

## Review on the Nutraceutical Values of *Borassus flabelifer* Linn.

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### ABSTRACT

**Background:** *Borassus flabelifer* has a lot of nutritive and nutraceutical values to enhance human life, as like medicine, food and it provides a lot of employment opportunities to rural peoples in various dimension.

**Area covered:** *B. flabelifer* have a high nutritive source which contains carbohydrates, protein, crude fiber, ash, iron, fat, strontium, copper, manganese, zinc, aluminum, arsenic, lead and nickel, calcium, phosphorus, thiamin, riboflavin, niacin and Vitamin C, etc., present in various parts of the plant.

**Expert opinion:** *Borassus flabelifer* plant different parts have various medicinal properties like anti-microbial, antioxidant, anti-inflammatory, etc. In these views this review focuses on the nutritive and nutraceutical values of *B. flabelifer* (Linn) plant sources.

**Keywords:** *Borassus flabelifer*, Palmyrah palm, Toddy, Nutraceutical, Medicine

### INTRODUCTION

Plants are completely covered in human life for food, shelter, clothes, etc. The sophisticated life gifted by plants to humans, especially nutritive and nutraceutical role in humans. In this view, this review article is focused on the nutritive and nutraceutical values of *Borassus flabelifer* (Linn) tree. The *B. flabelifer* is commonly known as Palmyra palm, native in Indian subcontinent and Southeast Asia. *B. flabelifer* is monocot plant belongs to the family "Arecaceae". *B. flabelifer* has lot of nutritive and nutraceutical values to enhance the human life, as like medicine, food and other by-products like the mat, hat, building materials, etc. Also, the palm tree to give lot of employment opportunities to rural peoples work on palm-based products like weaving mat, hat, fan, basket and other household products from palm leaf, toddy extracted from inflorescence of the palm tree, jaggery and other by-products produced from palm juice, germinated seed jelly, sprouts, palm jelly, fruit, etc., having much attention and the high market value based on those medicinal potential.

### NUTRITIONAL VALUES OF *Borassus flabelifer*

The nutritional values of sprouts (Odiyal) reported by Atchley [1], Morton [2] and Chayanika et al. [3]. The dry sprouts contain carbohydrates, protein, crude fiber, ash, iron, fat, strontium, copper, manganese, zinc, aluminum, arsenic,

lead and nickel (**Figure 1**). The nutritional values of Palmyra young fruit contains protein, fat, carbohydrate, fiber, calcium, phosphorus, iron, thiamin, riboflavin, niacin and Vitamin C represented in **Figure 2** [4].

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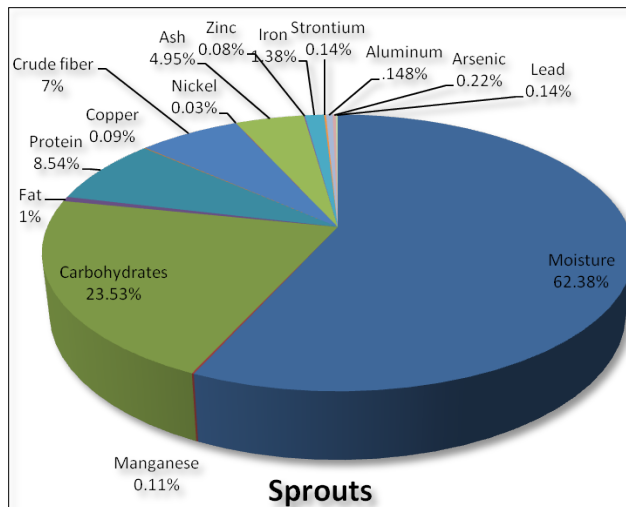


Figure 1. The nutritional values of sprouts (Odiyil).

