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Evaluation of the Antibacterial Potentials of SAP of *Borassus flabellifer*

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Tribhuvan Singh*, V Ravi Kumar, Syed Imran Ul Haq, Polkampally Sneha, B Abhinandan Rao, L Arun Kumar

*Guru Nanak Institutions Technical Campus –
School of Pharmacy, Ibrahimpatnam, Hyderabad-
501506, India.*

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ABSTRACT

The present study was designated to evaluate the in vitro antibacterial activity on Sap of *Borassus flabellifer*. Some bacteria like *E.coli*, *Streptococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumonia*, cause severe health problems to millions of people worldwide. Records show that many of the aqueous extracts obtained from various parts of different herbal plants exhibited significant antibacterial activity against this bacteria. We found a new compound resulting in the antibacterial activity on Sap of *Borassus flabellifer*. Antibacterial activities in four respective different volumes (0.5, 1, 1.5, 2 ml) were evaluated by zone of inhibition of 8 to 24mm of the bacteria were determined. Sap of *Borassus flabellifer* exhibited significant antibacterial activity. Sap of *Borassus flabellifer* successfully completed in vitro studies indicated that Sap of *Borassus flabellifer* possess significant antibacterial activity.

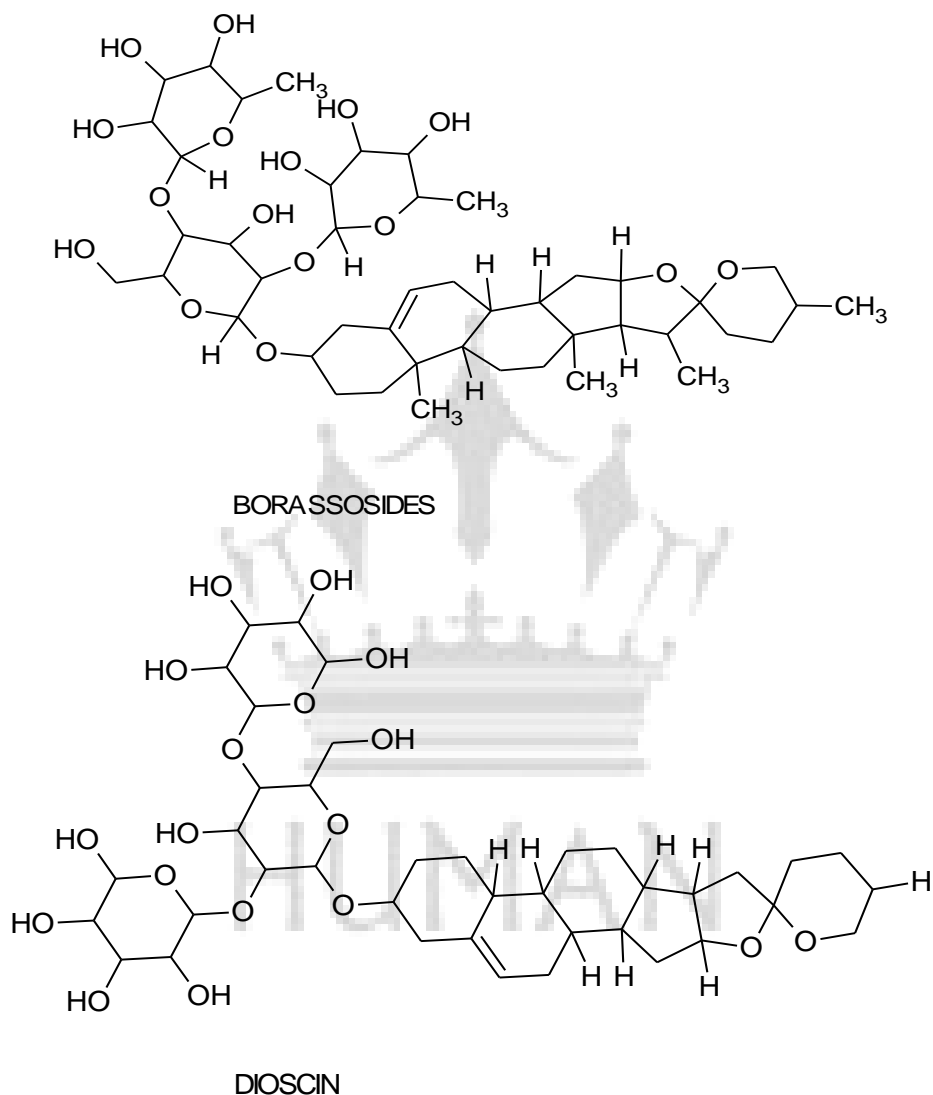
INTRODUCTION

Herbalism ("herbology") is the study of plants for medicinal purposes. Plants have been used for medical treatments through much of human history, and such medicine is still widely practiced today. Plant parts such as leaves, seeds, bark, berries, sap, roots, or flowers are widely used for their medicinal property. Modern medicine recognizes herbalism as a form of medicine. The World Health Organization (WHO) estimates that 80% of the populations of some Asian and African countries presently use herbal medicine for some aspect of primary health care. In some cases, antitumor and antimicrobial drugs, about 60% of the medicines are currently available in the market and most of these are in the late stages of clinical trials are derived from natural products, mainly from higher plants. Some synthetic drugs are also used for an antibacterial activity like ofloxacin, ciprofloxacin, and gatifloxacin which have a wide or narrow spectrum of activities.

