



## DRYING METHOD AND EXTRACTION VARIES THE ANTIOXIDANT ACTIVITY OF TRIBULUS

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### ABSTRACT

An significant stage in the manufacture of drugs for the extraction of chemical leads and the purity of raw drugs is the extraction process. Herbs are the origins of chemical components responsible for the complex functions of ownership, such as antioxidant function, etc. Extraction is a crucial step in the preservation of the raw drug's consistency and is of multiple forms. Both have their own benefits and drawbacks with regard to the efficiency of the extraction and the quantity of solvent used. Tribulus terrestris is a medicinal plant in South India, known to have many chemical components. A significant number of flavonoids are considered to be responsible for antioxidant activity. Plant aerial parts have been useful in handling many diseases, and chemical elements are known to be effective in other cases. Tribulus terrestris aerial parts have been extracted using ethanol and chloroform and three extraction methods. Ultrasound extraction was the best method of extraction and the best solvent for the extraction of flavonoids was found to be ethanol.

**Keywords:** Tribulus Terrestris , Phenols, Flavonoids, Extraction Method.

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### INTRODUCTION

An significant stage in the manufacture of drugs for the extraction of chemical leads and the purity of raw drugs is the extraction process. Herbs are the origins of chemical components responsible for the complex functions of ownership, such as antioxidant function, etc. Extraction is a key step in maintaining the consistency of the raw drug and is of different types. Both of them has its own advantages and disadvantages with respect to the consistency of the extraction and the amount of solvent used. The determination of the type of extraction process necessary for the extraction of the defined type of material is therefore of the utmost importance. [1]. Variations in the chemical constituents occur when the method of production is selected through variation or modification. Drugs are rough and fragile, delicate and tender such that,

depending on the type of drug, a particular type of extraction is required. There is also an important need to identify and develop protocols for the proper handling of medications after the medication is extracted. This finally establishes the purity of the raw material on the basis of the chemical constituents derived from the substance. [2]. There are few other steps in the manufacture of drugs, and one of the most important of these is the exploration of the best solvent for extraction. Rational solvents, such as diesel, methanol, chloroform, chloroform, distilled ethanol, ethyl acetate, etc., must be selected from the various solvents available for extraction in order to achieve the best yield of the chemical constituents [3]. The choice of the solvent is to be determined on the basis of the polarity and solubility of the chemical components of that particular solvent.

*Tribulus terrestris* is a medicinal plant in South India, considered to have many chemical constituents. It is believed to contain an immense amount of flavonoids responsible for antioxidant action [4,5,6]. The presence of different chemical elements isolated from the plant confirms the presence of flavonoids and other chemicals responsible for the pharmacological activities of the plant [7,8]. The key emphasis of this investigation was therefore

on the selection of the extraction procedure and the correct solvent for extraction and to examine the impact of the shift in the extraction solvent and the extraction process on the plant's antioxidant capacity.

## METHODOLOGY

### Plant parts

The aerial pieces of the *Tribulus terrestris* plant have been harvested and authenticated from the nearby farmland. The aerial sections were properly dried and powdered under shaded conditions. They were ground and sieved to manufacture fine powder and prepared for future use.

### Extraction of materials

Three extraction methods were selected for the study and two solvents based on the higher and lower polarity were selected (Chloroform and Ethanol). The powder was measured at 5gm. It was wrapped in filter paper and put in a soxhlet device. This was set up for 8 hours using all solvents in separate configurations. Upon completion of the process, the extracts were collected and filtered through the filter paper and condensed using a rotary vacuum evaporator. The next extract was a thick paste.

### Ultra sound assisted extraction

The aerial components of the plant were measured at about 5 gm and separated using ultra-sound devices. Ultrasound variables are set to the standard[9]. The temperature for extraction in the bath was continuously kept at 40°C with a pressure of 70 per cent and a frequency of 40 KHz. The computer was allowed to run for about 30 minutes. The resultant extract was then washed out and evaporated, resulting in a thick paste.

### Microwave assisted extraction

The extraction was powdered via the microwave in this process and the use of different solvents remained unchanged. The 5gm of powder beakers and the two solvents were then placed in the microwave. Variables have been optimized for microwave efficiency. The electricity is held at 400W and the temperature has been set at 40°C and the extraction process has been carried out for about 30 minutes [10]. The extracts that resulted were

purified and then evaporated to dryness. Dry extracts were then collected and used to determine the quality of phenols and flavonoids [11] and the ability of antioxidants.

