



**ORIGINAL RESEARCH PAPER**

**Ayurveda**

**PRELIMINARY CHEMICAL STUDIES AND PHYTO-CHEMICAL ANALYSIS ON SIDDHA HERBO-MINERAL DRUG RASA MEZHUGU**

**KEY WORDS:** Siddha, Mercury, Minerals, Chemical, Phyto-chemical, Rasa mezhugu.

**Dr. K. Nandhagopal**

M.D. Siddha, Consultant Siddha, Siddha Clinical Research Unit, Tirupati . Under CCRS, Ministry of AYUSH, Govt. of India.

**Dr. M. Kanniyakumari\***

M.D. Siddha, Professor, Maria Siddha Medical College, Nagercoil. \*Corresponding Author

**ABSTRACT**

Siddha treatment procedures are equally having 32 types of internal and 32 types of external medicaments to manage any kinds of diseases. In the 32 types of internal medicines so many herbs, metals, minerals and marine products are used. In this time tested system of medicine Siddhas were documented all the preparations by using their great cognizance and chemical knowledge to formulate the medicines in a precise manner. The form of medicine and indications are also fixed only after the so many trials and complete knowledge about the human body and drug delivery systems. That's why they were used single medicine to treat various systems of diseases by simply altering the adjuvants. Here the trial drug Rasa Mezhugu is the astonishing formulation given by the Great saint Agasthiyar showing his kindness towards the mankind. Even though it has to be proved scientifically for the better understanding of the modern world. Hence the trial formulation subjected to preliminary chemical studies and phyto-chemical analysis to establish the Siddha's Omnipotent thought process. These studies clearly prove that the trial drug does not have any heavy metals like Aluminium, Copper, Arsenic and Lead. But it has essential elements that maintain the normalcy of the body counteracting the disease progression. Also it is become evident that the trial drug formulation has alkaloids, cardiac glycosides, steroids, flavonoids, phlobatanins, glycosides, volatile oils and fixed oils. It has been proved scientifically as best in class medicine in the treatment of chronic diseases like Rheumatoid Arthritis and anti-aging.

**INTRODUCTION:**

Siddha medicine has immense faith in the miracles of mercurial drugs and in the prolongation of life through rejuvenating treatments and intense yogic practices. Silver, gold, zinc, copper, iron and other metals which are well known to have therapeutical effect and used as micro-nutrients in traditional medicines for more than 5000 years. Now a day's modern medicine is also using raw and salt form of these metals. But in siddha system these metal and mineral preparations are very consciously framed with 'sathru' (antagonist) 'mithru' (agonist) drugs to nullify the toxicity and increase the potency respectively<sup>1</sup>. By this, the heavy metals like mercury are modified to provide the safe therapeutic value in very low doses.

As per the siddha literature the mercury has all the six tastes and it has the potency of both heat and cold. So, mercury is a highly efficacious drug to act on all the three deranged humours of human body. When it is treated with some kind of herbals and cane jaggery, it becomes a wax like substance called as 'Mezhugu'<sup>2</sup>. These kinds of medicines were useful in the treatment of some chronic diseases like Rheumatoid arthritis, Hemiplegia, Spondylitis etc. This trial drug *Rasa Mezhugu*<sup>3</sup> is also one among them, so it's needed the standardisation and scientific validation.

Rheumatoid arthritis (RA) is a chronic autoimmune disease in which there is inflammation of joints, synovial proliferation and destruction of articular cartilage. Arthritis is not a single disease, but it is an umbrella term used to describe more than 100 chronic conditions that affect the musculoskeletal system<sup>4</sup>.

By the revised World Health Organization (WHO) criteria for the diagnosis of Rheumatoid arthritis, giving a prevalence of 0.75%, projected to the whole population, this would give a total of about seven million patients in India. The prevalence of RA in India is quite similar to that reported from the developed countries. It is higher than that was reported from China, Indonesia, Philippines and rural Africa. These findings are in keeping with the fact that the north Indian population is genetically closer to the Caucasians than to other ethnic groups<sup>5</sup>.

