alkaloids is derived from the phrase alkali-like and that they have a number of the characters of herbal amines. The definition of alkaloid is the natural compounds from herbal or artificial foundation that are fundamental in nature and include one or greater nitrogen atoms generally in heterocyclic ring and own unique physiological movement on human animal frame whilst used therapeutically. Alkaloids located in cinchona bark nonetheless play an critical position in medication for instance as antimalarial and anti arrhythmic drugs. Six respective derivatives (dihydro quinidine, dihydro quinine, quinidine, quinine, cinchonine and cinchonidine) has been quantified in crude plant extract. Total alkaloids are decided volumetrically through acid – base titration and calculated as quinine.

Determination of general alkaloids of extract

1. Introduce 10 ml of the cinchona extract right into a keeping apart funnel, upload 1N sulphuric acid (10 ml) and water 10 ml.

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2. Shake with 10 ml of chloroform and permit to split the mixture. Shake and permit to separate and discarded the chloroform layer.
3. Transfer the acid wash to the mom liquor and basify with approximately five ml of robust ammonia (take a look at with litmus paper)
4. Shake with successive quantities of chloroform (30,20,20 and 10 ml). Test for final touch of the extraction with mayers reagent.
5. Wash the blended chloroform extract with 10ml of water. Transfer the extract to a distillation flask to dispose of the solvent on a boiling water tubtub.
6. Add five ml of alcohol to the residue and evaporate the alcohol on a water tubtub.
7. Dissolve the residue in 2 ml of chloroform and upload 10 ml preferred N/10 hydrochloric acid. Heat on a water tubtub to dispose of the chloroform and again titrate the extra acid in opposition to N/10 sodium hydroxide the use of 3-five drops of methyl pink as indicator.

Fig 7: Total alkaloid content

Calculation

Each 1ml of N/10 hydrochloric acid – 0.03091 g of quinine

Percentage total alkaloids= [(10 ml of N/10 NaOH) × 0.0391 × 100] /10 = % w/v calculated as quinine

Determination of Total flavonoids content material

Total flavonoid content material changed into measured through the aluminum chloride colorimetric assay. An aliquot (1ml) of extracts or fashionable answers of Rutin (50, 100, 150, 2 hundred and 250µg/ml) changed into introduced to ten ml volumetric flask containing four ml of distilled water. To the flask changed into introduced 0.three ml 5% NaNO2, after 5 mins 0.three ml 10 % AlCl3 changed into introduced. After 5 mins, 2 ml 1M NaOH changed into introduced and the extent changed into made up to ten ml with distilled water. The solution changed into combined and absorbance changed into measured towards the clean at 510 nm.

Thin Layer Chromatography

TLC fingerprinting for each the extracts changed into accomplished through the use of appropriate solvent structures and the acquired spots had been predicted for his or her respective RF values. Solvent gadget used for aqueous extract changed into Chloroform: Methanol (Solvent gadget I) at the share of (2:8) and for ethanolic extract changed into Benzene: chloroform: acetone: methanol (Solvent gadget II) at the share of (9.5:0.5:0.5:0.5).

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Fig 8: TLC

Acid Nutralising Capacity:

A. Selection of samples

Commonly ate up business antacid capsules and herbal antacid treatments had been diagnosed primarily based totally on a literature survey and their availability.

B. Preparation of samples

Commonly ate up business antacids capsules and herbal antacid treatments had been accumulated and the juice changed into extracted from the samples.

C. Analysis of the antacid content material of the chosen sample

Analysis of Acid neutralizing ability changed into accomplished following the Rossett-Rice test. Back titration approach is the premise of this test. In this approach, an antacid is dissolved in an extra of acid and is titrated towards a acknowledged awareness of base till an endpoint is reached. The molarity of neutralized acid is same to the distinction among the moles of acid brought and consequently the moles of base required for the again titration.

Procedure

1. The antacid system is dissolved in a acknowledged quantity of surplus HCl and is titrated with an alkali, NaOH(aq) till sufficient OH– (from the NaOH solution) has been brought to completely react with the extra H+ (from the extra HCl withinside the solution).
2. A part of the brought acid is neutralized with the aid of using the antacid, the the rest is neutralized with the aid of using the NaOH brought. An equilibrium is reached while the wide variety of moles of NaOH brought is same to the wide variety of moles of HCl ultimate after the response with the antacid. HCl acts because the supply of H+(aq) and NaOH because the supply of OH–(aq). At the endpoint of the titration, the acid might be definitely neutralized with the aid of using the base. 1 g of every system changed into weighed and beaten the usage of mortar and pestle.
3. It changed into then transferred right into a conical flask and 25ml of 0.1 molarity of HCL changed into brought to every sample, 2-three drops of phenolphthalein indicator had been brought. The samples had been then titrated towards 0.1 M NaOH. The titrations had been repeated till concordant values had been obtained. The experiments had been undertaken beneathneath widespread laboratory conditions. Standardization of HCl and NaOH changed into achieved as consistent with the USP approach.

