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Estimation of TLC profile of Chywanprash (A poly herbal formulation) along with identification and quantification of Physico-chemical contents

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Abstract

The study was carried out with three different samples of Cyawanaprash avaleha (A poly herbal medicine) for determination of quality and their standardization through Physico-chemical parameters and their analysis. All the samples were analyzed by employing standard analytical parameters. Three sets of criteria of studies were taken into account 1. Physical characteristics such as colour, odour, taste, touch 2. Physical constants such as Loss on drying, Total ash, Acid Insoluble ash, Extractive value in different solvents (Ethyl alcohol, Methanol, Water, Xylene, Hexane, Petroleum ether) along with TLC (Thin Layer Chromatography) and 3. Chemical constituents for both qualitative and quantitative were carried out.

Keywords: Charak samhita, Chyawanaprash, standardization, physical characteristic, physical constant, chemical constituent, TLC

1. Introduction

Nature has bestowed India with an enormous wealth of medicinal plants and knowledge of herbs that made India as the medicinal forest of the world. In last few years country has witnessed a tremendous increase in the demand of herbal medicine/products.

Chyawanaprash avaleha, is one of the most popular herbal medicine of Indian traditional system of health sciences. All over the country, it is used as a household remedy which has popular nutritive value and has been relished as a health supplement since ancient times with the enthusiasm for past 5000 years. Chyawanaprash consists with 46 numbers of ingredients, based with stage wise incorporation and first ever appeared in document form in very oldest reference Charaka Samhita ^[1].

Ayurvedic Pharmacopeia of India (API) represents, Chyawanaprash avaleha is a poly herbal formulation, which is semisolid and sticky in nature (avaleha). It is a chocolate brown coloured having sweet taste with non-specific pleasant odour ^[2]. The original and first reference of Chyawanprash form Charak samhita, which is classified under the group of Rasayana (anabolic agent) formulation and useful in cough, dyspnoea, cachexia, voice disorder, gout, excessive thirst, urinary disorder, heart disease and seminal disorder ^[1]. Besides these particular indications it is claimed that Chyawanprash gives optimal growth in children, promotes intellect, memory and luster, enhance immunity to diseases, improves strength of sense organs, promotes sexual excitement, stimulates digestive power, boost longevity, gives clarity of complexion ^[1]. This polyherbal formulation has been regarded as one of the most respected anti-ageing Ayurvedic supplement, since before the clinical importance of vitamins, minerals and antioxidants were appreciated ^[3, 8].

The Indian Chyawanprash market is mostly takeover by Dabur India Pvt. Ltd., Patanjali, Charak pharma, Emami, Baidyanath and Dhootapapeswar etc. With this huge and competitive market segment, many companies are emphasizing on its acceptability by compromising with its quality and efficacy. On other hand consumer's concept of quality is magnetized towards organoleptic standards, standards for active medicaments, standard for dosage form and freedom from contaminants. They wish to ensure safety, efficacy and acceptability of the product. Therefore, the present study was undertaken to screen on pre-established physicochemical parameters for their validation and standardisation, so that uniformity as well as quality of the Chyawanprash can be assessed by fixing the same.

The study was carried out with three samples of Chyawanaprash through Physico-chemical standards and their analysis. Three sets of criteria were taken into account. Study on Physical characteristics, Physical constants and Chemical constituents.

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2. Material and Methods

All the ingredients included in the composition of Chyawanprash were identified and procured from the pharmacy of National Institute of Ayurveda., Jaipur except Go-ghrta (cow ghee), which was collected from Shri Lalitha Dairy Foods Pvt. Ltd., Satyanarayanapuram, Vijayawada. The

raw materials were authenticated by Pharmacognosy Laboratory of this Institute.

