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# Outline of the pharmacological and phytochemical profile of the jungle jalebi (*Pithecellobium dulce*)

## ABSTRACT

*Pithecellobium dulce* has numerous utilizations which has flexible jobs in the conventional arrangement of medication. A few investigations are being directed concerning the viability of the entire plant or its parts for the treatment of various sicknesses and ailments. Triterpenoids, sterols, flavonoids, tannins, and phytochemicals like quercetin, kaempferol, and dulcitol were recognized from the different pieces of the plant. In this article, the different remedial properties of *P. dulce* have been shown. *P. dulce* is an evergreen sharp tree; each piece of the plant has huge healthful values. The different parts of plant have been shown to display different pharmacological activities like anti-diabetic, locomotor, immunizing agent venom, free radical searching, protease inhibitor, mitigating, anti-bacterial, anti-mycobacterial, abortifacient, spermicidal, anti-convulsant, anti-ulcer, anti-diarrheal, anti-contagious, anti-tubercular, anti-tumor and as well as anti-oxidative properties and safety study like acute and sub-acute toxicity study. Therefore, the current review is cognizant on behalf of pharmacological studies, as well as phytochemicals.

**KEYWORDS:** *Pithecellobium dulce*, phytochemistry, traditional uses, antivenom, abortion, spermicidal safety study.

## INTRODUCTION

The Hindi name of Jungle jalebi is *Pithecellobium dulce* Benth, a woody legume native(northwestern region) of Mexico but now widely distributed all over India, Southeast Asia

30 and can also be found in South Africa and Australia; small to medium-sized. Height is about  
31 18m and is cultivated throughout India. Seeds of *P. dulce* species are traditionally used  
32 worldwide for food because they are highly protein in nature and also contain dietary **fibers** and  
33 unsaturated fatty acid contents(1).

34 **Synonyms:** *Pithecellobium littorale*, *Pithecellobium dulce* (Roxb.) Benth.

35 ✓ **Bark (contain 37 %tannin)** is used for the treatment of astringent in dysentery, dermatitis  
36 and inflammation in the eye.

37 ✓ **Leaves (contain quercetin, kaempferol, dulcitol and afezilin)** are reported for to have  
38 astringent, emollient, abortifacient and antidiabetic properties.

39 ✓ **Seeds** are used as glycosides, glycolipids, polysaccharides, steroids, saponins, lipids and  
40 phospholipids(2–4).

41 ✓ **Roots** take over estrogenic activity.

42 Recently the studies of plant on alkylated resins from seed oil have been reported. Traditionally  
43 fruits have been consumed, well known for their edible fruits; linear, and curved; with lengths  
44 from 10 to 13 cm. Normally, the single pod contains ten seeds (irregular in shape).

45 The chemical compounds present in plants are used as antidiabetics, anticancer, antiinflammation  
46 etc. There are several allopathic medicines used in the treatment of diseases but they also have  
47 several side effects and drug interactions, so there is a need for herbal treatments that have lesser  
48 or no side effect. Here, the review discusses the protection against various diseases and their  
49 pharmacological properties of the *P. dulce*(5,6).



50  
51 **Figure 1. *Pithecellobium dulce* (Jungle jalebi) Plant.**

52 **FAMILY**

53 The plant belongs to family Fabaceae. Most woody species are tropical; herbaceous (i.e.,  
54 nonwoody) species happen principally in mild districts, belongs to family Orchidaceae and  
55 assteraceae as well. It contains about 751 genus and 19000 species (7). Crotalaria, indigofera,  
56 astragalus, acacia, and mimosa are the widespread genus. About 19,000 known vegetable  
57 species add up to about 7% of blooming plant species. In tropical rainforests and in dry  
58 backwoods in the

59 Americas and Africa most widely recognized family is Fabaceae. Fabaceae is a single  
60 monophyletic family, Recent molecular and morphological evidence supports the fact. Here the  
61 conclusion has been given not just by the level of interrelation appeared by changed gatherings  
62 inside the family contrasted and that found among the Leguminosae. In addition by all the  
63 ongoing phylogenetic examinations dependent on DNA groupings(8,9). These investigations  
64 confirm that the family Fabaceae is a monophyletic bunch that is firmly identified with the  
65 families' *polygalaceae*, *surianaceae* and *quillajaceae*. A few products of the soil roots, various  
66 Leguminosae have human nourishment for centuries and their utilization is firmly identified with  
67 human advancement. Generic name is derived from the Greek words *pithekos* which means  
68 "ape" or "monkey," and *ellobion* stands for "earring," which means coiled shape. Genus is  
69 commonly known as blackbeads(10).