Calculation

Eq.(1) moles of acid neutralized = moles of acid added – moles of alkali required

= (VolumeHCl x MolarityHCl) – (VolumeNaOH x MolarityNaOH)

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Eq. (2) acid neutralizing capacity per gram of antacid = moles of HCL neutralized grams of antacid.

Fig 9: Acid neutralizing capacity

Data Analysis

The antacid values of the industrial and conventional antacids have been expressed as mean ± trendy blunders of the mean (SEM). An impartial t check become administered to test the distinction among the special classes of antacids to test their efficacy.. Data have been analyzed the use of the Statistical Package for Social Sciences (SPSS) (model 19.0) software. The importance degree for the distinction among become set at $p<0.05$.

Antimicrobial Activity

- The antibacterial interest become measured through agar cup method. Nutrient agar become organized and sterilized at 15Psi for 15 mins withinside the autoclave.
- It become allowed to chill under 450c and seeded with turbid suspension of check micro organism separately, organized from 24 hours antique slant cultures.
- 3% inocula have been used each time. The bacterial cultures decided on have been, Gram fine way of life viz Candida albicans.
- This seeded guidance become then poured in sterile Petridis beneathneath aseptic situation and allowed to solidify.
- Cups of 10 mm diameter have been borered withinside the agar plate with sterile cork borer.
- 50 and 100mg/ml of compound answers organized in Dimethyl sulphoxide (1%) have been brought withinside the cup beneathneath aseptic situation with the assist of micropipette.
- 100µlof DMSO become additionally located in one of the cup as blank(bad control). A trendy antibiotic disk impregnated with 10 gadgets of penicillin become additionally located at the seeded nutrient agar floor as trendy reference antibiotic (fine control).
- The plates have been stored in fridge for 15 mins to permit diffusion of the compound from agar cup into the medium.
- Then the plates have been shifted to incubator at 370 C and incubated for twenty-four hours.
- After incubation plates have been found for the region of inhibition of bacterial increase around the agar cup.
- Results have been recorded through measuring the region of inhibition in millimeter (mm) the use of region reader.

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Fig 10: Antimicrobial activity

III. RESULT AND DISCUSSION

3.1. Morphological Evaluation

Dendrocalamus strictus was evaluated for morphological parameters showed in the Table 1. The color of formulation was green . The odor of of the crude drug is chacteristic and taste was found to be bitter.

Table 3. Morphological evaluation

Sr. No	Parameter	Observation
1.	Color	Green
2.	Odour	Characteristic
3.	Taste	Bitter

3.2 Microscopical Evaluation

The microscopic study of the fresh leaf section showed presence of upper and lower epidermis and vascular tissues i.e. xylem and phloem. And determination of partical size of powder.

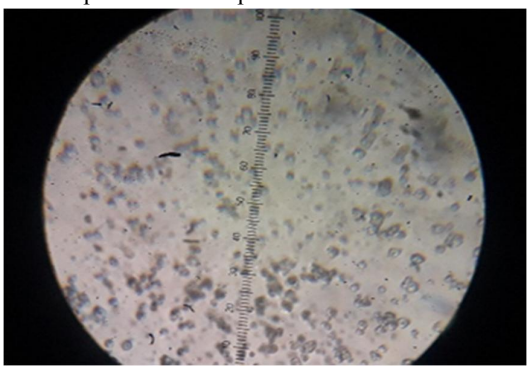

Image 11: Determination of powder partical size

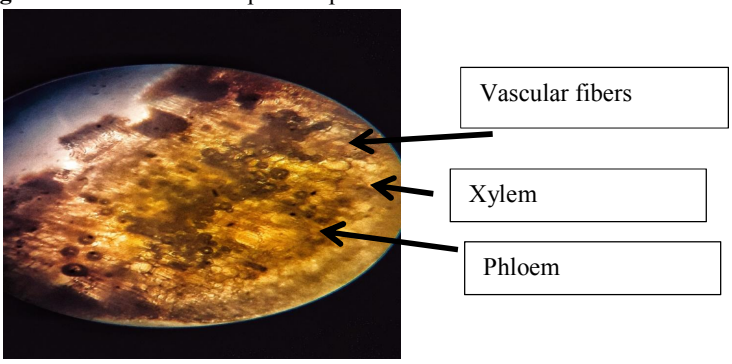

Image 12: T.S.mid rib of leaves

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3.3 Analytical Parameters

Dendrocalamus strictus was evaluated for analytical parameters was showed in the table 3. The total ash value was found to be 12% w/w. and water soluble and acid soluble ash found to be 4.2 and 6.5% respectively.

