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ANALYSIS OF KABASURAKUDINEER CHOORANAM-A SIDDHA FORMULATION

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ABSTRACT

The empirical wisdom of traditional medical system Siddha needs repeated time testing and Standardization. In this paper an attempt was made to evaluate official Siddha formulation mentioned in Siddha formulary, Kabasurakudineer chooranam by analytical methods and chromatographic studies. It is a compound formulation consisting of fifteen ingredients. It is commonly used for the treatment of fever with or without respiratory infection. It is prescribed in large during the epidemic of Swine flu as a prophylactic and Media reports gave a Renaissance to this official Siddha formulation.Kabasurakudineer chooranam was purchased from SKM Siddha and Ayurveda Company (India) Ltd.,Erode, Tamil Nadu, India. The chooranam was subjected to physico-chemical analysis, preliminary phytochemical analysis,TLC and HPTLC studies.This information will be used for laying down the pharmacopoeial standards of Kabasurakudineer chooranam.

Keywords: Kabasurakudineer chooranam, Physico-chemical analysis, phytochemical study.

INTRODUCTION

The Siddha system of medicine is predominantly practiced in South India. While accepting its benefits global community demands evidence based scientific explanation to understand the concept of Siddha system of medicine and demands quality matching International standards to reassure the efficacy of Siddha medicine. Siddha preparations have been classified into different categories of medicinal forms as 32 internal and 32 external andchooranam is one among the internal medicinal form. The current drug is further classified as kudineer chooranam which means a drug to be made into decoction and consumed. Standardization of herbal formulations is essential in order to assess the quality of drugs. In this paper an attempt was made to evaluate a Siddha formulation, Kabasurakudineer chooranam by analytical methods and chromatographic studies. Kudineerchooranam consists of coarse powders of drugs and is used for the preparation of decoction. Decoctions should be prepared whenever required and should not be stored for a long period, as molds develop in the decoction. Kabasurakudineer chooranam is commonly used in Siddha for the treatment of fevers and also as a prophylactic at the time of viral epidemics.[1].

MATERIALS AND METHODS

Kabasurakudineer chooranam is a compound formulation consisting of fifteen ingredients[2], which are given in Table I. Kabasurakudineer chooranam was purchased fromSKM Siddha and Ayurveda Company (India) Ltd. Saminathapuram, Modakurichi, Erode- 638104, Tamil Nadu, India.

Analytical methods

The analytical methodology includes determination of organoleptic characters, preliminary phytochemical analysis, physico-chemical analysis, TLC photodocumentation and HPTLC fingerprintstudies.

Organoleptic characters

The organoleptic characters such as colour, taste and odour were noted.

Physico-chemical parameters

The physico-chemical examinations include determination of total ash, acid insoluble ash, extractable matter in water and alcohol, loss on drying at 105˚C and pH of the water extract. All the physico-chemical parameters were determined by standard methods[3, 4].

Preliminary phytochemical analysis

Preliminary phytochemical analysis for phenols, terpenoids, steroids, flavonoids, quinones, coumarins, alkaloids, tannins, acids and glycosides were carried out by standard procedures[5, 6, 7].

Thin layer chromatographic (TLC) and high performance thin layer chromatographic (HPTLC) analysis

HPTLC is an invaluable quality assessment tool for the evaluation of herbal drugs and is the simplest separation technique today available to the analyst.

Preparation of extract of the drug for chromatographic analysis

Extract of the drug was prepared by soaking 4g of the chooranam overnightin 40ml chloroform, then boiled for 10 minutes on a waterbath, cooled and filtered. The filtrate was concentrated to 10ml. This extract was used for chromatographic studies[8].

Development of TLC photo documentation and HPTLC fingerprinting profile

Chloroform extract of the chooranam was applied in the form of bands with Camagmicrolitre syringe on a precoated silica gel 60 F_{254} plate (Merck) with Automatic TLC Sampler 4 (ATS4). Mobile phase used was Toluene: Ethyl acetate (3:1). Linear ascending development was done in twin trough glass chamber saturated with mobile phase. The plate was air dried and then photo documented at UV 254 nm and 366 nm using Camag Visualizer. The plate was scanned at UV 254 nm and 366nm using TLC Scanner 4 with winCATS software and the finger print profiles were documented. After derivatisation using vanillin-sulphuric acid reagent the plate was kept under white light and the TLC chromatograms were documented and also scanned at 575nm and finger print profile was recorded[9].

