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Research article

PRELIMINARY QUALITATIVE PHYTOCHEMICAL SCREENING OF KAARA VEDIUPPU PARPAM

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ABSTRACT

Phytochemicals are refer to biologically active, naturally formed chemical compounds in plant. Qualitative phytochemical analysis is an important tool to recognize the presence of bioactive constituents, It gave valuable information about the different phyto-constituents present in the extracts, which helps the future investigations regarding the selection of the particular extract for using and isolating the active principle compound. *Kaara vediyuppu parpam (K.V.P)* in the literature of *Kannusamy Paramparai Vaiththiyam, Author Vaiththiyar Kannusamy pillai,* for *Neerkattu (*Anuria*). K.V.P* is a herbo mineral drug under the classification of *Paspham.* Aim is to investigate the presence of phytochemicals in the drug *K.V.P.* The screening of alcoloids are used for the analysis of phytochemicals as described by Harborne and Onwukaemeand coworkers, 1999 were carried on alcoholic extract of drug. On alkaloid availability test, an orange red precipitate produced, that indicates presence of alkaloid. On phenol availability test, a blue or green colour was formed, that indicates presence of phenols. The *Siddha* herbo mineral formulation *K.V.P* shows the presence of phytochemicals. Alkaloids possess antispasmodic, analgesic, bactericidal effects. Alkaloids are the active principles producing many essential effects in protecting the body. They possess rich Anti-Oxidant property and protect body from oxidative stress. Phenol groups are the essential part of many anti-oxidant compounds.

Keywords:

Kaara Vediuppu Parpam , Phytochemical , Alkaloids, Phenols

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INTRODUCTION

In the earlier days physicians used to be, they controlled the formulator and all the processes right from collection to dispensing. In last few decades, there has been tremendous growth in the field of herbal medicines. It has become necessary to lay down stringent parameters to ensure batch-to-batch consistency and reproducibility. Therefore, standardization of herbal formulations has become extremely essential in order to assess the quality, purity, safety and efficacy of drugs based on the amounts of their active principles [(1).]

Standardization in herbo mineral formulations deals with ensuring establishment of standards for the quality and purity of raw materials, quality control during the drug manufacturing process, production of a good quality finished product, storage and distribution to maintain the quality of the final product. [(2).]

The term "herbal drugs" denotes plants or plant parts that have been converted into phytopharmaceuticals by means of simple processes involving harvesting, drying, and storage Phytochemicals (Greek word "phyto" means plant) are refer to biologically active, naturally formed chemical compounds in plant. Thousands of different phytochemicals have been found from vegetables, fruits, beans, whole grains, nuts and seeds. These chemicals are synthesized in each and every part of plant. These phyto constituents work with nutrients and fibres to form an integrated part of defence system against various diseases and stress conditions. Phytochemicals are basically divided into two groups, i.e. primary and secondary metabolites according to their functions in plant metabolism. Primary metabolites comprise of carbohydrates, amino acids, proteins etc., while secondary constituents consist of alkaloids, phenolic compounds, flavonoids, tannins, glycosides, terpenoids, saponins, and so on [(3).]

Qualitative phytochemical analysis is an important tool to recognize the presence of bioactive constituents. The qualitative phytochemical investigation gave valuable information about the different phytoconstituents present in the extracts, which helps the future investigations regarding the selection of the particular extract for using and isolating the active principle compound. Selected waste materials were tested for alkaloids, phenols, flavonoids, tannins, saponins, terpenoids, glycosides, steroids, sugar/carbohydrates, proteins/amino acids, fats and fixed oils. For confirmation of each phytoconstituents, minimum three spot tests were carried out. Majority of the plant material gave positive results for alkaloids, phenols, sugars and proteins.

Sugars and proteins are basic nutritional and structural metabolites so they are universal in distribution. Flavonoids, tannins, saponins and terpenoids were moderately distributed among selected waste materials. Glycosides, steroids and oil were the least recorded constituents. Presence or absence of secondary metabolites is depend upon the environment and physiology of plant as they are produced as a response of plant to the different surrounding conditions [(4),(5) & (6).]