Table 4: Analytical Parameters

Sr. No	Physical parameter	Drug name & Obtained value (%w/w)
1	Total Ash Value Water soluble ash Acid insoluble ash	12 % 4.2 % 6.5 %
2	Extractive Value Water Methanol	 12% 8%
3	LOD	1.92 %
4	Melting point	950C
5	Solubility	Water, Ethanol (50:50)

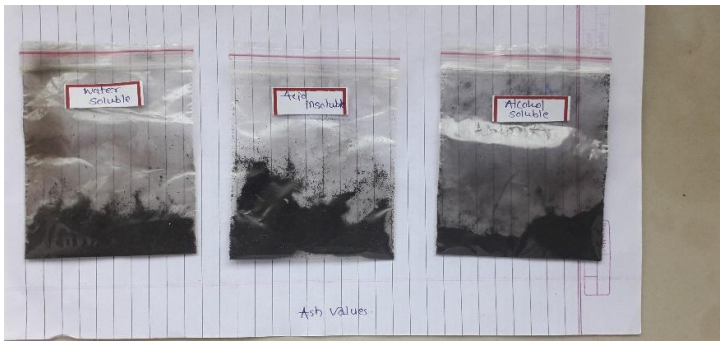

Image 13: Ash Value

3.4 Phytochemical Screening of Extract

The dendrocalamus strictus was evaluated for phytochemical parameters shown in the table It was found to be presence of phytochemicals such as flavonoids, alkaloids , glycosides and other constituents in aqueous and ethanolic extract.

Table 5: Phytochemical Screening of Extract

Sr.no	Test Name	Observations	
		Aqueous Extract	Ethanolic Extract
1.	**Flavonoids** Shinoda Test Alkaline test NH OH test	 ✓ ✓ ✓	 ✓ ✓ ✓
2.	**Glycosides** Keller Killani test Modified Borntragers test	 ✓ -	 ✓ ✓
3.	**Steroids** Salwoski test Libberman test	 ✓ -	 ✓ -

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4	**Protein** Biuret test Million test Xanthoprotein test	 - ✓ -	 - -
5.	**Alkaloids** Wagners test Hagers test	 ✓ -	 ✓ ✓
6.	**Carbohydrates** Molish test Benedicts test Barfoed test	 ✓ ✓ -	 ✓ ✓
7.	**Amino acid** Ninhydrin test Tyrosine test	 - ✓	 - ✓
8.	**Tannins & Phenolic Compound** Lead acetate	 ✓	 ✓

Fig 14: Test of phytochemical constituent

3.5 Total Phytochemical Content

Table 6: Total phytochemical content

Sr.no.	Total Content	Conc. Of content (mg/ml)
1	Alkaloid	0.246
2	Flavonoid	0.786
3	phenolic	0.258

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3.6 TLC

Table 7: Rf value table

Sr. No.	Extract name	Solvent system	
		No. of spot	Rf value
1	Aqueous extract	2	0.95
2			0.98

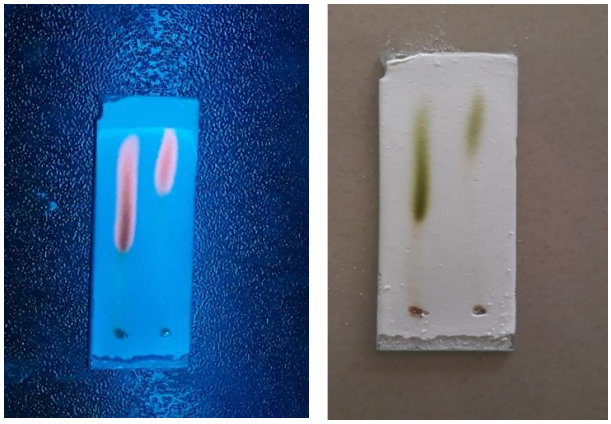

Fig 15: TLC

3.7 Acid Neutralizing Capacity

1 gm of each antacid tablet was taken and each of them contained strong base as an active ingredient .The higher the amount of Hydrochloric acid neutralized by antacids, the better is the acid neutralizing capacity.

Table 8: Acid neutralizing capacity

Antacid	Gelusil (Aluminium hydroxide)	Dygil (Magnesium hydroxide)	Dendrcalamus S. extract
Weight of sample	1 gm	1 gm	1 gm
Volume of NaOH required	10.2 ml	24.2 ml	23.3 ml
Volume of HCL required	25 ml	25 ml	25 ml
Moles of HCL neutalised	1.4	0.08	0.2

3.8 Antimicrobial Activity

Table 9: Antimicrobial Activity

Sr. No.	Dose	Compound	E.coli	Candida albicance
01	1%	DS1	16mm	15mm
02	0.5%	DS2	15mm	13mm
03	1%	DMSO	-ve	-ve
04	1%	Penicillin	11mm	11mm

IV. CONCLUSION

The present work was carried out on leaves of dendrocalamus strictus belonging to family poaceae. The study was done Qualitative & Quantitative properties of phytochemicals and pharmacological studies on leaves of dendrocalamus strictus. Physico-chemical parameters and phytochemicals study will guide in the proper identification of the plant species as well as help in authentication of the plant. Determined acid neutralizing capacity (0.2) and antimicrobial activity of dendrocalamus strictus.

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