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# Phytochemical Screening of Saccharum Officinarum (Linn.) Stem.

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**Abstract: Phytochemical screening is an important step which leads to the isolation of new and novel compounds. Saccharum officinarum (L.), family- Poaceae, is popularly known as noble cane, due to it's high sucrose content and low fiber content is one of the important industrial crops of the world. Stem of Saccharum officinarum were selected for phytochemical screening to identify the different classes of metabolites. Solvent extract of the plant material with the help of different solvents in the increasing order of polarity was taken. Benzene, Chloroform, Ethanol, methanol and Water revealed that Methanol & Water to be the best solvent in extracting metabolites from Saccharum officinarum. Phytochemical analysis of the extracts revealed presence of carbohydrates, proteins, alkaloids, flavonoids, Saponins, tannins & reducing sugar in stem of the saccharum officinarum. These studies provide referential information for correct identification and standardization of this plant material. Key words: Alkaloids, Flavonoids, Phytochemical, saponins, tannins.**

**Keywords:** Alkaloids, Flavonoids, Phytochemical, Saponins, Tannins.

## I. INTRODUCTION

Herbal drugs are referred as plants materials or herbs, which involves the use of whole plant or parts of plants to treat injuries or illnesses (1). Herbal drugs are used as therapeutic herbs to prevent and treat diseases and ailments or to support health and healing (2). Herbal medicines are used for the treatment of many ailments, including immune and 1. Psychiatric disorders, microbial and viral infections, non-communicable diseases such as cancer, malaria, and injuries, and reproductive health issues such as infertility. Some of the factors that facilitate high usage of herbal medicines include their local abundance, cultural significance, history of known efficacy, and, most importantly, inexpensive procurement compared to conventional pharmaceuticals (3). Ayurvedic herbal medicines ensure physical and mental health without side effects. The Ayurvedic herbal medicines help bring arogya to human body and mind ("arogya" means free from disease) while allopathic drugs/medicines have more side effects due to the presence of various toxic chemicals. In the present work we have the done the phytochemical screening of the stem of Sugarcane plant. Saccharum, is derived from the Greek word 'Sakcharon' which means sugar especially sucrose. Sugarcane, popularly known as noble cane, due to its high sucrose content and low fiber content is one of the important industrial crops of the world (4). It is the principal raw material for the sugar industry as 70% of the world's sugar comes from sugarcane. India is the second largest producer of sugar in the world after Brazil. Besides sugar production, large number of population in the tropics and subtropics relishes its juice, and consume raw cane (5). Sugarcane (Saccharum officinarum) is a full growing monocotyledonous crop that is cultivated in the tropical and subtropical regions of the world primarily for its ability to store high concentrations of sucrose or sugar in the stem. Sugarcane belongs to the grass family (Poaceae). Sucrose extracted and purified is used as raw material in human food industries or is fermented to produce ethanol (6). Sugarcane is very useful in scanty urination. It keeps the urinary flow clear and helps the kidneys to perform their functions properly. It is also valuable in burning micturition due to high acidity, gonorrhoea, enlarged prostate, cystitis and nephritis. Sugarcane juice increases vigour and sexual ability. It acts as an aphrodisiac and increases libido, quantity and quality of semen. Sugarcane contains trace amounts of folic acid or vit-B, is very beneficial for the pregnant women. Broadly there are two distinct agro-climatic regions of sugarcane cultivation in India, viz. Tropical and Sub-tropical. However, five agro-climatic zones have been identified mainly for the purpose of varietal development.They is –

- North western zone
- North central zone
- North eastern zone
- Peninsular zone –
- Coastal zone

Sugarcane extract has displayed a wide range of bio-logical effects including immune stimulation (7), anti-thrombosis activity, anti-inflammatory activity, vaccine adjuvant, modulation of acetylcholine release (8) and anti-stress effects. Sugar-cane juice has broad biological effects in raising innate immunity to infections (9).

*A. Vernacular Name*

Common Name: Sugarcane
Hindi: Eekh, Ganna
Sanskrit: Ikshu, pundrakah
Marathi: Sherdi
Telugu: Cheruku
Malayalam **:** Petta patti kabbu

Nutritional Value of Sugarcane (10)

The Juice Sugarcane Per Serving (28.35gm) Contain:

| | | |
|---|---|---|
| Energy | : | 111.13 KJ (26.56 K Cal) |
| Carbohydrates | : | 27.51 gm |
| Protein | : | 0.27 gm |
| Calcium | : | 11.23 mg (1%) |
| Iron | : | 0.37 mg (3%) |
| Potassium | : | 41.96 mg (1%) |
| Sodium | : | 17.01 mg (1%) |

Source – Nutrient Information From Esha Research.

## II. MATERIALS AND METHOD

The brief description of the glass ware, instruments, reagents and chemicals which were used in the study are given below.

*A. Glass ware*

Conical flask, Funnel, Glass rod, Pipettes, Measuring cylinder, Reagent bottle, Test tube, Beaker, Slide, Brush, Dropper, Crucible, Capillary tube, Iodine flask.