2.1 Preparation of Drug

2.1.1 Composition of Chyawanprash

Table 1: Sanskrit and Botanical Name

Sl. No	Sanskrit Name	Botanical Name (Family)	Parts Used	Proportion
1	<i>Bilva</i>	<i>Aegle marmelos</i> Corr. (Rutaceae)	St. Bk.	48g
2	<i>Agnimantha</i>	<i>Clerodendrum phlomidis</i> Linn.f. (Verbenaceae)	St. Bk.	48g
3	<i>Śyonāka</i>	<i>Oroxylum indicum</i> Vent. (Bignoniaceae)	St. Bk.	48g
4	<i>Kāśmarī (Gambhārī)</i>	<i>Gmelina arborea</i> Roxb. (Verbenaceae)	St. Bk.	48g
5	<i>Pātalā</i>	<i>Stereospermum suaveolens</i> DC. (Bignoniaceae)	St. Bk.	48g
6	<i>Balā</i>	<i>Sida cordifolia</i> Linn. (Malvaceae)	Sd.	48g
7	<i>Śālaparnī</i>	<i>Desmodium gangeticum</i> (L) DC. (Fabaceae)	Pl.	48g
8	<i>Prśniparnī</i>	<i>Uria picta</i> Desv. (Fabaceae)	Pl.	48g
9	<i>Mudgaparnī</i>	<i>Phaseolus trilobus</i> Ait. (Fabaceae)	Pl.	48g
10	<i>Māsaparnī</i>	<i>Teramnus labialis</i> Spreng. (Fabaceae)	Pl.	48g
11	<i>Pippalī</i>	<i>Piper longum</i> Linn. (Piperaceae)	Fr.	48g(taken out from 3 rd sample)
12	<i>Śvadaṁṣṭrā (Gokṣhura)</i>	<i>Tribulus terrestris</i> Linn. (Zygophyllaceae)	Pl.	48g
13	<i>Brhātī</i>	<i>Solanum indicum</i> Linn. (Solanaceae)	Pl.	48g
14	<i>Kaṇṭhakārī</i>	<i>Solanum surattense</i> Burm.f. (Solanaceae)	Pl.	48g
15	<i>Śṛṅgī</i>	<i>Pistacia integerrima</i> Stew. (Anacardiaceae)	Gl.	48g
16	<i>Tāmalakī</i>	<i>Phyllanthus amarus</i> Schum. (Euphorbiaceae)	Pl.	48g
17	<i>Drākṣā</i>	<i>Vitis vinifera</i> Linn. (Vitaceae)	Dr. Fr.	48g
18	<i>Jivanī</i>	<i>Leptadenia reticulata</i> Wt. (Asclepiadaceae)	Pl.	48g
19	<i>Puṣkara</i>	<i>Inula racemosa</i> Hook.f. (Asteraceae)	Rt.	48g
20	<i>Agaru</i>	<i>Aquilaria agallocha</i> Roxb. (Thymelaeaceae)	Ht. Wd.	48g
21	<i>Abhayā (Harītakī)</i>	<i>Terminalia chebula</i> Gaertn. (Combretaceae)	P.	48g
22	<i>Amṛtā (Guduci)</i>	<i>Tinospora cordifolia</i> Willd. (Menispermaceae)	St.	48g
23	<i>Rddhi</i>	<i>Habenaria intermedia</i> D. Don. (Orchidiaceae)	Sub.Rt.Tr.	48g
24	<i>Jīvaka</i>	<i>Mycrostylis wallichii</i> Lindl. (Orchidiaceae)	Pseudo bulb	48g
25	<i>Rṣabhaka</i>	<i>Mycrostylis museifera</i> Redly (Orchidiaceae)	Rt. Tr.	48g
26	<i>Śa ṭ ī</i>	<i>Curcuma zedoaria</i> Rosc. (Zingiberaceae)	Rz.	48g
27	<i>Mustā</i>	<i>Cyperus rotundus</i> Linn. (Cyperaceae)	Rt. Tr.	48g
28	<i>Punarnavā (Raktapunarnavā)</i>	<i>Boerhavia diffusa</i> Linn. (Nyctaginaceae)	Pl.	48g
29	<i>Medā</i>	<i>Polygonatum cirrhifolium</i> Royle (Liliaceae)	Rt.Tr.	48g
30	<i>Elā</i>	<i>Elettaria cardamomum</i> Linn. (Zingiberaceae)	Sd.	48g
31	<i>Candana (Śvetacandana)</i>	<i>Santalum album</i> Linn. (Santalaceae)	Ht.Wd.	48g
32	<i>Utpala</i>	<i>Nymphaea stellata</i> Willd. (Nymphaeaceae)	Fl.	48g
33	<i>Vidārī (Kanda)</i>	<i>Pueraria tuberosa</i> DC. (Fabaceae)	Rt. Tt.	48g
34	<i>Vṛṣamūla (Vāsā)</i>	<i>Adhatoda vasica</i> (L.) Nees. (Acanthaceae)	Rt.	48g
35	<i>Kākolī</i>	<i>Lilium polyphyllum</i> D. Don. (Liliaceae)	Sub. Rt.	48g
36	<i>Kākanāśikā</i>	<i>Martynia diandra</i> Glox. (Martyniaceae)	Fr.	48g
37	<i>Āmalaka (Āmalakī)</i>	<i>Emblia officinalis</i> Linn. (Euphorbiaceae)	P.	6kg,2.5kg, 2.5kg (for 3sample resp.)
38	<i>Jala (for decoction)</i>	Water		12.88lt.
39	<i>Ghrta</i>	Clarified butter from cow's milk	Ghee	288g
40	<i>Tāila (Tīla)</i>	<i>Sesamum indicum</i> L. (Pedaliaceae)	Oil	288g
41	<i>Matsyaṅdikā (Sarkarā)</i>	<i>Saccharum officinarum</i> Linn. (Poaceae)	Sugar	7.2kg,2.4kg 2.4kg (for 3sample resp.)
42	<i>Madhu</i>	Honey		288g
43	<i>Tugāksūrī (Vamśa)</i>	<i>Bambusa arundinaceae</i> Retz. (Poaceae)	Siliceous deposit	192g
44	<i>Pippalī</i>	<i>Piper longum</i> Linn. (Piperaceae)	Fr.	96g(taken out from 3 rd sample)
45	<i>Tvak</i>	<i>Cinnamomum zeylanicum</i> Blume (Lauraceae)	St. Bk.	48g
46	<i>Elā</i>	<i>Elettaria cardamomum</i> Maton. (Zingiberaceae)	Sd.	48g
47	<i>Patra (Tejapatra)</i>	<i>Cinnamomum tamala</i> Nees (Lauraceae)	Lf.	48g
48	<i>Keśara (Nāgakeśara)</i>	<i>Mesua ferrea</i> Linn. (Clusiaceae)	Stmn.	48g