Kaara vediyuppu parpam in the literature of *Kannusamy Paramparai Vaiththiyam, Author Vaiththiyar Kannusamy pillai, page no 380,381* for *Neerkattu (*Anuria*). Kaara vediyuppu parpam* is a herbo mineral drug under the classification of *Paspham.* Raw ingredients are *Vediyuppu (*Saltpetre - Potassium Nitrate) *2 palam (70gm), Vengaram (*Borax - Sodium bi borate)*2 palam (70gm)* and *Nirmulli sampal* (Long leaved barleria (ash of *Hygrophila auriculata*) - *2 palam (70gm)* [(7).]

Qualitative phytochemical screenings are used for the analysis of phytochemicals as described by Harborne and Onwukaeme and coworkers, 1999 were carried on alcoholic extract of certain trial drug.

OBJECTIVE

To investigate the presence of phytochemicals in the herbo mineral drug *Kaara vediyuppu parpam.*

MATERIALS AND METHODS

Purification of raw drugs

The purification of this drug is as follows as illustrated in *Gunapadam Thathu Jeeva Vagupu* and *Gunapadam mooligaiyiyal.*

1. Vediyuppu (Potassium nitrate***)***

1) *Vediuppu* : 280 g

2) Water : 1120g (1.12 liter)

3) Eggs : 04 No's

Water is added to the salt and boiled on a hearth with mild flames and then the white of Eggs added boiling salt water and bubbles appearing with impure substances removed with a wooden spoon.

Then the ingredients transferred to other glass vessels, sealed cloth, filtered and kept in places without aeration. Next day the water filtered and the salt dried in sunshade. This process repeated for seven times to get it purified.

End produced - 208g [(8)]

2. Vengaram (Borax)

Venkaram : 280g

Borax kept mud vessels and fried fill the moisture completely evaporates

End product 245g [(8)]

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3. Neerrmulli (Hygrophila auriculata)

Clean the whole plant of 9375g with purified water and dried in the sunlight. Then made it into ash by burning.

End product 242g [9]

Preparation of the drug

Purified ingredients of *Kaara vediyuppu parpam*

Fig 1: Potassium Nitrate (*Vediyuppu)*

Fig 2: Sodium bi borate (*Vengaram)*

Fig 3: *Hygrophila auriculata* (*Neermulli sampal)*

Fig 4: Hens egg albumen (*Muddai venkaru)*

Potassium Nitrate (*Vediyuppu)* : 140g (4*Palam*)

Sodium bi borate (*Vengaram)* : 140g (4*Palam*)

Ash of *Hygrophila auriculata* (*Neermulli sampal)*

: 140g (4*Palam*)

Hens egg albumen (*Muddai venkaru)*

: Required amount

Purified 140 g of *vediyuppu* and 140 g of *Venkaram and 140g of neermulli sambal* are ground with egg white yolk (Egg albumen) to a waxy consistency, and made in to 21 small discs (*Villai*) and dried. Then the disc (*Villai*) are cut into small pieces, placed in a mud flask, covered with a mud plate, and sealed with clay cloth (*Seelai man*). Then it is subjected into 3 incineration (*Pudam*) process as following,

With 49 cow dung cakes*(Varaadi)*

With 88 cow dung cakes *(Varaadi)*

With 96 cow dung cakes *(Varaadi)*

After cooling, each incineration process the processed medicine removed from the mud flask. The product was obtained and triturated in *Kalvam* and final product 57g of *Kaara Vediyuppu parpam* is prepared.

Fig 5: Prepared medicine of *Kaara vediyuppu parpam*

Storage

The drug *Kaara vediyuppu parpam* was stored in a clean air-tight glass container and used for further studies.

Administration of the drug

Form of the drug : Powder (*Parpam*)

Route : Enteral (oral)

Dose : 260- 390 mg (2-3 *Kundri yedai*), BID- morning and evening

Adjuvant : Tender coconut.

Shelf life : 75 years

Indication : *Neerkattu* (Anuria) [7]

The following tests are used for the analysis of phytochemicals as described by Harborne and Onwukaeme and coworkers, 1999 were carried on alcoholic extract of plant.