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### 73 **VERNACULAR NAME**

74 <b>Language</b>	<b>Name</b>
75 <b>Hindi:</b>	Jangle jalebi, Vilayati babul, Vilayati imli
76 <b>English:</b>	Quamachil, Madras thorn, manila tamarind
77 <b>Tamil:</b>	Kodukkaapuli
78 <b>Sanskrit:</b>	Kodukkaapuli
79 <b>German:</b>	Camambilarinde

80

### 81 **Taxonomical Classification**

82 <b>Domain:</b>	<i>Eukaryote</i>
83 <b>Kingdom:</b>	<i>Plantae</i>
84 <b>Subkingdom:</b>	<i>Tracheobionta</i>

85	<b>Species:</b>	<i>Pithecellobium dulce</i> (Roxb.) Benth.
86	<b>Class:</b>	<i>Magnoliopsida</i>
87	<b>Subclass:</b>	<i>Rosidae</i>
88	<b>Order:</b>	<i>Fabales</i>
89	<b>Family:</b>	<i>Fabaceae</i>
90	<b>Genus:</b>	<i>Pithecellobium</i> Mart.
91	<b>Botanical name:</b>	<i>Pithecellobium dulce</i> (11).

92

### 93 **BOTANICAL DESCRIPTION**

94 In tropical area the tree grows well at low and medium altitudes. The normal rainfall (low as  
 95 140mm and as high as 2,200mm) is tolerated. The plant growths need the average temperature  
 96 (18 - 27.9°C) and also needs a well-drained soil. A pair of straight stout short thorns at the base  
 97 of the leaf Pinnate leaves with a single pair pinnae, each with a single pair of leaflets often  
 98 variegated White flowers in globular heads c. 1 cm wide Coiled pinkish pods Shiny black seeds  
 99 c. 1 cm long, embedded in white pulp. But in favourable soil condition height reach of 10 metres  
 100 (5 - 6 years). After planting in field other than occasional pruning the tree doesn't need any  
 101 treatment.

102 *Pithecellobium dulce* pod's exterior resembles that of tamarind, but it easily peels away like the  
 103 thin skin of a green bean. The edible flesh may then be separated from the seeds and eaten out-  
 104 of-hand or prepared in sweet and savoury dishes. The Madras Thorn is a spiny tree that grows up  
 105 to 20 meters tall. It has an irregular spreading nature making it ideal for a perimeter hedge or  
 106 living fence. The curvy and spiralled pods are greenish-brown to red or pinkish colour. It is 10-  
 107 15 cm long x 1-2 cm wide. They are thin and flattened with approximately 10 seeds per pod.<sup>9</sup>the  
 108 pink, edible pulp of Madras Thorn is both sweet and savoury, with flavours of chestnut and  
 109 honey. It is the consistency of sticky popcorn, and mildly sour with a cleansing astringent quality  
 110 on the palate. Fresh Madras Thorn is highly perishable, and the pinkish-white pulp will quickly  
 111 oxidize once peeled. At room temperature, the fruits keep for three to four days.

### 112 **GEOGRAPHICAL DISTRIBUTION**

113 This plant originated from different countries is mentioned below:

- 114 ✓ Brazil
- 115 ✓ Argentina
- 116 ✓ Bolivia

117 ✓ Colombia

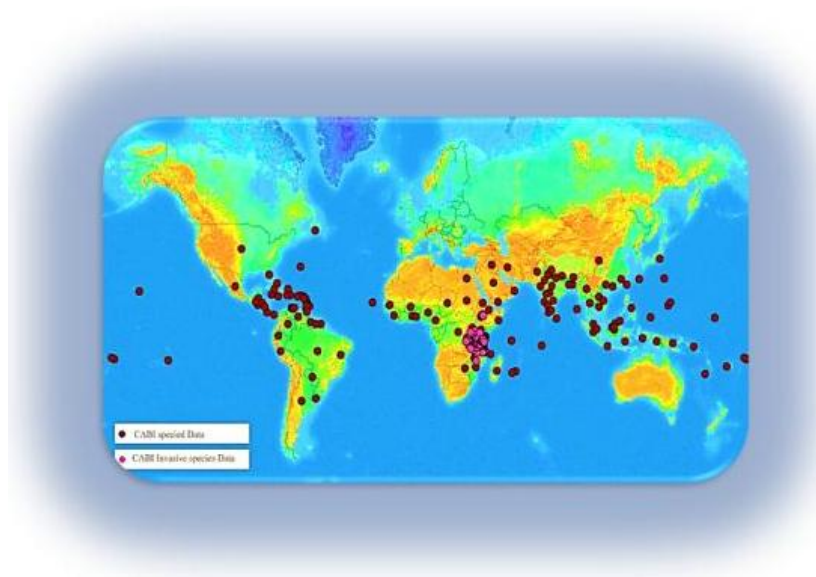
118 Jungle jalebi is the only specie that is widely spread outside from its origin. Eighteen species  
119 belongs to this genus; geographically distributed in many countries:

