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Physico chemical analysis of Parangipattai Rasayanam, A Siddha poly herbal formulation

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Abstract

Background: Standardization of Siddda drugs is the need of the hour. Parangipattai Rasayanam is a Siddha Poly Herbal formulation indicated for skin diseases in the text Pulippani vaithiyam-500. **Aim and Objective:** To do physicochemical analysis for the drug Parangipattai Rasayanam. **Materials and Methods:** The drug is prepared as per the method mentioned the classic siddha literature. The drug is subjected to physicochemical analysis such as total ash, loss on drying, total sugar, reducing sugar, fat content, microbial load, heavy metal analysis , High Performance Thin Layer Chromatography as per the Pharmacopeial laboratory standards of Indian medicine. **Results and Conclusion:** The drug is free of microbial contamination and Aflatoxins and Pesticide Residues.

Keywords: Poly Herbal formulation, High Performance Thin Layer Chromatography, Physico chemical Analysis,Siddha.

Introduction

A Siddha system of medicine is the oldest holistic management system with meticulously documented medicines and being practiced by a large population in south India. The WHO has appreciated the importance of medicinal plants for public health care in developing nations and has evolved guidelines to support the member states in their efforts to formulate national policies on traditional medicines and to study their potential usefulness including evaluation, safety and efficacy[1].*Parangipattaira sayanam* is a classic Siddha drug chosen from the text *Pulippani vaithiyam-500*. It is indicated for all kind of skin diseases, various ulcers,venereal diseases, peptic ulcer and arthritis[2]. The uses of scientific tools are essential to validate the traditional claim. Though Siddha drugs are considered to be safe and effective, it is the utmost duty of the physicians to standardize the formulation before trying out in humans. The drug is a poly herbal drug with Parangippattai as the main ingredient and many other herbal ingredients. The main aim of this study is to evaluate the Physico Chemical characters of the drug *Parangipattai* Rasayanam.

Aim and objective

The aim of this study is to do phsico chemical analysis, HPTLC finger printing for the drug *Parangipattai* Rasayanam.

Materials and Methods

3.1. Collection and Identification of plant materials:

The herbal ingredients were authenticated by the Assistant Professor of Medicinal botany Department of National Institute of Siddha, Chennai.

3.2. Preparation of the drug Parangippattai Rasayanam[2]:

3.1. Collection and Identification of plant materials:

The herbal ingredients were authenticated by the Assistant Professor of Medicinal botany Department of National Institute of Siddha, Chennai.

3.2. Preparation of the drug ParangippattaiRasayanam[2]:

Ingredients:

Sangamver (*Azima tetracantha* Linn)	:	35grams.
Peesangamver (*Clerodendrum inerme* Linn)	:	35grams.
Chithiramoolaver (*Plumbago zeylanica*,Linn)	:	35grams.
Nilappanaikizhangu (*Curculigo orchioides*)	:	35grams.
Amukkarakizhangu (*Withania somnifera*.Dunal,)	:	35 grams.
Kumilam ver (*Gmelina orborea*)	:	35 grams.
Nilakkumilam ver (*Gmelina asiatica*)	:	35 grams.
Nerunjil ver (*Tribulus terrestris*)	:	35 grams.
Poovarasam pattai (*Thespesia populnea*)	:	35 grams.
Sengaththari pattai (*Capparis sepiaria*)	:	17.5grams.
Chukku (*Zingiber officinale*.Roscoe.)	:	17.5grams.
Thippili (*Piper longum*.Linn.)	:	17.5 grams.
Milagu (*Piper nigrum*.Linn.)	:	17.5 grams.
Omam (*Carum copticum*)	:	17.5 grams.
Sirulavangapattai (*Cinnamomum verum*)	:	17.5grams.
Kostam (*Costus speciosus*)	:	17.5grams.
Sirunaagappoo (*Mesua nagassarium*)	:	17.5grams.
Citarathai (*Alpinia galangal*)	:	17.5grams.
Inji (*Zingiber officinale*)	:	17.5grams.
Lavanga illai (*Syzygium aromaticum*)	:	17.5grams.
Parangi chakkai (*Smilax china* Linn.)	:	175 grams.
Sugar	:	350 grams.
Honey	:	700 grams.
Ghee	:	700 grams.

3.3. Purification of raw drugs[3, 4]:

The raw drugs are purified as per the methods mentioned in the Siddha literatures.