RESULTS AND DISCUSSION

Organoleptic characters

Kabasurakudineer chooranam is a coarse powder, pale brown in Colour with characteristic odour and very bitter taste.

Physico-chemical parameters

The physico-chemical values are tabulated in Table 2.The total ash is the total amount of material remaining after ignition. Acid-insoluble ash measures the amount of silica present, especially as sand and siliceous earth.Alcohol & water soluble extractives determine the amount of active constituents extracted with solvents from the drug.

Preliminary phytochemical analysis

The preliminary phytochemical investigations of chooranam showed the presence of major secondary metabolites whichrevealsthe potent therapeutic activity. The results of the analysis are presented in Table 3.

TLC and HPTLC analysis

TLC photo documentation profiles of the chloroform extract of Kabasurakudineer chooranam at 254nm, 366nm and after derivatisation under white lightare given in Fig.1. The solvent system, Toluene: Ethyl acetate (3:1) efficiently resolved the components present in the crude extract.TLC pattern showed four visible bands under UV at 254nm with R_f 0.40, 0.45, 0.71 and 0.89 and at 366nm showed 13 major bands at R_f value 0.01,0.05, 0.09, 0.15, 0.18, 0.30, 0.34, 0.41, 0.47, 0.64, 0.71, 0.81 and 0.95.After derivatisation there were six visible bands observed of $R_f$values at 0.04, 0.32, 0.40, 0.49, 0.64 and 0.74.The HPTLC fingerprinting profiles of the chloroform extract of Kabasurakudineer chooranam was recorded at 254nm, 366nm and after derivatisation with vanillin – sulphuric acid at 575nm.The 3D densitometric chromatogram of the chloroform extract of Kabasurakudineer chooranam and the HPTLC fingerprinting profiles at 366nm are given in Figs. 2 and 3 respectively and the $R_f$values and percentage area of the peaks are shown in Table 4.Out of the 13 peaks observed at 366nm, four peaks (R_f 0.01, 0.64, 0.71 and 0.81) were significantly higher than others indicating that these chemical constituents are present in significant quantity in the crude extract.

Table 1: Ingredients of Kabasurakudineer chooranam

Sl. No.	Tamil Name	Botanical Name	Part used	Quantity
1	Chukku	*Zingiberofficinale* Rosc	Rhizome	1 part
2	Milaku	*Piper longum* L.	Fruit	1 part
3	Ilavangam	*Syzygiumaromaticum* (L.)Merr&L.M. Perry	Flower bud	1part
4	Sirukanchoriver	*Tragiainvolucrata* L.	Root	1 part
5	Akkarakaram	*Anacyclus pyrethrum* (L.)Lag.	Root	1 part
6	Mulliver	*Hygrophilaauriculata* (Schum.)Heine	Root	1 part
7	Kadukkaithol	*Terminalia chebula* Retz.	Pericarp	1 part
8	Adhatodaiilai	*Justiciaadhatoda* L.	Leaf	1 part
9	Karpuravalliilai	*Plectranthusamboinicus* (Lour) Spreng	Leaf	1 part
10	Koshtam	*Saussureacostus* (Falc.) Lipsch.	Root	1 part
11	Seenthil	*Tinosporasinensis* (Lour) Merr.	Stem	1 part
12	Ciruthekku	*Premnaherbacea* Roxb. (Offi-	Root	1 part