Three different samples of Chyawanprash were prepared according to the original reference on the basis of traditional principle with a partially modification (kinchit parivartit). First sample (C₁) - 500 Amalaki was considered as 6 k.g. and 7.2 kg sugar was added according to the traditional principle 'Sardha tula' (7.2 kg) instead of 'Chardha tula' (2.4 kg). Second sample (C₂) - 500 Amalaki was considered as 2.5 k.g., sugar as per the text 'Chardha tula'. In both the sample Pippali and Ela of kwatha dravyas (ingredients of decoction) were used as prakshepa dravyas (digestive, carminative & flavouring drug). Third sample (C₃) - Same as second sample but the total amount of Pippali from the composition was taken-out. These samples were prepared according to basic

principle of Avaleha kalpana and carried out in the Lab, Department of Rasashastra and B.K, National Institute of Ayurveda, Jaipur, Raj., India

2.2 Analytical Study

All the samples were analyzed by employing standard analytical parameters. Comparative differences in Physical characteristics such as colour, odour, taste, touch and values of Physical constants such as Loss on dry ^[9], Total ash ^[10], Acid Insoluble ash ^[10], Extractive value ^[9] in different solvents (Ethyl alcohol, Methanol, Water, Xylene, Hexane, Petroleum ether) and TLC (Thin Layer Chromatography) ^[9] were assessed.

Chemical constituents were analyzed for qualitative test such as Calcium, Iron, Sodium, Potassium, Steroids, Phenol and Reducing sugar at Pharmacognosy Lab, Department of Dravyaguna, National Institute of Ayurveda, Jaipur. The quantitative test such as Total fat, Total sugar, Total ascorbic acid and Total tannin were investigated at OASIS lab, Jipur [9].

2.1.1 Preparation of Extraction

5g avaleha of each sample to be tested was taken in the flasks. 100ml each of Methanol, Ethanol, Xylene, Hexane and P.ether were added to the avaleha separately.

For the determination of water soluble extractive, chloroform water (95ml distilled water and 5ml Chloroform) was added to the avaleha. All the flasks were shaken continuously for 6 hrs, then removed from the shaker machine and kept aside untouched for 18 hrs.

