

**INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN
CHEMISTRY AND PHARMACEUTICAL SCIENCES**

(p-ISSN: 2348-5213; e-ISSN: 2348-5221)

www.ijcrpcs.com

DOI: 10.22192/ijcrpcs

Coden: IJCROO(USA)

Volume 5, Issue 1 - 2018

Research Article



DOI: <http://dx.doi.org/10.22192/ijcrpcs.2018.05.01.007>

**Physico - chemical and Phytochemical analysis of
Hepato - Protective Traditional Siddha Medicine
*Manduradhi Kudineer***

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Abstract

Siddha system is one of the oldest systems of medicine in India. Most of the traditional systems of medicine are effective but they are lack in characterization and standardization. Worldwide the consumption of Siddha and Ayurvedha medicine also tremendously increased. There is a need to develop the characterization of Indian medicine. In Indian system of medicine the herbs are enormously used. Standardization of Siddha formulations is an essential factor in order to assess the quality, purity, safety and efficacy of drugs based on the concentration of their active principles. In this view, this study is aimed to characterize the Siddha herbo- metallic preparation *Manduradhi kudineer Chooranam* which is used for *Kaamalai* (Jaundice), *Paandu* (Anaemia), *Peruvairu* (Ascites) and *Kalleral* and *Manneeral Veekkam* (hepato-spleeno megaly). In this study the preliminary phytochemicals and physico-chemical analysis were performed. The results of preliminary phytochemical analysis showed the presence of alkaloids, glycosides, Saponins, Phytosterols, phenols, Flavonoids, Proteins and Amino acids. This study explored the natural photochemicals present in *Manduradhi kudineer*.

Keywords: Siddha medicine; *Manduradhi kudineer*; Characterization, Phytochemicals.

Introduction

Modern food styles, excessive medications, and exposure to pollutants besides many other factors have led to many serious diseases including liver damage¹. Production of reactive oxygen species is considered as a crucial factor leading to oxidative damage of tissues. They react with cell membrane; accordingly, many clinical disorders could be attributed to these free radicals². It has been reported that there has been an alarming increase in number of diseases and disorders caused by synthetic drugs prompting a switch over to traditional herbal medicine³. Recently, herbal products have gained attention as a major part of alternative medicine^{4,5}. Nowadays, discovery of new drug leads seems to focus on those of plant origin.

Herbal drugs play a significant role in the regeneration of liver cells and acceleration of healing process and hence management of many liver disorders².

Siddha system is one of the oldest systems of medicine in India. The term Siddha means achievements and Siddhars were saintly persons, masters in preparing medicine from herbal, metal, mineral and animal products. Even though the traditional systems of medicine are effective, to globalise the wealth of the Siddha system, there is a need to develop standardization technique⁶.

AYUSH has given preliminary guidelines for standardization / characterization of the conventionally used formulations. It is very important to establish a system of standardization for every plant medicine in the market⁷. In Siddha medicine the use of metals and minerals are more predominant in comparison to other Indian traditional medical systems. In the usage of metals, minerals and other chemicals, this system is far more advanced than *Ayurveda*⁸.

Manduradhi kudineer is a herbo metallic traditional Siddha formulation in which *Manduram* (*Ferroso Ferric oxide*) and five different herbs *Maavilai* (*Mangifera indica*), *Manjal karisalai* (*Wedelia chinensis*), *Keezhanelli* (*Phyllanthus amarus*), *Neermulli* (*Hygrophila auriculata*) and *Seeragam* (*Cuminum cyminum*) are used as ingredient. (Table 1). The decoction made from this siddha formulation and has been used for *Kaamalai* (Jaundice), *Paandu* (Anaemia), *Peruvairu* (Ascites) and *Kallerai* and *Manneeral Veekkam* (hepato-spleeno megaly)⁹.

