

STANDARDISATION STUDIES ON SOME MERCURIALS OF SIDDHA SYSTEM*

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ABSTRACT: *Ilinkaccenturam No.1, Canta Cantirotayam, Kowri Cintamani Centuram and Cati Campirakkulampu the four mercurial drugs of Siddha system of medicine have been chemically analysed for laying down standards. The physico-chemicals data presented can be taken as parameters to fix standards.*

INTRODUCTION

The Materia Medica of Siddha System includes drugs of plants, metals/minerals, marine products and animal products. Drugs of Thathupporutkal (inorganic drugs) are classified as (i) Ulokan (ii) Karacaram (iii) Patanankal (iv) Uparaca. Gold, silver, copper, tin, lead, iron, zinc, steel, thara, bronze and brass under the category 'Ulokan' are listed where the first seven are metals and the last four are alloys¹.

Mercury in Siddha system of medicine is called 'Iracam'. Iracam therein is said to be incompatible with lead monoxide, arsenic, arsenic pentasulphide, potassium nitrate, iron, camphor, calomel, amber and fuller's earth. It is said to be compatible with mica, lead, arsenic disulphide and tribulphide, sulphur, mercuric chloride, silver, copper, copper sulphate, zinc, coral rock and stibinite. Though mercury has not been mentioned as a ulokam (metal) in the siddha literature, it enters as an ingredient in several formulations of the system either as iracam or as its compounds namely Iracam (Mercury), Iraccacenturam (red oxide of mercury), Puram (calomel-Mercurous chloride) and Viram (Mercuric chloride).

Mercury is a blood purifier, carminative, antiseptic, nervinetonic, memory promoter and rejuvenator. The present study describes the preparation and chemical analysis of Ilinkaccenturam No.1, Canta cantirotayam, Kawri cintamani centuram and Cati campirakkulampu.

Materials and Methods

The ingredients were purchased from the Madras raw drug traders. Purification of the drug of metals / mineral origin was carried out wherever necessary according to the classical texts. Ingredients of each formulation were as follows:

Illinakacenturam No. 1:

Ilinkam (cinnabar) – Mercuric sulphide and Aaruttummatticamulaccaru – *Citrullus colocynthis* Schrad (juice of whole plant)

Canta cantirotayam :

Iracakarapuram (Calomel) – Mercurous chloride, Venkaram (borax), Sodium biborate, Kappumancal (turmeric) – *Curcuma longa* L. (rhizome) and

elumichampalaccaru – *Citrus aurantifolia* Swingle (fruit juice).

Kawri cintamani Centuram :

Iracam (Mercury), Kantakam (Sulphur) and Porikaram (Borax).

Cati campirakkulampu :

Karpuram (Camphor), Ilinkam (cinnabar) – Mercuri sulphide, elumichampalaccaru – *Citrus aurantifolia* Swingle (Fruit juice) and tulaciccaru – *Ocimum sanctum* L. (leaf juice).

The formulations were prepared as per the procedure described in siddha texts^{2,3}. Physico-chemical characters were determined by standard methods. Qualitative tests for organic and inorganic material were carried out as per procedure detailed in pharmacopoeial standards^{4,5}.

Isolation of curcumin

MeOH extract of cantacantirotayam was column chromatographed over silica gel (acme 100 – 200 mesh; 1:22). The EtOAc elution afforded crystals (0.5%) of curcumin. Thin layer chromatography (TLC) over silica gel-G for curcumin and camphor was carried in the following solvent systems. 1. Benzene: Ethyl acetate (3:1) and 2. Hexane : benzene (1:1).

The chromatograms were developed with H₂SO₄ – H₂O (1:1). After spraying, the plates were kept in the hot air oven at 110⁰C for about five minutes.

Results and discussion

The analytical values of ilinakaccenturam No 1 are shown in Table I. There was no loss on drying at 110⁰C indicating thereby

the absence of moisture. The acid insoluble ash was 0.06% while mercury was 85% and total sulphur was 15%.

The physico-chemical characters of cantacantirotayam are summarized in Table II. There was 1% volatile matter, 16.24% mercury and 10.8% borax in the medicine. Kappumancal – *Curcuma longa* L. was one of the ingredients in this formulation. The curcumin is the active principle of this plant. The curcumin from cantacantirotayam was isolated and was confirmed by m.p 183°, m.m.p and co tlc with an authentic sample. The R_f value was 0.56 and answered positively for phenol with FeCl₃ and also developed orangered colouration with alkali. Its concentration was 0.5% in the medicine. The characterization of curcumin can be taken as one of the parameters in addition to analytical data for laying down the standard for this medicine.

The analytical results of Kawri Cintamanicenturam are shown in Table III. The mercury and total sulphur were 33.9% and 87.6% respectively.

The physico-chemical values of caticampirakkulampu are summarized in Table IV. The mercury was 36.3% and total sulphur was 5.9%. Camphor which was one of the ingredients was confirmed by TLC in the solvent system hexanebenzene (1:1), by comparison with authentic sample.

The study has revealed that the moisture content and loss on ignition was negligible in the formulations containing inorganic ingredients, whereas these parameters had shown appreciable quantity in the formulation involving herbo-mineral drugs. The parameters studied in these formulations are reliable. Mercury is one of the ingredients in all these formulations. The estimation of mercury along with other

parameters as discussed can be used to lay down the standards for ilinkaccanturam No.1 cantacantirodayam, Kawri cintamanicenturam and caticampirakkulampu.

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Table 1
Analytical Values of Ilinkaccenturam No.1

Parameters	Value (%)
Colour	Reddish Orange
Odour	No characteristic odour
Taste	No taster
Touch	Fine
Description	Yielded the reactions characteristic of mercury and sulphate
Loss of drying at 110 ⁰ C	Nil
Loss of ignition	99.9
Acid insoluble ash	0.06
Mercury	85.00
Total sulphur	15.0
Free sulphur	2.6
Chloride	0.9

Table 2
Physico-chemical standards for Cantacantirodayam

Parameters	Value (%)
Colour	Orange
Odour	Pleasant odour

Taste	Astringent
Touch	Rough
Description	Yielded the reactions characteristic of sulphate chloride, borate, mercury and sodium. Also answered for phenol, quinine, coumarin, tannin acid.
Mottling	Slight mottling observed
Chipping	Can be chipped easily
Finishing	good
Intactness of the pills	good
Uniformity in weight of the pills :	
Average weight of the pills (20 pills)	0.095 mg
Variation in weight of the pills:	
Maximum	0.103 mg
Minimum	0.085 mg
Loss on ignition	85.8
Acid insoluble ash	0.74
Volatile matter	1.0
Mercury	16.24
Chloride	3.3
Borax (sodium biborate)	10.8
Curcumin	0.5%

Table 3
Physico-chemical parameters of Kawri Cintamani Centuram

Parameters	Value (%)
Colour	Black
Odour	No characteristic odour
Touch	Fine
Description	Yielded the reactions characteristic of sulphate, borate, sodium and mercury
Loss of drying at 110 ⁰ C	4.23
Loss of ignition	78.58
Acid insoluble ash	0.17
Mercury	33.9
Total sulphur	37.6
Borax (Sodium baborate)	15.97

Table 4
Physico-chemical parameters of Caticampirakkulampu

Parameters	Value (%)
Colour	Dark brown
Odour	Camphor smell
Touch	Astringent
Description	Yielded the reactions characteristic of chloride, sulphate, magnesium, calcium, mercury, iron and potassium (t). Also answered for acids, phenol, coumarin, triterpene and quinone
Loss of ignition	96.87
Mercury	36.3
Total sulphur	5.9

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