

# Evaluation of the Antioxidant Activity of Sap of *Borassus Flabellifer*

Tribhuvan Singh<sup>1\*</sup>, Syed Imran Ul Haq<sup>1</sup>, Ibrahim Makintami Ibrahim<sup>1</sup> and Ruchi Kumari<sup>2</sup>

<sup>1</sup>Guru Nanak Institutions Technical Campus-School of Pharmacy, Ibrahimpatnam, Hyderabad, India

<sup>2</sup>Scient Institute of Technology, Institute of Pharmacy, Ibrahimpatnam, Hyderabad, India, India

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## \*Corresponding author

Tribhuvan Singh, Guru Nanak Institutions Technical Campus - School of Pharmacy, Ibrahimpatnam, Hyderabad, India, Tel: +91-9951346454; Email: manjeet600@gmail.com

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## Abstract

The present study was designed to evaluate the *in-vitro* Antioxidant activity on Sap of *Borassus flabellifer*. The various parts of the Plant such as leaves, seeds, bark, berries, Sap, roots, or flowers are extensively used for their medicinal property. Similarly, we found Sap of *Borassus flabellifer* exhibiting certain medicinal property. We performed *in vitro* Antioxidant activities on Sap of *Borassus flabellifer* in four different volumes (1ml Sap + 0ml Water, 1ml Sap + 1ml Water, 0.5ml Sap + 1ml Water, 0.25ml Sap + 1ml Water) by methods such as Hydrogen peroxide scavenging activity, Nitric oxide scavenging activity and Lipid per oxidation inhibitory activity, compared with standard drug ascorbic acid dissolved in methanol solvent. The experiment was conducted and the results thus obtained showed that Sap of *Borassus flabellifer* exhibited significant Antioxidant activity.

## Introduction

Medicinal Plants have been used throughout human history for the treatment of many diseases, the chemical compounds present in the plant shows many biological activity such Anthelmintic [2], Antioxidant [3,4] Antimicrobial [6] activity etc . At least 12,000 such compounds have been identified so far, Chemical compounds present in plants mediate their effect on the human or animal body through processes which are identified and well understood. The medicinal plants do not differ from synthetic drugs in terms of their work. The various parts of the Plant such as leaves, seeds, bark, berries, Sap, roots, or flowers are extensively used for their medicinal property. The World Health Organization estimates that 80% of the populations of some Asian and African countries presently use natural medicine for primary health care. About 60% of the medicines available in the market are derived from natural products, mainly from higher plants. Some synthetic drugs are also used for Antioxidant activity [8] such as vitamin A D E K, as well as B-Complex. Mostly marketed drugs are expensive and show side effects. More than 70% of India's billions of populations still use these non-allopathic systems of medicine which is free from toxicity and provide cost effective treatment. Normally some developed countries such as Germany, Italy, France and the United States where appropriate guidelines for registration of such medicines exist.

The *Borassus flabellifer* an Asian palm, or sugar palm, is native to the Indian subcontinent and Southeast Asia, including Nepal, India, Bangladesh, Sri Lanka, Cambodia, Laos, Burma, Thailand, Vietnam, Malaysia, Indonesia and the Philippines. It consists of number of chemical constituents such as Potassium 152mg, Ash 0.4g, Copper 0.04mg, Protein 0.1gm, Zinc 0.01mg, Borassosides, Dioscin, Manganese, Fiber and Phosphorus in trace amounts. It has many pharmacological activities [5,7]. Sap of *Borassus flabellifer* has a crucial role in Ayurvedic medication. Fresh coconut

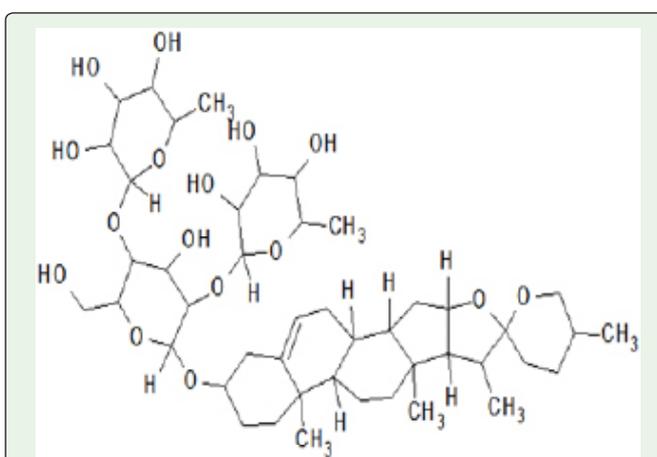


Figure 1: BORASSOSIDES.

