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Research Article

Evaluation of the poly herbal drug: *Keelvayu Nivarana Churnam*

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ABSTRACT

Siddha Medicine is regaining its lost glory throughout the World. For the universal acceptations of Siddha medicine we should standardize by scientific validation at various levels. Herbals have been an important source of medicine with qualities for thousands of years. Phytochemicals are the active principles of the herbal drug. *Keelvayu nivarana churnam* is one of the poly herbal drugs used for Arthritis. In this study we carried out powder microscopy for identification of the ingredient medicinal plants. We studied Physicochemical parameters like appearance, pH, total ash, loss on drying; water soluble extractive, alcohol soluble extractive, bulk density and tap density are evaluated. In Phytochemical screening the presence or absence of alkaloids, flavanoides, tannins, proteins, sterols, carbohydrates, glycosides, terpenoides, saponins and starch. We did Gas chromatography and Mass spectroscopy (GC-MS/MS) for the identification of bioactive compounds of *Keelvayu nivarana churnam*. These findings support the therapeutic value of *Keelvayu nivarana churnam* in Arthritis.

Keywords: Arthritis; *Keelvayu nivarana churnam*; Powder Microscopy; Physicochemistry and Phytochemistry; Gas chromatography-mass spectrometry (GC-MS/MS).

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INTRODUCTION

Siddha Medicine is regaining its glory throughout the World. The World Health Organization has emphasized that without the active participation of traditional medicine, the goal of "Health for all by 21st century" cannot be achieved¹. Traditional medicine is an important and often underestimated part of health services. Traditional medicine has a long history of use in health maintenance, in disease prevention and treatment, particularly for chronic disease². The WHO's Traditional Medicine Strategy 2014–2023 was promoting the safe and effective use of traditional medicine by regulating, researching and integrating traditional medicine products, practitioners and practice into health systems, where appropriate². The Siddha medicine is a pioneering ancient traditional medical system originated from Tamil speaking areas.

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity³. Arthritis means inflammation of joints. Siddhar Yugi munivar has classified *Vatha* diseases into 80 types in *Yugi Vaithya Chinthamani* 800. *Keel Vaayu* is one among them. Most of the symptoms present in Arthritis can be correlated to *Keel Vaayu*. *Keelvayu nivarana churnam* is the one of the drug for the *Keel Vaayu*.

Most of the traditional systems of medicine are effective but they lack of standardization. So, there is a need to develop a standardization technique⁴. Standardization of herbal formulation is essential in order to assess the quality of drugs^{5,6}. In this paper, attempts have been made to evaluate the poly herbal drug *Keelvayu nivarana churnam*.

In this study we carried out powder microscopy for identification of crude drug along with the authentication. We studied Physicochemical parameters like appearance, pH, total ash, loss on drying; water soluble extractive, alcohol soluble extractive, bulk density and tap density are evaluated. In Phytochemical screening the presence or absence of alkaloids, flavanoides, tannins, proteins, sterols, carbohydrates, glycosides, terpenoides, saponins and starch are qualify. We did Gas chromatography and Mass spectroscopy (GC-MS/MS) for the identification of bioactive compounds in *Keelvayu nivarana churnam*.

METHODOLOGY

The raw drugs of *Keelvayu nivarana churnam* were purchased from traditional medicinal shop in Thanjavur, Tamil Nadu. Healthy roots were washed several times with distilled water to remove the traces of impurities from the roots. Shade dried at room temperature for about 10 days

and ground in to fine powder using mechanical grinder. Keelvayu nivarana churnam consists of fine powder of *Nannariverpattai fine churnam (Hermidesmus indicus)*-10 parts, *Parangipattai fine churnam (Smilax china)* -10 parts, *Seemai amukara fine churnam (Withania somnifera)*-10 parts, *Chittarathai fine churnam (Alpinia officinarum)*- 5 parts⁷. The herbals were authenticated by Dr. John Britto, Director, the Rapinat Herbarium and Centre for Molecular Systematics, St. Joseph's college (Campus), Tiruchirappalli.

Powder microscopy analysis: Powder microscopy analysis is one of the simplest and cheapest methods in identification of crude drug along with the standardization. These characters will help in the identification of right variety and search for adulterants in sample by performing comparison study using authenticated sample. In Powder microscopy analysis a pinch of sample was treated with chloralhydrate and mounts with 30% glycerol and observed under microscope.

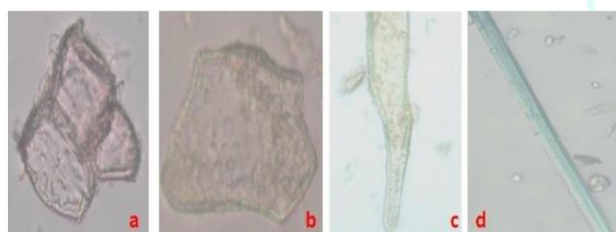
Physicochemical screening: The analytical data of various physicochemical parameters indicates that some parameters like Appearance, pH, Total Ash, Acid insoluble Ash, Loss on Drying at 105°C, Water soluble extractive (WSE), Alcohol soluble extractive (ASE), Bulk density (NS), Tap density (NS) of the study samples.