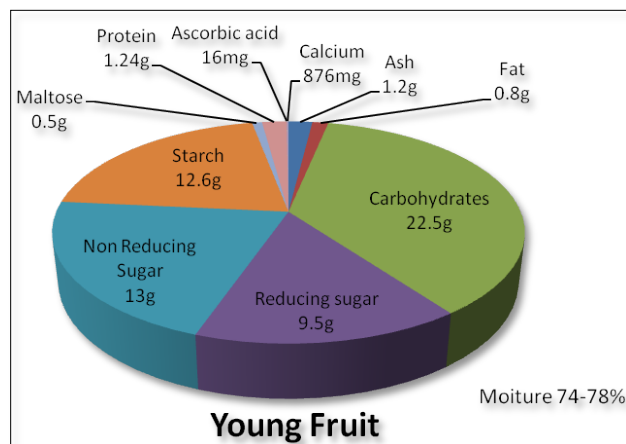


Figure 2. The nutritional values of Palmyra young fruit.

The fresh palm juice is a sweet, clear, colorless juice containing sucrose, reducing sugars (glucose, fructose, maltose and raffinose), protein and fat (Figure 3) [5,6].

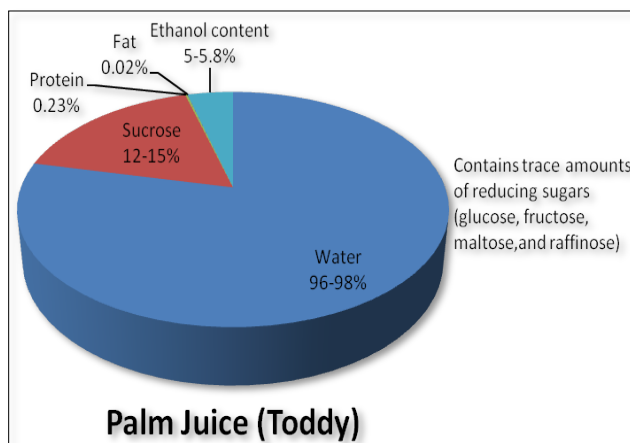


Figure 3. The nutritional values of fresh palm juice.

Half of the total sugars are fermented during the first 24 h and the ethanol content of the fermented palm sap reaches a maximum of 5.0-5.28% (v/v) after 48 h. Morton [2] reported

the nutritional contents of palm jaggery contain sucrose, iron, glucose, protein, fat, phosphorus, calcium, total minerals and copper (Figure 4).

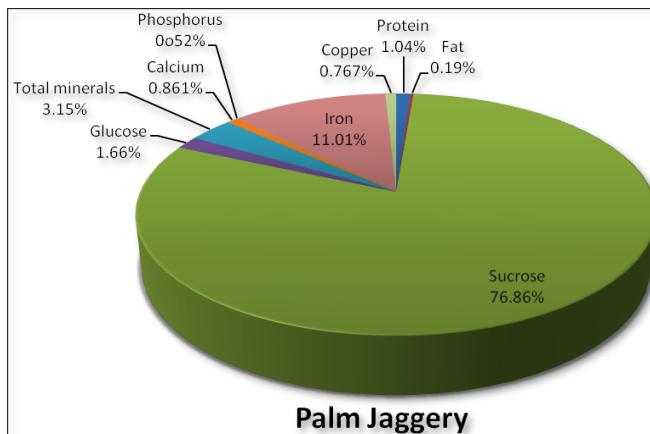


Figure 4. The nutritional contents of palm jaggery.

**Nutraceutical values**

*Borassus flabelifer* leaf extract have good inhibitory activity against different bacterial pathogens and it contains various phytochemicals responsible for good antioxidants reported by Jamkhande et al. [7]. The Paschapur et al. [8] studied the anti-inflammatory activity of male inflorescence obtained from *Borassus flabelifer* tree in the year of 2009. The fruits of the *Borassus flabelifer* (Palmyra) are used various properties in example it's used against helminthic, diuretic, antioxidant [9], enhanced antibacterial activity, wound healer, immune modulator, against inflammation, nausea and vomiting. It is also used to keep the body hydration, used to

relief the digestive problems and other stomach problem, laxative [10]. It prevents the malnutrition also.

