



COMPARATIVE STUDY OF CUCURBITACEAE MEDICINAL PLANTS FOR PHYSICOCHEMICAL PARAMETERS

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ABSTRACT:

Modern research tool for evaluation of plant drugs are available today but physicochemical method is the one simplest and reasonable method for the assessment of quality and purity of crude plant materials. With the aim of drawing the physicochemical parameters of Cucurbitaceae family, the present study deals with leaves of all the selected *Coccinia indica*, *Momordica dioica*, *Praecitrullus fistulosus*, *Trichosanthes dioica* medicinal plants. The Obtained information will be used for further help in identifying the crude drug as potent therapeutic agents and assist in standardization for excellence and clarity.

Keywords: Physicochemical, Ash, Cucurbitaceae, Leaves

1. INTRODUCTION

Cucurbitaceae family is major source of medicinal agents since ancient time. Various plant parts including leaves and fruits of this family have been established for their pharmacological potential. The family Cucurbitaceae is an interesting and an unusual family of dicotyledons. It is a medium sized family consisting of about 120 genera and more than 800 species distributed predominantly in the tropical and subtropical regions of the new and old world [1]. Cucurbitaceae plants are of high economic value being a major source of food for man [2]. In the series of Cucurbitaceae plants, *Coccinia indica*, *Momordica dioica*, *Praecitrullus fistulosus*, *Trichosanthes dioica* are most of the excellent plants, gifted by the nature having composition of all the essential constituents that are required for normal and good human health. *Coccinia indica* is perennial, scandent or prostrate plant which is commonly known as Kundru. *Momordica dioica* is a cucurbitaceous popular summer vegetable. The Plant is commonly known as Kakora in Gwalior Chambal Division of M.P. *Praecitrullus fistulosus*, also known as Tinda is a famous vegetable of South Asia, known as apple gourd, Indian baby pumpkin and Indian round gourd. *Trichosanthes dioica* is cultivated extensively throughout the warmer parts of India,

extending to Assam and E. Bengal to warmer parts of India. It is commonly known as Parwal in different areas.

Physicochemical evaluation of medicinal plants is a simple and reliable tool, by which complete information of the crude drug can be obtained. Sophisticated modern research tools for evaluation of the plant drugs are available today but physicochemical evaluation is one of the simplest and cheapest methods for establishing the correct identity of the source materials. Correct knowledge of crude drugs is very important aspect in preparation, safety and efficacy of the herbal product. Now-a-days medicinal plants have renowned medicinal significance and their usages are increasing day by day in routine life [3-5]. Different researches are going on to explore the beneficial, pharmacological and medicinal properties of herbal drugs. Hence, in this work an attempt was made for physicochemical evaluation of different cucurbitaceae medicinal plants.

2 MATERIALS AND METHODS

2.1 Preparation of plant drugs

Collected leaves of all the plants were identified by expert botanist. The leaves of *Coccinia indica*, *Momordica dioica*, *Praecitrullus fistulosus* and *Trichosanthes dioica* were shade dried and

converted into moderately coarse powder separately. Powdered drugs of all the plants were stored for further experimentation work.

2.2 Evaluation of Physicochemical parameters

Physicochemical parameters such as percentage of total ash, acid insoluble ash, water soluble ash and sulphated ash were calculated based upon standard procedures [6-9].

2.2.1 Determination of total ash

About 2 gm accurately weighed powdered drug was incinerated in a silica dish at a temperature not exceeding 450° C until free from carbon. It was then cooled and weighed. The percentage w/w of ash with reference to the air-dried drug was calculated.

2.2.2 Determination of acid insoluble ash

Ash is boiled with 25 ml dilute HCL (6N) for five minutes. The insoluble matter collected on an ash less filter paper, washed with hot water and ignited at a temperature not exceeding 450°C to a constant weight.

2.2.3 Determination of water-soluble ash

Ash is dissolved in distilled water and the insoluble part collected on an ash less filter paper and ignited at 450°C to constant weight. By subtracting the weight of insoluble part from that of the ash, the weight of soluble part of ash is obtained. Percentage of water soluble ash was calculated with reference to the air dried drug.

2.2.4 Determination of sulphated ash

2g of powdered samples are taken in crucibles and ignited at 450°C in a muffle furnace until the material gets thoroughly charred. The crucibles along with ash are taken out in desiccators and cooled. 1ml H₂SO₄ is added to each crucible in order to moisten the residue. Heat gently until white fumes was no longer evolved and ignites at 800°C until black particles were disappeared. The crucibles are removed from the muffle furnace and transferred to desiccators, cooled and weighed to give the sulphated ash content.

