

PHYSICO CHEMICAL CONSTANTS OF ALLIUM CEPA AND MEDICAGO SATIVA MOTHER TINCTURES

D. Ramesh *

Introduction

Allium cepa (Red onion) belonging to family Liliaceae is used in coryza with acrid nasal discharge and laryngeal symptoms (1-3). Earlier studies reported isolation of peptides, saponins and flavonoids (5-8). *Medicago sativa* (alfalfa) belonging to family Leguminaceae is mainly used for disorders characterised by malnutrition (3). Earlier work is confined to isolation of glyceroglycolipids, saponins, glycosides, myrcene, limonene, linolol and sterols (9-14).

The present investigation is undertaken to lay down physico-chemical standards of mother tinctures of these drugs which hitherto are lacking in standard works. A comparative study of authentic drugs with commercial samples is made. Physical constants, colour reactions and thin layer chromatography (TLC) studies help in determining the authenticity of drugs.

Material and Method

The plant material was supplied by CCRH's Survey of Medicinal Plants & Collection Unit at Ooty (Tamil nadu). The mother tincture of *Allium cepa* is prepared from bulbs of red onion following Class III old method (4). The mother tincture as such is used for colour reactions and the residue of the chloroform extract of mother tincture after evaporation to dryness at room temperature was used for TLC studies.

Shade dried, powdered plant material of *Medicago sativa* is extracted with various solvents at room temperature. These extracts as such are used for colour reactions and the residues after evaporation are used for TLC studies. Mother tincture is used as such for

colour reactions and chloroform extract of mother tincture after evaporation to dryness at room temperature is used for TLC studies (15,16).

Results and Discussion

Physical constants like colour, specific gravity, pH, % total solids w/v, and % alcohol contents v/v, colour reactions and TLC profiles of mother tinctures of *Allium cepa* and *Medicago sativa*, apart from % extractive values, colour reactions and TLC profiles of raw drug *Medicago sativa* are presented below.

Table - 1a
Physical Standards of Authentic and Commercial Mother Tincture of Allium Cepa

Physical constants	DSU sample (authentic)	AC CS1*	AC CS2	AC CS3	AC CS4
Colour of Mother Tincture	Reddish yellow	Yellow	Reddish yellow	Pale yellow	Reddish yellow
Specific gravity	0.933	0.944	0.983	0.944	0.944
pH	5.5	5-6	5.5-6	5	5
% Total solids w/v	3.7	3.6	14.7	3.8	4.2
% Alcohol contents v/v	42	44	41	50	44

* Research Officer (Chemistry), Drug Standardisation Unit (H), Hyderabad (Andhra Pradesh)

* *Allium cepa* commercial sample.

Table - 1 b
Colour reactions of Authentic and Commercial Mother Tinctures of Allium Cepa

Reagent	DSU Sample (authentic)	AC CS1	AC CS2	AC CS3	AC CS4
10% FeCl ₃	No change	No change	No change	No change	No change
10% Iodine	"	"	"	"	"
50% NaOH	Turned yellow	Turned yellow	Turned yellow	Turned yellow	Turned yellow
Liebermann Burchard	+	+	+	+	+
Millons	-	-	-	-	-
Ninhydrin	-	-	-	-	-
Mayer's	-	-	-	-	-
Spot test	-	-	-	-	-
Foam test	+	+	+	+	+
Ammoniacal silver nitrate	Black ppt.	Black ppt.	Black ppt.	Black ppt.	Black ppt.

Table - 1 c
TLC Profiles of Chloroform Extract of authentic and Commercial Mother Tincture of Allium Cepa

Chloroform extract of mother tincture	No. of spots	Rf. values	Spraying reagent	Solvent system
DSU sample	7	0.09, 0.15, 0.22, 0.29, 0.35, 0.76 and 0.95	10% Ethanolic H ₂ SO ₄	Chloroform
AC CS1	7	"	"	"
AC CS2	7	"	"	"
AC CS3	7	"	"	"
AC CS4	7	"	"	"

Table - 2a

Physico-chemical Constants of Medicago sativa Raw Drug

% Loss of moisture at 110°C	:	18%
Ash value	:	0.4121 gms.
Acid insoluble ash	:	7%
Water soluble ash	:	13%

