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Physicochemical Analysis in Standardization of Siddha Herbal Drug Kanduparangi Ver Chooranam (KVC)

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ABSTRACT:

Introduction: Tamil Nadu, South India, is home to an antiquated Siddha system of medicine. Siddha medicines arrest the body's cells from ageing. The word "Marunthu" (drug) itself refers to scented roots or leaves in Tamil literature. Siddhars who were the pioneers of the Siddha system have been writing down the formulation of numerous remedies since ancient times. Among those formulations, Kanduparangi Ver Chooranam (kvc) is one of the herbal formulation, which is said to be prescribed for sinusitis in classical siddha texts. Sinusitis is an infection of the sinuses. These infections usually happen after a cold or with allergies. Frontal sinus begins to grow after birth as nasofrontal ducts whereas maxillary, ethmoidal and sphenoidal sinuses are present right at birth. Sinusitis can be classified as either acute or chronic. The ethmoid and maxillary sinuses are the earliest to develop in paediatric sinusitis.

In recent times, among people, there has been a positive ray of hope in getting treatment from Siddha for sinusitis also. KVC was standardized using PLIM criteria, which were crucial to the process of Occidentalizing. **Material and methods:** KVC was made in accordance with GMP regulations. Physio-chemical analysis, HPTLC, TLC investigation, and the finding of organoleptic qualities are all part of drug standardization. The investigation was conducted at Noble Research Solution's facility in accordance with PLIM criteria. **Results:** Research findings indicate there are ten peaks in the HPTLC screening graphic. Other characteristics include loss of drying (8.06 %), total ash value (2.16%), acid insoluble ash (0.14%), water soluble extraction (18.77 %), alcohol soluble extraction (8.06 %), and pH (6.0) which is weakly acidic. **Conclusion:** Future clinical research and standardization would benefit from the published data.

Key word: Kanduparangi Ver Chooranam (kvc), Sinusitis, pharmacopeial laboratory for Indian medicine (PLIM), Nobel research institute, High Performance thin layer chromatography (HPTLC).

Index Terms – **Kanduparangi Ver Chooranam (kvc), Sinusitis, HPTLC, PLIM.**

INTRODUCTION

The Siddha system of Medicine is primarily focused on developing medications with high potencies and long-lasting lives for usage in the future. Additionally, it tries to sustain lifespan and improve cell regeneration. The Siddha Sutra emphasizes the line of usage of medicines as "*Verpaaru thazhaipaaru minginikaal Mellamella parpachenduram paare*" meaning, it has been suggested to use the pure herbs in liquid, powder, tablet, or paste form first. If such is not able to manage the illness, doctors will employ the combination of Purified animal products, metals, and minerals in addition to the herbs [1].

Since the system uses multiple combinations of medicines, increasing the possibility of adulteration and replacement, a minimal amount of quality control, usage of current technologies for the generation of standards is needed for these medications to be accepted globally. One such ways include standardization of Siddha medicines which ensures the safety and quality through various scientific parameters. Depending on the type of medicine, the product has to be examined for its suitable parameters[2]. In Siddha, the symptoms of Sinusitis can be correlated to Peenisam specifically Sura peenisam in children. Also, various Siddha medicines indicated for Peenisam were also evident in Siddha literature. With that importance, one such herbal formulation Kanduparangi ver chooranam which is mentioned in Gunapadam part -1, K.S.Murugesa Muthaliyar[3] for sinusitis, has been analysed for its Physicochemical and High-Performance Thin Layer Chromatography in order to promote its credibility through scientific way.

MATERIALS AND METHODS

The herbal preparation, Sathikkai podi, was identified in the canonical text " Gunapadam part -1, K.S.Murugesa Muthaliyar ". The ingredients for this formulation are included in Table -1[4]

Table – 1 INGREDIENTS OF Kvc

INGREDIENTS	BOTANICAL NAME
Kanduparangi ver	*Cleodendrum serratum*

COLLECTION, IDENTIFICATION AND AUTHENTICATION OF THE DRUG

The plant materials were procured from a raw drug shop located at Parry's Corner in Chennai, Tamil Nadu. These materials were subsequently verified and confirmed by botanical and pharmacological experts at the Government Siddha Medical College Hospital in Arumbakkam, Chennai – 106.

PURIFICATION OF THE DRUGS

The drug mentioned here was purified as per the Siddha literature. All impurities such as sand and dust have been removed.

PREPARATION OF THE DRUG PROCEDURE

- The purified raw drug listed in Table 1 was meticulously ground into a fine powder using a mortar and pestle.
- This powder, named Kanduparangi Ver Chooranam, was then stored in an airtight container for safekeeping.

STANDARDIZATION OF THE DRUG

1.Organoleptic Characters of SP

The Kanduparangi Ver Chooranam appeared to be dark brownish in colour with a characteristic bitter taste and had a strongly aromatic odour. The results were tabulated in the following table[5].