*B. Instrument*

Water bath, Electronic weighing machine, Rotatory flask shaker, Hot air oven, HPTLC, Fluorescence microscope (Binocular microscope), Soxhlet extraction unit, Desiccator, Test sieves, Mixer Grinder, Spatula, Heating mantle, Needle, Microtome machine.

*C. Reagents*

Fehling's solution A & B, Dragendorff's reagent, Mayer's reagent, Alpha nephthol solution, Wagner's reagent, Anthrone's reagent, Folin Denis reagent, Million's reagent, Hager's reagent, Aqueous basic lead acetate solution, Ammonia solution, Phosphoric acid.

*D. Chemicals*

10% Sodium hydroxide, Chloroform, Concentrate sulphuric acid, Ethanol, Distilled water, 50% Sulphuric acid, 50% Nitric acid. Sod. Tungustate, Iodine water, 1.5% Hydrochloric acid, 2M Hydrochloric acid, Potassium iodine, 3% Copper sulphate, Concentrate nitric acid, 0.2% Ninhydrin solution, Acetone, Sodium bicarbonate, Glycerin, 5% ferric chloride, 1N NaOH in methanol, 1N NaOH in water, Glycial acetic acid, 1N Hydrochloric acid, 50% HCl, 50% ammonia solution, 50% KOH.

- *Sample Collection and Powder Preparation*

The plant Saccharum Officinarum is widely found throughout the India. For our work plant sugarcane was collected from agricultural field situated at sitapur, chitrakoot, Satna, M.P. India. The plant was identified by Dr. Manoj Tripathi, Botanist. The stem was cleaned, dried and grounded to fine powder by using a electric mill grinder. The powder was sieved with 30# mess size (No.). Finally the sugarcane powder was stored in air tight container to prevent moisture and was used for further analyse. In the present study I have done the following tests.
Determination of moisture content (Loss on drying, LOD at 105oC)

- Determination of ethanol soluble extractive (ESE)
- Determination of water soluble extractive (WSE)
- Determination of chloroform soluble extractive
- Determination of benzene soluble extractive
- Determination of methanol soluble extractive
- Determination of total ash
- Fluorescence Study
- Preliminary Photochemical analysis
- Quantitative determination
- HPTLC fingerprint profile

- *Physicochemical parameters*

The total ash is particularly important in the evaluation of purity of drugs, i.e. the presence or absence of foreign organic matter such as metallic salts and/or silica. The total ash value of plant material indicated the amount of minerals and earthy materials attached to the plant material. The Loss on drying test is designed to measure the amount of water & volatile matters in a sample when the sample is dried under specified conditions. The extractive value of the powdered material was analyzed successively with the different known solvents i.e. Benzene, Chloroform, Ethanol, Methanol, Water.

- *Preparation 0f Sample Extracts:*

For analysis of phytochemicals, macerated the 2g air dried powder with 100 ml alcohol and distilled water separately in a closed iodine flask for 24 hours, shaking frequently during first 6 hours and allowed to stand for 18 hours. Then the solution was filtered by using whatman filter paper No.1.Both the extracts (alcoholic & aqueous) were used for the analysis of different bioactive constituents.

- *Preliminary phytochemicals Screening(11-12)*

The extracts obtained from successive solvent extraction were then subjected to various qualitative chemical tests to determine the presence of various phytoconstituents like Alkaloids, Carbohydrates, Proteins, Resins, Saponins, Starch, Flavonoids, Steroids, Glycosides, Tannins, Quinones and Phenolic Compounds Was Analysed by Following Methods.

*E. Test for Alkaloids*

*Mayer's Test:* Added few drops of Mayer's reagents to 1 ml of the acidic, aqueous extract of the powder.

*Dragendroff's Test:* Dissolved few mg of alcoholic or aqueous extract of powder in 5 ml of distilled water, added 2 M HCl until an acid reaction occurs, then added 1 ml of Drag end Orff's reagent.

*Hager's Test:* To 1 ml of alcoholic extract of powder and added few drops of Hangers reagent.

*F. Test for Carbohydrate*

*Anthrone's Test:* To 2 ml of anthrone's test solution, added 0.5 ml of aqueous extract of powder.

*Fehling's Test:* To 2 ml of aqueous extract of powder, added 1 ml of mix. of equal parts of Fehling's solution A and Fehling's solution B and boiled the content of the test tube for few minutes.

*Molish's Test:* To 2 ml of aqueous extract of the powder, added 2- drops of freshly prepared 20% alcoholic solutions of naphthol and Poured 2 ml of conc. $H_2SO_4$ so as to form a layer below the mixture.

*G. Test for Proteins*

*Biuret Test:* To 1 ml of hot aq. extract of sugarcane powder, added 5 – 8 drops of 10% w/v NaOH solution followed by 1 or 2 drops of 3% w/v $CuSO_4$ solutions.

*Xantho Protein Test:* A little residue was taken with 2 ml of water and 0.5 ml of concentrated nitric acid was added to it.

*Ninhydrin Test:* The Ninhydrin reagent is 0.1% w/v solution of Ninhydrin in n-butanol. A little of this reagent was added to the test extract.

