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PRELIMINARY QUALITY CONTROL STUDIES OF *TRIUMFETTA RHOMBOIDEA* JACQ.

Pharmacognosy

Siddhi Satish Mhatre * *Corresponding Author

Dr. Willy Shah Assistant Professor

ABSTRACT

The present study shows the physiochemical process of medicinal plant – *Triumfetta rhomboidea* Jacq. The samples were collected from Saphale, Maharashtra region. The samples were washed, dried and were made free from foreign materials. The samples collected were finely ground and subjected to various physiochemical tests such as total ash value, water soluble ash, acid insoluble ash and loss on drying. Optimization of solvents were carried out for the plant sample. Methanol proved to be the best extracting solvent for the plant samples.

KEYWORDS

Triumfetta rhomboidea Jacq., physiochemical, Methanol

INTRODUCTION

Triumfetta rhomboidea L. (Tiliaceae) is an annual herb; distributed in India, Ceylon, Malaya, Africa and America. Various parts of this plant are therapeutically active. In Ayurvedic system of medicine, the roots are regarded as bitter, tonic, acrid, styptic, galactagogue, aphrodisiac, immunomodulator, cooling, diuretic. Both the fresh leaves and barks are used to treat dysentery, tumors, diarrhoea, wounds and intestinal ulcer. The leaves, fruits and flowers of this plant are astringent, mucilaginous and demulcent and are used in treating gonorrhoea, leprosy and to promote parturition[1]. The quality monitoring of efficacy and remuneration of herbal products is critically important. Quality is described as the condition of a medicine determined by its impurity, purity, content, and other chemical, physical, or biological aspects, as well as by the production methods involved[2]. Extraction and processing of herbal plants is carried out for its direct consumption as herbal or traditional medicine or for some experimental applications. The preparation of herbal medicines for experimental use entails the meticulous and timely collecting of the specimens, expert authentication, appropriate drying, and grinding. This is succeeded by the extraction and isolation of the bioactive component, when applicable. Furthermore, it entails the assessment of both the quantity and quality of bioactive substances. The extraction of herbal plants involves isolating active plant compounds including alkaloids, flavonoids, terpenes, saponins, steroids, and glycosides, from inert materials using a suitable solvent and established extraction methods[3].

MATERIALS AND METHODS:

The whole plant material was collected from Saphale, Maharashtra region. The sample was dried in shade and grounded to fine powder. The powder was sieved through 0.25 micro mesh sizes and stored in tight container. The plant powder was subjected to various physiochemical tests as follows:

Total Ash Value:

The total ash method is designed to measure the total amount of material remaining after ignition. 2g of plant powder was taken in silica dish. It was ignited for 1 hour in Bunsen burner and later ignited in muffle furnace for 1 hour till grey ash was formed. It was cooled in desiccator and weighed. The process was repeated till the difference between two successive weighing was less than 1mg.

Acid Insoluble Ash:

Acid insoluble ash is the residue obtained after extracting the total ash with dilute hydrochloric acid and igniting the remaining insoluble matter.

2g of plant powder was taken in silica dish. It was ignited in Bunsen burner for 1 hour and later ignition was completed in muffle furnace for 1 hour till grey ash was obtained. The grey ash was transferred to flask containing 25ml of 2M HCl. The mixture was boiled for 10 minutes and cooled. It was later filtered through ashless filter paper. The residue was washed with hot water. The residue with filter paper was transferred to pre-weighed silica crucible and ignited in muffle furnace for about 1 hour at 450^0C.

Water Soluble Ash:

Total ash content which is soluble in water is called water soluble ash. $25cm^3$ of distilled water was added in silica dish containing total ash and boiled for 10 minutes. The insoluble matter was collected on ashless filter paper. The residue was washed with hot water and ignited in crucible for 15 minutes in muffle furnace at a temperature below 450^0C. The water-soluble ash was calculated by subtracting the weight of this residue from the weight of the total ash.