This time allowed complete extraction of the drug in to the solvent and filtered. 25ml of each filtrate were kept inside a hot air oven at a temp of 50°C for 6 hrs till completely dried and extractive value determinate.

2.1.2 Preparation of TLC

After determination of extractive value of different samples of Chyawanprash, these extracts were further dissolved in 0.5 ml of their respective solvents and 10 µl of each sample was applied (as per the procedure) on thin layer chromatographic plates (TLC aluminium pre-coated 0.25 mm Silica gel G 60 F₂₅₄ Merk) manually. With the help of TLC chamber, the TLC patterns were observed in the solvent system (A) Toluene: Ethyleacetate: Methanol; 80: 20: 2 and Solvent system (B) n-heptane: Ethyl Methyl Ketone: Methanol; 87: 51: 12. Solvent (A) was applied for Alcohol, Xylene, Hexane and P.ether extracts, where as Solvent (A) & (B) was applied for Methanol & Water extracts. The Chromatograms were visualized under 254 nm & 365 nm and under visible light after spraying Anisaldehyde Sulphuric acid (0.5 ml Anisaldehyde + 10 ml Glacial Acetic acid + 85 ml Methanol + 5 ml Sulphuric acid) heated at 110°C for 10 min. Rf values for distinct spots observed are also enumerated in tables (No.05-12)

3. Result and Discussion

Table 2: Observation on Physical characteristics

S.L No	Parameter	Result		
		C ₁	C ₂	C ₃
1	Colour	Yellowish brown	Greenish brown to black	Yellowish brown to black
2	Appearance	Semisolid↑- Solid↓	Semisolid	Semisolid
3	Smell/odour	Non aromatic, Chart-oily	Pleasant, Aromatic	Pleasant, Less aromatic
4	Touch	Soft↓	Soft	Soft
5	Taste	Sweet, Astringent, Sour	Sweet, Astringent, Sour	Sweet, Sour, Astringent

Physical characteristics revealed that the smell/odour of the sample - C₂ was pleasant aromatic where sample - C₁ was non aromatic and sample - C₃ less aromatic. The cause of non-aromatic may be due to low percentage of Prakshepa dravyas present in 100 gm of Chyawanprash of sample - C₁ i.e. consideration of weight of 500 Amalaki is may be responsible for its change.

Less aromatic of sample - C₃ is due to non-presence of Pippali because Pippali will create a special taste and smell of the product when it will be used as a Prakshepa dravya. These causes were affected the colour also.

It is observed that, the particles of the Prakshepa dravyas were seen inside the Avaleha from a particular distance just after completion of Chyawanprash Avaleha. But, after 15 days & onwards it was subsequently disappeared.

This is mainly due to 'Kalapaka'. Kalapaka is a traditional terminology which denotes 'In room temperature, slow & continuous physico-chemical changes have been taking place inside the Avaleha throughout its self-life. Secondly due to absorbance of liquid portion in leisure process, the particles get softened'. So that after 15 days onwards these particles were not seen inside Avaleha.

Table 3: Investigation on Physical constant

Sl. No.	Parameter	Results in % w/w		
		C ₁	C ₂	C ₃
1	Loss on Dry	2.007	2.39	5.37
2	Total Ash	2.12	2.864	2.311
3	Acid insoluble Ash	3.8	3.829	4.021

Table 4: Investigation on Extractive value

Sl. No.	Solvent	Results in % w/w		
		C ₁	C ₂	C ₃
1	Ethyl Alcohol	78.998	73.128	69.013
2	Methanol	82.967	70.445	65.858
3	Water	78.108	65.588	65.059
4	Xylene	5.168	9.434	8.295
5	Hexane	4.098	8.674	9.428
6	Petroleum ether (40-60°)	4.163	7.026	7.377

Sample C₃ contained more percentage (5.37 %) of moisture in comparison to sample C₁ & C₂. This is due to a little variation in the method of preparation. Maximum extractive value was

seen in Ethanol and Methanol soluble portion followed by Water soluble extractive. Lowest extractive value was observed in Petroleum ether followed by Hexane and Xylene.

