



## Evaluation of physicochemical parameters of *Delonix regia* (Boj. ex Hook.) Raf. leaves

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### Abstract

In ancient folk lore and traditional medicine *Delonix regia* (Boj. ex Hook.) Raf. Family Fabaceae is a one of the most widely used plant species characterized by its fern-like leaves and flamboyant display of orange-red flowers. The plant is used in the treatment of various disorders such as fever, microbial infection, in reducing pain. The present paper deals with the studies on evaluation of physicochemical parameters of leaves of *Delonix regia* (Boj. ex Hook.) Raf.

**Keywords:** delonix regia, leaves, physicochemical

### Introduction

*Delonix regia* (Bojer) Raf., fam., Fabaceae is a perennial legume tree, grown in tropical and subtropical regions and widely used as ornamental species. Morphologically the leaves are bipinnate, alternate, feathery, 20-60 cm long, bearing 10-25 pairs of pinnae, each with 30-60 opposite leaflets. The leaflets are 0.5-1 cm long, stalkless, minutely hairy on both sides. The inflorescences are slightly fragrant corymbs borne laterally at the end of the twigs. The inflorescence bears large (5-13 cm), magnificent flowers, orange-red in colour, loosely arranged on 5-7.5 cm long stalks. The 4 clawed-petals are spoon-like in shape and the 5 sepals are thick, green in color, finely hairy. The fruit is a 30-75 cm long pod, It is green and flaccid when young, turning to brown and woody at maturity. The pods remain on the tree after it has shed its leaves. The 30-45 seeds contained in the pods are hard, greyish, mottled, oblong in shape, looking like date pits<sup>[1-2]</sup>.

The World Health Organization (WHO) has listed more than 21,000 plants that are used for medicinal purposes around the world. India is the largest producer of medicinal herbs and is called as botanical garden of the world<sup>[3-4]</sup>. so, far no any systematic study was carried out in evaluating the pharmacognostical profile of leaves, therefore, the present work was undertaken.

### Material and Methods

#### Collection of herbs and their authentication

The leaves of *Delonix regia* (Bojer) Raf. were collected and identified & authenticated by Botanist, Jand was deposited in our Laboratory.

#### Physicochemical evaluation

The dried parts were subjected to standard procedure for the determination of various physicochemical parameters<sup>[5-7]</sup>.

#### Determination of foreign organic matter (FOM)

Accurately weighed 100 g of the drug sample and spread it out in a thin layer. The foreign matter should be detected by inspection with the unaided eye or by the use of a lens (6X). Separate and weigh it and the percentage present was calculate.

#### Determination of moisture content (LOD)

Place about 10 g of drug (without preliminary drying) after accurately weighing in a tared evaporating dish and kept in oven at 105<sup>o</sup> C for 5 hours and weigh. The percentage loss on drying with reference to the air dried drug was calculated.

#### Determination of ash value

The determination of ash values is meant for detecting low-grade products, exhausted drugs and sandy or earthy matter. It can also be utilized as a mean of detecting the chemical constituents by making use of water-soluble ash and acid insoluble ash.

#### Total ash

Accurately about 3 gms of air dried powder was weighed in a tared silica crucible and incinerated at a temperature not exceeding 450<sup>o</sup>C until free from carbon, cooled and weighed and then the percentage of total ash with reference to the air dried powdered drug was calculated. The percentage of total ash with reference to the air-dried drug was calculated.

#### Acid insoluble ash

The ash obtained in the above method was boiled for 5 minutes with 25ml of dilute HCl. The residue was collected on ash less filter paper and washed with hot water, ignited and weighed. The percentage of acid insoluble ash was calculated with reference to the air dried drug.

#### Water soluble ash

The ash obtained in total ash was boiled for 5 minutes with 25 ml of water. The insoluble matter was collected on an ash less filter paper, washed with hot water and ignited to constant weight at a low temperature. The weight of insoluble matter was subtracted from the weight of the ash. The difference in weights represents the water soluble ash. The percentage of water soluble ash with reference to the air dried drug was calculated.

