

Physico Chemical Analysis And Phyto Chemical Screening Of Anti -Hypertensive Siddha Formulation Veppampoo Tablet

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Abstract

Introduction : Herbal formulations usage is increasing day by day as therapeutics for various ailments. Since centuries, various traditional systems in the world including India had plant derived formulations as their main components. Eventhough they are almost safe, their quality, safety have to be analysed for their better use with scientific techniques.

Objective: The objective was to analyse the organoleptic characters, physico chemical properties and phytochemical screening of Siddha anti hypertensive formulation Veppampoo tablet.

Materials and methods: Veppampoo tablet was prepared as per GMP Guidelines and subjected to analysis for organoleptic characters and physico chemical properties at The Tamil Nadu Dr.MGR Medical university while screening of Phyto chemicals were performed at Noble research solutions, Chennai as per AYUSH(Ayurveda, yoga, Unani, Siddha, Homeopathy) Pharmacopaeo laboratory for Indian Medicine (PLIM) Guidelines.

Result : Physico chemical analysis showed loss on drying as 6.8%, total ash value 13.79%, acid soluble ash 6.25%, water soluble ash 2.6402%, water soluble extractive 7.3053% and acid soluble extractive 4.38% while screening of Phytochemicals showed the presence of phenol, steroid, tannin, triterpenoid, saponin and carbohydrate.

Conclusion: The results of the present study of Veppampoo tablet with regard to organoleptic, physico chemical properties and presence of important phytoconstituents assured the quality and justified the therapeutic use of the tablet as an anti hypertensive.

Key words: Siddha, physico chemical, phyto constituents, Veppampoo tablet

1. Introduction

In India, plants have been used as sources of medicine since the Vedic era. Ancient texts have reported about 500 plants with medicinal uses and various indigenous systems of medicines use around 800 plants [1]. Since time immemorial, ancient Indians, Egyptians, Chinese and people of other countries have employed a variety of plants and plant products for curing all kinds of ailments. Approximately 25 000 plant based formulations are available in the indigenous medical texts [2]. Among them, Siddha is one of the ancient traditional systems practiced in southern part of India. Medicinal plants are important sources and have been used for thousands of years for curing health conditions, and preventing diseases, including epidemics [3]. Despite the overwhelming impact of modern medicine and enormous breakthroughs in synthetic drug synthesis, traditional cures (now referred to as herbal pharmaceuticals/herbal treatments in many publications) are supported, suggested, and encouraged by the World Health Organization (WHO). Since these remedies are affordable, healthful, and trustworthy because they have no substantial adverse repercussions, they are not only popular but also a good way to cure the diseases [4,5].

Hypertension is one of the most common non-communicable prevalent disease in the world. Hypertension is responsible for around 16.5% of annual deaths worldwide [6] and is indeed the main cause of morbidity and mortality associated with cardiovascular diseases (CVDs) [7]. High blood pressure (BP) is a major risk factor and a better control of it can lead to prevention from CVDs. Poor adherence to medications is a major public health problem and remains one of the main unresolved issues in the management of hypertension. The use of natural herbal drugs with potential antihypertensive activity and fewer side effects can be a good substitute for synthetic drugs when associated with the change in lifestyle and light exercise [8].

In Siddha medicine, Veppampoo Tablet (mathirai) is a polyherbal formulation effective in regulating blood pressure [9]. The formulation was evaluated for its organoleptic properties, physico-chemical profile such as ash value, extractive value in water and alcohol and qualitative phytochemical screening to substantiate the quality and standardization of the formulation.

