

PHYTOCHEMICAL ANALYSIS OF SIDDHA HERBAL DRUG NIMBA PANCHANGA CHOORANAM (NPC)

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ABSTRACT

Vitiligo is an acquired depigmentation disorder characterized by the development of well-defined white patches on the skin due to the destruction or dysfunction of melanocytes. Although vitiligo is not a life-threatening condition, it significantly affects the patient's quality of life due to cosmetic disfigurement and associated psychological stress. Siddha system of medicine describes several herbal formulations for the management of Venpulli. Among them, Nimba Panchanga Chooranam, a polyherbal formulation mentioned in the classical Siddha text Agasthiyar Vaithiya Pillai Tamil, has been traditionally indicated for skin disorders. The present study was undertaken to evaluate the phytochemical constituents of Nimba Panchanga Chooranam (NPC). Preliminary qualitative phytochemical screening of the formulation was carried out using standard biochemical tests. The results revealed the

presence of alkaloids, flavonoids, steroids, triterpenoids, phenols, tannins, saponins and carbohydrates, while glycosides, proteins, coumarins, anthocyanins and betacyanin were

absent. The presence of these bioactive phytoconstituents suggests that Nimba Panchanga Chooranam may possess therapeutic properties such as antioxidant, anti-inflammatory and immunomodulatory activities, which could be beneficial in the management of Venpulli.

KEYWORDS: Siddha, Venpulli, Vitiligo, Nimba panchanga chooranam, phytochemical.

INTRODUCTION

In the Siddha system of medicine, vitiligo is described as Venpulli, which is classified under skin diseases caused by the imbalance of the three humours namely Vali, Azhal and Iyyam. Improper dietary habits, lifestyle changes, hereditary factors and environmental influences are believed to contribute to the development of this condition. Siddha literature emphasizes the use of herbal formulations and purification methods to restore the humoral balance and improve skin pigmentation.

Among the various herbal drugs described in Siddha texts for the treatment of skin diseases, Neem (*Azadirachta indica*) is considered highly effective due to its antimicrobial, anti-inflammatory, antioxidant and immunomodulatory properties. The formulation Nimba Panchanga Chooranam, mentioned in the classical text *Agasthiyar Vaithiya Pillai Tamil*, contains five different parts of neem along with other medicinal herbs such as Omam (*Trachyspermum ammi*), Tharai Ilai (*Fumaria parviflora*), Milagu (*Piper nigrum*) and Thippili (*Piper longum*), which are known for their therapeutic benefits in skin disorders.

Phytochemical analysis plays an important role in identifying the bioactive constituents present in herbal formulations, which may contribute to their pharmacological actions. Preliminary phytochemical screening helps to detect the presence of various secondary metabolites such as alkaloids, flavonoids, tannins, phenols, steroids and saponins, which are known to possess significant biological activities.

Therefore, the present study aims to perform qualitative phytochemical analysis of Nimba Panchanga Chooranam in order to identify the major phytoconstituents present in the formulation and to provide a scientific basis for its traditional use in the management of Venpulli (Vitiligo).

MATERIALS AND METHODS

Selection of the Trial Drug

For this present study, the polyherbal formulation “Nimba panchanga chooranam” a compound drug preparation for Venpulli (vitiligo) has been chosen from a classic siddha literature- Agasthiyar vaithiya pillai tamizh” Page number 70.

Table no. 1: Ingredients of Nimba panchanga chooranam.

S. No	Ingredients	Common/English name	Botanical name	Quantity
1.	Veppilai	Neem leaves	<i>Azadirachta indica</i>	13.65 g
2.	Veppam vithai	Neem seed	<i>Azadirachta indica</i>	13.65 g
3.	Veppam pattai	Neem bark	<i>Azadirachta indica</i>	13.65 g
4.	Veppam verpattai	Neem rootbark	<i>Azadirachta indica</i>	13.65 g
5.	Veppam poo	Neem flower	<i>Azadirachta indica</i>	13.65 g
6.	Omam	Ajwain seeds	<i>Trachyspermum ammi</i>	31.50 g
7.	Tharaa ilia	Indian fumitory	<i>Fumaria parviflora</i>	31.50 g
8.	Milagu	Black pepper	<i>Piper nigrum</i>	31.50 g
9.	Thiplili	Indian long pepper	<i>Piper longum</i>	15.75 g

Collection of the Raw Materials

The plant materials were procured from an indigenous raw drug shop located at Parry's Corner in Chennai, Tamil Nadu.

Identification and Authentication of the Drugs

All the raw materials were identified and authenticated by the PG and Research department of Botany, Pachaiyappa's College, Chennai.

Methods of Purification

The purification process for the drugs was based on the ancient Siddha literature Sikicha Rathna Deepam-Sarakku Suthimuraigal.

Preparation of the Drug

All the above-mentioned purified drugs are grinded together and finally the chooranam(powder) is stored in an air tight container.

PHYTOCHEMICAL ANALYSIS OF NIMBA PANCHANGA CHOORANAM(NPC)

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 coumarins

To the test sample, 1 ml of 10% sodium hydroxide was added. The presence of coumarins is indicated by the formation of yellow colour.

Test for saponins

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

Test for tannins

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

Test for glycosides- Borntrager's Test

Test drug is hydrolysed with concentrated hydrochloric acid for 2 hours on a water bath, filtered and the hydrolysate is subjected to the following tests. To 2 ml of filtered hydrolysate, 3 ml of chloroform is added and shaken, chloroform layer is separated and 10% ammonia solution is added to it. Pink colour indicates presence of glycosides.