Table.No:1: *Ingredients of Manduradhi Kudineer*

S.No	Siddha Name	English name / Chemical name	Quantity
1.	<i>Maavilai</i>	<i>Mangifera indica</i>	15gm
2.	<i>Manjal karisalai</i>	<i>Wedelia chinensis</i>	15gm
3.	<i>Keezhanelli</i>	<i>Phyllanthus amarus</i>	15gm
4.	<i>Neermulli</i>	<i>Hygrophila auriculata</i>	15gm
5.	<i>Seeragam</i>	<i>Cuminum cyminum</i>	5gm
6.	<i>Mandooram</i>	<i>Ferroso Ferric oxide</i>	25gm

Since there is no single study in analytical / characterization of this formulation *Manduradhi kudineer*. So this study is aimed to analyze the analytical parameters including preliminary phytochemical screening.

Materials and Methods

Preparation of *Manduradhi kudineer*:

Manduradhi kudineer is a herbo-metallic preparation in which 6 ingredients are used. The name of the ingredients is listed in Table no.1.

Method of Preparation:

All the ingredients were procured from authenticated country raw drug store Chennai. Then they were cleaned well and dried. All the ingredients were powdered separately as coarse powder and finally mixed together in specified proportions in geometrical manner to get uniform mixture. At the time of administration the decoction will be prepared.

Analytical Parameters:

Physico-chemical studies like total ash, water soluble ash, acid insoluble ash, water and alcohol soluble extract, loss on drying at 105°C were carried out as per the WHO guide lines¹⁰ and Indian Pharmacopoeia.¹¹ Preliminary phytochemical tests were performed as per the standard methods.

Organoleptic Evaluation:^{12,13}

The organoleptic characters of *Manduradhi kudineer* were evaluated based on the method described by

Siddiqui et al. Organoleptic evaluation refers to evaluation of the formulation by colour, odour, taste and texture etc. (Table. No: 2).

Physico-chemical investigations:^{14,15}

Physico-chemical parameters like ash value, extractive values were performed to the study drug *Manduradhi kudineer* as per the standard method. (Table. No: 3).

Preliminary Phytochemical Analysis:¹⁶

The preliminary phytochemical screening test was carried out for *Manduradhi kudineer* as per the standard conventional protocols (Table. No : 4).

Detection of alkaloids:

Extract was dissolved in diluted hydrochloric acid and filtered.

Mayer's test

2 ml of extract was treated with few drops of *Mayers'* reagent; formation of yellow colored precipitate indicates the presence of alkaloids.

Wagner's test

2 ml of filtrate was treated with *Wagner's* reagent. Formation of brown /reddish precipitate indicates the presence of alkaloids.

Detection of carbohydrate

Extract was dissolved in 5 ml distilled water and filtered. The filtrates was used to test for presence of carbohydrates.

Molisch's test

2 ml of filtrate was treated with few drops of alcoholic Alpha naphthol solution in a test tube. Formation of the violet ring at the junction indicates presence of Carbohydrates.

Benedict's test

Filtrate was treated with Benedict's reagent and heated gently. Orange red precipitate indicates the presence of reducing sugars.

Detection of Glycosides

Liebermann's test

2ml of extract was treated with 2ml chloroform and 2ml of acetic acid, Violet color change into blue and green indicates presence of Glycosides.

Detection of Saponins

Froth test

Extract was diluted with distilled water to 20 ml and this was shaken in a graduated cylinder for 15 minutes. Formation of 1 centimeter layer of foam indicates the presence of Saponins.

Foam test

0.5-gram extract was shaken with 2 ml of water. If foam produced persists for 10 minutes, it indicates the presence of Saponins.

Detection of phytosterols

Salkowski's test

Extract was treated with chloroform and filtered; the filtrate was treated with few drops of concentrated sulphuric acid, shaken well and allowed to stand for few minutes. Golden yellow color indicates the presence of triterpenes.

Detection of phenols

Ferric Chloride test:

2 ml of extract was treated with 3-4 drops of ferric chloride solution. Formation of bluish black color indicates the presence of phenols.

Detection of tannins

Gelatin test

To the extract, 1% of gelatin solution containing sodium chloride was added, formation of white precipitate indicates the presence of tannins.

