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PHYSICO-CHEMICAL PROFILE OF AMMI MAJUS

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ABSTRACT: whole part and mother tincture of Ammi majus were chemically analyzed for setting the standards in Homoeopathic system of medicine. Extractive value, Ash value, TLC UV study and the absorbance spectra in the range of 200-500 nm can be taken as parameters to fix standards.

INTRODUCTION

A. majus L., commonly called as "Ladies Lace", is native of Nile Delta regions of Egypt. In India, it was introduced in forest research institute, Dehra Dun in 1955 (Bradu & Atal, 1970 and singh, 1963) for its medicinal and ornamental value. The plant is used for the treatment of leucoderma and psoriasis (Anup Kumar, 1988 and Hansen, 1979). It has been recommended as a diuretic, expectorant and useful in jaundice (Khan & Rahman, 1985 and Lal, 1977). The fruits are used in vitilago also in the formation of suntan lotions (Anonymous, 1986). The essential oil extracted from fruits (commonly called seeds) has high-boiling hydrocarbons 1.34%, dipiperitone 10% an unsaturated cyclic terpeniole 15% and a mixture of furocoumarins 60% (Ashraf et al., 1979). Fruits contain protein 13.8%, fat 12.9% and xanthosine (Anonymous, 1985)

Five constituents (xanthotoxin, imperatorin, isopimpinellin, bergapten and isoimperatorin) isolated from the seeds were studies on contact dermatitis. The isoimperatorin was the strongest photoirritant compound (saeed & Khan, 1994). The leaves contain furocoumarins fraction is composed of xanthotoxin and isopimpinellin (Anonymous, 1985). The presence of nonfurocoumarin, umbelliprenin, glycosides of quercetin, luteolin and also two artifacts 7-inopropylpsoralene and dihydro oroselone are reported (Anonymous, 1985). The other furocoumarins, isolated from the fruits are bergapten, marmesin, isopimpinellin ammirin and 8-isopropeny 1-8, 9-dihydroangelicin (Blazek & stary, 1966 and Eisenreichoa et al., 1980). Physico-chemical evaluation of this plant is not recorded in Homoeopathic system which is the main objective of the present study.

MATERIALS AND METHODS

The air dried (shade) whole plant of A. majus were supplied by survey of Medicinal plants & collection Unit (Homoeopathy), Udhagamandalam, Tamil Nadu. The dried material was mechanically powdered to obtain a coarse powder, which is then subjected to moisture content Loss on Drying at 105^{o}C), total ash content, water soluble ash and acid insoluble ash, extractive value in different solvent (varying polarity). Maximum extractive

value (MEV) using different strength of alcohol (in order to fix the alcohol content for preparation of mother tincture) and mother tincture was prepared as per procedure laid down in Homoeopathic pharmacopeia of India (1971) percolation technique was adopted, for TLC studies, 25ml of MT was taken and alcohol content was evaporated over a water bath and extracted with 25ml of CHCL3 three times. The concentrated chloroform extract was spotted on the silica gel-G (Activated) Plate (0.5 mm layer thickness) using chloroform: Ethanol (98.5 : 1.5v/v), as mobile phase. The 5% of methanolic KOH as detecting agent. UV absorption spectroscopy was carried out by MT diluting one part of MT with 99 part of menstruum (Hydro-alcoholic mixture in a specific ratio i.e 40%) and run into 200-500 nm (160 A Shimadzu).

STANDARDISATION OF CRUDE DRUG

Moisture content (Loss on drying at 105^{o}C) - 5.25% w/w
Total ash content of powdered drug - 7.00% w/w
Water soluble ash - 5.35% w/w
Acid insoluble ash - 0.86 % w/w

EXTRACTIVE VALUE IN DIFFERENT SOLVENTS

a) Acetone - 6.00% w/w

b) Absolute alcohol - 3.50% w/w

c) Chloroform - 1.75% w/w

d) Methanol - 7.85% w/w

e) Pet-ether (60-80o) - 1.20% w/w

f) Water - 17.35% w/w

DETERMAINATION OF MAXIMUM EXTRACTIVE VALUE

To determine the maximum extractive value (MEV) using different strength of alcohol (30% to absolute) and water, the maximum extraction was 35 – 40% of alcohol and the extractive value was 14.30-13.75% (Table-1)

FORMULATION OF MOTHER TINCTURE (PERCOLATION METHOD)

Source of drug - SMPCU (H) Ooty T.N.

Part Used - Whole plant

Moisture content at 105^{o}C - 5.27% w/w

Maximum extractive value - 35-40%

Drug strength - 1/10

PREPARATION OF MOTHER TINCTURE (MT)

A. majus in coarse powder -100g

Purified water - 600ml

Strong alcohol - 421ml

To make one thousand milliliters of mother tincture

PHYSICO-CHEMICAL STANDARDISATION OF MT

1) Organoleptic Properties

a) Appearance - Clear, non-viscous, transparent liquid

b) Colour - pale yellow

c) Odour - Characteristic

2) Sediments - absent

3) Specific gravity - 0.96

4) Total solids - 1.65 w/v

5) Alcohol content - 40% v/v

6) pH value - 7

THIN LAYER CHROMATOGRAPHY

Thin layer chromatography (TLC) of chloroform extract of MT was carried out on silica gel-'G' (activated) plates (0.5 mm. layer thickness) using chloroform: Ethanol (98.5: 1.5 v/v) and spots were developed by exposing the plate in 5% methanolic KOH solution revealing the presence of three spots. The Rf values are 0.10 (greenish), 0.15 (greenish) and 0.78 (brownish) respectively.