Test for flavonoids

Alkaline reagent test. Two to three drops of sodium hydroxide were added to 2 mL of extract. Initially, a deep yellow colour appeared but it gradually became colourless by adding few drops of dilute HCL, indicating that flavonoids were present.

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 steroids

To the test sample, 2ml of chloroform was added with few drops of conc. Sulphuric acid (3ml), and shaken well. The upper layer in the test tube was turned into red and sulphuric acid layer showed yellow with green fluorescence. It showed the presence of steroids.

Triterpenoids

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

Test for Cyanins

Anthocyanin

To the test sample, 1 ml of 2N sodium hydroxide was added and heated for 5 min at 100°C. Formation of bluish green colour indicates the presence of anthocyanin.

Test for Carbohydrates - Benedict's test

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

Proteins (Biuret Test)

To extracts 1% solution of copper sulphate was added followed by 5% solution of sodium hydroxide, formation of violet purple colour indicates the presence of proteins.

RESULTS

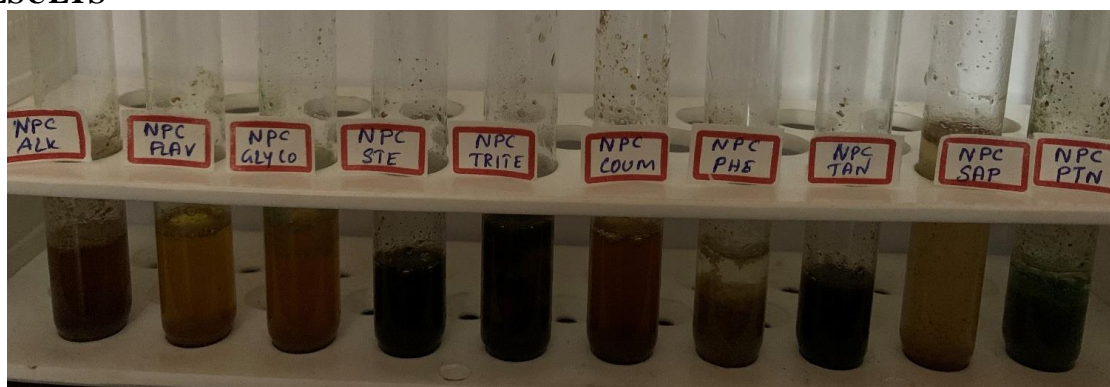


Fig 1: Qualitative Phytochemical Investigation.

Phytochemical analytical report

S.NO	TEST	OBSERVATION
1	ALKALOIDS	+
2	FLAVANOIDS	+
3	GLYCOSIDES	-
4	STEROIDS	+
5	TRITERPENOIDS	+
6	COUMARIN	-
7	PHENOL	+
8	TANIN	+
9	SAPONINS	+
10	PROTEIN	-
11	SUGAR	+
12	ANTHOCYANIN	-
13	BETACYANIN	-

DISCUSSION

Herbal formulations used in the Siddha system of medicine contain a variety of bioactive phytoconstituents that contribute to their therapeutic effects. Preliminary phytochemical analysis plays an important role in identifying these secondary metabolites and provides scientific evidence supporting the traditional use of herbal drugs.

In the present study, qualitative phytochemical screening of Nimba Panchanga Chooranam (NPC) revealed the presence of alkaloids, flavonoids, steroids, triterpenoids, phenols, tannins, saponins and carbohydrates, while glycosides, proteins, coumarins, anthocyanins and betacyanins were absent.

The presence of alkaloids in the formulation may contribute to its pharmacological activities such as anti-inflammatory and antimicrobial properties. These properties are beneficial in managing various skin disorders including vitiligo. Flavonoids and phenolic compounds are well known for their antioxidant activity, which helps in reducing oxidative stress, one of the major factors involved in melanocyte destruction in vitiligo.

Tannins and saponins possess antimicrobial and anti-inflammatory properties, which may help in improving skin health and preventing secondary infections. Steroids and triterpenoids are known to exhibit anti-inflammatory and immunomodulatory effects, which may help in regulating immune responses associated with the pathogenesis of vitiligo.

The formulation mainly contains five parts of neem (*Azadirachta indica*) along with *Trachyspermum ammi*, *Fumaria parviflora*, *Piper nigrum* and *Piper longum*, which are traditionally known for their detoxifying, anti-inflammatory and skin-protective properties. The combined action of these herbs may enhance the therapeutic potential of the formulation.

Thus, the presence of these phytoconstituents supports the traditional claim that Nimba Panchanga Chooranam may be beneficial in the management of Venpulli (vitiligo). However, further studies including pharmacological evaluation, standardization and clinical trials are necessary to scientifically validate its therapeutic efficacy and safety.

CONCLUSION

The present study carried out the qualitative phytochemical analysis of Nimba Panchanga Chooranam, a Siddha polyherbal formulation indicated for Venpulli (vitiligo).

The results revealed the presence of important bioactive constituents such as alkaloids, flavonoids, steroids, triterpenoids, phenols, tannins, saponins and carbohydrates. These phytochemicals are known for their antioxidant, anti-inflammatory, antimicrobial and immunomodulatory properties, which may contribute to the therapeutic activity of the formulation in skin disorders.

The findings of this study provide preliminary scientific evidence supporting the traditional use of Nimba Panchanga Chooranam in Siddha medicine. Further advanced studies such as pharmacological evaluation, toxicity studies and clinical trials are recommended to establish its efficacy and safety in the treatment of vitiligo.

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CONFLICTS OF INTEREST: None.

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