3.1 Thin Layer Chromatography (TLC)

Table 5: Rf values of Alcohol soluble portion (Fig. 1)

Sample	Under UV 254 nm	Under UV 365 nm	Under visible light after spraying and heating at 110°C
C ₁	0.146,0.207,0.475, 0.536,0.621,0.731, 0.817, 0.939	0.146*,0.207,0.475, 0.536,0.621,0.731, 0.939	0.146,0.207,0.304, 0.390,0.475,0.536 0.621,0.731,0.817 0.939
C ₂	0.146,0.207,0.475, 0.536,0.621,0.731, 0.817, 0.939	0.146,0.207,0.475, 0.536,0.621,0.731, 0.939	0.146,0.207,0.304, 0.390,0.475,0.536 0.621,0.731,0.817 0.939
C ₃	0.146,0.207,0.475, 0.536,0.621,0.731, 0.817, 0.939	0.146*,0.207,0.475, 0.536,0.621,0.731, 0.939	0.146,0.207,0.304, 0.390,0.475,0.536 0.621,0.731,0.817 0.939

* Pink florescent

Table 6: Rf value of Methanol soluble portion running with solvent A (Fig. 2)

Sample	Under UV 254 nm	Under UV 365 nm	Under visible light after spraying and heating at 110°C
C ₁	0.144,0.204,0.421, 0.469,0.566,0.686 0.939	0.144,0.204,0.289, 0.421,0.566	0.144,0.204,0.289, 0.421,0.469,0.566, 0.686,0.939
C ₂	0.144,0.204,0.421 0.469,0.566,0.686 0.939	0.144,0.204,0.289 0.421,0.469,0.566	0.144,0.204,0.289, 0.421,0.469,0.566 0.686,0.939
C ₃	0.144,0.204,0.421 0.469,0.566,0.686 0.939	0.144,0.204,0.289, 0.421,0.469,0.566	0.144,0.204,0.289, 0.421,0.469,0.566, 0.686,0.939

Table 7: Rf value of Methanol soluble portion running with solvent B (Fig. 3)

Sample	Under UV 254 nm	Under UV 365 nm	Under visible light after spraying and heating at 110°C
C ₁	0.309,0.547,0.630, 0.702	0.309,0.392,0.547 0.630,0.702	0.309,0.392,0.452, 0.547,0.630,0.702
C ₂	0.309,0.547,0.630, 0.702	0.154,0.309,0.547 0.630,0.702	0.154,0.309,0.392 0.452,0.547,0.630 0.702
C ₃	0.309,0.547,0.630, 0.702	0.154,0.309,0.392, 0.702	0.154,0.309,0.392, 0.452,0.547,0.630, 0.702

Table 8: Rf value of Water soluble portion running with solvent A (Fig. 4)

Sample	Under UV 254 nm	Under UV 365 nm	Under visible light after spraying and heating at 110°C
C ₁	0.141	0.141, 0.317	0.141,0.317
C ₂	0.141	0.141, 0.317	0.141
C ₃	0.141

Table 9: Rf value of Water soluble portion running with solvent B (Fig. 5)

Sample	Under UV 254 nm	Under UV 365 nm	Under visible light after spraying and heating at 110°C
C ₁	0.273	0.273
C ₂	0.273	0.141
C ₃

Table 10: Rf value of Xylene soluble portion (Fig. 6)

Sample	Under UV 254 nm	Under UV 365 nm	Under visible light after spraying and heating at 110°C
C ₁	0.136,0.295,0.431, 0.477,0.602 [†] ,0.704, 0.784,0.840	0.136,0.170,0.295,0.329,0.431,0.477, 0.602 [†] ,0.784	0.136,0.170,0.295, 0.329,0.431,0.477, 0.602 [†] ,0.704,0.784, 0.840
C ₂	0.136,0.159,0.431, 0.477, 0.602 [†] ,0.704, 0.840,0.931	0.136,0.159,0.431 0.477,0.602 [†] ,0.784	0.136,0.159,0.431, 0.477,0.602 [†] ,0.704, 0.840,0.931
C ₃	0.136,0.431,0.477, 0.602 [†] ,0.704,0.784, 0.840,0.931	0.136,0.295,0.329 0.431,0.477,0.602 [†] ,0.704,0.784	0.136,0.431,0.477, 0.602 [†] ,0.704,0.784, 0.840,0.931

† - Red colour

Table 11: Rf values of Hexane soluble portion (Fig. 7)