Table - 2b

% Extractive value (cold) colour and Nature of Extracts and Residue

Solvent	% Extractive value	Colour of extract	Colour & nature of residue
Petroleum ether (60-80°C)	0.9	Green	Creamish solid
Chloroform	1.2	Green	Greenish solid
Ethanol	2.2	Green	Greenish solid
Water	-	Light brown	Brownish solid

Table - 2c

Colour Reactions

Reagent	Petroleum ether extract	Chloroform extract	Ethanol extract	Water extract
10% Iodine	No change	Turned black	Turned black	Turned black
10% Iodine 50% NaOH	No change	No change	No change	No change
Lieberman Burchards	Turned white	Turned black	Turned black	Turned black
Millions	+	+	+	+
Ninhydrin	-	-	-	-
Mayer's	-	-	+	+
Spot test	-	-	-	-
Foam test	-	-	+	+

Total - 2d

TLC Profiles of various extracts

Extract	No. of spots	Rf values	Solvent system	Spraying reagent
Petroleum ether	6	0.18, 0.26, 0.33, 0.48, 0.66, 0.07	Chloroform	10% H ₂ SO ₄
Chloroform	5	0.19, 0.29, 0.46, 0.56 and 0.74	"	"
Alcohol	5	0.32, 0.42, 0.60, 0.71 and 0.79	"	"

Physico-chemical Constants of Medicago sativa Mother Tincture

Table - 3a

Physical constants of Mother Tincture of Medicago sativa

Physical constants	DSU sample	MS CS1**	MS CS2	MS CS3	MS CS4
Specific gravity	0.9352	0.9462	0.9491	0.9537	0.9492
pH	5	5 - 5.5	4.5 - 5.5	5.0 - 5.5	5.0 - 5.5
% Total solids w/v	0.5587	2.24	0.157	3.10	1.28
% Alcohol contents v/v	66	66	-	60	-

** Medicago sativa Commerical Sample.

**Table - 3b
Colour Reactions**

Reagent	DSU sample	MS CS1	MS CS2	MS CS3	MS CS4
10% FeCl ₃	Black	Black	Black	Black	Black
10% Iodine	-	-	-	-	-
50% NaOH	-	-	-	-	-
Liebermann Burchard	+	+	+	+	+
Millions	Green	-	-	Green	-
Ninhydrin	-	-	-	-	-
Mayer's	+	+	+	+	+
Wagner's	-	-	-	-	-
Spot test	-	-	-	-	-
Foam test	+	+	+	+	+

Table - 3c

TLC Profiles of Mother Tincture of Medicago sativa Commerical and Authentic Samples

Chloroform extract of Mother Tincture	No. of spots	Rf values	Solvent system	Spraying reagent
DSU sample (authentic)	7	0.07, 0.16, 0.21 0.33, 0.51, 0.60 and 0.80	Chloroform:10% H ₂ SO ₄ acetic acid 48 : 2	
MS C1	4	0.33, 0.51, 0.60 and 0.80	"	"
MS C2	4	"	"	"
MS C3	7	0.07, 0.16, 0.21 0.33, 0.51, 0.60 and 0.80	"	"
MS C4	4	0.33, 0.51, 0.60 and 0.80	"	"

The results of authentic mother tincture (prepared at this Unit) of Allium cepa are comparable with four commercial samples analysed (Tables -1a to 1c), except for high percentage total solids (14.7) in case of AC CS2 and percentage alcohol (50) in case of AC CS3.

In case of Medicago sativa mother tincture, out of the four commercial samples analysed only one sample MS C3 is comparable with authentic sample in all respects except for percentage total solids (3.10 and 0.558) (Table - 3a).

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Dr. Hahnemann in his article "*Spirit of the Homoeopathic Medical Doctrine*" (1813) wrote :

" Human life is in no respect regulated by purely physical law, which only obtain among inorganic substances. The material substances of which the human organism is composed no longer follow, in this vital combination the laws to which material substances in the inanimate condition are subject; they are regulated by the laws peculiar to vitality alone, they ae themselves animated and vitalised. Here a nameless fundamental power reigns omnipotent, which abrogates all the tendency of the component parts of the body to obey the laws of gravitation, of momentum, of the "Vis inertia", of fermentation, of putrefaction, etc., and brings them under the wonderful laws of life alone -- in other words, maintains them in the condition of sensibility and activity necessary to the preservation of the living whole, a condition almost spiritually dynamic."

Essays on Homoeopathy (p.84)
Dr. B.K. Sarkar