Test for Alkaloids

A small segment of the *Siddha* preparation *Kaara vediyuppu parpam* was mixed separately with a few drops of dilute hydrochloric acid and filtered. The filtrates were tested carefully with *Dragandroff's test* as follows:

Dragandroff's test

8gm of $Bi(No_3)_3$. $5H_2O$ was dissolved in 20 ml HNO_3 and 2.72g of potassium iodide in 50 ml H_2O.These were mixed and allowed to stand. When KNO_3 crystals out, the supernatant was discarded off and made up to 100 ml with distilled water. The alkaloids were regenerated from the precipitate by treating with Na_2CO_3 followed by extraction of the liberated base with ether.To 0.5ml of alcoholic solution of extract added to 2.0 ml of HCl.

To this acidic medium 1.0 ml of reagent was added. An orange red precipitate produced immediately indicates the presence of alkaloid.

Test for Flavanoids

Small quantity of *Siddha* preparation *Kaara vediyuppu parpam* was treated with 0.5ml of alcohol and got the solution of extract, 5-10 drops of dilute HCl and a pinch of Magnesium chloride were added and solution was boiled for a few minutes. Presence of reddish pink or dirty brown colour indicates the presence of flavanoids.

Test for Saponin

In a test tube containing 0.5 ml of aqueous extract of *Siddha* preparation *Kaara vediyuppu parpam*, a drop of sodium bicarbonate was added. The mixture was shaken vigorously and kept for 3 minutes. A honeycomb like froth was formed and it showed the presence of Saponin.

Test for Phenol

Ferric chloride test

To 2 ml of alcoholic solution of extract of *Siddha* preparation *Kaara vediyuppu parpam*, 2 ml of distilled water followed by drops of 10% aqueous solution of $FeCl_3$ solution were added. Formation of blue or green colour indicates the presence of phenols**.**

Test for Steroids

Salkowski test

To 2ml of chloroform extract of *Siddha* preparation *Kaara vediyuppu parpam,* 1ml of concentrated H_2SO_4 was added carefully along the sides of test tube. A red ring was produced in the chloroform layer in the presence of steroids.

Test for Glycosides

A small amount of alcoholic extract of *Siddha* preparation *Kaara vediyuppu parpam* was dissolved in 1 ml of H_2O and the aqueous NaOH solution was added. Formation of yellow colour indicates the presence of glycosides.

Test for Tannins

Ferric chloride test

To 1-2 ml of aqueous extract *Siddha* preparation *Kaara vediyuppu parpam*, few drops of 5% ferric chloride solution were added. A bluish black colour which disappears in addition of a few ml of sulfuric acid, there is no formation of yellowish brown precipitate.

Test for Terpenoids

To 2ml of chloroform extract *Siddha* preparation *Kaara vediyuppu parpam* 1ml of conc.H_2SO_4 was added carefully along the sides of the test tube. In presence of terpenoids, red colour was produced in chloroform layer.

Test for Carbohydrates

A small quantity of preparation will dissolve separately in 5ml of distilled water and filter it. The filtrate will subject to Molisch's test to detect the presence of carbohydrates. Filtrate will treated with 2-3 drops of 1% alcoholic alpha-naphthol solution and 2ml of concentrated sulphuric acid will add along the sides of the test tube. Appearance of brown ring at the junction of 2 layers shows the presence of carbohydrates.

Tests for Lignin

Small quantities of preparation will dissolve separately in few ml of alcoholic solution of hydrochloric acid and phloroglucinol gives red color, which shows lignin is present.

Tests for Fixed oils and Fats

(a) Spot Test

A small quantity of preparation will place between 2 filter papers. Oil stains produced with any extract shows the presence of fats and fixed oils.

(b) Saponification Test

A small quantity of preparation will treat with few drops of 0.5N alcoholic potassium hydroxide along with 2 to 3 drops of phenolphthalein. Later the mixture is reflux for about 2h. Soap formation indicates the presence of fats and fixed oils.

