IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

PHYSICOCHEMICAL ANALYSIS IN STANDARDIZATION OF SIDDHA POLYHERBALDRUG MOOLANOI CHOORANAM (MNC)

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Abstract: **Introduction:** One of the oldest documented medical systems is the Siddha system, which originated in the Indian subcontinent. Siddhars who were the pioneers of the Siddha system have been writing down the formulation of numerous remedies since ancient times. Among those formulations, Moolanoi Chooranam (MNC) is one of the polyherbal formulation, which is said to be prescribed for Moolam in classical siddha texts. Ull Moolam is one among those of Moolanoigal. Ullmoolam (Internal Haemorrhoids) will benefit from the use of this medication. Drug standardization and publication are seen as the keys to spreading authenticity in today's globalized society. MNC was standardized using PLIM criteria, which were crucial to the process of Occidentalizing. **Material and methods:** MNC was made in accordance with GMP regulations. Physico-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 six peaks in the HPTLC screening graphic. Other characteristics include loss of drying (5.16 %), total ash value (1.8%), acid insoluble ash (0%), water soluble extraction (15.6 %), alcohol soluble extraction (8.1%), and pH(6.80) which is weakly acidic. **Conclusion:** Future clinical research and standardization would benefit from the published data. **Keyword:** Moolanoi Chooranam (MNC), Ullmoolam, Internal Haemorrhoids, pharmacopeial laboratory for Indian medicine (PLIM), Nobel research institute, High Performance thin layer chromatography (HPTLC).

Index Terms– Moolanoi Chooranam(MNC), Ull Moolam (Internal Haemorrhoids), HPTLC,PLIM.

INTRODUCTION

Developed in the Indian subcontinent, the Siddha system of medicine stands as one of the enduring healthcare traditions, having been enshrined in ancient texts.The fundamentals and principles largely rely upon 5element theory, taste and three humours [1].Thriving under government support as one of the recognized Ayush systems, Siddha medicine serves a significant portion of the population through both public and private healthcare facilities. Its rich history is evident in the vast collection of herbals, mineral, marine, and metallic medicinal preparations meticulously documented and preserved by its ancient founders. Within this vast array of remedies, Moolanoi Chooranam, a poly herbal preparation, has traditionally been

used to address Moolam . Recognizing the potential of Siddha medicine in this age of technological advancement, the WHO has endorsed efforts to identify active ingredients and standardize drug studies based on PLIM guidelines. This standardization process not only enhances the legitimacy of Siddha medicine but also serves as a bridge towards wider acceptance. Moolanoi Chooranam itself is undergoing thorough evaluation, including assessments of its organoleptic properties, physical characteristics, and composition through qualitative and quantitative analysis.

MATERIALANDMETHODS

The poly herbal preparation, Moolanoi Chooranam, was identified in the canonical text "Theraiyar Vaithiya kaviyam[2]". The ingredients for this formulation are included in Table – 1[3-8]

S.NO	INGREDIENTS	BOTAMNICALNAME/CHEMICALNAME	QUANTITY
1	THUTHUVALAI	*Solanum trilobatum*	1 Palam(35gms)
2	KARISALAI VER	*Eclipta prostrate*	1 Palam(35gms)
3	MERUGAN KIZHANGU	*Alocasia indica*	1 Palam(35gms)
4	KARUNAI KIZHANGU	*Amorphopallus paeonifolius*	1 Palam(35gms)
5	ARUGAN VER	*Cyanodon dactylon*	1Palam(35gms)
6	NEERPOONDU KIZHANGU	*Hygrophilia auriculata*	1Palam(35gms)

COLLECTION, IDENTIFICATION AND AUTHENTICATION OF THE DRUG

All necessary plant materials were procured from a raw drug shop located at Parry's Corner in Chennai, TamilNadu. These materials were subsequently verified and confirmed by botanical (GSMC/MB 624-629)[8] and pharmacological experts at the Government Siddha Medical College Hospital in Arumbakkam, Chennai – 106.

