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## Use of pharmacognosy to study *Pithecellobium dulce* (Roxb). Benth. Stem and leaves

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**Abstract**

Pharmacognosy is the study of medicinal drugs derived from plants or other natural sources. The American Society of Pharmacognosy defines pharmacognosy as "the study of the physical, chemical, biochemical and biological properties of drugs, drug substances or potential drugs or drug substances of natural origin as well as the search for new drugs from natural sources. The present study is of *Pithecellobium dulce* (Roxb.) Benth. which belongs to family Leguminosae and sub family Mimosae. It includes the evaluation like physicochemical parameters like preliminary phytochemical screening, total ash, water soluble ash, acid insoluble ash and extractive values in different solvents which are also required in correct identification of crude drug i.e. *Pithecellobium dulce* as mentioned in the Pharmacopoeia of India. Leaves yield quercetin, kaempferol, dulcitol and afezililn which are used as medicine against cancer and as antioxidants.

**Keywords:** *Pithecellobium dulce*, phytochemical screening, ash value, extractive values

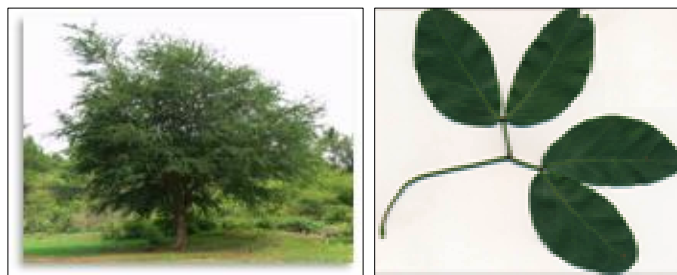
**Introduction**

*Pithecellobium dulce* (Roxb.) Benth. belongs to family Leguminosae and sub family Mimosae. It is commonly called Madras thorn, monkey pod in English, Vilayati chinch in Marathi, Jungle Jalebi, Vilayati babul in Hindi [1].

**Morphology of *Pithecellobium dulce***

Erect trees or large spiny tree, often cultivated by roadsides and in gardens. It is also grown in form of hedges after proper cutting. The tree is called rain tree, because of a legend that it was always raining under its branches. Bark grey white. Leaves are bipinnate. White Flower, Flowers in Globose axillary heads, usually hermaphrodite and pentamerous. Stamens monadelphous, much exerted;

Anthers not gland -crested. Ovary Sessile or stalked, many ovules; style filiform, stigma minute capitate. Pod strap-shaped, falcate or circinate, usually dehiscent and much twisted in a late stage, the sutures not thickened. The seeds yield Oil. They also used in diabetes. Seed Black, enveloped in pulpy white aril.



**Fig 1:** Erect trees or large spiny tree, often cultivated by roadsides and in gardens

**Chemical Constituents:** Leaves yield quercetin, kaempferol, dulcitol and afezililn. Fatty acid analysis of seed extract yielded 9 saturated and 17 unsaturated fatty acids. Total protein content was highest in the seeds (50.3-67.1%), followed by stems, roots, leaves, flowers, and fruits [2].

**Uses:** It is used as antiseptic, lightens skin, prevents hair loss, treats oily scalp, aids weight loss, good for pregnant women, boosts immune system and treats fever [3].

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**Materials and Methods**

The plant material i. e. Leaves and Stem of *Pithecellobium dulce* for the present work was collected from Digha, District Thane, India and authenticated.

For preliminary phytochemical screening, determination of ash content, percentage extractive values, standard methods were method used [4-7].

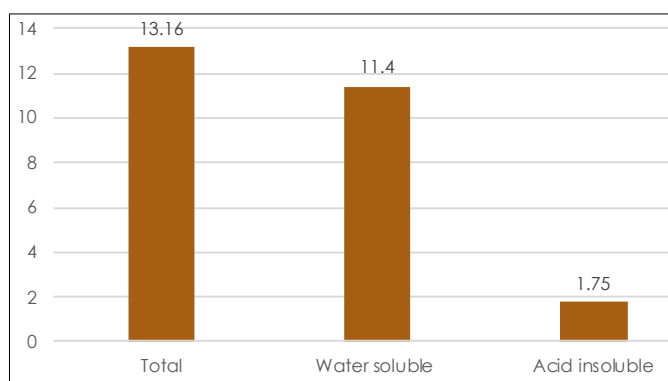
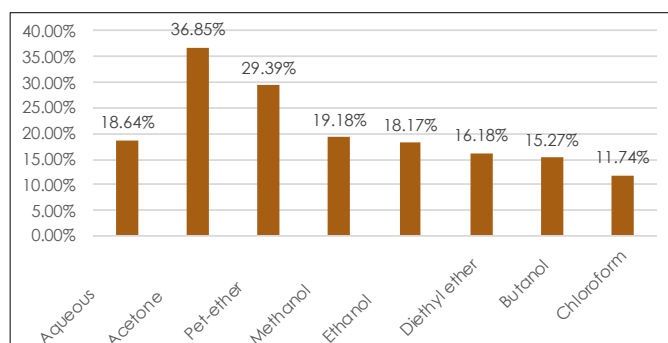
**Observations and Results****Table 1:** Preliminary phytochemical screening