*H. Test for Resins*

Dissolved 1 ml of extract in 1 ml of acetone and poured the solution into 5 ml distil water.

*I. Test for Saponins*

*Foam Test:* To 5 ml of aq. extract of Sugarcane powder, added few drops of sodium bicarbonate. Shaked vigorously and left it for few minutes.

*J. Test for Starch:*

Dissolved 0.015g of iodine and 0.075g of KI in 5 ml of distilled water and added 2 -3 drops of an aq. extract of Sugarcane powder.

Test for Flavonoids: Shinoda's test: To 0.5 ml of alcoholic extract of sugarcane powder, added 5-10 drops of concentrate HCl followed by small 0.5g of 'Mg' metal.

*Alkaline Reagent Test:* To the test solution added sodium hydroxide solution.

*K. Test for Steroids:*

*Salkowski's reaction:* Added 1 ml of concentrate $H_2SO_4$ to 2 ml of chloroform extract of the Sugarcane powder carefully, from the side of test tube.

*Test For Glycosides:* Borntrager's Test: One ml of benzene and 0.5 ml of dilute ammonia solution were added to the ethanolic extract of sugarcane powder.

*Test for Tannins:* Ferric Chloride test**:** To 1 – 2 ml of extract of Sugarcane powder, added few drops of 5% $FeCl_3$ solutions.

*L. Test for Quinones*

1 ml of the sample extract was treated with alcoholic potassium hydroxide solution.

*M. Test for phenolic compounds*

The extract was taken in water and warmed; to this added 2 ml of ferric chloride solution and observed.

Fluorescence characters of the plant powder and extract (13,14,15): When physical and chemical parameters are inadequate as it often happens with the powdered drugs, the plant material may be identified from their adulterants on basis of fluorescence study. The treatment of powdered drugs with different chemical reagents reveals the presence of different chemical constituents with fluorescence character in UV light. Therefore, the results obtained from the present fluorescent studies will also help to check any impurities present in plant powder.

## III. QUANTITATIVE ANALYSIS

Carbohydrates, Proteins, Tannins, Alkaloids and Flavonoids was carried out using for standard methods .

1. Estimation of total Carbohydrate by Anthrone method (16)
2. Protein estimation by Lowry's Method (17-18)
3. Estimation of Tannin by Folin-Denis method (16)
4. Estimation of Alkaloids by Dragendorff's Reagent method (19)
5. Determination of Flavonoid by Bohm and Kocipai – Abyazan (1994) (20)

## IV. RESULTS & DISCUSSION

The Observations are Tabulated in The Given Tables Below:-

| SR. NO. | PARAMETERS | % W/W |
|---|---|---|
| 1 | Total Ash Value | 2.005 |
| 2 | Loss on Drying | 2.769 |

Table 1: Physicochemical Parameters of Powdered of Stem of Saccharin Officinarum (L.).

| SR.NO. | SOLVENT EXTRACT | CONSISTENCY | YIELD % W/W |
|---|---|---|---|
| 1 | Benzene | Non sticky | 1.04 |
| 2 | Chloroform | Non sticky | 0.99 |
| 3 | Ethanol | Sticky | 9.6416 |
| 4 | Methanol | Sticky | 39.91 |
| 5 | Water | Sticky | 28.2566 |

Table 2: Extractive Values of Stem of Saccharum Officinarum (L.).

| S. No. | Powder + Reagents | Observation in day light | Observation at 366 nm |
|---|---|---|---|
| **1.** | Powder as it | Cream colour | Bluish white colour |
| **2.** | Powder + 1 N HCl | Cream colour | White colour |
| **3.** | Powder + 1N NaOH Water | Yellow colour | Greenish colour |
| **4.** | Powder + 1 NaOH MeOH | Dirty marine colour | Green colour |
| **5.** | Powder + 50 % KOH | Brown colour | Greenish colour |
| **6.** | Powder + 50 % H2SO4 | Pale yellow colour | Pale green colour |
| **7.** | Powder + Conc. H2SO4 | Brown colour | Black colour |
| **8.** | Powder + Acetic acid | White colour | White colour |
| **9.** | Powder + 50 % $HNO_3$ | Brown colour | Greenish yellow Colour |
| **10.** | Powder + Iodine water | Cream colour | White colour |

Table 3: Fluorescence Analysis of Stem of Saccharum Officinarum (L.).