Some specialized treatments were given with lot of minerals and herbo mineral drugs. These drugs are promisingly good with minimal adverse effects. Hence author chosen this particular drug because of its potency and able to prevent the complications of RA.

**MATERIALS AND METHODS:**

*Vaalai Rasam* (Pure form of Mercury) was ground with the Clove

*churnam* first in order to denature the ill effects of the heavy metal. After this the long pepper *churnam* was added and ground till they get finely mixed and then the china root *churnam* was added and ground in a mortar. After getting a well blend mixture of those, Cane jaggery was added and grounded till getting a mezhugu consistency. Then the mezhugu was carefully collected and stored in a labelled airtight container and kept carefully in the absence of sunlight for 1 month for customizing the drug<sup>3</sup>.

**Preliminary chemical studies on *Rasa mezhugu*:**

Since it is a herbo-mineral formulation, preparation of sodium carbonate extract of the trial drug is must and the preparatory process is given below.

**Preparation of Sodium Carbonate extract:**

2 gm of the sample is mixed with 5 gm of Sodium carbonate and taken in a 100 ml beaker and 20 ml of distilled water is added. The solution is boiled for 10 minutes, cooled and then filtered<sup>6</sup>. The filtrate is called sodium carbonate extract. With the extract as the base so many qualitative analysis were done and the results were presented in the table 2.1

**Phytochemical Analysis:**

Phytochemical screening procedures carried out were adopted from this analysis determines the biologically active compounds that contribute to the flavour, colour and other characteristics of herbo-mineral formulation.

**Phytochemical screening:**

Chemical tests were carried out using the aqueous extracts from the trial drug and or the powdered specimens, using standard procedures to identify the constituents<sup>7</sup>.

The results of the phyto chemical screening were given in the table 2.2.

**RESULTS AND DISCUSSION:**

**Table: 2.1. Preliminary chemical studies on *Rasa mezhugu*:**

Test for Chemicals	Observation	Inference
Ammonium	No appearance of brown colour	--
Sodium	No appearance of intense yellow colour	--
Magnesium	No formation of white precipitate	--
Aluminium	No characteristic changes	--

Potassium	No formation of yellow precipitate	--
Calcium	Formation of white precipitate	+
Ferrous iron	Appearance of blood red colour	+
Copper	No formation of blue precipitate	--
Zinc	No formation of white precipitate	--
Arsenic	No formation of brownish red precipitate	--
Mercury	Formation of yellow precipitate	+
Lead	No formation of yellow precipitate	--
Chloride	Formation of white precipitate	+
Phosphate	No formation of yellow precipitate	--
Carbonate	Formation of effervescence	+
Nitrate	No characteristic changes	--
Starch	No formation of blue colour	--
Reducing sugar	Mild colour changes	Trace
Alkaloids Meyer's method	Appearance of cream colour	+
Dragendroff' method	Appearance of orange precipitate	+
Amino acids	Formation of violet precipitate	+
Tannic acid	Formation of bluish black precipitate	+
Tannins	Formation of white precipitate	+
Unsaturated compounds	Get decolorized	+
Saponins	No froth formation	--
Sugar- Benedict's method	Mild colour change	+
Steroids - Liberman Burchard test	No formation of red colour	+
Protiens - Biuret test	Formation of violet colour	+
Flavanoids	No formation of pink colour	+
Phenols	No formation of deep green colour	--

From the above table, it is clear that this herbo-mineral formulation has essential elements that maintains the normalcy of the body counteracting the disease progression. i.e., The calcium helps in increasing the bone density thus preventing the osteoclastic activity. The iron present in this helps to get rid of anaemia caused by the disease. The chloride and carbonate ions helps in maintaining the cellular integrity by governing the acid base balance of the cell.