RESULTS AND DISCUSSION

Phytochemical analysis of *Kaara vediyuppu parpam*

On alkaloid availability test, an orange red precipitate produced, that indicates presence of alkaloid. On flavonoid availability test, No characteristic change was observed. On phenol availability test, a blue or green colour was formed, that indicates presence of phenols

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Table No: 2 Results of Bio-chemical analysis Acid radicals of "Kalladaippu Chooranam

S.No	Phytochemicals	Test	Result
1	Alkaloids	Dragandroff's test	++Ve
2	Flavanoids	Alkaline reagent test	-Ve
3	Phenols	Ferric chloride test	+Ve
4	Glycosides	Alcoholic extract with NaOH test	-Ve
5	Saponins	Froth test	-Ve
6	Steroids	Salkowski test	-Ve
7	Tannins	Ferric chloride test	-Ve
8	Terpenoids	Chloroform extract and H_2SO_4 test	-Ve

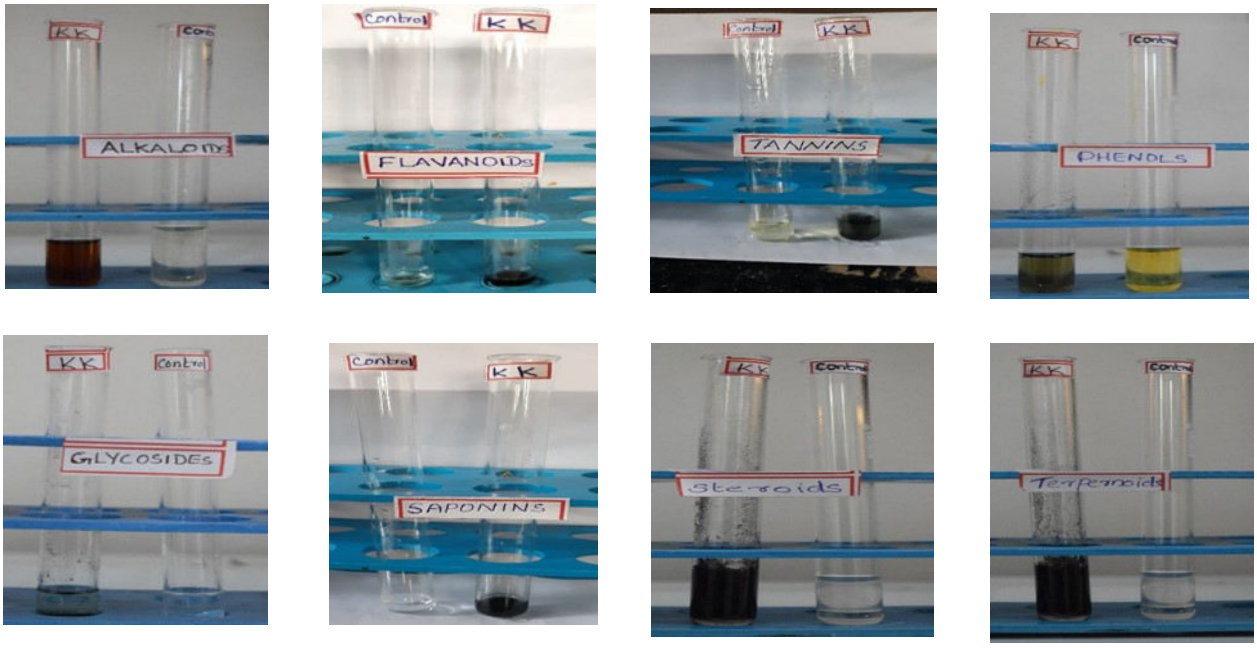

Fig 6: Phytochemical analysis results on *KVP*

On glycosides, No characteristic change was observed. On Saponins availability test No characteristic change was observed. On steroids availability test No characteristic change was observed on tannins availability test No characteristic change was observed. On terpinoids availability test No characteristic change was observed.

Phytochemicals are natural bioactive compound found in Herbal products, which act as a defense system against diseases, and more accurately, to protect against diseases. The phytochemical analysis reveals the presence of Alkaloids and Phenol.

CONCLUSION

From the above study, it is concluded that the *Siddha* herbo mineral formulation *Kaara vediyuppu parpam* shows the presence of phytochemicals. Alkaloids possess antispasmodic, analgesic, bactericidal effects. Alkaloids are the active principles producing many essential effects in protecting the body. Effective Anti-Hyperglycemic agent. They possess rich Anti-Oxidant property and protect body from oxidative stress. Phenol groups are the essential part of many anti-oxidant compounds.

CONFLICT OF INTEREST: None declared

SOURCE OF FUNDING: Nil

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