2.2.5 Determination of moisture content

Place about 5 to 10 gm of powder accurately weighed in a tared evaporating dish. Place the loaded bottle in the drying chamber. Dry the test

specimen at 105°C for 3 hours, and weigh. Continue the drying and weighing at half an hour interval until difference between two successive weighing corresponds to not more than 0.25 per cent.

2.2.6 Determination of foreign matter

The 50 gm drug sample was spread in a thin layer, and the pieces of foreign matter were sorted out by visual examination. The powder of foreign matter was sifted through a 250-micron sieve. All portions of the foreign matter were pooled and weighed.

3. RESULTS AND DISCUSSION

3.1 Determination of total ash

The total ash in terms of powdered drug *Coccinia indica*, *Momordica dioica*, *Pracecitrullus fistulosus* and *Trichosanthes dioica* was found 10%, 7.25%, 9.40% and 8.50% respectively. Low total ash implies the crude plant has low inorganic components. The findings were shown in fig 1.

3.2 Determination of acid insoluble ash

Acid insoluble ash with respect to powdered drug of *Coccinia indica*, *Momordica dioica*, *Pracecitrullus fistulosus* and *Trichosanthes dioica* was found 1.80%, 2.10%, 1.50% and 1.50% respectively. Acid insoluble ash values give an idea about the presence of Silica and Oxalates in drugs. The findings were shown in fig 2.

3.3 Determination of water-soluble ash

Water-soluble ash in terms of powdered drug of *Coccinia indica*, *Momordica dioica*, *Pracecitrullus fistulosus* and *Trichosanthes dioica* was found 4.10%, 3.80%, 3.0% and 4.4% respectively. Water-soluble ash is used to determine the amount of inorganic compounds present in herbal drugs or medicinal plants. The findings were shown in fig 3.

