

SHORT COMMUNICATION

## Qualitative Phytochemical Screening of *Saccharum spontaneum* Linn. Leaf Extracts

S. Komathi and M. Fernandus Durai\*

Dept. of Biochemistry, Sacred Heart College (Autonomous), Tirupattur-635 601, Vellore District, Tamil Nadu, India  
Fernandusnit@gmail.com\*; +91 9087467832

### Abstract

*Saccharum spontaneum* Linn. leaf extracts was investigated for its phytochemical constituents using standard methods. The leaf powder was extracted with solvents namely aqueous, ethanol, acetone, petroleum ether and chloroform. Qualitative analysis of the leaf extract confirmed the presence of various phytochemicals. Tannins were noted in aqueous and acetone extracts only. Saponins were absent in aqueous and ethanol extracts whereas, quinones was absent in chloroform extract. Terpenoids were present only in aqueous and chloroform extracts. Alkaloids tested negative for chloroform and petroleum ether extracts whereas, glycosides were absent in all the leaf extracts tested. Cardiac glycosides were present only in aqueous extract whereas, coumarins were absent in chloroform and petroleum ether extracts. Anthocyanins were absent in all the leaf extracts tested whereas, betacyanin were absent in chloroform and petroleum ether extracts.

**Keywords:** Phytochemicals, *Saccharum spontaneum*, leaf extracts, aqueous extract, solvent extracts.

### Introduction

*Saccharum spontaneum* Linn. is a plant belongs to Poaceae family and locally known as Kasa is a tall erect reed-like perennial grass (Kirtikar and Basu, 2005). This plant mostly occurs in the sides of the river and widely distributed in Andhra Pradesh and Vellore district in Tamil Nadu (Trease and Evans, 1989). In India, it is considered as valuable popular folk medicine. The fresh juice of the stem of *S. spontaneum* is used for the treatment of mental illness and mental disturbances by the vaidhiyars (Harbone, 2005). This plant is also used to treat diseases of vatam and pittam, vomiting, mental diseases, abdominal disorders, dyspnoea, anaemia and obesity (Yoganarashimhan, 2002). Ghani (2003) reported that the leaves and stalks contain lignin, carbohydrates, proteins and amino acids, which is used for the treatment of free radicals scavenging activity and anti-hemolytic activity. Considering the above facts, this study investigated the phytochemical constituents of *Saccharum spontaneum* Linn. leaf extracts.

### Materials and methods

**Collection of plant material:** Healthy plants of *Saccharum spontaneum* were collected from different regions of Chennai, Tamil Nadu. The collected plants were brought to the laboratory, shade-dried and maintained at Queen Mary's College, Chennai.

**Preparation of leaf extracts:** About 1 g of dried powder of *S. spontaneum* leaf was extracted with 20 mL ethanol, acetone, chloroform, aqueous and petroleum ether for 1 min using an Ultra Turax mixer (13,000 rpm) and soaked overnight at room temperature.

The sample was then filtered through Whatman No. 1 paper in a Buchner funnel. The filtered solution was evaporated under vacuum in a rotary-evaporator at 40°C to a constant weight and then dissolved in respective solvents. The dissolving rate of the crude extracts was approx. 100%. The solution was stored at 18°C until use.

**Phytochemical screening:** Phytochemical screening of *S. spontaneum* leaf extracts were assessed by standard method as described by Savithramma *et al.* (2011) and Selvaraj *et al.* (2014).

**Test for Tannins:** One mL of the leaf extract was added to 1 mL of 5% ferric chloride. Formation of dark blue or greenish black indicates the presence of tannins.

**Test for Saponins:** One mL of the leaf extract was added to 1 mL of distilled water and shaken in graduated cylinder for 15 min; lengthwise formation of 1 cm layer of foam indicates the presence of saponins

**Test for Quinones:** One mL of the leaf extract was added to 1 mL concentrated sulphuric acid. Formation of red color indicates the presence of quinones.

