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Physicochemical Parameters of *Boswellia serrata* Roxb. Leaves

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ABSTRACT

India is one of the country in the world having 'God's Blessing' in the form of treasure of medicinal plants. With food, cloth and shelter, healthy life is the main right of human being. Since thousands of years people used to take plant originated products to make life healthy and wealthy too.

In our present study the plant *Boswellia serrata* Roxb. Family *Burseraceae* leaves were subjected to determination of physicochemical parameters. The total Ash value, Acid insoluble ash value, Alcohol soluble extractive value, Water soluble extractive value, Water soluble ash value etc. was determined.

INTRODUCTION

Boswellia serrata is one of the medicinal plant of *Burseraceae* family. In the plant kingdom, *Burseraceae* family is characterized with 17 genera and 600 species widespread in all tropical region. Genus *Boswellia* contains about 25 known species. Most of them occur in Arabia, North Eastern coast of Africa and India. In India, it is found in western Himalaya, Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Bihar and Orissa. It is also known as Kundur, Salai, Luban etc.

Uses in Ethnomedicine:

The bark is sweet acrid, cooling and tonic. It is good for pitta, asthma, ulcers, and skin diseases. The exudates oleo-gum resin is useful in urinary disorders, goiter, gout, piles cutaneous and nervous diseases.

It is useful in alzheimer, arthosis, boil, bursitis, cancer, edema, fever, inflammation, vaginosis, wound, wrinkle etc.

Traditional uses:

Boswellia serrata gum resin is used as an antiseptic, antifungal and antimicrobial, anti-inflammatory, arthritis, anti-obesity, asthma, cardio-tonic, anti-convulsant.

The qualitative phytochemical study of different extracts indicates presence of alkaloids, tannins, triterpenoids, steroids etc. in preliminary phytochemical screening.

Need of the study:

Most of the crude drugs are put in quarantine store and they remain there for long time. During storage, proper ventilation, humidity control, suitable temperature and light such conditions should be ensured to maintain their original pharmacological action. However, it is observed that crude plant materials, before being taken for processing, are not analyzed which can lead to changes in original characteristics. To avoid this, the crude drugs should be tested for the following tests as per the USP and Indian Herbal Pharmacopoeia (IHP).

1. Ethanol soluble extractive value.
2. Water soluble extractive value.

3. Total ash content.
4. Ash which is insoluble in acid.
5. Ash which is soluble in water.
6. Loss on drying.

Here we have reported the determination of ash values, total ash content, ethanol soluble extractive value, water soluble extractive value from the leaves of the plant.

MATERIALS AND METHODS

Plant Material Collection and Authentication:

Boswellia serrata leaves were collected from Laling forest near Dhule city, District- Dhule M.S. (India). The leaves were shed dried, grind to powder and used for extraction of constituents of plant.

The plant specimen was identified and authenticated by Dr.L.K.Kshirsagar, Department of Botany, S.S.V.P.S's L.K. Dr.P R Ghogrey Science College Dhule (M.S).

Determination of Alcohol Soluble Extractive Value: -

10gm of the air-dried coarse powder of *Boswellia serrata* leaves were macerated with 100ml of 90% ethanol in a closed flask for 24 hours shaking frequently during the first 6 hours and allowed to stand for 18 hours. Thereafter, it was filtered rapidly. 25ml of the filtrate was evaporated to dryness in a tarred flat bottom shallow dish, dried at 105^0C and weighed. The percentage of ethanol soluble extractive value was found to be 4.48 (See Table 1).

Determination of Water Soluble Extractive Value:

Powdered *Boswellia serrata* leaves (10gm) were weighed accurately and macerated with 100ml of water in a closed flask for 24 hours. It was shaken frequently during the first 6 hours and allowed to stand. After 18 hours it was filtered rapidly. Then 25ml of the filtrate was evaporated to dryness in a tarred flat-bottom shallow dish, dried at 105^0 C and weighed. The percentage of water soluble extractive was 7.36 (See Table 1).

Loss on drying:

Loss on drying is the loss in weight in percentage which determines the amount of volatile matter of any kind (including water) that can be driven off under the condition specified. About 1.5gm of powdered drug was weighed accurately in a porcelain dish which was previously dried at 105^0C in hot air oven to constant weight and then weighed. From the difference in weights, the percentage loss on drying with reference to the air-dried substance calculated was 5.34.

Table 1: Percentage of extractive values

Sr.No.	Parameters	Result % (w/w)
1	Water soluble extractive value	7.36
2	Alcohol soluble extractive value	4.48
3	Loss on drying	5.34

Ash Values: Ash values are helpful in determining the quality and purity of crude drug, especially in the powdered form. It usually represents the inorganic salts naturally occurring in the drug and adhering to it. The objective of ash value detection of drug is to remove all traces of organic matter, which may otherwise interfere in an analytical determination. Hence, an ash determination furnishes a basis for judging the identity and cleanliness of a drug. Procedure given in Indian Pharmacopoeia was used to determine the different ash values such as total ash, acid insoluble ash, and water soluble ash etc.

Determination of total ash value: About 3 grams of air dried *Boswellia serrata* leaves powder was taken in a tarred silica crucible. It was incinerated by gradually increasing the temperature to make it dull red hot until free from carbon. The crucible was cooled and weighed, repeated for constant value. Then the percentage of total ash was found to be 7.3.

Determination of acid insoluble ash value: The ash obtained as directed under total ash value was boiled with 25ml of 2N HCl for 5 minutes. The insoluble matter was collected on an ashless filter paper, washed with hot water, ignited and weighed. The percentage of acid insoluble ash was found to be 4.8.

Determination of water soluble ash value: The total ash obtained was boiled with 25ml of water for 5 minutes. The insoluble matter was collected on an ashless filter paper, washed with hot water and ignited for 15 minutes at a temperature above 25^0C. The weight of insoluble matter was subtracted from the weight of total ash. The difference in weight represents the water soluble ash value. The percentage of water soluble ash was found to be 3.84. All the ash values are recorded in Table 2.

Table 2: Percentage of Ash Values

Sr. No.	**Studied parameters**	**Observation (% w/w)**
1	Total ash value	7.3
2	Acid insoluble ash value	4.8
3	Water soluble ash value	3.84

SUMMARY AND CONCLUSION

In the present study of physicochemical analysis loss on drying, ash values, extractive values etc. were determined for *Boswellia serrata Roxb.* leaves. The water soluble and alcohol soluble extractive values were checked quantitatively. The water soluble extractive values were found higher than alcohol soluble extractive values.

In recent years, ethnobotanical and traditional uses of natural compounds, especially of plant origin received much attention as they are well tested for their efficacy and generally believed to be safe for human use. They obviously deserve scrutiny on modern scientific lines such as phytochemical investigation, biological evaluation, toxicity studies, investigation of molecular mechanism of action (s) of isolated phytochemicals and their clinical trials. It is best classical approach in the search of new lead molecules for management of various diseases. Thorough screening of literature available on *Boswellia serrata Roxb.* depicted the fact that it is a popular remedy among the various ethnic groups, Vaidya, Hakims and Ayurvedic practitioners for cure of ailments. Following the traditional and folk claims very little efforts have been made by researchers to explore the therapeutic potential of this plant leaves and there is need to explore its uses very thoroughly.

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