3.4 Determination of sulphated ash

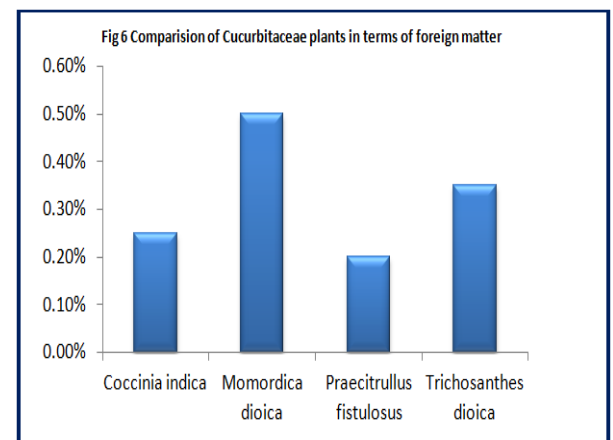
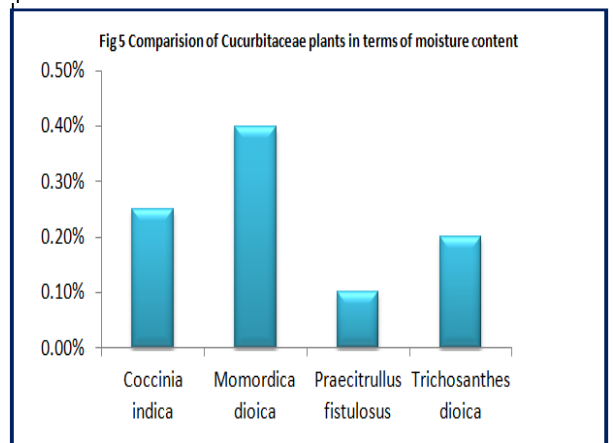
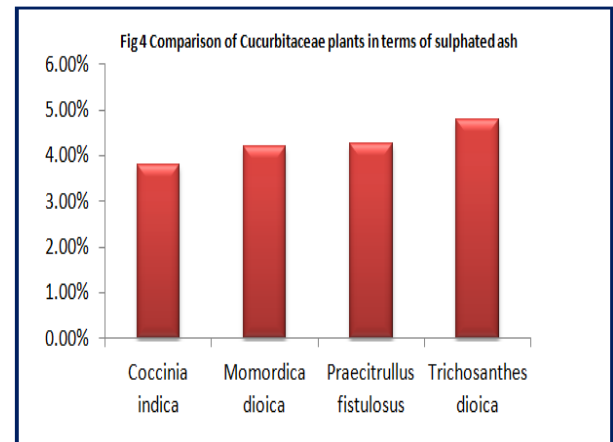
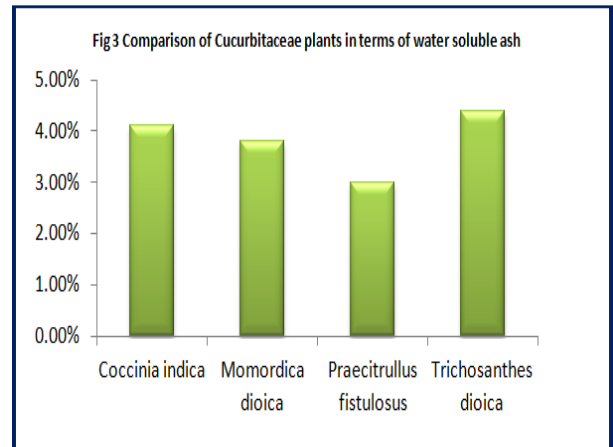
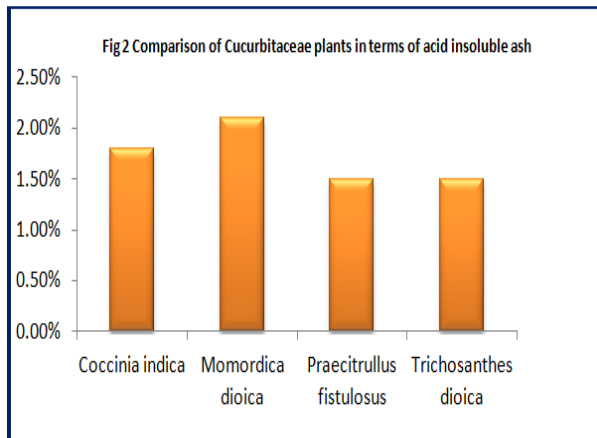
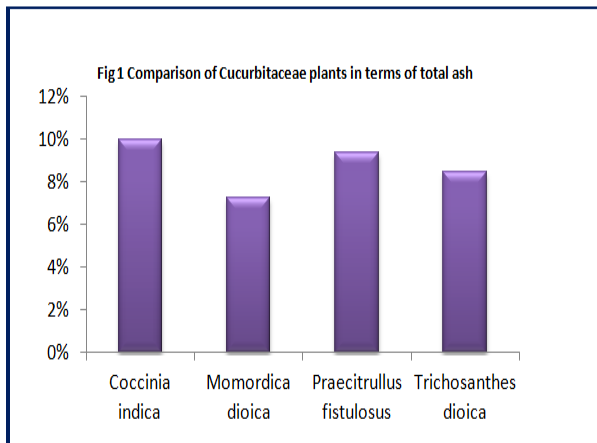
Sulphated ash with respect to powdered drug of *Coccinia indica*, *Momordica dioica*, *Pracecitrullus fistulosus* and *Trichosanthes dioica* was found 3.80%, 4.20%, 4.25% and 4.80% respectively. Sulphated ash measures the amount of non-volatile impurities present in organic substance. The findings were shown in fig 4.

3.5 Determination of moisture content

Moisture content in terms of powdered drug of *Coccinia indica*, *Momordica dioica*, *Praceitrullus fistulosus* and *Trichosanthes dioica* was found 0.25%, 0.40%, 0.10% and 0.20% respectively. Determination of moisture content indicates the medicinal use of the drug. Low moisture content is always desirable for higher stability of drugs. The higher or lower percentage of moisture indicates the existence of wet or dry climate which may favour the growth of microorganisms and in turn will result in deterioration of the crude drug. The findings were shown in fig 5.

3.6 Determination of foreign matter

Foreign matter in terms of powdered drug of *Coccinia indica*, *Momordica dioica*, *Praceitrullus fistulosus* and *Trichosanthes dioica* was found 0.25%, 0.50%, 0.20% and 0.35% respectively. Determination of foreign matter indicates the quality of the herbal preparations. Foreign matter should not be more than 2% as per standards. The findings were shown in fig 6.



4. CONCLUSION

Authenticity, purity and assay are important attributes for assuring the quality and standardization of herbal drugs. The present study may be useful to supplement information in respect to its identification, authentication and standardization of herbal drugs. In other words, the physicochemical features examined in the present study may serve as tool for identification of the plant for validation of the raw material and for standardization of its formulations at herbal industrial level in the coming days [10]. Today sophisticated modern research tools for evaluation of the plant drugs are available but physicochemical method is still one of the simplest and cheapest methods to start for establishing the correct identity of the source materials. Hence, physicochemical evaluation of different cucurbitaceae medicinal plants will help in identifying the crude drug as potent therapeutic agents.

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