



**PHYSIOCHEMICAL EVALUATION AND DRUG REVIEW ANALYSIS OF SIDDHA
HERBAL FORMULATION – THIPPILIYATHI CHOORANAM**

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ABSTRACT

Siddha is one of the oldest systems of healthcare adopted by ancient traditional healers like “Siddhars”. Siddha system has marked best in recent times because of known side effects caused by conventional allopathic medicines. The awareness and promotion of practicing Indian medicines has increased consistently in recent years. Still now there is no proper documentary or literature evidence available for most of the novel formulations in siddha system of medicine. The main objective of the present research work is to carry out the phytochemical evaluation of the formulation Thippiliyathi chooranam (TYC) and to establish the basic category of bioactive components responsible for the therapeutic activity of TYC. This drug comprises of unique combination of two formulations such as Thripala and Thrikaduku along with some more herbs. As per literature evidence TYC is presently prescribed for clinical conditions like arthritis, psoriasis, management of dropsy, ascites etc. This effort will generously explore the documentary based evidence of novel formulations like TYC among the population and will fruitfully make the usage of TYC.

KEYWORDS: Siddha, Indian medicine, Thippiliyathi chooranam, Thripala, Thrikaduku, Phytochemical evaluation.

INTRODUCTION

Herbs and herbal medicines are preferred by people of economic zones since ages, and nearly 80% of the global population still rely on herbs and herbal remedies for chronic ailments.^[1] Siddha is one of the oldest systems of medicine, which is in practice since ages. Due to globalizations and increased awareness, the traditional medicine usage is increasing every year. With an increase in global demand for herbal medicine, it is now important to ensure consistency in quality of products from batch to batch. To achieve this, a contemporary approach to one of the most renowned formulations mentioned in siddha Triphala was taken up as a model. This approach will help to control the process parameters during manufacturing.^[2,3,4]

Thippiliyathi chooranam (TYC) comprises of a unique combination of two formulations such as Thripala and Thrikaduku along with namely other herbs. The

formulation triphala comprises of *Terminalia chebula*, *Terminalia bellirica* and *Embilica officinalis*. This blend of combination has numerous health benefits and acts as a natural detoxifier, aids in alleviating digestive problems, sharpens eye sight, improves blood circulation, halts progression of inflammation, boosts immune system and posses anti-allergic properties. The clinical management of diabetes, aids in weight loss, prevention of cancer, anti-microbial, regulation of hormonal imbalance, controls dizziness and motion sickness.^[5-10]

The formulation Thrikaduku is a powerful blend of combinations such as *Piper nigrum*, *Piper longum* and *Zingiber officinalis*. Black pepper (*Piper nigrum*) is a widely consumed spice, which is also an herb commonly used in folk medicine. Piperine, a major alkaloid constituent of black pepper, exerts antitumor activities in a variety of cancers. *Piper longum* is used as a single

drug and also in combination to treat various diseases related to the respiratory and digestive system. Further it is used for the ailment of insomnia, asthma, head ache, spleen and liver enlargement.

Piperine inhibited proliferation and induced apoptosis via activating caspase-3 and PARP cleavage. EGF-induced MMP-9 expression was suppressed by piperine via interfering with ERK1/2, p38 MAPK, leading to a reduction in migration.^[11-12]

Oral administration of *Z. officinale* extract has shown different and inconsistent effects, depending on the quantity of consumption. Although administration of squeezed ginger extract to mice twice has elevated the tumor necrosis factor- α (TNF- α) in peritoneal cells, long-term consumption of the extract has increased the serum corticosterone level and has reduced proinflammatory markers.^[13] *Z. officinale* was also tested in type 2 diabetic patients with low-grade inflammation; after 2 months of treatment, serum level of TNF- α and high-sensitivity C-reactive protein (hs-CRP) were decreased definitely.^[14] In patients with osteoarthritis, ginger had not only efficacy in pain improvement identical to Diclofenac 100 mg but also no side effects.^[15] Ginger extract has been compared to Ibuprofen and Indomethacin in osteo arthritis patients; the results have exerted improving function of Ibuprofen, Indomethacin, and ginger extract equally in pain score.^[16-17] Ginger powder has had ameliorative effect in musculoskeletal and rheumatism patients through inhibiting cyclooxygenase and lipoxygenase pathway in synovial fluid.^[18]

MATERIALS AND METHODS

Collection and Identification of raw materials

The required raw drugs were procured from a well reputed indigenous drug shop. The raw drugs were identified and its quality assessed by an expert from Department of Medicinal Botany of National Institute of Siddha. The raw drugs were purified and the medicines were prepared in Gunapadam laboratory of National Institute of Siddha.