Table – 2 Organoleptic Characters of SP

State	Solid
Nature	ModeratelyFine
Odour	Strongly Aromatic
Touch	Soft
Flow property	Non-Free flowing
Appearance	Dark Brownish

Table -3 Solubility profile

S.NO	Solvent Used	Solubility/ Dispersibility
1	Chloroform	Insoluble
2	Ethanol	Soluble
3	Water	Soluble
4	Ethyl acetate	Insoluble
5	DSMO	Soluble

2.PHYSIOCHEMICAL ANALYSIS OF KANDUPARANGI VER CHOORANAM (KVC)

The preliminary physiochemical screening test was carried out for Kanduparangi Ver Chooranam (kvc) as per the standard procedures mentioned here under.

2.1 Percentage Loss on Drying

Test drug was accurately weighed in evaporating dish. The sample was dried at 105ºC for 5 hours and then weighed.

2.2 Determination of Total Ash

Test drug was accurately weighed in silica dish and incinerated at the furnace a temperature 400ºC until it turns white in color which indicates absence of carbon. Percentage of total ash will be calculated with reference to the weight of air-dried drug.

2.3 Determination of Acid Insoluble Ash

The ash obtained by total ash test will be boiled with 25 ml of dilute hydrochloric acid for 6mins. Then the insoluble matter is collected in crucible and will be washed with hot water and ignited to constant weight. Percentage of acid insoluble ash will be calculated with reference to the weight of air-dried ash.

2.4 Determination of Alcohol Soluble Extractive

Test sample was macerated with 100 ml of Alcohol in a closed flask for twenty-four hours, shaking frequently during six hours and allowing it to stand for eighteen hours. Filter rapidly, taking precautions against loss of solvent, evaporate 25 ml of the filtrate to dryness in a tared flat bottomed shallow dish, and dry at 105ºC, to constant weight and weigh. Calculate the percentage of alcohol-soluble extractive with reference to the air-dried drug.

2.5 Determination of Water Soluble Extractive

Test sample was macerated with 100 ml of chloroform water in a closed flask for twenty-four hours, shaking frequently during six hours and allowing it to stand and for eighteen hours. Filter rapidly, taking precautions against loss of solvent, evaporate 25 ml of the filtrate to dryness in a tared flat bottomed shallow dish, and dry at 105ºC, to constant weight and weigh. Calculate the percentage of water-soluble extractive with reference to the air-dried drug.

2.6 pH determination

Required quantity of test sample was admixed with distilled water and the subjected to screening using pH meter.

Table -4 Physio-Chemical Analysis of Siddha formulation kanduparangi ver chooranam

S.NO	PARAMETER	MEAN (n=3) SD
1	Loss on Drying at 105 °C (%)	8.06 ± 0.81
2	Total Ash (%)	2.16± 0.41
3	Acid insoluble Ash (%)	0.14 ± 0.025
4	Water soluble Extractive (%)	18.77 ± 2.41
5	Alcohol Soluble Extractive (%)	8.06± 1.40
6	Ph	6.0

1.IDENTIFICATION -TLC/HPTLC

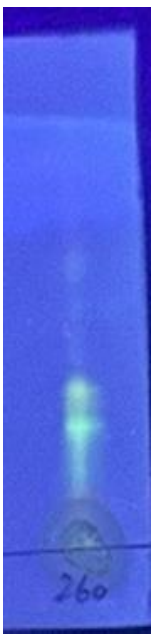


Figure-1 TLC Visualization of SP at 366nm

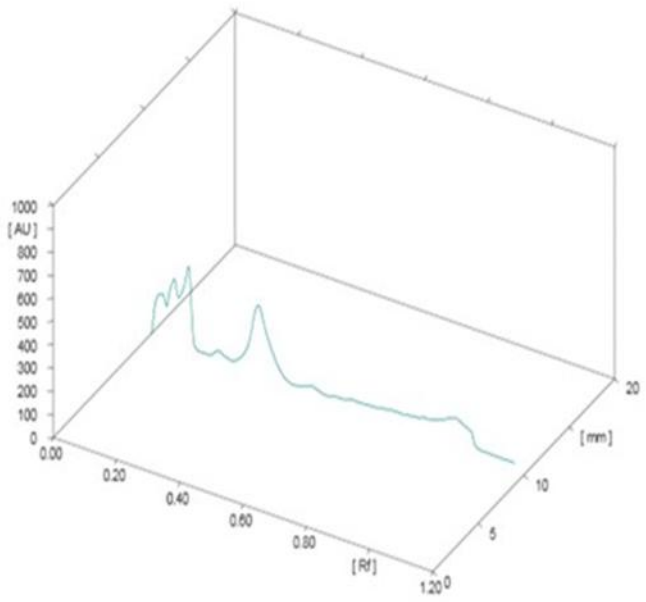
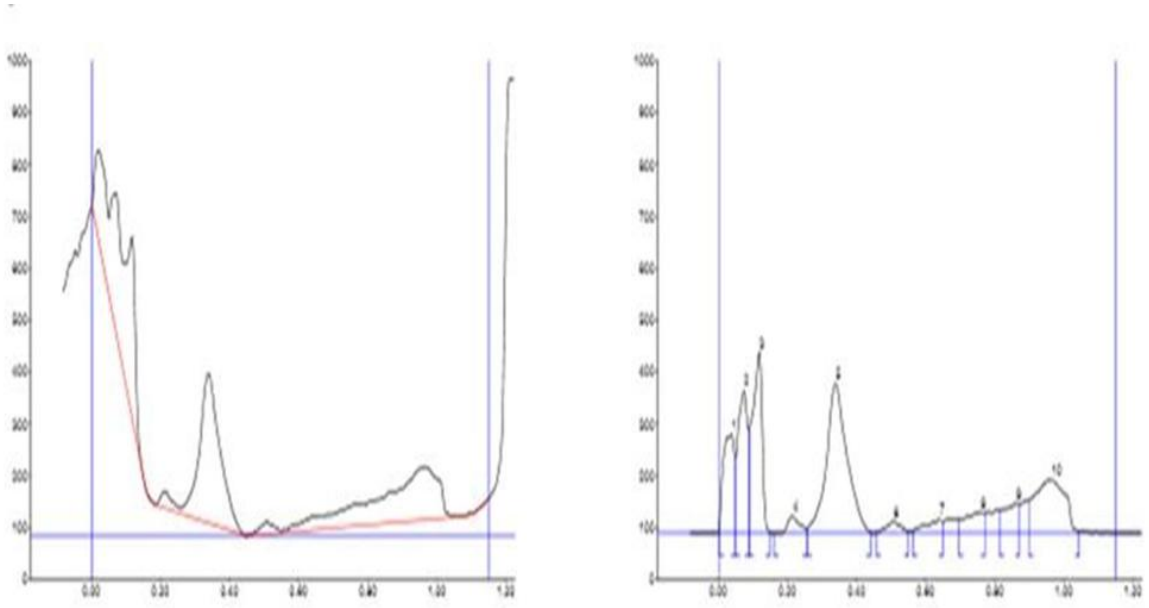