| S. No. | Name of experiments | Observation | Result |
|---|---|---|---|
| **1.** | **Alkaloids** | | |
| | a. Mayer's test | White colour appear | Present |
| | b. Hager's test | Light yellow colour appear | Absent |
| | c. Dragendorff's test | Orange colour appear | Present |
| **2.** | **Carbohydrate** | | |
| | a. Anthrone's test | Green colour appear | Present |
| | b. Fehling's test | Brick-red colour appear | Present |
| | c. Molish's test | Red-violet ring appear | Present |
| **3.** | **Proteins** | | |
| | a. Bieuret's test | Red colour appear | Present |
| | b. Millon's reagent | Light red colour appear | Present |
| | c. Ninhydrin test | purple colour appear | Present |
| | d. Xantho protein test | White colour appear | Absent |
| **4.** | **Resins** | Turbidity are seen | Present |
| **5.** | **Saponin test** | | |
| | a. Foam test | Honey comb-like structure are formed | Present |
| **6.** | **Starch test** | Redish colour appear | Absent |
| **7.** | **Tannin test**<br>a. Ferric chloride test<br>b. Potassium dichromate test | <br>Orange colour appear<br>Orange colour appear | <br>Absent<br>Absent |
| **8.** | **Phenolic compounds** | Yellow colour appear | Absent |
| **9.** | **Flavonoid test** | | |
| | a. Shinoda's test | Pink colour appear | Present |
| | b. Alkaline reagent test | Yellowish colour appear | Present |
| **10.** | **Steroid test** | | |
| | a. Salkowski's test | Light yellow colour appear | Absent |
| **11.** | **Glycoside test**<br>a. Borntrager's test | <br>Reddish pink colour appear | <br>Present |

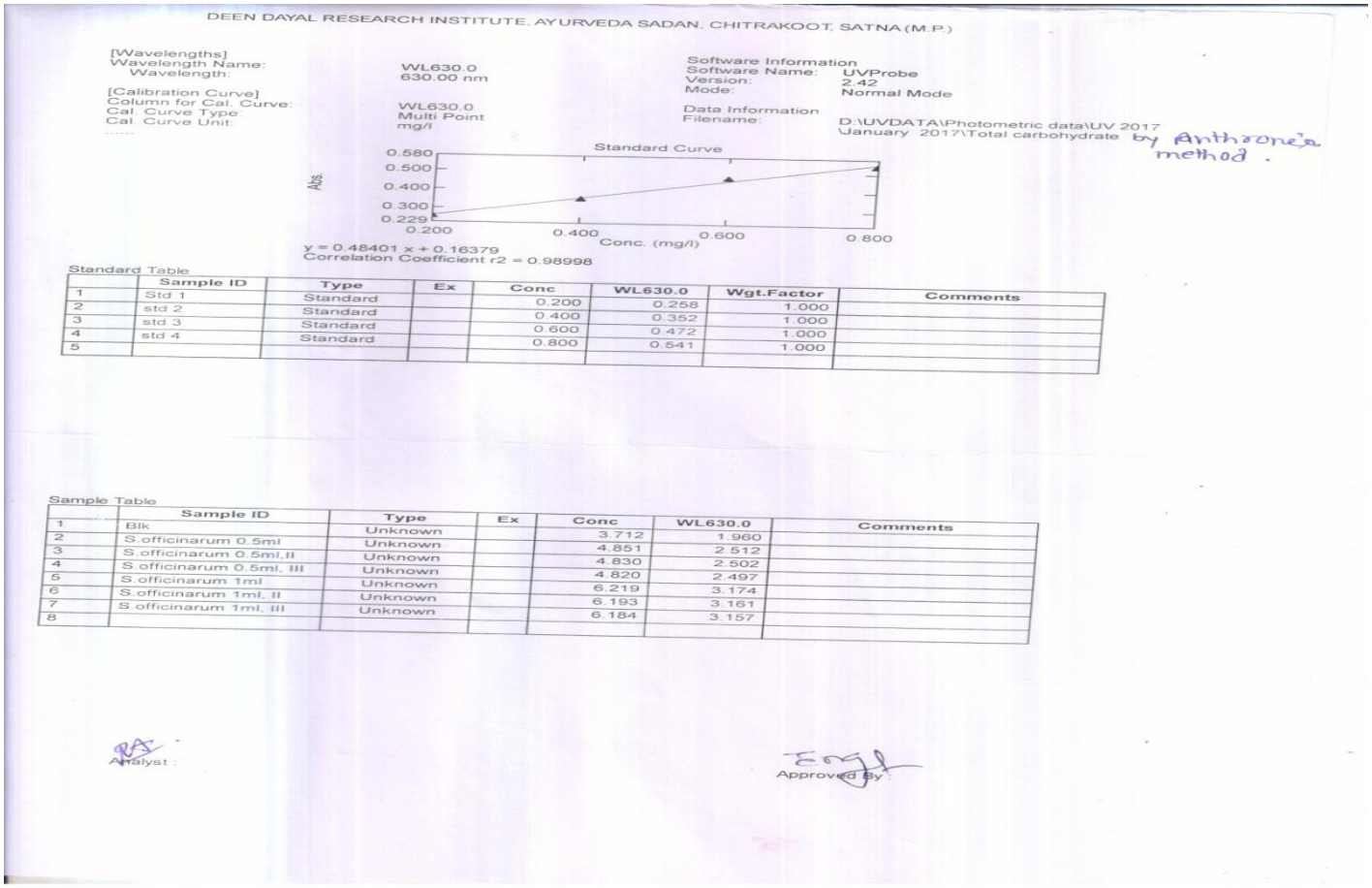
Table 4: Preliminary Phytochemical Screening of Aqueous Extract