Mostly marketed drugs have been effective in controlling the infection but some drugs are expensive and show side effects. About 70-80% of the world's population of developing countries depends on plants for primary health care. 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. Some bacteria like *E.coli*, *Streptococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumonia* causes severe health problems to millions of people throughout the world. These infections have been associated with low standard of sanitation, and between millions and billions, people are estimated to be infected annually worldwide.

The Toddy Palm (*Borassus flabellifer*) the 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 is reportedly naturalized in Pakistan, Socotra, and parts of China. It consists of number of chemical constituents such as Borassosides, Dioscin, Moisture (%) 98.8, Potassium (mg) 152, Ash (g) 0.4, Copper (mg) 0.04, Protein (g) 0.1, Zinc (mg) 0.01, Manganese (mg), Fiber (g) and Phosphorus (mg) in trace amounts. The Sap of *Borassus flabellifer* acts as an antioxidant⁴. Young roots are diuretic⁵ and show anthelmintic activity^{2,10}. Decoction of young roots is used for respiratory

diseases⁶. Jiggery from the sap is an antidote for poisoning. Hence, it is given for treating disorders of the liver and gleans. Juice from the flowering stalks is given in the treatment of diabetes. Leaf extract is given in secondary syphilis. Sap of *Borassus flabellifer* can be used for treating kidney stones⁷.



MATERIALS AND METHODS³

Sap of *Borassus flabellifer* was collected early in the morning in order to prevent fermentation with calcium carbonate from Tallaguda near to Ibrahimpatnam, Rangareddy Dist. Different volumes (0.5, 1, 1.5, 2 ml) of Sap of *Borassus* were taken. Sap of *Borassus flabellifer* were evaluated by zone of inhibition of the bacteria in a nutrient agar medium was determined. Sap of *Borassus flabellifer* exhibited significant antibacterial activity^{8,9}.

PROCEDURE:

ANTIBACTERIAL ACTIVITY¹:

Antibacterial activity on some bacteria like *E.coli*, *Streptococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumonia* was determined and the zone of inhibition is noted at respective different volumes (0.5, 1, 1.5, 2 ml) was calculated. The antibacterial activity in all the different volumes was prominently shown and the result was good.

RESULTS AND DISCUSSION

The antibacterial activity of Sap of *Borassus flabellifer* is studied with four different volumes (0.5, 1, 1.5, 2 ml) against *E.coli*, *Streptococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumonia* was determined by cup plate method and nutrient agar media and standard drug for the comparison at the concentration 50µg /ml against gram positive and gram negative bacteria were used for the studies. Data in Table No.1 clearly indicate that compound exhibits antibacterial activity. The zone of inhibition of the Sap of *Borassus flabellifer* was between 8 to 24mm at 0.5, 1, 1.5, 2 ml is tabulated as under.

TABLE NO.1.

Antibacterial activity of Sap of *Borassus flabellifer* with Standard Drug

| Zone of Inhibition - Diameter (in mm) | | | | | |
|--|-------|---------------|------------------|--------------------|---------------------|
| Name | | <i>E.coli</i> | <i>S. aureus</i> | <i>B. subtilis</i> | <i>K. pneumonia</i> |
| Sap of <i>Borassus flabellifer</i> (T) ml | 0.5ml | 9 | 8 | 9 | 8 |
| | 1ml | 13 | 14 | 13 | 12 |
| | 1.5ml | 16 | 16 | 16 | 15 |
| | 2ml | 23 | 24 | 24 | 22 |
| Ofloxacin (S) µg/ml | 50µg | 28 | 30 | 30 | 27 |

TABLE NO. 2

Chemical tests for Sap of *Borassus flabellifer*

| S. No | Name of chemical tests | Observation | Present /Absent |
|-------|------------------------|--------------------|-----------------|
| 1. | Carbohydrates | Pale black color | Present |
| 2. | Volatile oil | Colorless solution | Absent |
| 3. | Glycosides | Yellow color | Absent |
| 4. | Alkaloids | Pale yellow color | Present |

CONCLUSION

In the present study antibacterial activity of Sap of *Borassus flabellifer* was performed and various components present in the Sap of *Borassus flabellifer* are responsible for antibacterial activity. Sap of *Borassus flabellifer* was found to have excellent antibacterial activity as compared to the standard drug used for the study.

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