Preliminary phytochemical analyses: Preliminary phytochemical analyses were carried out for the presents/absence of alkaloids, flavonoids, tannins, proteins, sterols, carbohydrates, glycosides, terpenoids, saponins and starch.

GC-MS/MS analysis: The drug was extracted with ethanol and analyzed through Gas Chromatography - Mass Spectrometry/ Mass Spectrometry for identification of different compounds. GC Programme - Column BR-5MS (5% Diphenyl / 95% Dimethyl poly siloxane), 30m x 0.25mm ID x 0.25 µm df, Equipment Scion 436-GC Bruker, Carrier gas 1ml per min, Split 10:1, Detector TQ Quadrupole Mass Spectrometer, Software MS Work Station 8, Sample injected 2 µl. Oven temperature Programme -110° C hold for 3.50 min, Up to 200° C at the rate of 10° C/min - No hold, Up to 280° C at the rate of 5° C / min- 12 min hold, Injector temperature 280° C, Total GC running time: 40.50 min. MS Programme- Library used NIST Version-11, Inlet line temperature 290°C Source temperature 250° C Electron energy 70 eV, Mass scan (m/z) 50-500 amu, Solvent Delay 0-3.5 min, Total MS running time: 40-50 min⁸.

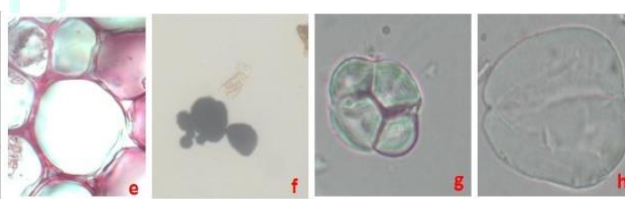
RESULTS AND DISCUSSION

Powder microscopy analysis: In Powder microscopy analysis⁹ of *Keelvayu nivarana churnam* reveals, colour: light brown, texture: fine powder, odour: no characteristic odour and Taste: slightly sweet. Following cell components were found cork cells, parenchyma cells, tracheids, vessels, fibers and starch grains (*Withania somnifera*) (Fig.1). Presence of mucilaginous paranchymatous cells, fibers spherical and ovoid simple and compound starch grains 2-9 components, 16-38 µm in dia and hilum in center (*Smilax china*) (Fig.2). Xylem vessels with simple pits, laticiferous cells tracheids (*Hemidesmus indicus*) (Fig.3). Paranchymal cells filled with starch grains, schizogenous (resin) canals, vessels with scalariform and reticulate thickening and presence of tracheary fibers (*Alpeniya officinarum*) (Fig.4).



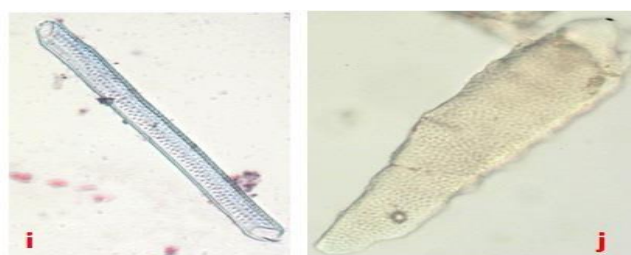
a. Cork cells b. Parenchyma cells c. tracheid d. fibres (amukkara)

Figure 1



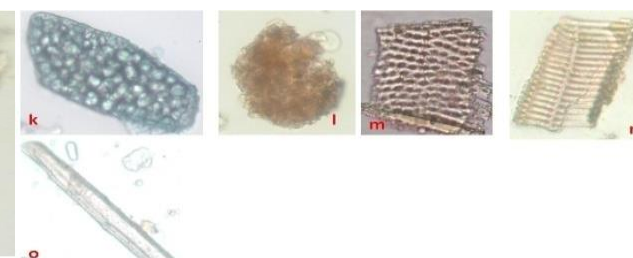
e. Mucilaginous Parenchyma f & g. simple and compound starch grains h. starch grain with centre hilum (Parangipattai)

Figure 2



i. Vessel element with simple pits j. laticiferous cell (nannari)

Figure 3



k. parenchyma cells filled with starch grains, l. schizogenous (resin) canals, m. vessel element with reticulate thickening, n. vessel element with scalariform thickening, o. tracheary fibers (arathai).

Figure 4

Physicochemical screening: Results of the analytical data¹⁰ of various physicochemical parameters like Appearance, pH, Total Ash, Acid insoluble Ash, Loss on Drying at 105°C,

Water soluble extractive (WSE), Alcohol soluble extractive (ASE), Bulk density (NS), Tap density (NS) of the study sample were calculated in Table-1.