2. Material and Methods

2.1 Ingredients

Veppampoo tablet comprised of fifteen herbal ingredients - *Azadirachta indica* (Neem flowers), *Phyllanthus amarus*, *Solanum trilobatum*, *Eclipta prostate*, *Zingiber officinalis*, *Piper longum*, *Piper longum*, *Terminalia chebula*, *Embelica officinalis*, *Terminalia bellarica*, *Syzigium aromaticum*, *Cinnamomum zeylanicum*, *Elaterria cardamom*, *Coeus vettiveroides* and *Citrus lemon* [9]

2.2 Collection of raw material

Drugs were procured from indigenous raw drug store at Parys, Chennai, identified and authenticated by the Botanist of Govt Siddha Medical College, Chennai, Tamilnadu. (voucher number GSMC/MB-89/21 -- 100/21)

2.3 Sample preparation

The polyherbal siddha formulation Veppampoo Tablet (VPT) was prepared as per classical Siddha text. The ingredients were purified according to the classical text Sikitcha rathna deepam saraku suthi muraigal [10]. After purification the ingredients were grounded separately in to powder as per the ratio described in the text . All the powdered drugs were mixed in the stone mortar and grounded with required quantity of lime juice for three days and made in to 500 - gram tablets. The tablets were dried well in shade and stored in a clean dry air tight container. Organoleptic characters identification and physico chemical analysis of VPT was carried out at The Tamil Nadu Dr. MGR Medical university, Guindy, Chennai, whereas phyto chemical screening was performed at NABH accredited lab, Noble research solutions, kolathur, Chennai, ISO 9001: 2015.

2.4 Organoleptic characters

The organoleptic characters of VPT such as state, nature, consistency, colour, odour, taste had been observed and depicted in Table1.

2.5. Physico-Chemical Parameters

Percentage of loss on drying, total ash, acid-insoluble ash, water soluble ash, water soluble extractive and alcohol soluble extractive were carried out and calculated based on the AYUSH PLIM Guidelines. The different extracts of the formulation were prepared for the study and the results were given in Table 2.

2.6. Phytochemical Screening

2.6.1 Methodology

The qualitative phytoconstituents tests performed for the presence of alkaloids, coumarins, saponins, tannins, glycosides, flavonoids, phenols, steroids, Triterpenoids, Cyanins, carbohydrates and proteins to the test sample VPT were described below and the results obtained were given in Table 3 [11].

Test for alkaloids:

Mayer's Test: To the test sample, 2ml of mayer's reagent was added, a dull white precipitate revealed the presence of alkaloids.

Test for flavonoids:

Alkaline reagent test: Two to three drops of sodium hydroxide were added to 2ml of extract. If flavonoids were present, a deep yellow colour would have appeared and it gradually became colourless by adding a few drops of dilute HCL. Absence of the above colour change indicated absence of flavonoids.

Test for glycosides:

Borntrager's Test: Test drug was hydrolysed with concentrated hydrochloric acid for 2 hours on a water bath, filtered and the hydrolysate was subjected to the following tests. 2 ml of filtered hydrolysate was taken and 3 ml of chloroform was added and shaken well. Chloroform layer was separated and after that 10% ammonia solution was added to it. Absence of pink colour indicated there was no glycosides.

Test for steroids:

Salkowski test: To the test sample, 2ml of chloroform was added with few drops of concentrated Sulphuric acid and shaken well. The upper layer in the test tube turned into red and sulphuric acid layer showed yellow with green fluorescence which confirmed the presence of steroids.

Test for Triterpenoids:

Liebermann–Burchard test: To the chloroform solution, few drops of acetic anhydride was added and mixed well. After that, 1 ml concentrated sulphuric acid was added from the sides of the test tube, appearance of red ring indicated the presence of triterpenoids.

Test for coumarins:

Sodium hydroxide test: To the test sample, 1 ml of 10% sodium hydroxide was added. The presence of coumarins was indicated by the formation of yellow color. Since there was absence of yellow colour, coumarins was not present in the sample VPT.

Test for phenols:

Lead acetate test: To the test sample; 3 ml of 10% lead acetate solution was added. A bulky white precipitate indicated the presence of phenolic compounds.

Test for tannins:

Ferric chloride test: test: To the test sample, ferric chloride was added, formation of a dark blue or greenish black color showed the presence of tannins.