UV- VIIBLE SPECTROPHOTOMETRY

The alcoholic extract (MT) was prepared by diluting one part of MT with 99 parts of menstruum (specific ratio of alcohol and water) for UV studied. The absorption spectra was scanned in the range of 200-500 nm and two distinct peaks (max) at 240.0 nm and 209.0nm. Were observed.

RESULTS AND DISCUSSION

In India A. Majus and A. visnaga were introduced and cultivated for its medicinal value (Umrao singh et al., 1982). A. majus have been allotted for drug standardization programme at homoeopathic drug research institute, by central council for research in homoeopathy to lay down/fix standards in Homoeopathic system of medicine. The raw drug studies shows that the moisture content is 5.27% total ash content in powered drug 7.0% water soluble ash 5.35% and acid insoluble ash was 0.86%. The extractive value in different solvents like, acetone, alcohol chloroform, methanol, petroleum ether (60-80^{o}) and D water used in addition to analytical data for laying down the standard for this drug.

Formulation of MT has been done on the basis of maximum Extractive value (MEV) using various alcohol strength (Table No.1) and percolation method has been used for the preparation.

Physico- chemical standardization studies of MT has revealed that the specific gravity 0.96, total solids 1.65% w/v, alcohol content 40% v/v and pH value 7.0 approx. were observed.

It is evident from the TLC studied, that the chloroform extract of the MT shows three prominent spoots with Rf values 0.10 & 0.15 (greenish) and 0.78 (brownish) Diluted MT when scanned in UV-visible spectrum in the range 200-500 nm showing two distinct peaks (max) at 240.0 nm and 240.0 nm. (Fig 1).

The parameters studied in these formulation on A. majus can be taken as characteristic features of this drug in homeopathic system of medicine.

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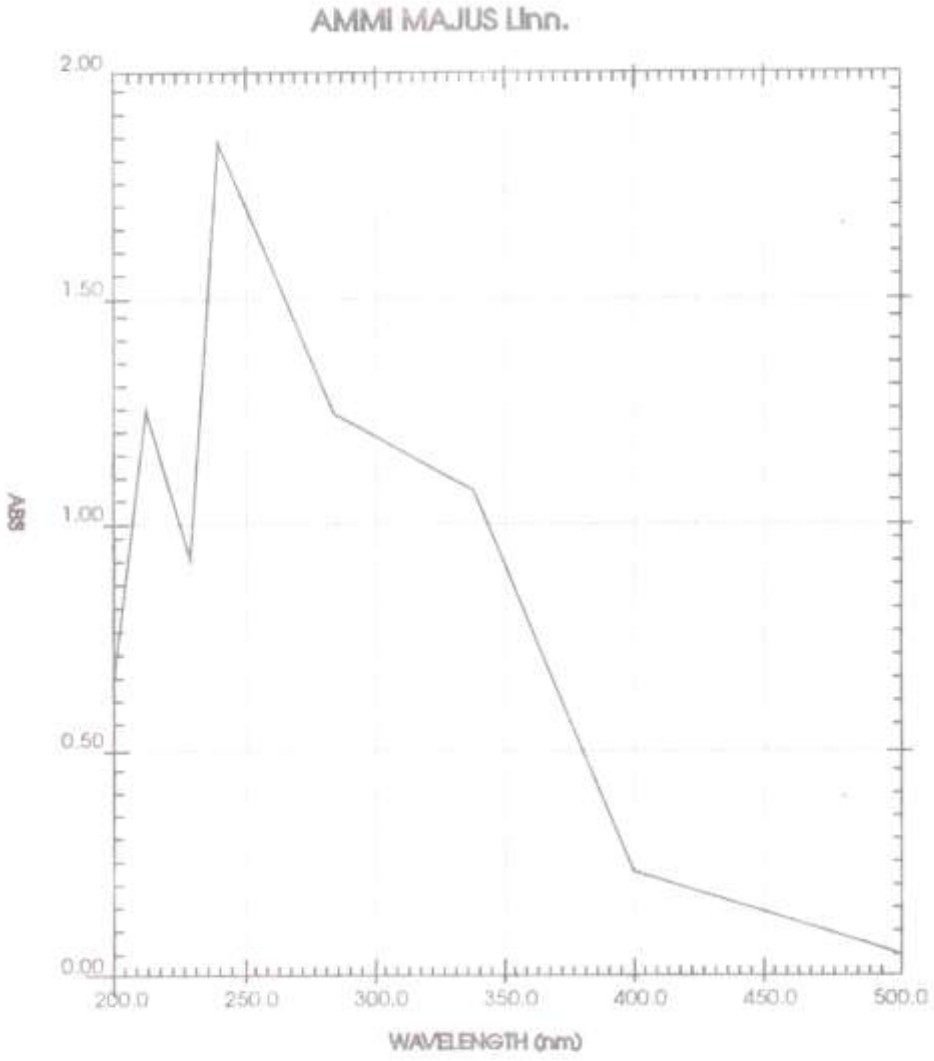

Peak - Pick

Peak No.	λ	ABS	Valley λ	ABS
1.	240.0	1.796	221.0	0.928
2.	209.0	1.239		

TABLE NO 1
DETERMINATION OF MEV USING DIFFERENT RATIO OF ALCOHOL AND WATER.

S.no.	Percentage of Alcohal mean	Extractive Value %(MEV)	Remarks
1.	30	13.50	35-40% of alcohol may be recommended for the preparation of mother tincture on the basis of Maximum Extractive Value (MEV)
2.	35	14.30	
3.	40	13.75	
4.	45	12.30	
5.	50	11.80	
6.	55	10.25	
7.	60	12.92	
8.	65	12.04	
9.	70	11.60	
10.	75	10.90	
11.	80	9.50	
12.	85	5.70	
13.	90	3.83	
14.	95	3.70	
15.	99.5	3.50	

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