PURIFICATION OF THE DRUGS

All the drugs mentioned here were purified as per the Siddha literature. All impurities such as sand and dust have been removed.

PREPARATION OF THE DRUG
PROCEDURE:

The purified raw drugs listed in Table1 were meticulously ground into a fine powder using a mortar and pestle.This powder, named Moolanoi Chooranam (MNC)[2], was then stored in an airtight container for safekeeping.

STANDARDIZATION OF THE DRUG

1.Organoleptic Characters of MNC

The Moolanoi Chooranam appeared to be Pale brownish in colour with a characteristic bitter taste and had a strong characteristic odour · The results were tabulated in the following table.

Table-2 Organoleptic Characters of MNC

State	Solid
Nature	Fine powder
Odour	Strong Characteristic
Touch	Soft
Flow Property	Free flowing
Appearance	Pale 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	DMSO	Soluble

2. PHYSICOCHEMICAL ANALYSIS OF MOOLANOI CHOORANAM(MNC)

The preliminary physicochemical screening test was carried out for Moola Noi Chooranam(MNC) as per the standard procedures mentioned here under [9-10]

Percentage Loss on Drying

Test drug was accurately weighed in evaporating dish. The sample was dried at 105^{o}C for 5 hours and then weighed.

Determination of Total Ash

Test drug was accurately weighed in silica dish and incinerated at the furnace a temperature 400^{o}C 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.

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.

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 105^{o}C, to constant weight and weigh. Calculate the percentage of alcohol-soluble extractive with reference to the air-dried drug.

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.

pH determination

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

Table-4 Physico-Chemical Analysis of Siddha formulation Moolanoi chooranam

S.No	Parameter	Mean (n=3) SD
1.	Loss on Drying at 105 °C (%)	5.167 ± 0.1528
2.	Total Ash (%)	1.833 ± 0.3786
3.	Acid insoluble Ash (%)	0 ± 0
4.	Water soluble Extractive (%)	15.67 ± 5.033
5.	Alcohol Soluble Extractive (%)	8.1 ± 1.418
6.	Ph	6.80

3. Identification-TLC/HPTLC:

Figure-1 TLC Visualization of MNC at 366 nm

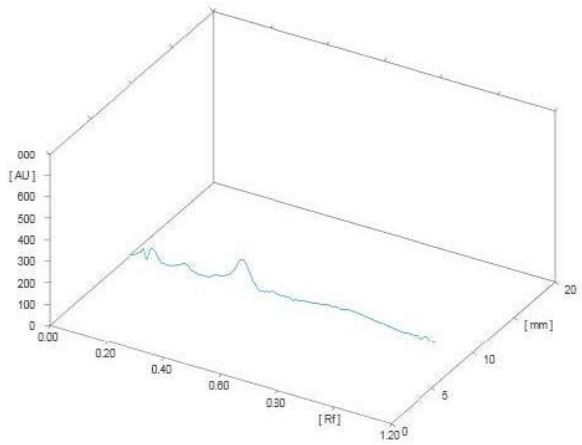
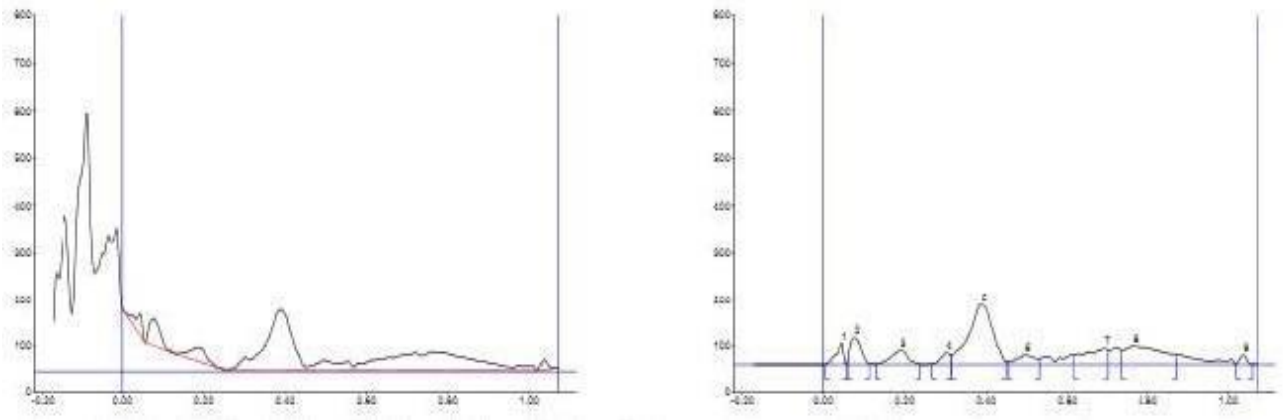