### Determination of swelling index

Swelling index is determined for the presence of mucilage in the seeds. Accurately weigh 1 g of the seed and placed in 150 ml measuring cylinder, add 50 ml of distilled water and kept aside for 24 hours with occasional shaking. The volume occupied by the seeds after 24 hours of wetting was measured.

### Determination of extractive value

This method determines the amount of active constituents extracted with solvents from a given amount of medicinal plant material. It is employed for materials for which as yet no suitable chemical or biological assay exists.

### Cold maceration

Place about 4.0g of coarsely powdered air-dried material, accurately weighed, in a glass-stoppered conical flask. Macerate with 100ml of the solvent specified for the plant material concerned for 6 hours, shaking frequently, then allow to stand for 18 hours. Filter rapidly taking care not to lose any solvent, transfer 25 ml of the filtrate to a tared flat-bottomed dish and evaporate to dryness on a water bath. Dry at 105°C for 6 hours, cool in a desiccator for 30 minutes and weigh without delay. Calculate the content of extractable matter in mg per g of air dried material. For ethanol-soluble extractable matter, use the concentration of solvent specified in the test procedure for the plant material concerned; for water-soluble extractable matter, use water as the solvent.

### Results and Discussion

The leaves of *Delonix regia* (Bojer) Raf. was collected and identified morphologically and compared with standard pharmacopoeial monograph. The diagram of leaves was given in figure 1.



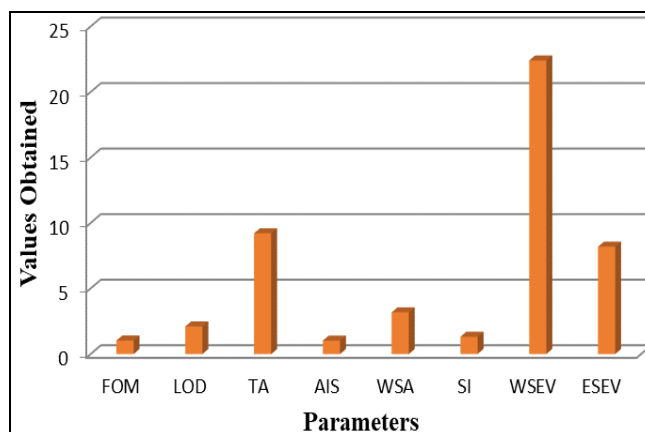
Fig 1: *Delonix regia* (Bojer) raf. leaves

The dried leaves *Delonix regia* (Bojer) Raf. was subjected to standard procedure for the determination of various physicochemical parameters. The results were presented in table 1.

Table 1: Physicochemical evaluation of *Delonix regia* (Bojer) raf. leaves

S/No.	Parameters	DRL
1.	FOM	1.03±0.05
2.	LOD	2.10±0.11
3.	TA	9.21±0.32
4.	AIS	1.02±0.01
5.	WSA	3.18±0.12
6.	SI	1.32±0.14
7.	WSEV	22.41±1.12
8.	ESEV	8.19±1.41

Note: All values are expressed as Mean±SEM, n=3



Graph 1: Physicochemical evaluation of *Delonix regia* (Bojer) raf. leaves

### Conclusion

The leaves of *Delonix regia* (Boj.) Raf. has been used extensively by tribals of India for the treatment of several disease and disorders such as inflammation, microbial infection, wound healing and so on and that's due to presence of various active phyto-constituents. However, there are still many areas that need further research to avail the health benefits of phyto-constituents of *Delonix regia* (Boj.) Raf. Still studies need to be done to explore the potential phyto-constituents from the leaves and to explore many other pharmacological significance of the plant which will be used for the prevention of various other diseases. In the present paper various physicochemical parameters of the leaves were investigated and reported.

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