Test for saponins:

Foam test: To the test sample, 5 ml of water was added and the tube was shaken vigorously. Copious lather formation indicated the presence of Saponins.

Test for Cyanins:

Aanthocyanin / Betacyanin

To the test sample, 1 ml of 2N sodium hydroxide was added and heated for 5 minutes at 100°C. Absence of formation of bluish green colour indicated the absence of anthocyanin.

Test for Carbohydrates :

Benedict's test: To the test sample about 0.5 ml of Benedic's reagent is added. The mixture was heated on a boiling water bath for 2 minutes. A characteristic coloured precipitate indicated the presence of sugar.

Test for Proteins:

Biuret Test: To the extract, 1% solution of copper sulphate was added followed by 5% solution of sodium hydroxide. Formation of violet purple colour was indicated by the presence of proteins. Since there was no purple colour obtained protein was absent in the sample VPT.

Results

The results obtained for Organoleptic characters, Physico chemical analysis and phytochemical screening of the formulation Veppampoo Tablet were given in the following tables 1,2,3.

Table 1. Organoleptic characters of Veppampoo Tablet

State	Solid
Nature	Fine
Odor	Strong Characteristic
Touch / Consistency	Soft
Flow Property	Non- free flowing
Colour	Brownish
Taste	Acidic

Table 2. Physico-Chemical Analysis of Siddha formulation Veppampoo Tablet

S.no	Parameters	Percentage
1	Loss on drying	6.8 %
2	Total ash value	13.79 %
3	Acid insoluble ash	6.25 %
4	Water soluble ash	2.6402 %
5	Water soluble extractive	7.3053 %
6	Alcohol soluble extractive	4.38 %

Table 3. Phytoconstituents analysis of Siddha formulation Veppampoo Tablet

S.no	Phytoconstituents	VPT
1	Alkaloids	-
2	Flavanoids	-
3	Glycosides	-
4	Steroids	+
5	Triterpenoid	+

6	Coumarin	-
7	Phenol	+
8	Tanin	+
9	Saponin	+
10	Anthocyanin	-
11	Betacyanin	-
12	Carbohydrate	+
13	Protein	-

+ Indicates presence and - Indicates absence of the Phytoconstituents

Discussion

Many Siddha formulations as well as herbal formulations of various traditional systems had been studied previously for their physico chemical and phytoconstituents nature. The studies were done to establish the quality and presence of bioactive components of the formulations so that the safety of the drug would be ensured. A study had been reported previously, that the ingredients of Siddha polyherbal formulation VPT posses antihypertensive and other pharmacological properties related to hypertension [12]. Antioxidant study of VPT revealed most notable phenolic and flavonoid compound and exhibited solid antioxidant activities, which were comparable to the commercial, medicate antioxidant ascorbic acid. High performance thin layer chromatography (HPTLC) analysis showed the presence of twelve prominent peaks with Rf value ranges from 0.02 to 0.86 with a maximum peak area of 9463.4 as fifth prominent peak in the finger profile [13]. Added to this heavy metal, aflatoxin, pesticide residue and microbial count study done on VPT as per PLIM guidelines showed values below the limits specified [14,15]. In this consequence, the physico chemical and phytochemical evaluation were done to establish the quality and maximum beneficial properties possessed by the formulation VPT.

Conclusion

Organoleptic properties showed VPT had solid nature, soft consistency and acidic taste, which were considered as suitable properties for a tablet formulation. Physico chemical analysis showed loss on drying as 6.8%, total ash value 13.79 % , water soluble ash 2.6402 % less than acid soluble ash 6.25 % , water soluble extractive 7.3053 % and acid soluble extractive 4.38%. Phytochemical screening showed the presence of triterpenoid, steroid, Phenol, saponin, tannin and sugar as bioactive components which justifies its therapeutic use in hypertension.

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Author's contribution

The author DR.S.M.C executed the study and written the draft, edited and approved by other authors.

Conflict of interest

The authors declared no conflict of interest.

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None

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