Preparation of Thippiliyathi chooranam

Ingredients: Thippili (Piper Longum), Milagu (Piper Nigrum), Chukku (Zingiber Officinale), Kaduku (Brassica Nigra), Muthakaasu (Cyperus Rotundus), Nellivattal (Phyllanthus Emblica), Manjal (Curcuma Longa), Kadukkaai (Terminalia Chebula), Thaandrikaai (Terminalia Bellerica), Elakkalli (Euphorbia Ligularia), Maramanjil (Cosciniun Fenestratum), Sevviyum (Piper Nigrum) - Equal quantity. The above mentioned raw drugs were taken in equal amounts and made into fine powder. The prepared Chooranam was stored in clean and dry glass bottles for further use.

Chemicals: Solvents and chemicals of analytical grade were procured from E. Merck and S.D. fine chemicals, Mumbai.

Preliminary Phytochemical Analysis^[19]

Sample Preparation

Aqueous extract of the formulation TYC was subjected to the following analysis

1) Test for alkaloids

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

2) Test for tannins

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

3) Test for flavonoids

To 0.1ml of the test sample about 5 ml of dilute ammonia solution was been added followed by addition of few drops of conc. Sulfuric acid. Appearance of yellow colour indicated the presence of Flavonoids.

4) Test for carbohydrates

To the test solution about two drops of the Molisch reagent (a solution of -naphthol in 95% ethanol) was added. The solution was then poured slowly into a tube containing two ml of concentrated sulfuric acid so that two layers formed. A positive test was indicated by: The formation of a purple product at the interface of the two layers.

5) Test for Reducing sugar - Benedict's test

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

6) Test for Proteins (Biuret Test)

Biuret test: Equal volume of 5% solution of sodium hydroxide and 1% copper sulphate were added. Appearance of pink or purple colour indicated the presence of proteins and free amino acids.

7) Test for Aminoacids (Ninhydrin)

Ninhydrin test: The extracts were heated with 5% Ninhydrin (in butanol) solution in boiling water bath for 10min and the development of purple or bluish colour indicated the presence of amino acids.

8) Test for Volatile oils

After hydro-distillation of the test sample, characteristic odour of the distillates and their non-permanent staining of filter papers indicated the presence of volatile oils

9) Test for Unsaturated compounds

Orange bromine water can be used to test for unsaturation. When it was added to a test sample, the bromine water stayed orange with a saturated sample. The bromine water colourless with an unsaturated compound presenting samples

10) Test for Inorganic Elemental Analysis^[20]

Carried out as per the standard procedure for carry out the inorganic elemental analysis protocol established by Divakaran et al

11) Test for Organoleptic Characters

Carried out in accordance with standard procedure established by AYUSH guidelines Organoleptic characters of TYC^[21-24]

RESULTS

Results on Organoleptic characters of TYC

Results of organoleptic features of TYC revealed greenish yellow colour in appearance with characteristic odour and the taste appeared pungent with soft consistency. The results of are tabulated in Table 01.

Preliminary phytochemical analysis of TYC

Preliminary phytochemical analysis of TYC revealed the presence of more significant phytochemicals such as Alkaloids, Flavonoids, Tannins, Unsaturated compounds. The results of phytochemical analysis are tabulated in Table 02.

Qualitative Parameters of TYC in Inorganic Test

Inorganic qualitative analysis of the test drug TYC revealed the presence of inorganic elements such as calcium, magnesium, iron, chlorides and sodium. The results of qualitative inorganic chemical analysis are tabulated in Table 03.