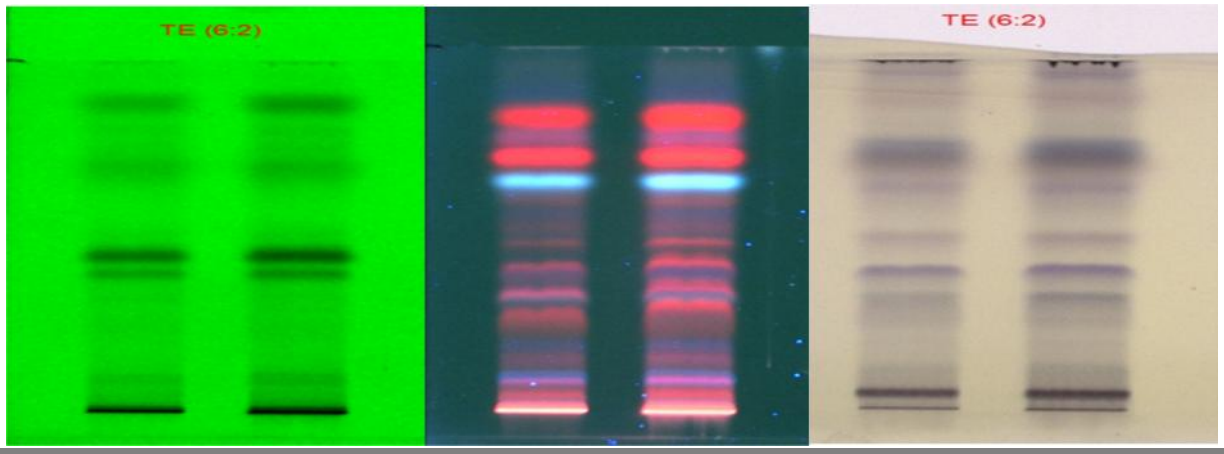
		cial substitute)		
13	Nilavembucamulam	*Andrographispaniculata* (Burm.f.) Nees	Whole plant	1 part
14	Vattathiruppver	*Cissampelospareira* L.	Root	1 part
15	Koraikkizhangu	*Cyperusrotundus* L.	Rhizome	1 part

Table 2: Physico-chemical parameters of Kabasurakudineerchooranam

Sl.No.	Parameter	I	II	Mean
1.	Loss on Drying at 105^0C %	7.51	7.23	7.37
2.	Total Ash Content %	9.48	9.63	9.55
3.	Acid Insoluble Ash %	1.61	1.40	1.50
4.	Water Soluble Extractive %	17.54	18.30	17.92
5.	Alcohol Soluble Extractive %	7.75	7.60	7.67
6.	pH	6.12	6.12	6.12

Table 3: Preliminary phytochemical studies of Kabasurakudineerchooranam

Sl. No.	Phytochemicals	Observation
1	Terpenoid	+ve
2	Phenol	+ve
3	Steroid	+ve
4	Flavonoid	+ve
5	Alkaloid	+ve
6	Tannin	+ve
7	Glycosides	+ve
8	Quinones	+ve
9	Acids	-ve
10	Coumarin	-ve
11	Sugars	+ve
12	Saponins	-ve



Under UV 254 under UV 366 Derivatised in Vanillin–Sulphuric acid and viewed in white light

Fig 1: TLC photo documentation profiles of the chloroform extract of Kabasurakudineer chooranam

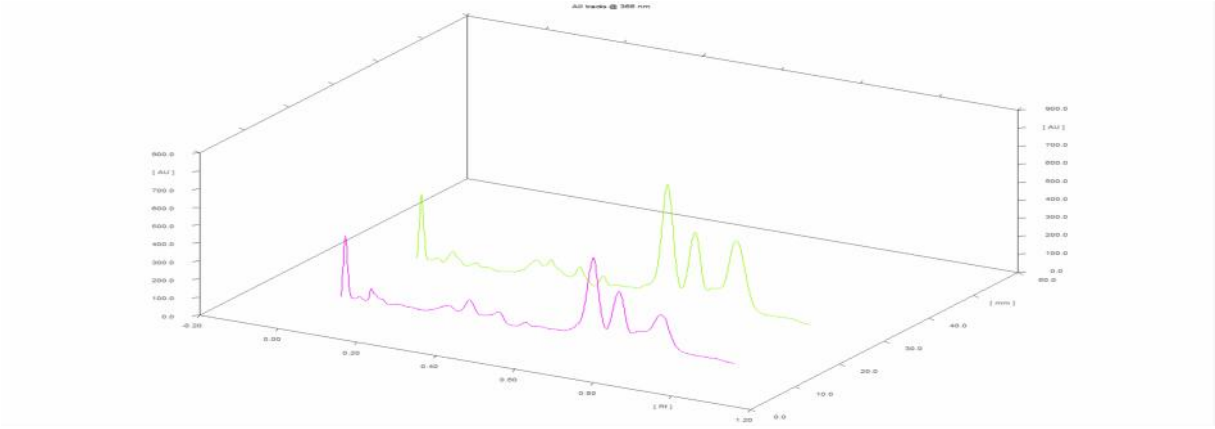


Fig 2: 3D densitometric chromatogram at 366 nm of 10 and 15µl of chloroform extract of Kabasurakudineer chooranam