| S.No. | Name of experiments | Observation | Result |
|---|---|---|---|
| **1.** | **Alkaloids** | | |
| | Mayer's test | Pale yellow colour appear | Present |
| | Wagner's test | Yellow ppt. Appear | Present |
| | Dragendorff's test | Orange colour appear | Present |
| **2.** | **Carbohydrate** | | |
| | Anthrone's test | Green colour appear | Present |
| | Fehling's test | Brick-red colour appear | Present |
| **3.** | **Proteins** | | |
| | Bieuret's test | Red colour appear | Present |
| | Millon's reagent | Light red colour appear | Present |
| | Ninhydrin test | Purple colour appear | Absent |
| | Xanthoproteic test | Light yellow appear | Absent |
| **4.** | **Resins** | Turbidity are seen | Present |
| **5.** | **Saponin test** | | |
| | Foam test | Honey comb-like structure are not formed | Absent |
| **6.** | **Starch test** | Reddish colour appear | Absent |
| **7.** | **Tannin**<br>Ferric chloride test<br>Potassium dichromate test | <br>Orange colour appear<br>Dark colour appear | <br>Absent<br>Present |
| **8.** | **Phenolic compounds** | Pale green colour appear | Present |
| **9.** | **Flavonoid test** | | |
| | Shinoda's test | No change in light brown colour | Absent |
| | Alkaline reagent test | Yellow colour appear | Present |
| **10.** | **Steroid test** | | |
| | Salkowski's test | Light yellow colour appear | Absent |
| **11.** | **Glycoside test**<br>Borntrager's test | <br>Reddish pink colour appear | <br>Present |
| **12.** | **Quinones test** | Yellow colour appear | Absent |

Table 5: Preliminary Phytochemical Screening of Ethanol Extract

| Sr.No. | Name of constituents | mg/ml or % |
|---|---|---|
| **1** | Tannin | 0.2588 mg/ml |
| **2** | Total Carbohydrates<br>a. For 0.5 ml<br>b. For 1 ml | <br>a. 0.78471 mg/ml<br>b. 2.1491 mg/ml |
| **3** | Protein<br>a. For 0.1 ml<br>b. For 0.2 ml | <br>a. 0.3072 mg/ml<br>b. 1.1891 mg/ml |
| **4** | Alkaloid | 46.2566 mg/ml |
| **5** | Flavonoid | 43.6292 % |

Table 6: Quantitative Analysis of Stem of Saccharum Officinarum (L.).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Wavelength: 630.00 nm

[Calibration Curve]
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Cal. Curve Type: WL630.0
Cal. Curve Unit: Multi Point
mg/l

Software Information
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Version: 2.42
Mode: Normal Mode

Data Information
Filename: D:\UVDATA\Photometric data\UV 2017 \January 2017\Total carbohydrate by Anthrone's method.




y = 0.48401 x + 0.16379
Correlation Coefficient r2 = 0.98998

Standard Table

| | Sample ID | Type | Ex | Conc | WL630.0 | Wgt.Factor | Comments |
|---|---|---|---|---|---|---|---|
| 1 | Std 1 | Standard | | 0.200 | 0.258 | 1.000 | |
| 2 | std 2 | Standard | | 0.400 | 0.352 | 1.000 | |
| 3 | std 3 | Standard | | 0.600 | 0.472 | 1.000 | |
| 4 | std 4 | Standard | | 0.800 | 0.541 | 1.000 | |
| 5 | | | | | | | |

Sample Table

| | Sample ID | Type | Ex | Conc | WL630.0 | Comments |
|---|---|---|---|---|---|---|
| 1 | Blk | Unknown | | 3.712 | 1.960 | |
| 2 | S.officinarum 0.5ml | Unknown | | 4.851 | 2.512 | |
| 3 | S.officinarum 0.5ml,II | Unknown | | 4.830 | 2.502 | |
| 4 | S.officinarum 0.5ml, III | Unknown | | 4.820 | 2.497 | |
| 5 | S.officinarum 1ml | Unknown | | 6.219 | 3.174 | |
| 6 | S.officinarum 1ml, II | Unknown | | 6.193 | 3.161 | |
| 7 | S.officinarum 1ml, III | Unknown | | 6.184 | 3.157 | |
| 8 | | | | | | |

Analyst :

Approved By :

ISSN No: - 2456 – 2165

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[Wavelengths]
Wavelength Name: WL660.0
Wavelength: 660.00 nm

[Calibration Curve]
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Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/l

Software Information
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Version: 2.42
Mode: Normal Mode