**Table :2.2. Phyto chemical analysis results:**

S.No.	Phytochemicals	Test Results
1.	Alkaloids	Positive
2.	Terppenoids	Negative
3.	Cardiac Glycosides	Positive
4.	Steroids	Positive
5.	Phenolic Compounds	Negative
6.	Flavonoids	Positive
7.	Tannins	Positive
8.	Phlobatannins	Positive
9.	Saponins	Negative
10.	Glycosides	Positive
11.	Volatile oil	Positive
12.	Phytosterol	Negative
13.	Proteins	Negative
14.	Carbohydrate	Positive
15.	Fixed oil	Positive

From this analysis, it is become evident that the trial drug formulation has alkaloids, cardiac glycosides, steroids, flavonoids, phlobatannins, glycosides, volatile oils and fixed oils. The Alkaloids, Flavonoids, and Tannins scavenges the free radicala

and ensure the antioxidant property of the drug. The phyto-steroids quench the pain and the process of the disease by the anti-inflammatory and analgesic quality. The presence of cardiac glycosides avoids the cardiac complications of the disease. Other important essential oil constituents of clove oil include Acetylugenol, Beta-caryophyllene and Vanillin; Crategolicacid; Tannins, Gallotannic acid, **Methyl salicylate (pain killer)** to reduce the pain and inflammation<sup>6</sup>.

**CONCLUSION:**

The Preliminary chemical studies on *Rasa mezhugu* clearly proves that the trial drug does not have any heavy metals like Aluminium, Copper, Arsenic and Lead. The availability of mercury in the trial drug just because of the formulation contains it. But due to the proper following of Standard Operational Procedures (SOP) the *Vaalai Rasam* (The Mercury obtained from Cinnabar) in the purest form and dose not having any other heavy metals which are usually present along with raw mercury. Also the availability of Ferrous iron, Chloride, Steroids, Tannins, Tannic acids and Flavonoids proves the potency of the drug on treating Auto immune diseases like RA and SLE with the much better Anti-oxidant property may prove its significance therapeutically.

The Phytochemical analysis of the drug shows that it contains Calcium, Iron, and Tannins, Alkaloids, Steroids, Phlobatannins, Phenolic Compounds, Flavonoids and Cardiac Glycosides. It is related in treatment of Rheumatoid Arthritis. Hence the Siddha formulation *Rasa Mezhugu* one of the innovative formulation by the Great siddhar Agasthiyar has been proved scientifically as best in class medicine in the treatment of chronic diseases like Rheumatoid Arthritis and anti-aging.

**REFERENCES:**

1. Dr. R. Thiagarajan., Gunapadam – II & III Part – Thathu Jeeva Vaguppu., Pub: Indian Medicine and Homeopathy Dept. Chennai – 106.
2. Bharathathin Siddha Marunthugal (Seimurai kurippu nool),1984. pg no:31-33 Pub: Controller of Publication, Health department - Delhi, Ministry for Health and Family welfare, Govt of India
3. AGATHIYAR PARIPURANAM-400, song no. 126-129, page no. 131.
4. Cooke TD, Jasin HE (1972) The pathogenesis of chronic inflammation in experimental antigen-induced arthritis. I. The role of antigen on the local immune response. *Arthr Rheum* 15:327-337.
5. Cooke TD, Hurd ER, Ziff M, Jasin HE (1972) The pathogenesis of chronic inflammation in experimental antigen-induced arthritis. II Preferential localization of antigen-antibody complexes to collagenous tissues. *J Exp Med* 135:323-338
6. Ashokan P. Analytical Biochemistry (Biochemical Techniques) – First ed., 112-117.
7. Javanmardi J, Stushno C, Locke E, Vivanco JM. Antioxidant activity and total phenolic content of Iranian *Ocimum* accessions. *Food Chemistry*. 2003; 83: 547-550.
8. Keith Wilson and John Walker. Principles and Techniques of Practical Biochemistry. (Fourth edition). New York, NY: Cambridge University Press.