3.4. Analytical specifications of semisolid drugs[5]:

1..Description : Colour, Odour, Taste, 2. Loss on drying at 1050 C, 3. Total – ash, 4. Acid – insoluble ash, 5. pH, 6. Total solid, 7. Fat content, 8. Reducing sugar,9. Total sugar, 10.Identifications: TLC/HPTLC, 11. Test for heavy metals: Lead, Cadmium, Mercury, Arsenic, 12. Microbial contamination: Total bacterial count, Total fungal count, 13. Test for specific Pathogen: *E. coli, Salmonella* spp., *S.aureus, Pseudomonas aeruginosa*, 14. Pesticide residue: Organochlorine pesticides, Organophosphorus pesticides, 15 Test for Aflatoxins (B1,B2,G1,G2).

3.6 HPTLC Analysis of aqueous extract of PRM

Materials and methods

Test solution preparation

The PRM sample were 1g was weighed in an electronic balance and dissolved in 10ml of Aqueous solvent and centrifuged at 3000rpm for 5min. respectively. These solutions were used as test solution for HPTLC analysis.

Sample application

10µl of test solutions and 5µl of standard solution were loaded as 6mm band length in the 10 x 10 Silica gel 60F_{254}TLC plate using Hamilton syringe and CAMAG LINOMAT 5 instrument.

Spot development

The samples loaded plate was kept in TLC twin trough developing chamber (after saturated with Solvent vapor) with respective mobile phase (standards) and the plate was developed in the respective mobile phase up to 80mm.

Photo-documentation

The developed plate was dried by hot air to evaporate solvents from the plate. The plate was Photodocumented the images at UV 254nm.

Scanning

The plate was fixed in scanner stage (CAMAG TLC SCANNER 3) and scanning was done at UV 254nm. The Peak table, Peak display and Peak densitogram were noted. The software used was winCATS 1.3.4 version.

3.7. Physicochemical analysis[6]:

The sample is tested for the following parameters as per the guidelines followed by WHO. Loss on drying, Total ash, Water soluble ash, Acid insoluble ash, Water soluble extractive, Alcohol soluble extractive, Fat content, Reducing sugar, Total sugar, Microbial load Aflatoxins and Heavy metals.

Results and Discussion

4.1. Organoleptic characters:

Colour- Purple own.
Odour–pleasant
Taste : sweet
Consistency - semisolid

The sweet taste and semisolid consistency is due to the addition of sugar, ghee and honey.

4.2. Physico-Chemical Parameters:

The results of the physicochemical parameters are given in Table 1.

Table 1: Results of physicochemical parameters

S.No	Parameters	Results
1.	Loss on Drying at 105°C	7.35 %
2.	Total Ash	2.33 %
3.	Acid insoluble Ash	0.41%
4.	pH(10% Solution)	5.03%
5.	Total Solid	92.65%
6.	Fat content	22.11%
7.	Reducing Sugar	17.15%
8.	Total Sugar as sucrose	10.49%

Loss on drying indicates the moisture content. The total ash content is the measure of inorganic constituents present in the drug. High ash content explains its unsuitable nature to be used as drug.

4.3. Heavy metal analysis:

The observed results of heavy metal analysis are tabulated below in table 2.

Table 2: Results of heavy metal analysis:

Heavy Metal	Specification as per AYUSH/WHO/FDA (26….)	Observed Result
Lead	10ppm	0.59ppm
Cadmium	0.3ppm	ND
Arsenic	3.0ppm	ND
Mercury	1ppm	ND

The heavy metals such as cadmium, arsenic and mercury are not detected and the presence of lead is within the permissible limit.

4.4. Test for Aflatoxins and Pesticide Residues:

Table 3: Results of test for Aflatoxins and Pesticide Residues:

Test	Observed Result
Aflatoxin B1	ND
Aflatoxin B2	ND
Aflatoxin G1	ND
Aflatoxin G2	ND
Organophosphorus	ND
Organochloride	ND
Synthetic pyrethroids	ND

4.5. Test for Bacterial and Fungal count:

Table 4: Results of test for bacterial and fungal count:

Test	Specification as per AYUSH/WHO/FDA	Observed Result
Total bacterial count	NMT 10^5 CFU/g	34,000CFU/g
Total fungal count	NMT 10^3 CFU/g	< 10 CFU/g
E.coli	Absent/g	Absent/g
Salmonella	Absent/g	Absent/g
Pseudomonas aeruginosa	Absent/g	Absent/g
Staphyloccus aureus	Absent/g	Absent/g

The bacterial and fungal loads are within the prescribed limits.The above results suggests that the prepared drug Parangippattai Rasayanam is of standard quality.