Figure-2 3D – Chromatogram

Table-5 Analysis of High-Performance Thin Layer Chromatography (HPTLC) of Siddha Formulation Moolanoi chooranam(MNC)



Peak Table

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %
1	0.00	0.7	0.04	45.8	11.31	0.06	3.4	425.6	4.29
2	0.06	12.7	0.08	57.2	14.13	0.11	3.1	808.2	8.15
3	0.13	0.0	0.19	30.5	7.53	0.24	0.5	661.1	6.67
4	0.27	0.6	0.30	26.2	6.48	0.31	20.3	310.3	3.13
5	0.32	20.6	0.39	127.8	31.57	0.45	5.7	3948.7	39.84
6	0.45	6.2	0.50	21.1	5.21	0.53	13.1	504.5	5.09
7	0.62	20.4	0.69	34.9	8.62	0.70	32.2	1045.2	10.55
8	0.73	31.0	0.76	39.7	9.82	0.88	20.4	2027.1	20.45
9	1.02	0.7	1.04	21.6	5.33	1.06	0.3	180.3	1.82

HPTLC finger printing analysis of the sample reveals the presence of nine prominent peaks corresponds to the presence of nine components present within it. Rf value of the peaks ranges from 0.06 to 1.02.

DISCUSSION

This study aimed to characterize the physicochemical properties of Moolanoi Chooranam (MNC), a Siddha polyherbal 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 (1.83%) suggests the presence of minerals and non-combustible earthy materials in MNC. This value provides a baseline for further investigation into the specific mineral composition. Low acid-insoluble ash (0.0%) indicates minimal silica content, which aligns with quality standards for herbal drugs. Water-soluble ash (15.6%) represents the portion of inorganic material readily dissolvable in water. Further studies could explore the specific water-soluble constituents; Loss on drying (5.16%) indicates a relatively low moisture content, suggesting good stability and potential for a longer shelf life for MNC. Extractive values like water soluble extract (15.6%) and alcohol soluble extract (8.15%) 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 MNC. Chromatographic analysis TLC and HPTLC analyses were performed using visible light Short-wave UV light 254nm and light long-wave UV light 365 nm. Rf value of the peaks ranges from 0.00 to 1.02 (Table 5). This study serves as a preliminary investigation into the

physicochemical properties of MNC .While the findings provide a foundation for further research. Building on the insights gained from this study, future research can explore more about the polyherbal formulation.This study lays the groundwork for a more comprehensive understanding of Moolanoi Chooranam and its potential as a therapeutic agent.

CONCLUSION

Physicochemical analysis of Moolanoi Chooranam(MNC) 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 Moolanoi Chooranam (MNC) as a complementary or alternative treatment option for Ullmoolam.This can be a valuable basic source of data for future research.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to the esteemed lecturers of the Pg Pothu Maruthuvam department at Government Siddha Medical College, Chennai. Their invaluable guidance and insightful feedback have been instrumental throughout my research project.I am also immensely thankful to Dr.K.Kanakavalli , Principal of Government Siddha Medical College, Chennai, and The Tamil Nādu Dr. M.G.R. Medical University for their support. Furthermore, I extend my sincere appreciation to my colleagues and friends for their unwavering guidance and encouragement throughout this journey.

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