Figure- 2 3D-Chromatogram

Table - 5 Analysis of High-Performance Thin Layer Chromatography (HPTLC) of Siddha Formulation kanduparangi ver chooranam (kvc)



PEAK TABLE

HPTLC finger printing analysis of the sample reveals the presence of six prominent peaks corresponds to the presence of six components present with in it. Rf value of the peaks ranges from 0.00 to 0.90.

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %
1	0.00	20.3	0.04	191.2	13.73	0.05	146.1	3021.4	10.50
2	0.05	146.7	0.07	276.0	19.82	0.09	200.5	3821.1	13.28
3	0.09	203.5	0.12	350.5	25.17	0.15	0.8	4875.4	16.94
4	0.16	0.0	0.22	32.2	2.31	0.26	9.4	555.1	1.93
5	0.26	10.0	0.34	288.8	20.74	0.44	1.9	8548.3	29.70
6	0.46	1.5	0.51	24.9	1.79	0.55	3.5	479.0	1.66
7	0.57	4.7	0.64	25.4	1.83	0.65	23.2	622.2	2.16
8	0.70	26.1	0.76	41.4	2.97	0.77	41.0	1127.8	3.92
9	0.82	43.4	0.86	59.5	4.27	0.87	57.3	1276.2	4.43
10	0.90	64.1	0.97	102.8	7.38	1.05	2.0	4451.6	15.47

DISCUSSION

This study aimed to characterize the physicochemical properties of Kanduparangi Ver Choornam (KVC), a Siddha herbal preparation, using a variety of techniques. The findings provide valuable insights into the potential safety, quality, and future research directions for this traditional medicine. Physicochemical parameters such as ash content (2.16%) suggests the presence of minerals and non-combustible earthy materials in SP. This value provides a baseline for further investigation into the specific mineral composition. Low acid-insoluble ash (0.014%) indicates minimal silica content, which aligns with quality standards for herbal drugs. Further studies could explore the specific water-soluble constituents; Loss on drying (8.06%) indicates a relatively low moisture content, suggesting good stability and potential for a longer shelf life for KVC. Extractive values like Water-soluble extract (18.77%) and alcohol-soluble extract (8.06%) provide an initial understanding of the proportions of polar and non-polar compounds present in the raw drug (Table 4). These values can serve as a reference for future studies aiming to isolate and identify the active constituents of KVC. Chromatographic analysis TLC and HPTLC analyses were performed using visible light Short-wave UV light 254nm and light long-wave UV light 366 nm. Rf value of the peaks ranges from 0.00 to 0.90 (Table 5). This study serves as a preliminary investigation into the physicochemical properties of KVC. While the findings provide a foundation for further research. Building on the insights gained from this study, future research can explore more about the siddha herbal formulation. This study lays the groundwork for a more comprehensive understanding of Kanduparangi ver chooranam and its potential as a therapeutic agent.

CONCLUSION

Physicochemical analysis of Kanduparangi ver chooranam (KVC) indicates that it falls within acceptable parameters for further investigation. The profile suggests potential safety and efficacy, which warrants further exploration through preclinical and randomized clinical trials. These trials would definitively establish the drug's efficacy, pharmacological properties, and therapeutic effects, potentially positioning Kanduparangi ver chooranam(KVC) as a complementary or alternative treatment option for Sinusitis in children. This can be a valuable basic source of data for future research.

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