Sample	Under UV 254 nm	Under UV 365 nm	Under visible light after spraying and heating at 110°C
C ₁	0.383,0.488,0.534,0.732,0.790,0.906	0.116,0.244,0.488,0.534,0.639,0.732,0.790	0.116, 0.244*,0.383,0.488*,0.534,0.639,0.732,0.790,0.906
C ₂	0.116,0.244,0.488,0.534,0.639,0.732,0.790	0.081*,0.116,0.244,0.488,0.534,0.639,0.732	0.116,0.244,0.383,0.488,0.534,0.639,0.732,0.790
C ₃	0.116,0.383,0.488,0.534,0.639,0.732,0.790	0.081*,0.116,0.244,0.488,0.534,0.639,0.732	0.116*,0.244,0.383,0.488,0.534,0.639,0.732,0.790

* Pink florescent

* Light green but varies according to the time passes away

Table 12: Rf value of Petroleum ether soluble portion (Fig. 8)

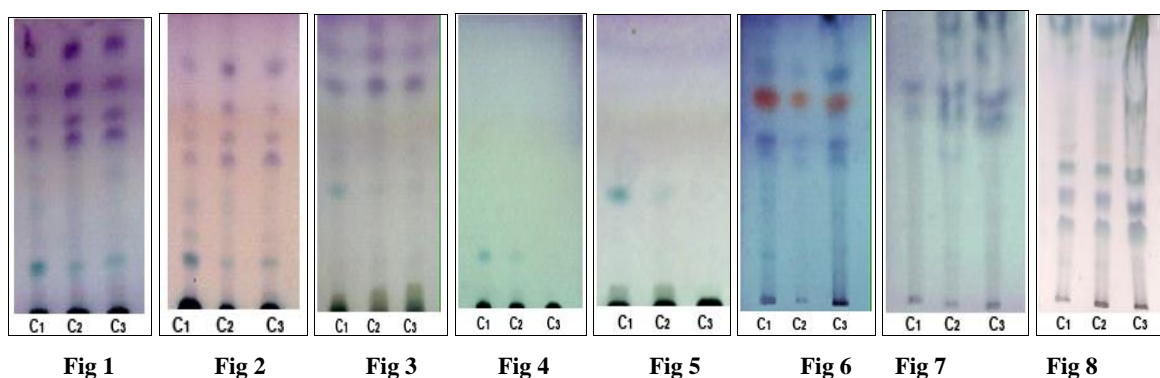
Sample	Under UV 254 nm	Under UV 365 nm	Under visible light after spraying and heating at 110°C
C ₁	0.105,0.211,0.282, 0.376,0.423,0.517,0.694,	0.105,0.211,0.282,0.376,0.423,0.458,0.564	0.105,0.211,0.282, 0.376,0.423,0.458,0.517,0.564,0.694
C ₂	0.105,0.211,0.282, 0.376,0.423,0.458,0.517,0.564,0.694	0.105,0.211,0.282,0.376,0.423,0.458,0.564,0.600	0.105,0.211,0.282, 0.376,0.423,0.458,0.517,0.564,0.600, 0.694
C ₃	0.211,0.282,0.376, 0.423,0.517,0.564,0.694,0.952	0.211,0.282,0.376,0.423,0.564	0.105,0.211,0.282,0.376,0.423,0.517,0.564,0.694,0.952

Maximum number of spot was observed in Ethanol extract of three samples (10 spots) under visible light. 8 & 7 spots were seen under 254 nm & 365 nm respectively for all three samples. While, at the mark 0.146, pink fluorescent colour spot was observed in sample C₁ & sample C₃ under 365nm. Xylene extract samples were produced red fluorescent colour spot under visible light at mark 0.602. Hexane extract produced pink fluorescent colour spot at the mark 0.081 in the sample C₂ under the light 365nm. Methanol extract of three samples showed 7 spots under visible light and under 254 nm & 365 nm, 4 & 3 spots were observed respectively. The least spots were detected in the Water extract of three samples but no spot was observed in sample C₃ under all three lights when

TLC running with solvent (B).

Above observations shows that the highest number of spots were produced in Ethanol extract whereas the lowest number of spots were detected in Water soluble extracts but while water extract produced an average extractive value like as Ethanol and Methanol extracts. It can be inferred that in water extract, the solubility of herbal components is less but the sugar solubility may be more than Ethanol and Methanol solvents. Therefore it is produced an average extractive value in all three samples.