A HPTLC profile is done for the drug Parangippattai Rasayanam. The HPTLC image is shown in Figure1.

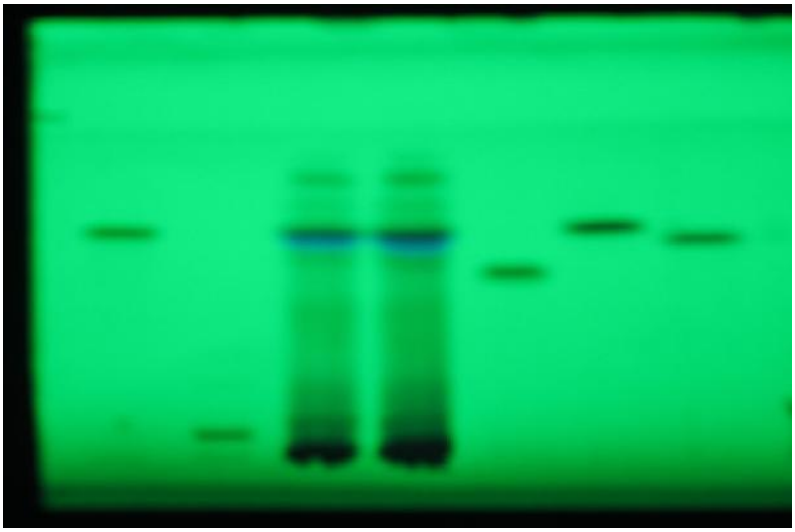
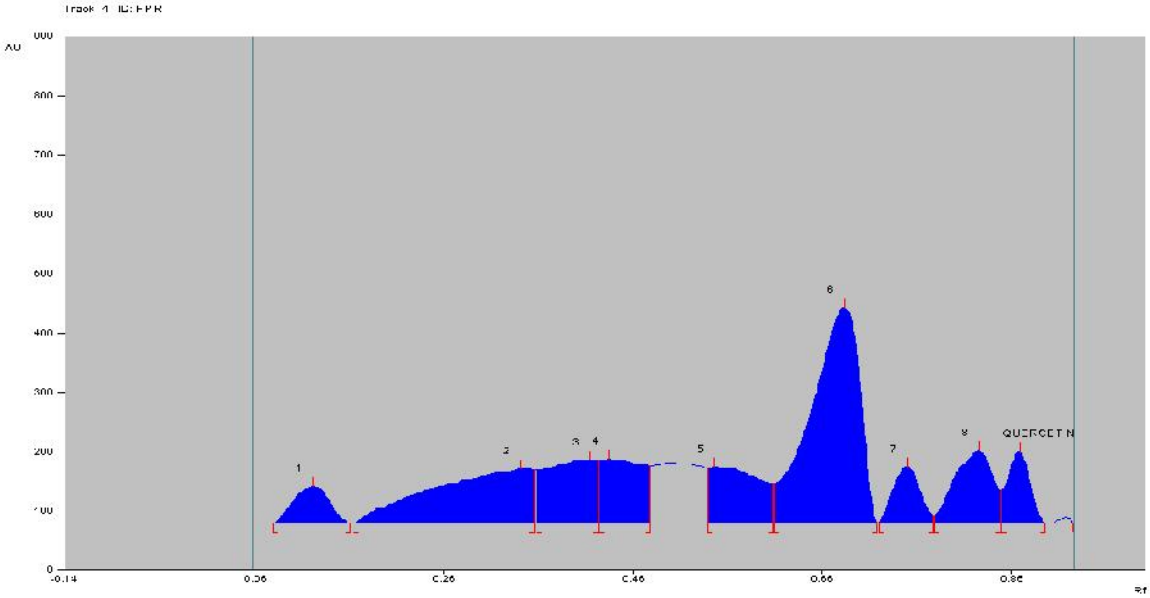
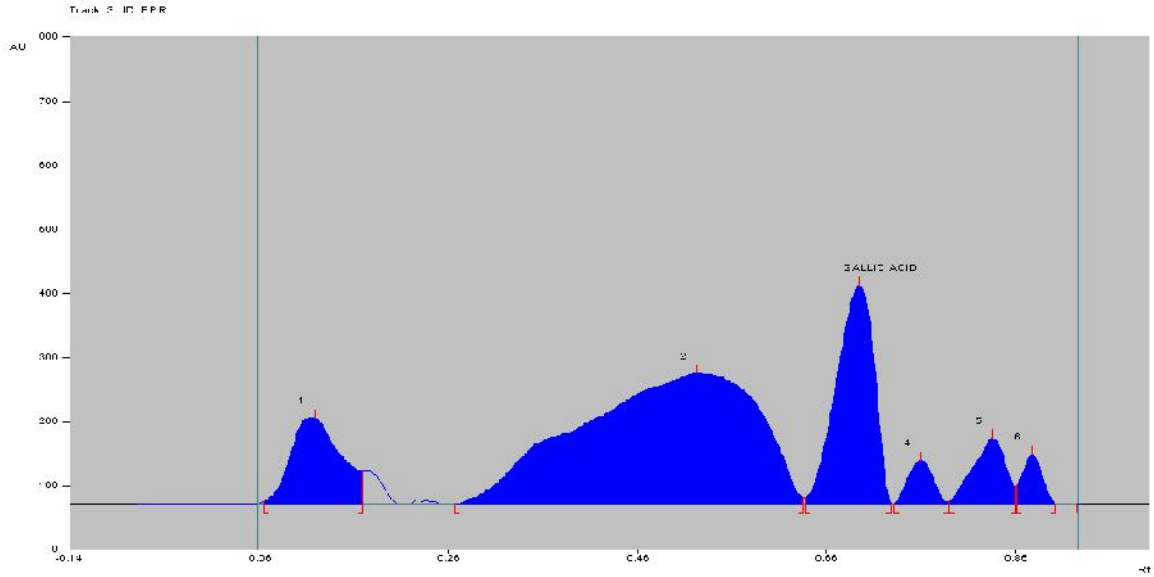
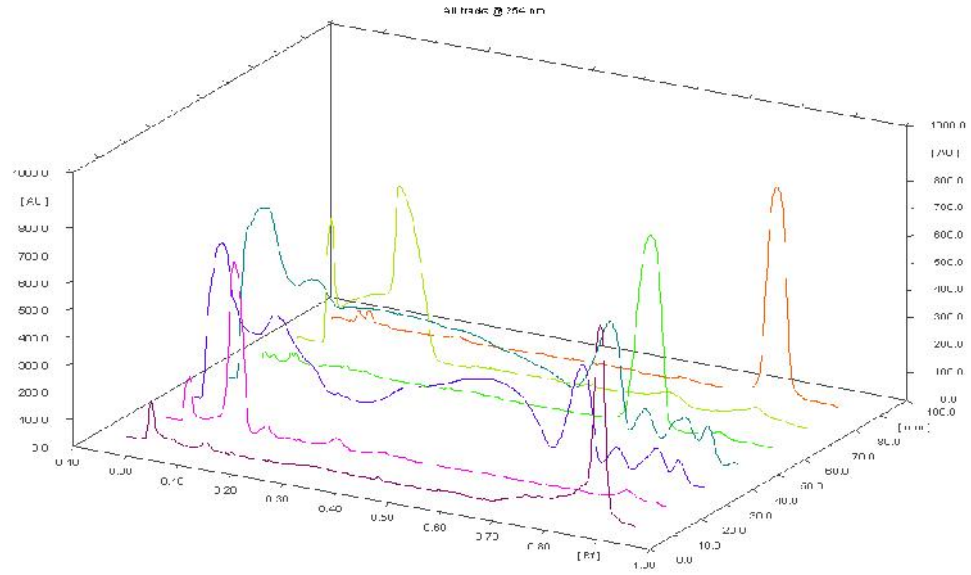


Fig 1 HPTLC chromatogram of standards and SRB

Track 1 Quercetin - standard as reference marker
Track 2 Rutin standard as reference marker
Track 3 Aqueous extract of PRM
Track 4 Aqueous extract of PRM
Track 5 Gallic acid - standard as reference marker
Track 6 Mangiferin- standard as reference marker
Track 7 Cafffeic acid-standard as reference marker







Peak table

Track No	Amount of Sample	Peak	Rf	Name of std
1	5µl	**1**	**0.86**	**Quercetin**
2	5 µl	**1**	0.09	**Rutin**
3	10 µl	**1**	0.01 ,0.11,0.22,0.52,0.69,0.**76**,**0.83,0.88**	**Quercetin and gallic Present**
4	10 µl	**1**	0.03,0.12,0.25,0.31,0.40,0.68,0.**75**,0.82,0.**87**,0.92	**Quercetin and gallic Present**
5	5 µl	**1**	**0.76**	**Gallic acid**
6	5µl	**8**	0.15	**mangiferin**
7	**5**µl	**8**	0.83	**Caffeic acid**

Conclusion

Based on the above results, it can be assumed that the drug Parangippattai Rasayanam has validated the traditional claim.

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