120 ✓ India

121 ✓ Huawei

122 ✓ Tropical Africa (12).

123



124

125 **Figure 2.** Worldwide Distribution of *Pithecellobium dulce*. (Jungle jalebi).

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## 127 **TRADITIONAL USES**

128 ➤ Astringent, homeostasis (bark, pulp of fruit)

129 ➤ Antipyretic

130 ➤ Eye inflammation (eye infections and swelling of the eyelids)

131 ➤ To treat gum ailments,

132 ➤ Toothache

133 ➤ Anticancer

134 ➤ Bile (leaves, also prevent abortions)

135 ➤ Antiulcer (Seed)

136 ➤ Haemorrhages

137 ➤ Chronic diarrhoea

138 ➤ Tuberculosis.

### 139 PHYTOCHEMISTRY

140 Table 1. **plant**parts used for the study and their chemical name

S. No.	Part used	Chemical Name
1.	Bark	Catechol
2.	Wood	Campesterol
3.	Wood	Melacacidin
4.	Seeds	Hederagenin
5.	Seeds	Pitheduloside A
6.	Seeds	Pitheduloside B
7.	Seeds	Pitheduloside D
8.	Seeds	Pitheduloside F
9.	Seeds	Pitheduloside H
10.	Seeds	Pitheduloside I
11.	Seeds	Pitheduloside K
12.	Leaves	Octacosanol
13.	Leaves	Kaempferol
14.	Seeds	Pithogenin
15.	Fruits	Ellagic acid
16.	Fruits	Gallic acid
17.	Fruits	Mandelic acid
18.	Fruits	Ferulic acid
19.	Fruits	Vanillic acid
20.	Fruits	Coumaric acid
21.	Fruits	Rutin
22.	Fruits	Naringin
23.	Peel, leaves	Quercetin
24.	Peel, seeds	Stigmasterol
25.	Fruits, peel	Pinitol
26.	Seeds	Oleanolic acid
27.	Seeds	Echinocystic acid
28.	Leaves	Dulcitol
29.	Stem	Prenylapigenine
30.	Fruits	Daidzein

141

### 142 RESULTS AND DISCUSSION

143 ◆ **Abortion Activity**

144 The isoflavonoid isolated from root remove, took a stab in female rodents, demonstrated segment  
145 subordinate estrogenic development and extending dode weight  $15.5 \pm 0.25$  mg in control group  
146 to  $34.2 \pm 0.68$  mg in orally treated rodents dosing (1.25 mg/kg/day for 4 days).

147 ◆ **Antivenom Activity**

148 Polyphenols from water concentrate of *P. dulce* was tried for their inhibitory exercises against  
149 *Naja kaouthia* (NK) venom by In-vitro balance technique.

150 ◆ **Spermicidal Activity**

151 The saponins of *P. dulce* were besides introduced to tests for the spermicidal property by  
152 exhibited to activity in the debilitating against human semen.

153 ◆ **Antiinflammatory Activity**

154 The saponin (containing two genin acids, echinocystic corrosive and oleanolic destructive with  
155 xylose, arabinose and glucose as sugar moieties) procured from results of *P. dulce* has been  
156 concentrated against the exudative and proliferative time of provocative reaction in pale cleaned  
157 individual rodents by using carrageenan induced oedema and formaldehyde started joint pain  
158 models.

159 ◆ **Antitubercular Activity**

160 leaves extraction (by hexane, chloroform and alcoholic) was read for their anti-mycobacterial  
161 action by BACTEC460TB-Radiospirometric framework. The concentrates of the leaves were  
162 perused for their anti-mycobacterial activity by BACTEC460TB-Radiospirometric structure.  
163 Alcoholic aggregate 20mg/ml the conc. exhibited most raised activity when essentially  
164 indistinguishable with standard meds for ex. rifampicin, streptomycin, ethambutol, pyrazinamide  
165 andisoniazid(13,14).