T.S. + Reagent	Observations	Inference
(Benedict's Test) T.S. + Benedicts reagent	Solution appears green	Reducing sugars Present
(Cobalt-chloride Test) T.S. + Cobalt chloride (boil and cool) + Drop of NaOH	Greenish Blue Colour	Hexose Sugar Present
(Ninhydrin Test) T.S. + Ninhydrin solution (boiling water bath)	Purple colour appears	Amino acid Present
(Test for Flavonoids) T.S. + Sodium Hydroxide	Yellow Colour (which decolourises after addition of acid)	Glycosides Present
(Test for Alkaloids) T.S. + Dragendorff reagent	Orange Brown ppt	Alkaloids present
(Test for Alkaloids) T.S. + Wagner's reagent	Reddish brown ppt	Alkaloids Present
(Test for Tannins and Phenolic Compounds) T.S.+ Dil. HNO <sub>3</sub>	Yellow Colour	Tannin and Phenols Present
(Test for Potassium) T. S. + Sodium Cobalt Nitrate Solution	Yellow ppt	Potassium Present
(Test for Sulphate) T.S. + 5% BaCl <sub>2</sub>	White Crystalline BaSO <sub>4</sub> ppt. Insoluble in HCl	Sulphate Present
(Test for Sulphate) T.S. + Lead Acetate reagent	White ppt soluble in NaOH	Sulphate Present
(Test for chloride) T.S. + Lead Acetate reagent	Ppt soluble in hot water	Chloride Present
(Confirmatory test for Oxalic Acid) T.S. + 5% Lead Acetate	White ppt	Oxalic Acid Present
(Confirmatory test for Oxalic Acid) T.S. + 1% KMnO <sub>4</sub> and Dil. H <sub>2</sub> SO <sub>4</sub>	Colour of KMnO <sub>4</sub> Disappears immediately	Oxalic Acid Present

**Ash content**

The total ash value is 13.16% and acid insoluble ash value is 1.75%. The aqueous extractive value was 18.64%, acetone extractive value was 36.85%, pet ether extractive value was

29.3%, methanol extractive value was 19.18%, ethanol value was 18.17%, diethyl ether extractive value was 16.18%, butanol extractive value was 15.27% and chloroform extractive value was 11.74%

**Fig 2:** % Ash Value**Fig 3:** Extractive values in %

## Discussion

Nutritional qualities and proximate analysis of three medicinal plant parts (*Xylopiya aethiopicum*, *Blighia sapida* and *Parinari polyandra*) commonly used by pregnant women in the Western Part of Nigeria [8]. Physico-chemical evaluation, preliminary phytochemical investigation, fluorescence and TLC analysis of leaves of the plant *Lasia spinosa* (Lour) Thwaites [9]. Comparative proximate analysis of ethanolic and water extracts of *Cymbopogon citratus* (lemon grass) and four tea brands. Results from the study showed that there were significant ( $p < 0.05$ ) differences in the proximate composition of the various tea brands compared with lemon grass [10]. A comparative study on proximate analysis conducted on medicinal plants of Chhattisgarh, CG, India. The leaves of *Ocimum sanctum*, *Azadirachta indica* and *Millettia pinnata*, *Andrographis paniculata* were dried and powdered and the mixture were subjected to proximate analysis [11].

Pharmacognostic studies of *Euphorbia hirta*, pharmacognostic studies of *Costus speciosus*, of *Calophyllum inophyllum*, of *Carica papaya* have also been done [12-15].

## Summary

Phytochemical analysis showed presence of reducing sugars, hexose sugar, amino acids, glycosides, alkaloids, potassium, sulphate, chloride, oxalic acid, tannins and phenols. The total ash content is 13.16%, water soluble ash content is 11.4% and acid insoluble ash is 1.75%. Extractive value is highest in Acetone followed by petroleum ether, methanol, water, ethanol, diethyl ether, Butanol, chloroform in the order 36.85 > 29.39 > 19.18 > 18.64 > 18.17 > 16.18 > 15.27 > 11.74.

## Conclusion

The present information on the pharmacognostic evaluation of the plant *Pithecolobium dulce* delivered the qualitative and quantitative parameters serve the important information to the identity and to determine the quality and purity of the plant material in the future. These parameters could be used to check if the plant material is adulterated or not.

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