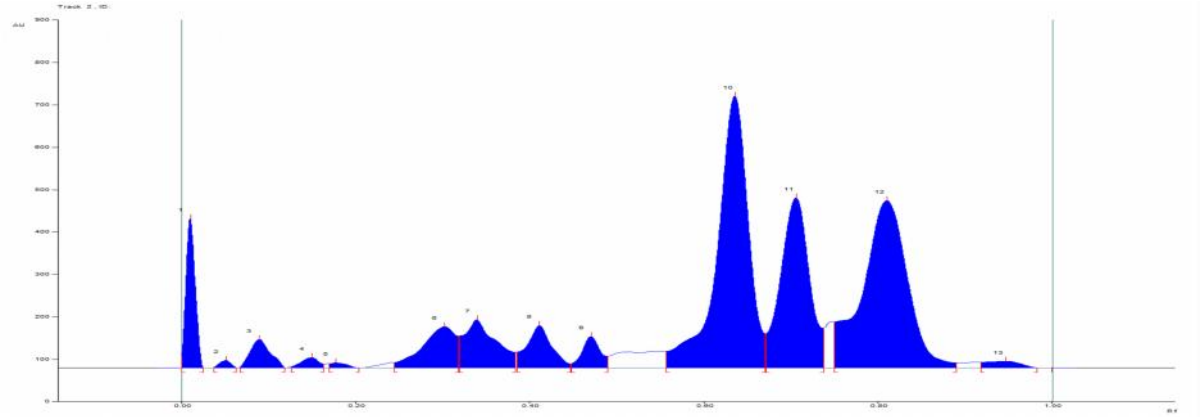


Fig 3: HPTLC Finger print profile of chloroform extract of Kabasurakudineer chooranam at 366 nm

Table 4: R_f table of chloroform extract of Kabasurakudineer chooranam

Track 2, ID:

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	26.9 AU	0.01 Rf	351.4 AU	15.23 %	0.02 Rf	0.1 AU	2999.0 AU	4.89 %
2	0.04 Rf	0.9 AU	0.05 Rf	17.4 AU	0.75 %	0.06 Rf	0.5 AU	182.4 AU	0.30 %
3	0.07 Rf	1.0 AU	0.09 Rf	66.9 AU	2.90 %	0.12 Rf	0.5 AU	1224.8 AU	2.00 %
4	0.13 Rf	3.1 AU	0.15 Rf	23.7 AU	1.03 %	0.16 Rf	8.7 AU	391.0 AU	0.64 %
5	0.17 Rf	9.5 AU	0.18 Rf	11.9 AU	0.51 %	0.20 Rf	0.1 AU	175.9 AU	0.29 %
6	0.24 Rf	12.3 AU	0.30 Rf	97.3 AU	4.22 %	0.32 Rf	75.3 AU	3008.0 AU	4.91 %
7	0.32 Rf	75.4 AU	0.34 Rf	113.2 AU	4.91 %	0.38 Rf	36.7 AU	3352.2 AU	5.47 %
8	0.39 Rf	37.0 AU	0.41 Rf	100.0 AU	4.33 %	0.45 Rf	9.2 AU	2314.3 AU	3.78 %
9	0.45 Rf	9.7 AU	0.47 Rf	73.5 AU	3.19 %	0.49 Rf	27.4 AU	1249.2 AU	2.04 %
10	0.56 Rf	39.1 AU	0.64 Rf	640.7 AU	27.77 %	0.67 Rf	80.3 AU	18669.6 AU	30.46 %
11	0.67 Rf	80.7 AU	0.71 Rf	401.4 AU	17.39 %	0.74 Rf	93.5 AU	10737.0 AU	17.51 %
12	0.75 Rf	108.0 AU	0.81 Rf	394.8 AU	17.11 %	0.89 Rf	12.1 AU	16494.0 AU	26.91 %
13	0.92 Rf	13.0 AU	0.95 Rf	15.3 AU	0.66 %	0.98 Rf	0.1 AU	504.7 AU	0.82 %

CONCLUSION

Analysis of Kabasurakudineer has been carried out with a view to suggest standards for evaluating its quality and purity. The analytical parameters along with TLC photo documentation and HPTLC fingerprinting profile will be diagnostically important characters in fixing its pharmacopoeial standards.

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