### Antioxidant activity invitro

Using hydrogen peroxide free radical scavenging activity [12], the in vitro antioxidant role of the extract was calculated. The dilutions were formulated using serial dilutions of extracts at usual concentrations, and the resulting solutions were then allowed to react with hydrogen peroxide. To test the absorbance at 230nm under UV spectroscopy, this reaction mixture was used. The percentage of H<sub>2</sub>O<sub>2</sub> scavenging activity was measured using Absorption[13].

## RESULTS

Using different extraction solvents and multiple extraction methods, field aerial parts were dried and extracted. The values of the investigations are given by the tabulated results. Table 1 displays the LOD for the aerial parts. Table 2 indicates the percent yield of the corresponding solvents and methods of extraction. The Ultra sound-assisted extraction system yielded more than the other two methods when it came to the extraction process, followed by microwave-assisted extraction. While Soxhlation is an efficient extraction process, it has yielded less than the other two techniques. Using the folin ciocaltus reagent process, the polyphenols and flavonoids contained in the extracts were examined. In contrast to the chloroform extract, ethanol extracts gave a higher yield. This may be because of the solubility in the solvents of phenols and flavonoids. Ultrasound extraction gave greater yields when compared to extraction methods and was tabulated. Using the hydrogen peroxide process, the antioxidant activity of the extracts was determined and the results were interesting and similar to the percentage yields of the extraction method and the extraction solvent. In ultrasound extraction, ethanol extract showed a greater yield, accompanied by microwave-assisted extraction. In all solvents, complete ultrasound extraction resulted in better activity, and ethanol extract achieved the best results in all three extraction methods.

**Table 1. % yield, TPC and TFC content of extract of Tribulus**

Sl.no	Extract	% yield	TPC	TFC
1	Ultrasound-Ethanol	26.23	199.42±9.34	97.12±7.52
2	Microwave-Ethanol	23.12	151.86±10.73	78.57±4.41
3	Soxhlet-Ethanol	19.34	107.53±7.06	50.72±8.58
4	Ultrasound-Chloroform	27.81	174.78±11.5	92.43±5.74
5	Microwave-Chloroform	22.95	103.61±8.49	57.51±6.83
6	Soxhlet-Chloroform	18.79	69.11±78.32	43.94±7.14

**Table 2. Antioxidant activity of various extracts of Tribulus**

Sl.no	Variables	Concentration of extract ( $\mu\text{g/ml}$ )				
		20	40	60	80	100
1	Ultrasound-Ethanol	43.24 $\pm$ 0.82	54.12 $\pm$ 2.03	77.43 $\pm$ 0.92	93.35 $\pm$ 0.98	102.50 $\pm$ 3.36
2	Microwave-Ethanol	40.53 $\pm$ 0.94	53.34 $\pm$ 4.41	72.6 $\pm$ 1.04	87.61 $\pm$ 1.07	95.7 $\pm$ 4.59
3	Soxhlet-Ethanol	31.47 $\pm$ 1.02	42.72 $\pm$ 0.63	63.84 $\pm$ 3.7	75.93 $\pm$ 6.43	80.15 $\pm$ 0.99
4	Ultrasound-Chloroform	41.12 $\pm$ 1.07	55.38 $\pm$ 5.52	73.05 $\pm$ 0.73	88.11 $\pm$ 0.82	96.73 $\pm$ 4.20
5	Microwave-Chloroform	27.39 $\pm$ 3.45	36.43 $\pm$ 0.95	54.71 $\pm$ 0.99	65.24 $\pm$ 3.35	72.96 $\pm$ 2.05
6	Soxhlet-Chloroform	25.78 $\pm$ 5.01	32.65 $\pm$ 0.84	40.23 $\pm$ 4.36	53.40 $\pm$ 0.74	64.48 $\pm$ 5.23
7	Ascorbic Acid	44.65 $\pm$ 4.36	56.8 $\pm$ 6.27	75.90 $\pm$ 4.14	89.52 $\pm$ 2.19	98.34 $\pm$ 0.98

**CONCLUSION**

In the treatment of many diseases, plant aerial parts have been successful, and chemical components in other cases are known to be effective. Using ethanol and

chloroform and three methods of extraction, *Tribulus terrestris* aerial parts were extracted. The best extraction process was ultrasound extraction and the best solvent for the extraction of flavonoids was found to be ethanol.

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