Data Information
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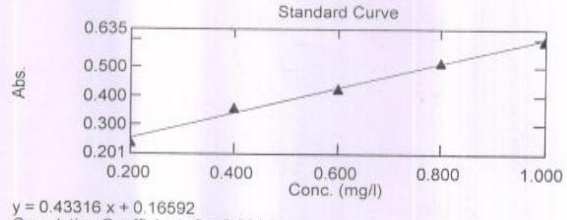


y = 0.43316 x + 0.16592
Correlation Coefficient r2 = 0.99154

Standard Table

| | Sample ID | Type | Ex | Conc | WL660.0 | Wgt.Factor | Comments |
|---|---|---|---|---|---|---|---|
| 1 | Std 1 | Std-Repeat | | 0.200 | 0.237 | 1.000 | |
| 2 | Std 1-2 | Std-Repeat | | 0.200 | 0.238 | 1.000 | |
| 3 | Std 1-3 | Std-Repeat | | 0.200 | 0.238 | 1.000 | |
| 4 | Std 1-Avg | Average | | 0.200 | 0.238 | 1.000 | Avg of preceding 3 Samples |
| 5 | Std 2 | Std-Repeat | | 0.400 | 0.358 | 1.000 | |
| 6 | Std 2-2 | Std-Repeat | | 0.400 | 0.358 | 1.000 | |
| 7 | Std 2-3 | Std-Repeat | | 0.400 | 0.358 | 1.000 | |
| 8 | Std 2-Avg | Average | | 0.400 | 0.358 | 1.000 | Avg of preceding 3 Samples |
| 9 | Std 3 | Std-Repeat | | 0.600 | 0.426 | 1.000 | |
| 10 | Std 3-2 | Std-Repeat | | 0.600 | 0.426 | 1.000 | |
| 11 | Std 3-3 | Std-Repeat | | 0.600 | 0.426 | 1.000 | |
| 12 | Std 3-Avg | Average | | 0.600 | 0.426 | 1.000 | Avg of preceding 3 Samples |

Sample Table

| | Sample ID | Type | Ex | Conc | WL660.0 | Comments |
|---|---|---|---|---|---|---|
| 1 | Blank | Unk-Repeat | | | 0.143 | |
| 2 | Blank-2 | Unk-Repeat | | | 0.143 | |
| 3 | Blank-3 | Unk-Repeat | | | 0.143 | |
| 4 | Blank-Avg | Average | | -0.053 | 0.143 | Avg of preceding 3 Samples |
| 5 | S.officinarum Stem 0.1ml | Unk-Repeat | | | 0.442 | |
| 6 | S.officinarum Stem 0.1ml-2 | Unk-Repeat | | | 0.442 | |
| 7 | S.officinarum Stem 0.1ml-3 | Unk-Repeat | | | 0.442 | |
| 8 | S.officinarum Stem 0.1ml-Avg | Average | | 0.637 | 0.442 | Avg of preceding 3 Samples |
| 9 | S.officinarum Stem 0.2ml | Unk-Repeat | | | 0.824 | |
| 10 | S.officinarum Stem 0.2ml-2 | Unk-Repeat | | | 0.824 | |
| 11 | S.officinarum Stem 0.2ml-3 | Unk-Repeat | | | 0.824 | |
| 12 | S.officinarum Stem 0.2ml-Avg | Average | | 1.519 | 0.824 | Avg of preceding 3 Samples |
| 13 | | | | | | |

Analyst :

Approved By :

ISSN No: - 2456 – 2165

Standard Table

| | Sample ID | Type | Ex | Conc | WL660.0 | Wgt.Factor | Comments |
|---|---|---|---|---|---|---|---|
| 13 | Std 4 | Std-Repeat | | 0.800 | 0.516 | 1.000 | |
| 14 | Std 4-2 | Std-Repeat | | 0.800 | 0.516 | 1.000 | |
| 15 | Std 4-3 | Std-Repeat | | 0.800 | 0.515 | 1.000 | |
| 16 | Std 4-Avg | Average | | 0.800 | 0.516 | 1.000 | Avg of preceding 3 Samples |
| 17 | Std 5 | Std-Repeat | | 1.000 | 0.592 | 1.000 | |
| 18 | Std 5-2 | Std-Repeat | | 1.000 | 0.592 | 1.000 | |
| 19 | Std 5-3 | Std-Repeat | | 1.000 | 0.592 | 1.000 | |
| 20 | Std 5-Avg | Average | | 1.000 | 0.592 | 1.000 | Avg of preceding 3 Samples |
| 21 | | | | | | | |

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[Wavelengths]
Wavelength Name: WL700.0
Wavelength: 700.00 nm

[Calibration Curve]
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Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/l

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Version: 2.42
Mode: Normal Mode

Data Information
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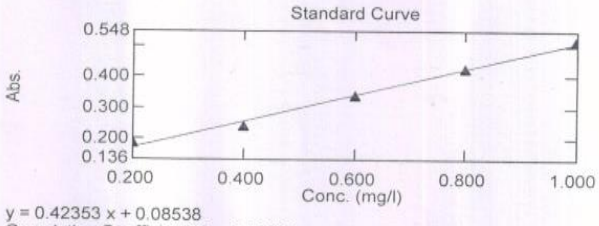