TLC fingerprint profile of different soluble portion of Chyawanprash in various Running Solvent



4. Chemical Constituent

Table 13: Observation on Qualitative test

Sl. No	Constituent	Results		
		C ₁	C ₂	C ₃
1	Calcium	+	+	+
2	Iron	+	+	+
3	Sodium	+	+	+
4	Potassium	+	+	+
5	Steroids	+	+	+
6	Phenol	+	+	+
7	Reducing Sugar	+	+	+

4.1 Quantitative Analysis

Table 14: Observation on Quantitative test

S. No	Constituent	Results in %		
		C ₁	C ₂	C ₃
1	Total Fat	5.168	9.434	8.295
2	Total Sugar	54.42	45.50	43.80
3	Total Ascorbic acid	0.07	0.11	0.065
4	Total Tannin	3.944	3.468	3.234

Quantitative analysis explores sample C₂ contained maximum quantity of Fat (9.43%) and Ascorbic acid (0.11 %) while,

sample C₁ contained maximum quantity of Sugar (54.42 %) in comparison to other samples. These variations are due to variation in ratio of quantity of main ingredient as 500 Amalaki, sugar and fat contents in all three samples of Chyawanprash. Pippali was taken out from sample C₃ only to compare the observations and to fix the standardisation parameters with sample C₁ & C₂.

and Distributers, Delhi, 2002, 22-28.

5. Conclusion

The prepared formulation is screened for various standardization parameters as per pharmacopoeia standards. The approaches of chemo-profiling by using T.L.C. may satisfy the needs of herbal formulation standardization to certain extent. The research out comings on the standardization parameters can be used for evaluating the quality, purity and uniformity of the formulation.

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7. Conflicts of interest: None

8. List of Abbreviations

Dr.Fr., Dried fruit; Fl., Flower; Fr., Fruit; Gl., Gall leaves; Ht.Wd., Heart wood; Lf., Leaf; P., Pericarp; Pl., Plant (whole); Rt. Bk., Root bark; Rt.Tr., Root tuber; Rt., Root; Rz., Rhizome; Sd., Seed; St., Stem; St. Bk., Stem bark; Stmn., Stamens; Sub. Rt. Tr., Subterranean root tuber; Sub. Rt., Subterranean root.

9. Reference

1. Charak samhita, Com-mentary of Chakrapanidatta, Ed. by Acharya Yadavji TrikarmaJi, Chaukhambha Surbharti Prakashan, Varanasi. 2002; 1(1):379.
2. Anonymous: Ayurvedic Pharmacopeia of India Part-II (Formulation): Department of AYUSH, Government of India. Volume - I, 1st Edition, 2007, 13-16.
3. Kumar A, Kaur P, Rinwa P. Comparative study of various marketed brands of Indian Chyawanprash for their anti anxiety and anti oxidant potential. Int. J. Pharm. Res. Bio-Sci. 2012; 1(4):296-310.
4. Parle M, Bansal N. Anti-amnesic Activity of an Ayurvedic Formulation Chyawanprash in Mice: Evid Based Complement Alternat Med, 2011, 1-9.
5. Midha A, Purohit S. Determination of free radical scavaging activity in herbal supliment Chyawanprash, Int J Drug Dev Res. 2011; 3:328.
6. Shastry JLN, Gupta A, Brindavanam NB, Kanjilal S, Kumar S, Setia M *et al.* Qantification of Immunity status of Dabur Chyawanprash - A Review (Part – 2 Clinical studies), Indian J Applied Res. 2014; 4:205.
7. Madan A, Kanjilal S, Gupta A, Sastry JLN, Verma R, Singh AT *et al.* Evaluation of Immunostimulatory activity of Chyawanprash using In-vitro assays, Indian J Exp Bio. 2015; 53:158-163.
8. Ojha JK, Khana NN, Vajpay HS, Sharma N. A Clinical study on Chyawanprash as an adjuvant in the treatment of pulmonary tuberculosis, J Res Indian Med. 1975; 10:11
9. Indian Pharmacopoea, Chemical test and assays, Vol-II, Appendices-III, Third edition, Controller of publications, Delhi, 1985, 49-A87.
10. Anonymous. Quality Control Methods for Medicinal Plant Materials, W.H.O., Geneva, A.I.T.B.S Publishers