166 ◆ **Activity of Protease Inhibitor**

167 A seed of *P. dulce* is isolation and characterizations of a protease inhibitor are seemed.

#### 168 ◆ **Antimicrobial Activity**

169 The methanolic and aq. concentrate of *P. dulce* seeds have indicated fungistatic and have  
170 fungicidal impacts against plant pathogens like *Fusarium oxysporum*, *Botrytis cinerea*,  
171 *Penicillium digitatum*, and *rhizopus stolonifer*. A couple triterpene saponins, pitheduloside A, B,  
172 E, F and I frustrated in vitro mycelial progression of *Rhizopus stolonifer* and *Colletotrichum*  
173 *gloeosporioides*. The plant concentrate of the less-polar hexane and polar methanol attempted  
174 against different microorganisms and parasites were in the like way observed as  
175 incredible(15,16).

#### 176 ◆ **Anti-Ulcer genic Activity**

177 Anti-ulcer activity is the ulcer control rodents. The activities of H (+), K (+) - ATPase and  
178 myeloperoxidase, seen as essentially raised up and saw as lessened in cure pre-treated rodents.  
179 Acute gastric ulcer controlling liquor, acetylsalicylic destructive, or hypothermic impediment  
180 stress to rodents pre-treated with HAEPD (200 mg/kg body weight for multi day). The effects of  
181 *P. dulce* difference standard prescription with omeprazole.

#### 182 ◆ **Activity of Locomotor**

183 Locomotor activity is called CNS depressant activity. It is watery and alcoholic of leaf of *P. dulce*  
184 was evaluated using actophotometer in pale skinned person rodents. In light of addition in the  
185 centralization of GABA as a primary concern it shows a CNS depressant movement. The power  
186 of alcoholic and watery concentrates of leaf contrasted and chlorpromazine(17,18).

187

### 188 **SAFETY STUDY**

#### 189 ☐ **Acute toxicity study**

190 The rodents were fasted for whole with water at free access. For the intense danger, they were  
191 randomly partitioned in two gatherings of males, each successively dosed at interims of 48 hour.  
192 The controlled group got orally refined water; experimental group was orally treated with stem  
193 bark hydroethanolic concentrate of *P. dulce* with extraordinary dose of 5 g/kg. Animals were

194 watched for general behavioral and body weight changes, hazardous manifestations and  
195 mortality inside a time of four hr. for guaranteed indications of harmfulness and in any event  
196 once every day for 14 days for postponed indications of poisonous quality. After sedation by  
197 inward breath with ether, the spinal-rope of rodents was dis-joined by extending(19).

198

#### 199 **❑ Sub-acute toxicity study**

200 Repeated dose of orally toxicity study was done by OECD rule 407 [20] with slight adjustment  
201 without EDTA were centrifuged. The animals were partitioned into three groups of 6animals  
202 each (3 males and 3 females). First group got 10 mL/kg body weight of distilled water and kept  
203 as control. Second and third group got extracted portions of 0.5 and 1 g/kg body then weight  
204 individually. For twenty eight days the extract were given and at a similar time and saw in any  
205 event twice day by day for bleakness and mortality, the animals(B.W.)were evaluated daily. On  
206 day 29, after an overnight fast the rodents were anesthetized with ether and blood tests were  
207 acquired by retro-orbital cut, utilizing fine cylinders for hematological and biochemical  
208 investigations with and without EDTA(20).

#### 209 **CONCLUSION**

210 In the present review we have made an attempt to congregate the taxonomical, botanical and  
211 Pharmacological information on *Pithecellobium dulce*, a medicinal plant used in the Ayurveda.  
212 *Pithecellobium dulce* has a solid intense in wellbeing advancing, illness forestalling and life  
213 delaying properties which has been depicted, explored and checked by current specialists. In any  
214 case, the inherently dynamic mixes and the substance dependable have been resolved at this  
215 point, and a few components of the activity of *Pithecellobium dulce* are as yet obscure. Along  
216 these lines, bioassay-guided separation and distinguishing proof of the bioactive parts must be  
217 created to uncover the structure-movement relationship of these dynamic segments. Anyway  
218 more examinations are required to investigate the utilization of the plant for commercialization  
219 of dynamic elements of organic and home grown medication applications.

#### 220 **ETHICAL STATEMENT**

221 A pharmacist works to advance each patient's well-being in a discreet, kind, and caring way.

222

#### 223 **INFORMED CONSENT**

224 Using websites, review articles, and other sources to produce research content.

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UNDER PEER REVIEW