

## ***JUNGLE JALEBI (PITHECELLOBIUM DULCE): AN UNDERUTILISED NUTRITIVE WILD FRUIT***

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### **ABSTRACT**

*Jungle Jalebi (Pithecellobium dulce)* is an underutilised traditional plant found all over of the India. By the finding of different studies, it can be concluded that it is a good source of protein (approximately 12g/100g on dry weight basis) and ascorbic acid (approximately 138mg/100g on fresh weight basis). The presence of several bioactive components makes it an easily available cost-effective nutraceutical treasure. However, the scope of animal and human supplementation trials along with development of value-added products is still needed to fully reap nutritive and economic potential of *Jungle Jalebi*.

### **INTRODUCTION**

Wild fruits constitute an important component of traditional diets of local communities (Deshmukh and Waghmode, 2011). With the treasure trove of nutrients in their composition, these wild fruits are abundantly available but still underutilised due to unawareness, changing life style and urbanization. One such promising and abundantly available wild fruit plant is *Jungle Jalebi (Pithecellobium dulce)*. It is a shrub widely in India beside road and jungle sides. It is also is an important source of income and an important constituent of local tribal communities who harvest the pods every year from the wild. The tribal communities who nurture this traditional wisdom of use of wild fruits is somewhere unable to reap its full benefits due to unawareness, lack of processing, impact of urbanization and westernization and changes in life style pattern.

The circular tamarind like fruits of *Jungle Jalebi* is the most promising and edible part of the whole tree. Its raw pods are chewed naturally as tamarind available during the summer season. It has a fairly good number of bioactive compounds, such as flavonoids, antioxidants, phenolics, carotenoids, etc. Although they are not consumed in large quantities, their role in local communities cannot be ignored.

However, due to low consumption and less processing, the yield of *Jungle Jalebi* fruit mostly ends in biowaste or fodder. The potential of its fruits is still awaiting to be captured fully as promising nutritive food source that can be used in health promotion in cost effective manner. Alves *et al* (2008) suggested that many of these fruits could be processed into value-added products like beverages, juices, pickles, jams, nectars, etc. for special markets where the exotic character of such products as well as the bioactive

compounds capable of curing degenerative diseases could be appreciated.

### 1. Plant and fruit description

Other name: *Manila Tamarind*, *Vilayatiimli*, *KodukkaPuli*, *Manila tamarind*, *Ganga tamarind*, *Madras thorn*, *Monkey pod* and *Devil's necklace*.

*Pithecellobium dulce* popularly known as *Jungle Jalebi* belongs to family Leguminosae, subfamily Mimosoidae. It has been originated from Mexico and introduced in India as a hedge plant (Khatraet al 1994). It is now widespread in tropical regions where it can be found along rivers and roadsides, in dry thickets or forests, from sea level up to an altitude of 1800 m and in areas where annual

rainfall ranges from 400 mm to 1500 mm (Ecocrop 2011; FAO 2011; Sunarjono *et al* 1991).

*Jungle Jalebi* is a fast-growing, small to medium-sized semi-evergreen leguminous tree (5-20m). Manila tamarind has a short, stout, greyish trunk with low irregular branches and forms a broad crown. While tree appears evergreen, the leaflets are deciduous and shed in succession. Fruits are greenish-brown to red-pinkish, indehiscent pods. Pods are rather thin, 10-15 cm long x 1-2 cm wide, and set in a spiral of 1 to 3 whorls. The pods contain 10 seeds. The seeds are flattened, black and shiny and approximately 1 cm in diameter (Ecocrop 2011, FAO, 2011).



**Jungle Jalebi tree**



**Fruits of Jungle Jalebi tree**

#### **Potential use of *Jungle Jalebi* plant:**

Manila tamarind is a multipurpose tree yielding pods, leaves and seed oil. The FAO (2011), prepared a catalogue for grass and forage legumes and suggested that *Jungle Jalebi* can be used as:

**Edible food source:** Its pods are edible and contain a thick sweetish acidic pulp. They can be eaten raw or processed into a soft drink similar to lemonade. Oil can be extracted from the seeds and is used for cooking or for making soaps.

**Livestock fodder:** Manila tamarind oil meal, pods and leaves are useful livestock feeds. The by-product of oil extraction is a protein-rich meal (30% protein) that can be fed to animals. Manila tamarind is one of the most important browse species and is primarily used as a fodder during the dry season of Latin America (Le Houérou, 1980).

**Timber for construction:** Manila tamarind provides valuable hardwood timber for construction, panelling, boxes

and posts but should not be used for fuel since it is very smoky. The tree is planted for shade, shelter, thorny hedges and as an ornamental tree (Ecocrop, 2011).

**Fencing and hedging:** Manila tamarind makes thorny living fence posts and hedges (FAO, 2011).

**Environmental protection:** Manila tamarind is an N<sub>2</sub>-fixing legume that can survive dry periods and grow in most types of soil.

**Afforestation:** It is also tolerant of salinity and will grow in brackish water (Selvam, 2007). Manila tamarind may be used in afforestation (Orwa *et al*, 2009).

**Ethnomedicine:** Different parts of the *Jungle Jalebi* are employed for treatment of several ailments. It has also been reported to act as emollient, anodyne and larvicidal in folk medicines and as folk remedy for earache, leprosy, peptic ulcers, toothache etc (Rajasab and Isaq, 2004).

