

## Ash value and extractive value comparison between pet ether and ethanolic extracts of *Bacopa monnieri*, *Evolvulus alsinoides*, and *Tinospora cordifolia*

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### ABSTRACT

**Aim:** *Bacopa monnieri*, *Evolvulus alsinoides* and *Tinospora cordifolia* are the important ayurvedic medicine belonging to family Scrophulariaceae, Convolvulaceae and Menipermeaceae. These are the traditionally used medicine and possess important medicinal properties. The physicochemical standardization is very important for the valuable relevance of the plant parts in recent medicine system. **Methods:** Hence, the present study was undertaken to evaluate ash value and extractive value comparison between pet ether and ethanolic extracts of *Bacopa monnieri* (BME), *Evolvulus alsinoides* (EAE), and *Tinospora cordifolia* (TCE). **Results:** Physicochemical standardization showed the presence of ash value and extractive value in Pet ether and Ethanolic extracts of BME, EAE, and TCE. In present investigation, when comparison between Pet ether and Ethanolic extracts of BME, EAE, and TCE; Ethanolic extracts of these plants showed more ash value and extractive value as compared to Pet ether extracts of these plants.

**KEY WORDS:** Ash value and extractive value comparison, *Bacopa monnieri*, *Evolvulus alsinoides*, *Tinospora cordifolia*

### INTRODUCTION

Indian Ayurvedic Pharmacopoeia recorded more than 300 medicinal floras that are in general use in native system of remedy. It has been pragmatic that there is an extensive dissimilarity and disparity in clinical consequences obtained by the use of crude drugs obtained from different geographical regions.<sup>[1]</sup> The acquaintance of chemical compounds presents in a plant helps the scientists to be aware of the mode of action of drug.<sup>[2]</sup> Medicinal plants are the vital natural resource of life-saving drugs. Secondary metabolites of plants possess natural properties such as antioxidant, antiapoptosis, antiaging, anticarcinogen, anti-inflammatory, antiatherosclerosis, cardiovascular protection, inhibition of angiogenesis, and cell proliferation action.<sup>[3-7]</sup> Herbal medicines are shows potential alternative over contemporary synthetic drugs. They prove minimum or no side effects and are considered to be safe. Commonly herbal formulations involve the use of fresh or dried plant parts.<sup>[8]</sup>

According to the World Health Organization, more than 80% of the world's population relies on conventional medicines for their most imperative healthcare requirements.<sup>[9]</sup> Along with the 120 active compounds currently isolated from the higher flora are comprehensively used in modern therapy, at present, 80% illustrate an optimistic association between their modern curative use and the conventional use of the flora from which they are derived.<sup>[10]</sup> Standardization is a system to make sure that each packet of medication that is sold has the correct amount and will induce its therapeutic effect.<sup>[11]</sup> Determination of extractive values, ash residues, and active components (saponin, alkaloids, and essential oil content) plays a significant role for standardization of the indigenous crude drugs.<sup>[12]</sup>

The plant possesses important medicinal properties but most of the advantages are still limited to tribal areas because of raw awareness and lack of proper scientific standardization. For the valuable relevance of the plant parts in recent medicine and physicochemical standardization is very important.<sup>[13]</sup> Hence, the present study was undertaken to evaluate ash value and extractive value comparison between pet ether and ethanolic extracts of *Bacopa monnieri*

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**Table 1: Ash value and extractive value of pet ether and ethanolic extracts of BME**

Name of test	Pet ether (%)	Ethanolic (%)
Water-soluble ash	7.71	11.28
Acid-insoluble ash	1.76	5.13
Water-soluble extractive value	15.47	18.31
Alcohol-soluble extractive value	6.03	8.82

BME: Ethanolic extracts of *Bacopa monnieri***Table 2: Ash value and extractive value of pet ether and ethanolic extracts of EAE**

Name of test	Pet ether (%)	Ethanolic (%)
Water-soluble ash	7.16	13.44
Acid-insoluble ash	3.11	6.93
Water-soluble extractive value	11.72	14.19
Alcohol-soluble extractive value	5.81	7.62

EAE: Ethanolic extracts of *Evolvulus alsinoides***Table 3: Ash value and extractive value of pet ether and ethanolic extracts of TCE**

Name of test	Pet ether (%)	Ethanolic (%)
Water-soluble ash	4.93	9.64
Acid-insoluble ash	0.87	2.58
Water-soluble extractive value	10.48	15.02
Alcohol-soluble extractive value	3.24	5.86

TCE: Ethanolic extracts of *Tinospora cordifolia*

(BME), *Evolvulus alsinoides* (EAE), and *Tinospora cordifolia* (TCE).