y = 0.42353 x + 0.08538
Correlation Coefficient r2 = 0.99338

Standard Table

| | Sample ID | Type | Ex | Conc | WL700.0 | Wgt.Factor | Comments |
|---|---|---|---|---|---|---|---|
| 1 | Std 1 | Std-Repeat | | 0.200 | 0.183 | 1.000 | |
| 2 | Std 1-2 | Std-Repeat | | 0.200 | 0.184 | 1.000 | |
| 3 | Std 1-3 | Std-Repeat | | 0.200 | 0.184 | 1.000 | |
| 4 | Std 1-Avg | Average | | 0.200 | 0.184 | 1.000 | Avg of preceding 3 Samples |
| 5 | Std 2 | Std-Repeat | | 0.400 | 0.238 | 1.000 | |
| 6 | Std 2-2 | Std-Repeat | | 0.400 | 0.238 | 1.000 | |
| 7 | Std 2-3 | Std-Repeat | | 0.400 | 0.238 | 1.000 | |
| 8 | Std 2-Avg | Average | | 0.400 | 0.238 | 1.000 | Avg of preceding 3 Samples |
| 9 | Std 3 | Std-Repeat | | 0.600 | 0.337 | 1.000 | |
| 10 | Std 3-2 | Std-Repeat | | 0.600 | 0.337 | 1.000 | |
| 11 | Std 3-3 | Std-Repeat | | 0.600 | 0.337 | 1.000 | |
| 12 | Std 3-Avg | Average | | 0.600 | 0.337 | 1.000 | Avg of preceding 3 Samples |

Sample Table

| | Sample ID | Type | Ex | Conc | WL700.0 | Comments |
|---|---|---|---|---|---|---|
| 1 | Blk | Unk-Repeat | | | 0.036 | |
| 2 | Blk-2 | Unk-Repeat | | | 0.036 | |
| 3 | Blk-3 | Unk-Repeat | | | 0.036 | |
| 4 | Blk-Avg | Average | | -0.116 | 0.036 | Avg of preceding 3 Samples |
| 5 | S.officinarum Stem | Unk-Repeat | | | 0.231 | |
| 6 | S.officinarum Stem-2 | Unk-Repeat | | | 0.231 | |
| 7 | S.officinarum Stem-3 | Unk-Repeat | | | 0.231 | |
| 8 | S.officinarum Stem-Avg | Average | | 0.344 | 0.231 | Avg of preceding 3 Samples |
| 9 | | | | | | |

Analyst :

Approved By

ISSN No: - 2456 – 2165

Standard Table

| | Sample ID | Type | Ex | Conc | WL700.0 | Wgt.Factor | Comments |
|---|---|---|---|---|---|---|---|
| 13 | Std 4 | Std-Repeat | | 0.800 | 0.425 | 1.000 | |
| 14 | Std 4-2 | Std-Repeat | | 0.800 | 0.425 | 1.000 | |
| 15 | Std 4-3 | Std-Repeat | | 0.800 | 0.425 | 1.000 | |
| 16 | Std 4-Avg | Average | | 0.800 | 0.425 | 1.000 | Avg of preceding 3 Samples |
| 17 | Std 5 | Std-Repeat | | 1.000 | 0.514 | 1.000 | |
| 18 | Std 5-2 | Std-Repeat | | 1.000 | 0.514 | 1.000 | |
| 19 | Std 5-3 | Std-Repeat | | 1.000 | 0.514 | 1.000 | |
| 20 | Std 5-Avg | Average | | 1.000 | 0.514 | 1.000 | Avg of preceding 3 Samples |
| 21 | | | | | | | |

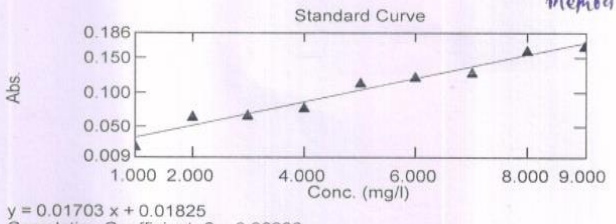
DEEN DAYAL RESEARCH INSTITUTE, AYURVEDA SADAN, CHITRAKOOT, SATNA (M.P.)

[Wavelengths]
Wavelength Name: WL435.0
Wavelength: 435.00 nm

[Calibration Curve]
Column for Cal. Curve: WL435.0
Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/l

Software Information
Software Name: UVProbe
Version: 2.42
Mode: Normal Mode

Data Information
Filename: D:\UVDATA\Photometric data\UV 2017 \April 2017\Alkaloid estimation by Dragendorff's method




y = 0.01703 x + 0.01825
Correlation Coefficient r2 = 0.96238

Standard Table

| | Sample ID | Type | Ex | Conc | WL435.0 | Wgt.Factor | Comments |
|---|---|---|---|---|---|---|---|
| 1 | Std 1 | Std-Repeat | | 1.000 | 0.024 | 1.000 | |
| 2 | Std 1-2 | Std-Repeat | | 1.000 | 0.024 | 1.000 | |
| 3 | Std 1-3 | Std-Repeat | | 1.000 | 0.024 | 1.000 | |
| 4 | Std 1-Avg | Average | | 1.000 | 0.024 | 1.000 | Avg of preceding 3 Samples |
| 5 | Std 2 | Std-Repeat | | 2.000 | 0.066 | 1.000 | |
| 6 | Std 2-2 | Std-Repeat | | 2.000 | 0.066 | 1.000 | |
| 7 | Std 2-3 | Std-Repeat | | 2.000 | 0.067 | 1.000 | |
| 8 | Std 2-Avg | Average | | 2.000 | 0.066 | 1.000 | Avg of preceding 3 Samples |
| 9 | Std 3 | Std-Repeat | | 3.000 | 0.069 | 1.000 | |
| 10 | Std 3-2 | Std-Repeat | | 3.000 | 0.069 | 1.000 | |
| 11 | Std 3-3 | Std-Repeat | | 3.000 | 0.068 | 1.000 | |
| 12 | Std 3-Avg | Average | | 3.000 | 0.069 | 1.000 | Avg of preceding 3 Samples |