Loss On Drying:

5g of plant powder was weighed in stoppered weighing bottle. The bottle was placed in oven for 2 hours. The bottle was removed, covered and placed in desiccator. The cooled bottle was later weighed. The above procedure was repeated till the difference between two successive weights was less than 2mg.

Optimisation Of Extractive Values For Various Solvents:

0.5g of plant powder was accurately weighed in five different stoppered conical flasks. In each flask 10ml of water, methanol, ethyl acetate, toluene and n-hexane were added respectively. The contents were mixed and allowed to stand for 1 hour. It was filtered through Whatmann filter paper no.41 in pre-weighed beakers. The solvents were evaporated to dryness and dried residue was weighed and percentage extractions were calculated.

Optimisation Of Volume Of Solvent:

0.5g of plant powder was added to six different stoppered bottles containing different volumes of methanol (25ml, 50ml, 100ml, 125ml,150ml) was taken. It was mixed for 5minutes and kept for 1 hour. The solvent was filtered through Whatmann filter paper no.41 in pre-weighed beakers separately and the solvent was evaporated to dryness. The dried residue was weighed and percentage extraction was calculated.

Optimisation Of Time:

The optimum time was found by using the optimised volume with single extraction and retaining the weight of 0.5gm plant powder. The flask contents were filtered at different times. The optimised time was chosen as the time after which the weight of the extract did not increase any more.

Optimisation Of Number Of Extractions

The optimised quantity of the chosen solvent was introduced to the sample in several glass stoppered conical flasks, which were allowed to rest for the designated duration and later filtered. The residues were subsequently placed in flasks and re-extracted using the optimised solvent and duration.

RESULTS AND DISCUSSIONS:

The results obtained for proximate analysis are as follows:

Table 1: Physiochemical parameters of *Triumfetta Rhomboidea* Jacq.

Sr.No.	Parameters	Value in %
1	Total Ash	7.01
2	Acid Insoluble Ash	0.46
3	Water Soluble Ash	4.24
4	Loss on drying	7.54

The results obtained for optimisation of extractants are as follows:

Table 2.1: Suitable Solvent for extraction of *Triumfetta Rhomboidea* Jacq.

Sr.No.	Solvents	Weight of powder(g)	Extractive Values %
1	Water	0.5	12.25
2	Methanol	0.5	6.71
3	Ethyl acetate	0.5	4.25
4	Toluene	0.5	1.33
5	n-hexane	0.5	0.18

Table 2.2: Optimisation of Volume of Solvent for *Triumfetta Rhomboidea* Jacq.

Sr.No.	Volume (ml)	Weight of powder(g)	Extractive Values %
1	25	0.5	8.25
2	50	0.5	10.64
3	75	0.5	12.12
4	100	0.5	13.98
5	125	0.5	15.20
6	150	0.5	16.02

Table 2.3: Optimisation of Time for *Triumfetta Rhomboidea* Jacq.

Sr.No.	Time	Weight of powder(g)	Extractive Values %
1	30	8.32	8.32
2	60	9.88	9.88
3	90	11.03	11.03
4	120	13.23	13.23
5	150	14.12	14.12

Table 2.4: Optimisation of Number of extractions for *Triumfetta Rhomboidea* Jacq.

Sr.No.	Number of extractions	Weight of powder(g)	Extractive Values %
1	1	0.5	13.01
2	2	0.5	14.21
3	3	0.5	15.53
4	4	0.5	16.06
5	5	0.5	16.52

CONCLUSION:

Standardization of plants for various herbal development has become a necessity in current research area. The study carried out in this work provides a preliminary standardization process for both the plants i.e., *Triumfetta Rhomboidea and Eranthemum Roseum*. The physiochemical parameters such as total ash value, acid insoluble ash, water soluble ash and loss of drying were carried out. Solvent optimization was carried out using Water, Methanol, Ethyl acetate, Toluene and n-hexane as extracting solvents. Methanol showed good extracting results compared to other volatile organic solvents.

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