Table 1: Physicochemical screening

Sl. No.	Parameters	Results
1	Appearance	Light brown coloured fine powder
2	pH	7.35
3	Total Ash	4.120% w/w
4	Acid insoluble Ash	0.3034% w/w
5	Loss on Drying at 105 ^o C	5.658% w/w
6	Water soluble extractive(WSE)	20.16% w/w
7	Alcohol soluble extractive(ASE)	6.541% w/w
8	Bulk density (NS)	0.3556 g/ml
9	Tap density (NS)	0.5430 g/ml

Preliminary phytochemical analyses: The results of Phytochemical screening of the *Keelvayu nivarana churnam* are presented in¹¹ Table 2.

Table 2: Phytochemical screening

	Parameters	Results
1	Alkaloids	Present
2	Flavonoids	Present
3	Tannins	Present
4	Proteins	Present
5	Sterols	Present
6	Carbohydrates	Present
7	Glycosides	Absent
8	Terpenoids	Present
9	Saponins	Absent
10	Starch	Present

GC-MS/MS analysis:

In nanari ver pattai churnam (*Hemidesmus indicus*) seventeen (17) compounds were identified by GC-MS/MS analysis and GC- MS/MS Chromatogram was shown in Fig.5.

In parangipattai churnam (*Smilax china*) sixteen (16) compounds were identified by GC-MS/MS analysis and GC-MS/MS analysis Chromatogram was shown in Fig.6.

In *semai amukara churnam (Withania somnifera)* thirteen (13) compounds were identified by GC-MS/MS analysis and GC- MS/MS Chromatogram was shown in Fig.7.

In *chittaraththai churnam (Alpeniya officinarum)* fourteen (14) compounds were identified by GC-MS/MS analysis and GC- MS/MS Chromatogram was shown in Fig.8, are follows¹².

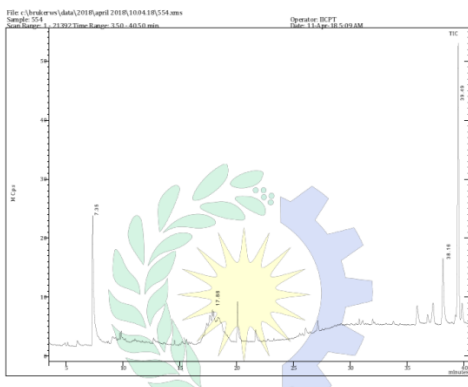


Fig.5, GC- MS/MS Chromatogram nanari ver pattai churnam

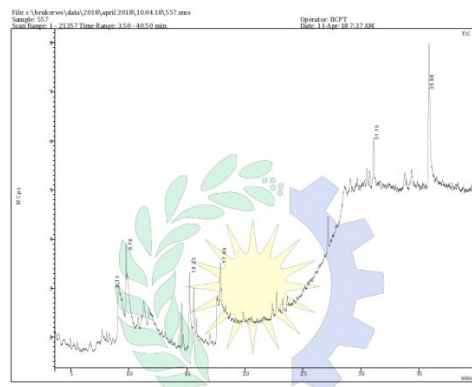


Fig.6, GC-MS/MS Chromatogram parangipattai churnam

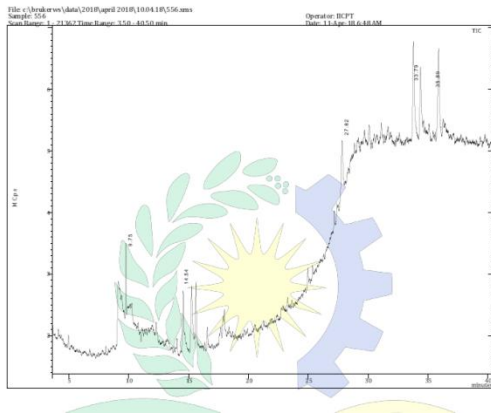


Fig.7, GC- MS/MS Chromatogram semai amukara churnam

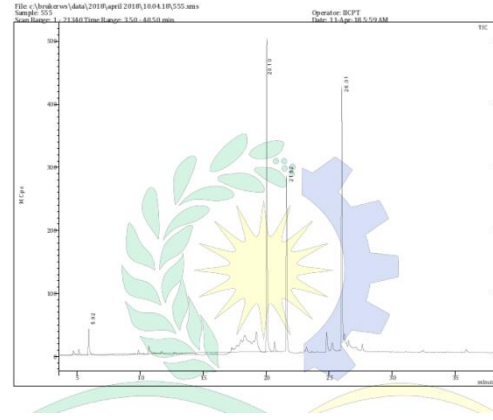


Fig.8, GC- MS/MS Chromatogram chittaraththai churnam

CONCLUSION

The physicochemical evaluation *Keelvayu nivarana churnam* was established by the above studies.

Disclosure of conflict of interest: The author's declare that there is no conflict of interests regarding the publication of this paper.

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