



TO STUDY SOLVENT SELECTION AND EXTRACTION METHOD FOR MEDICINAL PLANT

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ABSTRACT Medicinal Plant have a long history to use in developing human health & curing diseases. They provide unlimited components with complex chemical structure & they form many bioactivities in medicinal plant is naturally occurring, they attracts wide interest of researchers & identification of the active components. In medicinal plant firstly identification characterization etc. In this research using a model herb material, *Azadirachta indica* Studies chemical extractability of different solvents with various polarities, Several extraction methods were used & their extraction efficiencies were compared. The extraction methods used in process. This step identify many process including bioactive component identification, isolation, his research were Soxhelt extraction (SE), Accelerated solvent extraction (ASE). In this process chemical profile & yield of each extract & the throughout capability of different extraction methods are discussed.

KEYWORDS : Medicinal Plant, Soxhelt extraction, Accelerated extraction. Hexane DMSO, Water, Ethyl acetate.

INTRODUCTION:-

In this evidence based activity is the development of modern herbal products, they are herb preparation & extraction is the first step important, in bioactivity & chemical identification process. Also use the down stream process possible, including bioactive component identification, isolation & characterization. They are several extraction techniques used including steam distillation, solvent extraction, Soxhlet percolation, Ultrasound Assisted Extraction (UAE), Microwave Assisted Extraction (MAE) method¹⁻⁴.

Soxhelt extraction (SE) & accelerated solvent extraction (ASE) these are selected for comparison & sequential & parallel extraction techniques were used in this study.

Different solvent used in medicinal plant extraction need to be volatile & leaves no residue when dried. This type of solvent exchange & bioassay i.e. Solvent like (Hexane, Chloroform Methanol, processing & water & DMSO also selected due to their popularity.

MATERIALS & METHODS:-

Materials:- *Azadirachta indica* are obtained from India. Solvents used for extractions, including Hexane, Ethyl acetate, Methanol, DMSO & Water

ASE Extraction methods & procedure

In a "sequential extraction" technique, the residue of the previous extraction is used as the feed for the next extraction. The extraction temperature was 80°C for hexane, chloroform, & ethyl acetate, 95°C for Methanol, 100°C for DMSO / Methanol / Water, & 130°C for water. The operation pressure was also monitored.

For each extraction solvent step was a static extraction stage & a dynamic extraction stage the static extraction stage time is about 30 min. & the dynamic extraction time is also 30 min. at a flow rate.

Soxhlet Extraction

To powdered botanicals were extracted at a solvent to mass ratio of 1:1 (v/w). Both sequential & parallel techniques were used in the Soxhelt extraction. In SAE Process, an individual sample was directly extracted by soaking it overnight while stirring.

Yield Measurement

The extract solutions of hexane, chloroform, ethylacetate, & Methanol were vacuum dried with rotary evaporator. The final extract weight was measured in a pre weighed flask.

HPLC Analysis

Two different HPLC conditions were used to analyze the extract samples. The first condition used a Luna PFP column with a 0.4% phosphoric acid / acetonitrile gradient starting at 6/2.

Experimental results

These extraction methods were used in this study, including Soxhelt, ASE. The extracts were then dried by rotary evaporation. Extraction solvents were arranged in sequential or parallel scheme. The dry mass was measured & the extraction yield was calculated. The result were recorded in Table 1 In this study, Yield is defined as ratio of extract dry mass to raw material mass.

Table 1 Extraction yield of different techniques using different solvents. (mg extract / g raw material)

Solvents/ Technologies	Soxhlet - sequential	Soxhlet - parallel	SAE - parallel	ASE - sequential
Hexanes	4.26	20.5	11.5	16.2
Chloroform	14.22	31.5	19.5	8.9
Ethyl Acetate	2.85	32.6	15.5	3.6
Methonal	84.4	18.7	116.0	125.6
DEW (DMSO/ROH/Water)	-----	----	180.5	128.3
Water	-----	----	----	133.4

DISCUSSION & CONCLUSION

From the results, both yields extraction solvent are fairly close, in spite of extraction methods. Thus it can be concluded that the extraction techniques are not essential to the chemical extractability or the quality of the extract. The Solvents used in the process have more critical roles on the two extract qualities.

The selection of an extraction technique will be depending on operational requirements. These factors include, but not limited to, instrument cost, labor cost, operational cost, consumable cost. The extraction time is another factor that directly related to the method, which is a key consideration in certain laboratory practice.

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