## METHODS

### Selection, Collection, and Authentication of Plants

Plants were selected on the basis of the literature survey, information collected from standard books and also from traditional medicine system practitioners. Plants were collected from the hills of Solan region of Himachal Pradesh, India. These plants were authenticated in the Department of Forestry Dr. Y.S. Parmar University, Solan, Himachal Pradesh, India. The samples of plants were linked to UHF-Herbarium with field book number 12547, 12548, and 12549 for *Bacopa monnieri*, *Evolvulus alsinoides*, and *Tinospora cordifolia*, respectively.

### Extraction and Preparation of Combinations

The plants materials were processed and dried in shade. Dried plant materials were crushed and were extracted with ethanol using Soxhlet apparatus after defatting with pet ether (40:60). Ethanolic extracts were dried at 40°C using rotary vacuum evaporator and kept in airtight container till any further use.

## Physicochemical Evaluation

Physicochemical testing was performed to identify the presence of ash value and extractive value.

### Determination of Ash Value

#### Water-soluble ash

Boiled the total ash for 5 min with 25 ml of water, collected the soluble matter in a crucible, ignited, and weighed. We calculated the percentage of water-soluble ash with reference to air-dried drug as follows.

$$\% \text{ Water soluble ash value} = \frac{\text{Wt. of total ash} - \text{Wt. of water insoluble ash}}{\text{Wt. of crude drug taken}} \times 100$$

#### Acid-insoluble ash

Is residue obtained after boiling the total ash with dilute hydrochloric acid, and igniting the remaining insoluble matter. Boiled the ash for 5–10 min with 25 ml of dilute hydrochloric acid, collected the insoluble matter in a crucible or on an ashless filter paper, ignited, and weighed. Now, we calculated the percentage yield of acid insoluble ash with reference to the air-dried drug as follows.<sup>[14]</sup>

$$\% \text{ Acid insoluble ash value} = \frac{\text{Wt. of acid insoluble ash}}{\text{Wt. of crude drug taken}} \times 100$$

### Determination of extractive value

#### Water-soluble extractive value

About 1 g of air-dried drug, coarsely powdered was macerated with 100 ml of distilled water in a closed flask for 24 h shaking frequently. Solution was filtered and 25 ml of filtrated was evaporated in a tarred flat bottom shallow dish, further dried at 100°C and weighted. The percentage of water-soluble extractive was calculated with reference to the air-dried drugs.<sup>[15]</sup>

#### Alcohol-soluble extractive value

Macerated 5 g accurately weighed coarse powdered drug with 100 ml of alcohol (90% v/v) in a stoppered flask for 24 h, shaking frequently during first 6 h. Filtered rapidly through filter paper taking precaution against excessive loss of alcohol. Evaporated 25 ml of alcoholic extract to dryness in a tarred dish and weighed it. We calculated the percentage w/w of alcohol-soluble extractive with reference to the air-dried drug using following formula as follows.<sup>[14]</sup>

$$\% \text{ Alcohol-soluble extractive value} = \times 4 \text{ (Wt. of residue)}$$

## RESULT

### Ash value and extractive value evaluation of *Bacopa monnieri*

On the basis of Table 1, comparison between pet ether and Ethanolic extracts of BME; Ethanolic extract showed more ash value and extractive value as compared to pet ether extract.

### Ash value and extractive value evaluation of *Evolvulus alsinoides*

On the basis of Table 2, comparison between pet ether and ethanolic extracts of EAE; ethanolic extract showed more ash value and extractive value as compared to pet ether extract.

### Ash Value and extractive value evaluation of *Tinospora cordifolia*

On the basis of Table 3, comparison between pet ether and ethanolic extracts of TCE; ethanolic extract showed more ash value and extractive value as compared to pet ether extract.

## DISCUSSION AND CONCLUSION

In the present study, it was observed that the pet ether and ethanolic BME, EAE, and TCE showed the presence of ash value and extractive value [Tables 1-3]. When comparison between pet ether and ethanolic BME, EAE, and TCE, ethanolic extracts of these plants showed more ash value and extractive value as compared to pet ether extracts of these plants [Tables 1-3].

From present investigation, it can be concluded that ash value and extractive value comparison is subsequently significant and that may lead to their quantitative evaluation of compounds.

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