Table 1: Results of Organoleptic characters of TYC

S. No	Parameters	TYC
1	Colour	Greenish yellow
2	Odour	Characteristic
3	Taste	Hot(chilli)
4	Consistency	Soft

Table 2: Results of Preliminary Phytochemical Analysis of Test drug TYC

S.No.	Parameters Test	TYC
1	Unsaturated compounds	+
2	Tannins	+++
3	Flavanoids	+
4	Alkaloids (Dragandroff's)	+++
5	Carbohydrates(Molish)	—
6	Reducing Sugar (Benedict's)	—
7	Proteins (Biurets test)	—
8	Amino Acids	—
9	Volatile oil	—

+ Present and - Absent

Table 3: Qualitative parameters of TYC - Inorganic test

S. No.	Parameters	TYC
1	Carbonate	—
2	Calcium	++
3	Magnesium	++
4	Potassium	—
5	Sulphide	—
6	Iron	+++
7	Sulphate	—
8	Chloride	+
9	Nitrite	—
10	Sodium	+

+Present and - Absent

DISCUSSION

The use of plants for the purposes of healing predates recorded history. Researchers found that people in different parts of the world tend to use the same plants for similar purposes. Chinese and Egyptian papyrus records of ancient times described the medicinal uses of plants as early as 3,000 BC. Indigenous cultures such as African and Native American habituated herbs in their healing rituals, while others evolved with traditional medical systems such as siddha, ayurvedic and traditional Chinese medicine. In recent years, interest towards herbal medicine as greatly increased, leading to scientific heed in the medicinal use of plants to treat various ailments and enhance general health and well-being.

Traditional siddha practitioners identify the genuinity and standards of the formulation by its organoleptic characters. Results of organoleptic features of TYC revealed greenish yellow colour in appearance with characteristic odour and the taste appears pungent with soft consistency.

The use of herbal medicine is leading modality, followed in Middle East, Europe, Israel and certain other advance countries, in order to treat cancer patients. According to latest WHO reports, even advanced countries have adopted traditional system of herbal treatment including; Belgium (31%), Australia (48%), France (49%), Canada (70%) and Germany (77%). The 25% of the crude drugs used in the last two decades are derived from plants, out of which only 5–15% have been investigated for bioactive compounds. Recent surveys reveal the use of such phytochemicals for cancer treatment due to their relatively low/nontoxic, antitumor property with minimal side effects. A research finding on complementary and alternative medicines identified 143 articles from different Middle-Eastern countries. The report findings performed in Turkey, Israel and other advance countries showed, half of the patients diagnosed with cancer used CAM therapy even during chemotherapy.^[25] Preliminary phytochemical analysis of TYC reveals the presence of more significant phytochemicals such as Alkaloids, Flavonoids, Tannins, Unsaturated compounds.

Nowadays, quality assurance is a thrust area for the evaluation of traditionally used medicinal plants and herbal formulations. In almost all traditional systems of medicines, the quality control aspect has been covered by careful observation of skillful physicians. Inorganic qualitative analysis of the test drug TYC reveals the presence of inorganic elements such as calcium, magnesium, iron, chlorides and sodium.

Thippiliyathi Chooranam contains 12 numbers of herbal drugs. In Siddha aspect the characteristic of herbal drugs are classified in to Suvai, Thanmai, and Piruvu. In this formulation most of the drugs are Kaarpu Suvai Piruvu. This Suvai acts as a blood purifier. It nourishes the skin and cures diseases. The indications of Thippiliyathi

Chooranam are ascites, dropsy, and chronic skin diseases. The activities of this drug are anti-oxidant, carminative, laxative, astringent etc.

WHO supports indigenous systems of health care which is found to be potent and beneficial. This translates the health care delivery into a cost effective measure. Traditional herbal medicines comprises of plant derived substances with minimal or no industrial processing which is used to treat diseases within local or regional healing practices. Developing countries cannot afford increase the cost of health care. There is renewed interest in traditional medicines. Many countries including the Indian subcontinent, China, United States of America as well as WHO have recently invested substantially in research of traditional herbal medicine. Managing health has become an expensive affair.^[26] Therefore, more efficient and effective public health awareness and preventive measures are mandatory to gauge this worldwide problem.

CONCLUSION

From the results of the present investigation it was concluded that the preliminary qualitative analysis of TYC reveals the presence of phyto-chemicals such as glycosides, flavonoids, alkaloids, amino acids, and also inorganic substances such as calcium, magnesium, iron, chlorides and sodium were found. Present work was carried out for the development of quality standards of Thippiliyathi Chooranam and better understanding of formulation based on Siddha principles. Preliminary Physiochemical studies have been useful for identifying of Siddha formulations. The results obtained from this study could be utilized for further standardization and evaluation of this novel formulation by the researchers in the near future.

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