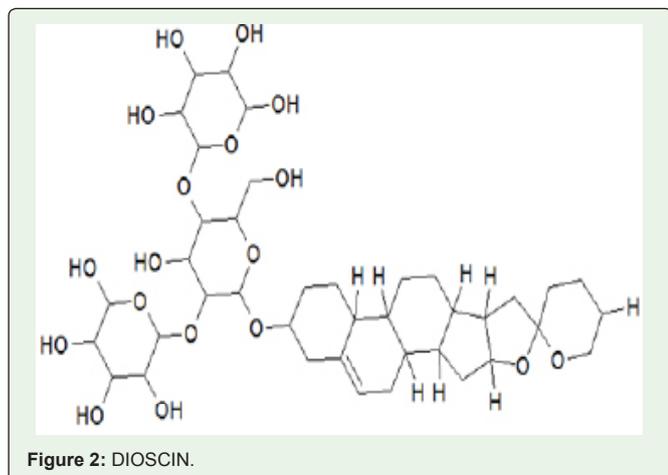


Figure 2: DIOSCIN.

of *Borassus flabellifer* comprises many physicochemical properties which has several health advantages. It is low in calories. If it is fermented, the acidic properties escalated into it and the fresh sap changes into alcohol.

## Materials and Methods

Sap of *Borassus flabellifer* was collected from Toddy palm (plant) near Ibrahimpatnam, early in the morning. To prevent the sap from fermentation calcium carbonate is added in required quantity. We prepared Four different volumes of sap and water (1ml Sap + 0ml Water, 1ml Sap + 1ml Water, 0.5ml Sap + 1ml Water, 0.25ml Sap + 1ml Water) were taken, Sap of *Borassus flabellifer* were evaluated for antioxidant activity by performing hydrogen peroxide scavenging activity, nitric oxide scavenging activity and lipid peroxidation inhibitory activity and compared with standard drug ascorbic acid dissolved in methanol solvent.

## Procedure of Antioxidant Activity

### Hydrogen Peroxide Scavenging Activity [9,10]

A solution of hydrogen peroxide (20 mM) was prepared in phosphate buffer saline (pH 7.4). Various dilutions (1ml Sap + 0ml Water, 1ml Sap + 1ml Water, 0.5ml Sap + 1ml Water, 0.25ml Sap + 1ml Water) of the test samples or standard, ascorbic acid, mixed with 1 ml of hydrogen peroxide solution in phosphate buffer saline. The absorbance was measured at 230 nm after 10 min.

Table1: Antioxidant activity of Sap of *Borassus flabellifer* with Standard Drug.

Test(T) and standard(S)	IC-50 (Mean ± S.D.)*µg /ml		
	Nitric oxide scavenging activity	Hydrogen peroxide scavenging activity	Lipid peroxidation inhibitory activity
Standard Ascorbic Acid with Methanol(S)	54 ± 0.088	40 ± 0.031	29 ± 0.35
1ml Sap + 0ml Water(T)	49 ± 0.049	42 ± 0.095	43 ± 0.092
1ml Sap + 1ml Water(T)	30 ± 0.049	22 ± 0.035	29 ± 0.025
0.5ml Sap + 1ml Water(T)	20 ± 0.125	21 ± 0.235	23 ± 0.326
0.25ml Sap + 1ml Water(T)	10 ± 0.032	11 ± 0.034	10 ± 0.039

### Nitric Oxide Scavenging Activity [11]

The different dilution test sample (1ml Sap + 0ml Water, 1ml Sap + 1ml Water, 0.5ml Sap + 1ml Water, 0.25ml Sap + 1ml Water) containing sodium nitroprusside (10 mM, 0.5 ml), phosphate buffer saline (pH 7.4, 0.5 ml), ascorbic acid as a standard solution in dimethyl sulphoxide (0.25ml), was incubated at 25°C for 30 min. 0.25ml of sulphanilic acid reagent was added and mixed well, to keep for 5 min for completion of diazotization. Then, 0.25ml of naphthyl ethylene diamine dihydrochloride was added, mixed and stand for 10 min in diffused light. A pink colored chromophore was developed. The absorbance was measured at 640 nm.

### Lipid Peroxidation Inhibitory Activity [12]

Egg lecithin (3 mg / ml phosphate buffer, pH 7.4) was sonicated in an ultrasonic sonicator for 10 min to ensure proper liposome formation. Test samples different dilution (1ml Sap + 0ml Water, 1ml Sap + 1ml Water, 0.5ml Sap + 1ml Water, 0.25ml Sap + 1ml Water) were added to liposome mixture (0.25 ml), the control was without test sample. Lipid peroxidation was induced by adding ferric chloride (10 µl, 400 mM) and ascorbic acid (10 µl, 200 mM). Then incubation for 30 min at 37 °C the reaction was stopped by adding hydrochloric acid (0.25 ml, 0.25 N) containing trichloroacetic acid (15 mg / ml), thiobarbituric acid (2.75 mg / ml) and butylated hydroxy anisole (0.50 mg / ml). The reaction sample was warm for 15 min, cooled, centrifuged at 1000 rpm for 15 min and the absorbance was measured at 532 nm.

## Results and Discussion

The Antioxidant activity of Sap of *Borassus flabellifer* is studied with four different volumes (1ml Sap + 0ml Water, 1ml Sap + 1ml Water, 0.5ml Sap + 1ml Water, 0.25ml Sap + 1ml Water), was determined by hydrogen peroxide scavenging activity, nitric oxide scavenging activity and lipid peroxidation inhibitory activity. Data in Table 1 clearly indicates that compound exhibit specific Antioxidant activity.

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