The sprouts are used as laxative reported by Shirisha et al. [11]. The roots of the *Borassus flabelifer* are cooling and used as diuretic and anti-helminthic activity. The stem extracts contains bitter taste and it is used as mouth wash. Dennis et al. [12] reported *Borassus flabelifer spadix* used to relieve heat burn and use to enlarge the spleen and liver. The spadix (flower) involved in diuretic agent, stimulant laxative, anti-phlegmatic, liver disorder and analgesic activity [11] and also used against inflammation (Figure 5) [8].

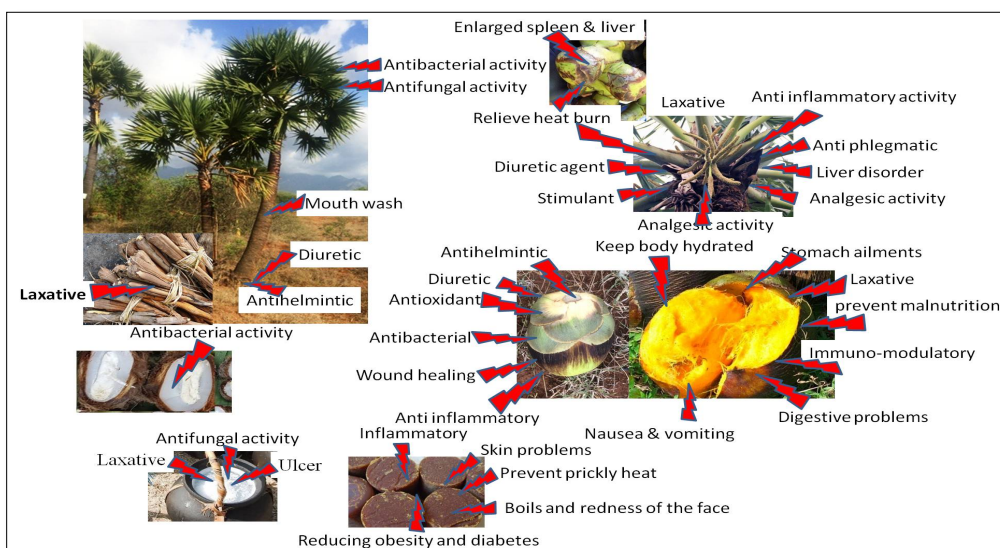


Figure 5: Nutraceutical values of *Borassus flabellifer* L.

The product of Palmyra sap (toddy) obtained by tapping the inflorescence tip. This toddy had high nutrients with antifungal property [13] it is also used as ulcer [14] and

laxative. The byproducts of palm sugar against inflammation, skin problems, prevent prickly heat, boils and

redness of the face. It is used as reducing obesity and diabetes [15].

## CONCLUSION

*Borassus flabelifer* is an official tree of Tamil Nadu and it has a lot of nutritive and nutraceutical values which are well studied and reported by many researchers. Another side, poor knowledge and exposure many people destroy the Palmyra tree for used in bricks industries as firewood. Due to the significant medicinal values of Palmyra tree, it is used in folk medicine to cure many diseases and enhance human life. As like medicine, *Borassus flabelifer* is a rich source of bioceutical and it exhibits many biological properties and also used as a remedy of many diseases, disease treatment. Most of the parts of palmyra trees are used as a food and medicine. Further, it is known various applications and it provides self-reliant lifestyle and employment opportunity in rural people. In this view, the *Borassus flabelifer* tree is one of the most protectable one. The Governments has to stop the Palmyra tree cutting by legislation and promote research and development on *Borassus flabelifer* towards sustainable development. There are many challenges to Researchers, regarding the development of many value-added products from palmyra palm towards attaining sustainable development. Further, researchers need to develop a new micropropagation technique which is essential for culturing the *Borassus flabelifer* tree.

## CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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## REFERENCES

- Atchley AA (1984) Nutritional value of palms. *Principes* 28: 138-143.
- Morton JF (1988) Notes on distribution, propagation, and products of *Borassus* palms (Arecaceae). *Econ Bot* 42: 420-441.
- Sahni C, Shakil NA, Jha V, Gupta RK (2014) Screening of nutritional, phytochemical, antioxidant and antibacterial activity of the roots of *Borassus flabellifer* (Asian Palmyra Palm). *J Pharmacogn Phytochem* 3: 58-68.
- Vengaiiah PC, Vijaya Kumara B, Murthy GN, Prasad KR (2015) Physico-chemical properties of palmyrah fruit pulp (*Borassus flabellifer* L). *Nutr Food Sci* 5: 1000391.
- Shamala TR, Sreekantiah KR (1988) Microbiological and biochemical studies on traditional Indian palm wine fermentation. *Food Microbiol* 5: 157-162.
- Sekar S, Mariappan S (2005) Usage of traditional fermented products by Indian rural folks and IPR. *Ind J Tradit Knowledge* 6: 111-120.
- Jamkhande PG, Suryawanshi VA, Kaylankar TM, Shailesh LP (2016) Biological activities of leaves of ethnomedicinal plant, *Borassus flabellifer* Linn. (Palmyra palm): An antibacterial, antifungal and antioxidant evaluation. *Bull Faculty Pharm Cairo Univ* 54: 59-66.
- Paschapur MS, Patil MB, Kumar R, Patil SR (2009) Evaluation of anti-inflammatory activity of ethanolic extract of *Borassus flabellifer* L. male flowers (inflorescences) in experimental animals. *J Med Plants Res* 3: 49-54.
- Pramod HJ, Yadav AV, Raje VN, Mohite M, Wadkar G (2013) Antioxidant activity of *Borassus flabellifer* (Linn.) fruits. *Asian J Pharm Tech* 3: 16-19.
- Rajendran K, Balaji P, Jothi BM (2008) Medicinal plants and their utilization by villagers in southern districts of Tamil Nadu. *Ind J Tradit Knowledge* 7: 417-420.
- Shirisha G, Sarshaik R, Nagasowjanya J (2018) *Borassus flabellifer* fruit versatile pharmaceutical application: An overview. *Int J Adv Res Med Pharm Sci* 3: 1-9.
- Dennis VJ (2011) *Palms Johnson: Palm Ash*, 3726 Middle brook Ave. Cincinnati, OH 45208 USA 55(3).
- Singh T (2016) Evaluation and determination of antifungal potentials of sap of *Borassus flabellifer*. *J Pharm Sci Biosci Res* 20: 1-6.
- Jana H, Jana S (2017) Palmyra palm: Importance in Indian agriculture Rashtriya Krishi 12: 35-40.
- Bhaskar K (2017) India *Borassus flabellifer* L. A tree behind the forest with multiple uses in rural areas: A case study from Nellore district, Andhra Pradesh, India. *Imp J Interdiscip Res* 3: 1486.
- Duddukuri GR, Yarla NS, Kaladhar DSVGK (2011) Preliminary studies on *in vitro* antimicrobial activity and phytochemical analysis of tender seed coat aqueous crude extract of *Borassus flabellifer* Linn. *Asian J Biochem Pharm Res* 1: 517-523.
- Jerry A (2018) A comprehensive review on the medicinal properties of *Borassus flabellifer*. *J Acad Ind Res* 7: 93-97.
- Singh T, Verma AK, Ulhaq SI, Mounika N (2017) Evaluation and determination of antifungal potentials of sap of *Borassus flabellifer*. *J Pharm Sci Biosci Res* 1: 111-113.