A Comparative Study on Moisture Content of Selected Euphorbiaceae Plants and Its Pharmaceutical Significance in Mother Tincture Preparation

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Abstract

Moisture content estimation plays a central role in the preparation and standardization of homoeopathic mother tinctures [1]. This study investigates three Euphorbiaceae plants— Cnidoscolus aconitifolius, Euphorbia hirta, and Acalypha indica—using the gravimetric method [2]. Results were correlated with menstrum calculations to demonstrate how inherent plant moisture alters extraction efficiency and drug strength. The findings emphasize moisture analysis as an essential pharmaceutical parameter for accurate homoeopathic drug standardization [3].

Keywords : Moisture content, Euphorbiaceae family, Mother tincture, Drug standardization.

Introduction

The Euphorbiaceae family contains more than 7,500 species with diverse medicinal applications [4]. In homoeopathic pharmacy, mother tinctures are prepared using fresh plant materials whose inherent moisture can significantly alter alcohol concentration, extraction efficiency, and stability [1]. Accurate moisture determination ensures compliance with pharmacopoeial requirements for drug strength [2].

Botanical and Pharmacognostic Overview

Cnidoscolus aconitifolius

Cnidoscolus aconitifolius is known for its high nutritive and medicinal properties, including antioxidants, vitamins, and minerals [5]. It is traditionally used for diabetes, inflammation, and renal disorders.

Fig 1:*Cnidoscolus aconitifolicus*.

Euphorbia hirta

Euphorbia hirta is an important ethnomedicinal plant widely used for asthma, bronchitis, diarrhea, and microbial infections [6]. Its latex contains flavonoids and phenolics contributing to its therapeutic value.

Fig 1:*Euphorbia hirta*.

Acalypha indica

Acalypha indica contains alkaloids, flavonoids, and glycosides with expectorant, antimicrobial, and dermatological applications [7]. It is widely used in traditional and homoeopathic systems.

Fig 1:*Acalypha indica*.

Materials and Methods

Materials used

1. Cnidoscolus aconitifolius
2. Euphorbia hirta
3. Acalypha indica

Part Used:

Fresh Leaves of Cnidoscolus aconitifolius

Whole plant of Acalypha indica

Whole plant of Euphorbia hirta

Gravimetric Method (Loss on Drying)

The gravimetric method is recommended by WHO for moisture content determination in medicinal plant materials [2]. It involves controlled heating to remove moisture without degrading active phytochemicals [4].

Gravimetric (Loss on Drying) Method

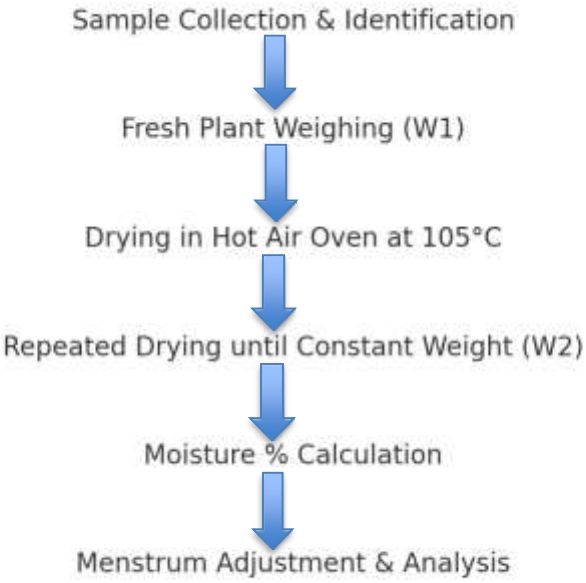
Fresh sample weighed (W1)

Dried at 105°C till constant weight (W2)

Moisture (%) = ((W1 - W2) / W1) × 100

Equipment: Hot air oven, crucible dish, weighing balance

Experimental Procedure Flowchart



Results

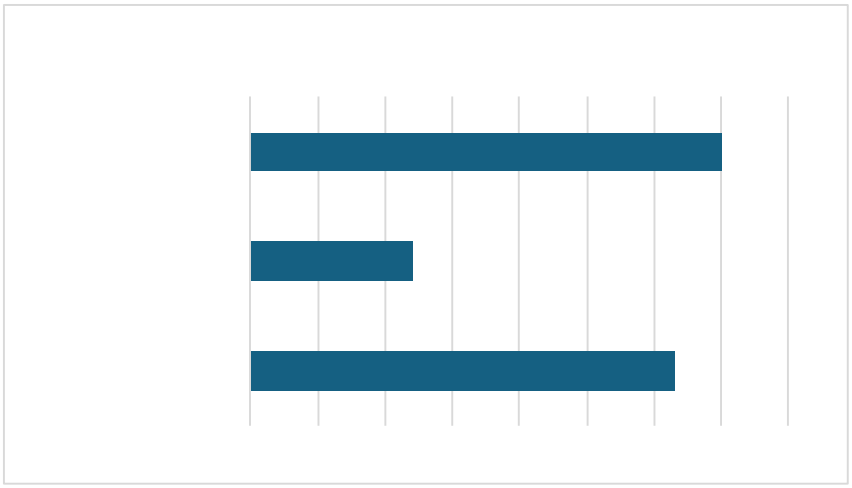


Table 1

PLANT NAME	FAMILY	PARTS USED	MOISTURE CONTENT (%
Cnidoscolus aconitifolius	Euphorbiaceae	Leaf	81.3%
Euphorbia hirta	Euphorbiaceae	Whole plant	77.4%
Acalypha indica	Euphorbiaceae	Whole plant	82%

Table 2

Discussion

Moisture content exhibits a crucial influence on mother tincture preparation [1]. Highmoisture plants such as Cnidoscolus aconitifolius (82%) necessitate greater adjustment of menstrum strength to ensure accurate drug extraction [2]. Variations observed between the study values and pharmacopoeial standards highlight the importance of species-specific moisture determination [3]. Accurate moisture calculation prevents microbial growth, fermentation, and deviation in alcohol concentration.

The Problem: If we use 100g of fresh plant, we are not using 100g of dry plant matter. A large portion is water.

The Moisture Content Helps to tells us the exact amount of Dry Plant Material (Drug) and Inherent Plant Water in a given mass of fresh herb.

This data allows us to calculate the required amount and strength of ethanol to ensure the final menstrum, after absorbing the plant's water, reaches the exact, desired concentration.

Acalypha Indica –HPI Volume I

Mother Tincture φ -Drug strength 1/10

moist magma containing solids 100 g and plant moisture 300 ml - 400 g
Purified Water - 100 ml

Strong Alcohol - 635 ml to make one thousand millilitres of the Mother Tincture.

Moisture content =(300/400)*100

=75%

From this study,

Moisture content of Acalypha indica -82% Difference in moisture content -7%

moist magma containing solids 100 g and plant moisture 300 ml - 400 g
Purified Water - 93 ml (100-7)

7% of 100ml =(7/100) *100

=7ml

Strong Alcohol - 635 ml to make one thousand millilitres of the Mother Tincture.

Conclusion

Moisture analysis is indispensable in homoeopathic pharmacy for maintaining accurate drug strength, extraction efficiency, and pharmacopoeial compliance [1]. This study confirms that Euphorbiaceae plants possess high moisture levels that require precise menstrum corrections. Incorporating moisture estimation as a routine procedure enhances the reliability of mother tincture preparation [2].

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