Active components of *Jungle Jalebi* are found to be abortifacient, anti-inflammatory, antivenom, protease inhibitory, spermicidal, antimicrobial,

antitubercular and hepatoprotective (Barrera *et al*. 2003; Pithayanukulet *al* 2005; Manna *et al* 2011).

It can be used as food (sweet pods), firewood, honey, fodder, soap oil, tannin, hedges, and shade.

### Nutritional Composition of *Jungle Jalebi* fruits

**Proximate composition:** The findings of studies depicted in table No.1 shows that fruits of *Jungle Jalebi* are rich in protein and carbohydrate. The dry fruits were found to contain approximately 12g protein/100g. The carbohydrate content varied 71.76 to 76.87 in dry pods while 18.2-19.6 in fresh pods. Cheema *et al*(2017) also reported that fresh pods contain 2.56±0.09 and 0.15±0.09 of reducing and non-reducing respectively. Thus, the low amount of sugar with high complex carbohydrate may make it an effective low glycaemic food source. Kumar *et al* (2017) also found that saponin enriched fractions *Jungle Jalebi* fruits are safe in consumption for mice up to 2000 mg/kg and significantly prevented blood glucose level in sucrose tolerance test by inhibiting enzymes responsible for hydrolysis of sucrose.

**Table No. 1: proximate composition of fruits of *Jungle Jalebi* on dry weight basis per 100g.**

	Fresh fruit	Fresh fruit	Blanched fruit	Pulp
	Dry weight basis	Dry weight basis	Dry weight basis	Fresh weight basis
Moisture (g)	76.14±1.39*	6.72±0.83	7.87±0.96	78.8*
Fat (g)	0.19±0.05	0.24±0.62	0.42±0.48	0.4-0.5*
Fiber (g)	5.60±0.26	1.3±0.18	3.42±0.52	1.1-1.2
Ash (g)	-	2.41±0.21	4.85±0.35	-
Protein (g)	2.53±0.14*	12.47±0.43	11.68±0.87	2-3.3*
Carbohydrate (g)	-	76.87±1.71	71.76±1.08	18.2-19.6
	Cheema <i>et al</i> (2017)	Joshi and Joshi(2015)	Joshi and Joshi(2015)	Verheji and Coronal (1991)

\*evaluated on fresh weight basis

**Mineral Composition:** Verheji and Coronal (1991) reported that pulp of fresh pods of *Jungle Jalebi* contain 13mg calcium, 42mg Phosphorus and 0.5 mg iron.

**Vitamin Content:** Cheema *et al*(2017) reported that 100g of fresh pods of *Jungle Jalebi* contain  $132.9.30 \pm 0.06$ mg ascorbic acid,  $0.260 \pm 0.20$  mg thiamine,  $0.127 \pm 0.30$ mg riboflavin in its composition. Verheji and Coronal (1991) also reported the same amount of ascorbic acid in fresh fruits of *Jungle Jalebi*.e., 138mg with 25IU of Vitamin A.

**Bioactive components:** Sharma *et al*(2014)indicated presence of several

bioactive compounds such as alkaloids, flavonoids, Glycosides, phenols, resins, saponins, steroids, tannins and terpenoids in preliminary phytochemical screening of hydro ethanolic extract fresh pods of *Jungle Jalebi*. Cheema *et al* (2017) reported that fresh pods contain  $516.30 \pm 0.07$ mgtotal phenols,  $85.68 \pm 0.04$ mgflavonoids, and  $9.75 \pm 0.84$ mgcarotenoids on fresh weight basis.

**Therapeutic role of *Jungle Jalebi* fruits:**

In traditional system of medicine, it was used for the treatment of diabetes, toothache, earache, leprosy, peptic ulcer, and used as an astringent, emollient, and abortifacient (Duke and Wain, 1981).

Effective agent	Research study	Key Findings
Antihyperglycemic	Kumar <i>et al</i> (2017)	97% enriched saponin fraction of <i>Jungle Jalebi</i> seeds displayed superior inhibition of enzymes $\alpha$ -glucosidase and $\alpha$ -amylase and significantly prevented rise in blood glucose level.
	Nagmotiet <i>al</i> (2015)	Oral administration of <i>Jungle Jalebi</i> seeds (125, 250 and 500mg/kg) for 21 days caused a significant decrease in fasting blood glucose, HbA <sub>1C</sub> and significant increase in body weight, serum insulin, total protein, and liver glycogen levels in treated diabetic rats.
Cardioprotective	Thangarajamet <i>al</i> 2015	Fruit peel extracts of <i>Jungle Jalebipositively</i> altered the activities of marker enzymes and biochemical parameters in isoproternol-induced myocardial infarction in male Wister rats.

**CONCLUSION**

From the analysis of traditional knowledge and analysis studies it is clear that *Jungle Jalebi* fruit is a cost effective nutritive and therapeutic agent. However, the scientific approval by means of in vivo, invitro and human trials are still needed along with the formulation and popularisation of value-added products of *Jungle Jalebi* fruits.

It will not only boost the diversity in use of *Jungle Jalebifruits* in diet but also promote the vocal for local for entrepreneurship.

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