Sample Table

| | Sample ID | Type | Ex | Conc | WL435.0 | Comments |
|---|---|---|---|---|---|---|
| 1 | Blk | Unk-Repeat | | | 0.007 | |
| 2 | Blk-2 | Unk-Repeat | | | 0.007 | |
| 3 | Blk-3 | Unk-Repeat | | | 0.007 | |
| 4 | Blk-Avg | Average | | -0.653 | 0.007 | Avg of preceding 3 Samples |
| 5 | S.officinarum, Stem bark | Unk-Repeat | | | 0.813 | |
| 6 | S.officinarum, Stem bark-2 | Unk-Repeat | | | 0.813 | |
| 7 | S.officinarum, Stem bark-3 | Unk-Repeat | | | 0.814 | |
| 8 | S.officinarum, Stem bark-Avg | Average | | 46.699 | 0.813 | Avg of preceding 3 Samples |
| 9 | | | | | | |

Analyst

Approved By

ISSN No: - 2456 – 2165

Standard Table

| | Sample ID | Type | Ex | Conc | WL435.0 | Wgt.Factor | Comments |
|---|---|---|---|---|---|---|---|
| 25 | Std 7 | Std-Repeat | | 7.000 | 0.129 | 1.000 | |
| 26 | Std 7-2 | Std-Repeat | | 7.000 | 0.129 | 1.000 | |
| 27 | Std 7-3 | Std-Repeat | | 7.000 | 0.129 | 1.000 | |
| 28 | Std 7-Avg | Average | | 7.000 | 0.129 | 1.000 | Avg of preceding 3 Samples |
| 29 | Std 8 | Std-Repeat | | 8.000 | 0.161 | 1.000 | |
| 30 | Std 8-2 | Std-Repeat | | 8.000 | 0.161 | 1.000 | |
| 31 | Std 8-3 | Std-Repeat | | 8.000 | 0.160 | 1.000 | |
| 32 | Std 8-Avg | Average | | 8.000 | 0.161 | 1.000 | Avg of preceding 3 Samples |
| 33 | Std 9 | Std-Repeat | | 9.000 | 0.167 | 1.000 | |
| 34 | Std 9-2 | Std-Repeat | | 9.000 | 0.167 | 1.000 | |
| 35 | Std 9-3 | Std-Repeat | | 9.000 | 0.167 | 1.000 | |
| 36 | Std 9-Avg | Average | | 9.000 | 0.167 | 1.000 | Avg of preceding 3 Samples |

## V. DISCUSSION

Table-1 reveals the moisture contents at 105 $^0$C and the total ash value and it was 2.769 %, 2.005% respectively. Table-2 reveals the benzene, chloroform, ethanol, methanol & water soluble extractive value and it was 1.04%, 0.99%, 9.641%, 39.91%, 28.256% respectively. The fluorescence characteristics of powderd sample with different reagent were observed under day light and UV light (366nm). It is a tool for the determination of constituents present in the plant that gives an idea on its chemical nature.

Preliminary photochemical screening of aqueous extract of stem was performed for screening and identification of bioactive chemical constituents present in them and their findings revealed the presence of various phytochemicals such as carbohydrate, protein, resin, saponin, flavonoids, tannin but starch and steroids are absent. In case of ethanolic extract, presence of alkaloids, carbohydrate, protein, resin, tannin was seen but saponin, starch and steroids were absent.

The quantitative determination of the bioactive constituents in the present study shows the presence of tannin is 0.2588 mg/ml, total carbohydrates, for 0.5 ml is 0.7847 mg/ml & for 1 ml is 2.1491 mg/ml, alkaloid is 46.2566 mg/ml & flavonoid content was 43.6292 % is reported.

## VI. CONCLUSION

Ayurvedic herbal medicines ensure physical and mental health without side effects containing the natural ingredients. The Ayurvedic herbal medicines help bring arogya to human body and mind (“arogya” means free from disease) while allopathic drugs/medicines have more side effects due to various toxic chemicals.

From the study it is quite clear that the plant Saccharum officinarum produce several compounds including alkaloids, tannins, phenolics, flavonoids, proteins, reducing sugars, and resins . The constituents of stem of Sugarcane have several medicinal properties and can be utilized for the treatment of various diseases. So, it can be concluded that this plant can be used for treating various ailments without any side effects.

## VII. AKNOLEDMENTS

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