Detection of flavonoids

Alkaline reagent test

The extract was treated with few drops of 10% sodium hydroxide, formation of intense yellow color then on addition of diluted hydrochloric acid it becomes colorless, and it indicates the presence of flavonoids.

Lead acetate test

Extract was treated with few drops of lead acetate solution; yellow color precipitate indicates the presence of flavonoids.

Detection of proteins and amino acids

Xanthoproteic Test:

The extract was treated with few drops of Conc. Nitric acid. Formation of yellow colour indicates the presence of proteins.

Detection of diterpenes

Copper Acetate test

Extract was dissolved in water and treated with 3-4 drops of copper Acetate solution; formation of emerald green color indicates the presence of diterpenes.

Test for gum and mucilage

The extract was dissolved in 10 ml of distilled water and to this 2ml of absolute alcohol with the constant stirring white cloudy precipitate indicates the presence of gum and mucilage.

Test for Quinones

Extract was treated with sodium hydroxide blue or red precipitate indicates the presence of Quinones.

Results and Conclusion

As a part of standardization procedure, the sample was tested for relevant physicochemical parameters, and also subjected to Preliminary phytochemical analysis through quality control measures. Organoleptic parameters revealed that light brown in colour, with an aromatic odour, Astringent taste and coarse texture (Table. No: 2).

Table. No: 2: Organoleptic characters of Manduradhi Kudineer

S.No	Organoleptic Characters	Observation
1.	Colour	Light brown
2.	Odour	Aromatic
3.	Taste	Astringent
4.	Texture	Coarse powder

Results of physico-chemical parameters Total ash, Acid insoluble ash, Alcohol soluble extractives, Water soluble extractive, Loss on drying at 105° C were analyzed and the results were tabulated (Table. No:3). Ash value is useful in determining authenticity

and purity of drug and also these values are important quantitative standards. Percent weight loss on drying or moisture content was found to be 9.59% w/w. The less value of moisture content could prevent bacterial, fungal or yeast growth.

Table. No: 3: Physico- chemical Evaluation of Manduradhi Kudineer

S.No	Parameters	Percentage
1	Loss on drying 105°C	9.59%
2	Total ash value	46.37%
3	Acid insoluble ash	37.60%
4	Water soluble ash	1.20%
5	Water soluble extraction	12.02%
6	Alcohol soluble extraction	11.24%

Preliminary phytochemical analysis revealed the presence of alkaloids, glycosides, Saponins, Phytosterols, phenols, Flavonoids, Proteins and Amino acids, Diterpenes, Gum & mucilage and Quinone (Table. No: 4). This study concluded that, the effect of

Manduradhi kudineer may be due to the presence of bioactive compounds particularly flavonoids, phenolic compounds and phytosterols which may enhance the therapeutic effect.

Table. No:-4: Phytochemical Screening of Manduradhi Kudineer:

S.No	Phytochemicals	Test Name	Aqueous extract
1	Alkaloids	Mayer's test	Present
		Wagner's test	Present
2	Carbohydrates	Molisch's test	Absent
		Benedict's test	Absent
3	Glycosides	Libermann Burchard's test	Present
4	Saponins	Froth test	Present
		Foam test	Present
5	Phytosterols	Salkowski's test	Present
6	Phenols	Ferric chloride test	Present
7	Tannins	Gelatin test	Absent
8	Flavonoids	Alkaline Reagent test	Absent
		Lead acetate test	Present
9	Proteins and Amino acids	Xanthoproteic test	Present
10	Diterpenes	Copper acetate test	Present
11	Gum & mucilage	Extract + alcohol	Present
12	Quinone	NAOH +Extract	Present

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	Subject: Siddha Medicine
Quick Response Code	
DOI: 10.22192/ijrcrps.2018.05.01.007	

How to cite this article:

S. Iyswarya, S. Visweswaran, V. Banumathi. (2018). Physico - chemical and Phytochemical analysis of Hepato - Protective Traditional Siddha Medicine *Manduradhi Kudineer*. *Int. J. Curr. Res. Chem. Pharm. Sci.* 5(1): 32-36.

DOI: <http://dx.doi.org/10.22192/ijrcrps.2018.05.01.007>