**Test for Flavonoids:** One mL of the leaf extract was added to 1 mL 2N sodium hydroxide. Formation of yellow color indicates the presence of flavonoids.

**Test for Alkaloids:** One mL of the leaf extract was added to 2 mL of concentrated hydrochloric acid. Then few drops of Mayer's reagent was added. Presence of green color or white precipitate indicates the presence of alkaloids.

Table 1. Phytochemical screening of *Saccharum spontaneum* leaf extracts.

Phytochemicals tested	Aqueous	Ethanol	Chloroform	Petroleum ether	Acetone
Tannins	+	-	-	-	+
Saponins	-	-	+	+	+
Quinones	+	+	-	+	+
Terpenoids	+	-	+	-	-
Steroids	+	+	+	+	+
Flavonoids	+	+	+	-	+
Phenols	+	+	+	+	+
Alkaloids	+	+	-	-	+
Glycosides	-	-	-	-	-
Cardiac glycosides	+	-	-	-	-
Coumarins	+	+	-	-	+
Anthocyanin	-	-	-	-	-
Betacyanin	+	+	-	-	+

'+' – Present; '-' Absent.

**Test for Glycosides:** One mL of the leaf extract was added to 3 mL chloroform and 10% ammonium solution. Formation of pink color indicates the presence of glycosides.

**Test for Cardiac Glycosides:** One mL of the leaf extract was added to 2 mL glacial acetic acid and few drops of 5% FeCl<sub>3</sub>. This was under layered with 1 mL of concentrated sulphuric acid. Formation of brown ring at interface indicates the presence of cardiac glycosides.

**Test for Terpenoids:** One mL of the leaf extract was added to 2 mL chloroform along with concentrated sulphuric acid. Formation of red brown color at the interface indicates the presence of terpenoids.

**Test for Phenols:** One mL of the leaf extract was added to 2 mL distilled water followed by few drops of 10% FeCl<sub>3</sub>. Formation of blue/green color indicates the presence of phenols.

**Test for Steroids:** One mL of the leaf extract was added to 2 mL chloroform and 1 mL sulphuric acid. Formation of reddish brown ring at interface indicates the presence of steroids.

**Test for Coumarins:** One mL of the leaf extract was added to 1 mL 10% NaOH. Formation of yellow color indicates the presence of coumarins.

**Test for Anthocyanin and Betacyanin:** One mL of the leaf extract was added to 1 mL of 2N sodium hydroxide and heated for 5 min at 100°C. Formation of bluish green color indicates the presence of anthocyanin and formation of yellow color indicates the presence of betacyanin.

## Results and discussion

Table 1 lists the phytochemical constituents of *Saccharum spontaneum* leaf extracts. Tannins were noted in aqueous and acetone extracts only.

Saponins were absent in aqueous and ethanol extracts whereas, quinones was absent in chloroform extract. Terpenoids were present only in aqueous and chloroform extracts. All extracts tested positive for steroids and phenols whereas, flavonoids were absent in petroleum ether extract. Alkaloids tested negative for chloroform and petroleum ether extracts whereas, glycosides were absent in all the leaf extracts tested. Cardiac glycosides were present only in aqueous extract whereas, coumarins were absent in chloroform and petroleum ether extracts. Anthocyanins were absent in all the leaf extracts tested whereas, betacyanin were absent in chloroform and petroleum ether extracts. Presence of valuable phytoconstituents such as quinones, terpenes, alkaloids, saponins, tannins, coumarins, phenolic compounds, steroids and glycosides were reported in the plant extract of *Saccharum spontaneum* (Suresh kumar *et al.*, 2009). Sathya and Kokilavani (2013) in their study reported various phytoconstituents namely alkaloids, flavonoids, tannins, steroids, terpenoids, glycosides and phenolic constituents in the *Saccharum spontaneum* root extracts.

## Conclusion

This study showed interesting preliminary phytochemical constituents in aqueous and solvent leaf extracts of *Saccharum spontaneum*. The active components may be quantitatively assayed to evaluate its antibacterial potential for further research.

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