

STANDARDISATION OF CIVANAR AMIRTAM

A. SARASWATHY AND M. GIRIJA RANI

Drug standardisation research Unit (Siddha), Captain Srinivasa Murthi Drug Research Institute for Ayurveda, Arumbakkam, Madras – 600 106

Received: 27 March, 1996

Accepted: 8 July, 1997

ABSTRACT: *Civanar amirtam* is a siddha herbo- mineral formulation prescribed for rheumatism, bronchial asthma, tuberculosis and leprosy. Of the nine ingredients which constitute the preparation, four are inorganic and the others are plant drugs, Attempts have been made to chemically analyse and to identify the presence of each ingredient in the medicine to lay down standards. The identification of various chemical constituents present in the plant drugs using TLC technique by comparison with authentic chemicals, along with the physico-chemical parameters and quantification of inorganic ions established the presence of each ingredient. The parameters presented can be considered viable for prescribing dependable standards to this preparation.

INTRODUCTION

The Siddha pharmacopoeia committee has listed '*Civanar amirtam*' under the category *karuppu*. It derives its name from the black colour of the finished product. *Civanar amirtam* is prescribed for rheumatic diseases, bronchial asthma, delirium, ascites and tuberculosis¹. It is also used for diseases due to deranged bile, leprosy, colic, pile and in insect stings². Earlier workers have reported the drug to possess a significant anti-inflammatory diuretic and antimicrobial activities^{3,4}. The nine ingredients which constitute the preparation are shown in table 1. The present paper describes the detailed chemical analysis of *Civanar amirtam* to lay down standards.

MATERIAL AND METHODS

The raw drugs were procured from the authorized drug dealers madras, Botanically/chemically identified, and subjected to

preparation as per siddha text¹ Qualitative and quantitative analysis was done following the procedure detailed in pharmacopoeial standards for ayurvedic formulation⁵ qualitative inorganic analysis was carried out after igniting the sample except mercury which was analysed using the medicine. The organic secondary metabolites were tested with the CHCl₃ and ETOH extracts of the drug^{5,6}. The exhaustive extracts of the medicine in n-hexane benzene, CHCl₃ were subjected to thin layer chromatography (tlc) over silica gel in the following solvent systems⁷.

1. n-Hexane : Benzene (2:1)
2. Benzene : Ethyl acetate (12:1)
3. Benzene : Ethyl acetate (10:1)

Total alkaloid was estimated as per the method given in India Pharmaceutical Codex⁸.

Table -1
Ingredients of *Civanar amirtam*

S.No.	Tamil name	Botanical/Chemical name	Anatomical part	Qty. g
1.	<i>Iracam</i>	Mercury	-	10
2.	<i>Kantakam</i>	Sulphur	-	10
3.	<i>Iruvi</i>	<i>Dryopteris filix –mas</i> Schott	rhizome	10
4.	<i>Karunabi</i>	<i>Aconitum Sp.</i>	rhizome	10
5.	<i>Cukku</i>	<i>Zingiber officinal Rosc.</i>	Dried rhizome	10
6.	<i>Manocilai</i>	<i>Arsenic disulphide</i>	-	10
7.	<i>Poritta</i> <i>Venkaram</i>	<i>Sodium baborate</i> (dehydrated)	-	10
8.	<i>Tippili</i>	<i>Piper longum L.</i>	fruiting inflorescence	10
9.	<i>Milaku</i>	<i>P.nigrum L.</i>	fruits	80

Result and Discussion

The product was a black fine powder, with pungent taste and smell of pepper. The qualitative inorganic analysis showed the presence of chloride, sulphate, carbonate, phosphate, oxalate, borate, sulphur, sodium, iron, calcium, mercury, arsenic and magnesium. The organic components analysed were steroid, triterpenoid, alkaloid, quinine, flavonoid, furan, coumarin, tannin, saponin, phenol and sugar.

The physico-chemical data are summarized in table2. Of the nine ingredients which constitute the medicine, four are of inorganic origin and the rest are botanicals. To identify the presence of inorganic ions, solubility of the medicine in water and the elements present were determined. Thus the

estimated water soluble (15.03%) along with the various ions viz. mercury 6.1 and borax 5.79% confirmed that presence of the inorganic ions, *manocilai* (arsenic disulphide), the arsenical drug was identified by quantitatively estimating arsenic 3.2% and sulphur contents 14.11%. LC of the extracts also showed the presence of free sulphur by comparison with an authentic sample (fig.c)

The remaining five herbal drugs have essential oils and other secondary metabolites, therefore, the estimated volatile matter content (0.332%), exhaustive extraction values and alcohol soluble (12.08%) can be also considered as parameters (Table 2).

Aconitum sp., *Piper nigrum* and *P.longum* have alkaloids, hence that total alkaloid was estimated as 4.108%. The alkaloid piperine (3.7%) is present in both *P.longum* and *P. nigrum*. The identification of piper longumine and piper longuminine from the TLC of the solvent extracts was conclusive evidence for the presence of *P.Longum* in the medicine by co-TLC with authentic samples (fig B&C).

Although the piperine content would characterize the presence of *P.nigrum*, other parameters have been considered to differentiate *P. nigrum* in the presence of *P.longum*. TLC examination of the volatile matter (fig 4) resulted in the characterization of piperonal, caryophyllene (*P.nigrum*) and zerumbone and citral (*Z. officinale*), the respective major volatile oil constituents by comparison with authentic samples, which confirmed the identity of *P. nigrum* and *Z.officinale* in the medicine.

The solvent extracts of the medicine developed in 10:1 benzene : EtOAc resolved into spots which were almost identical to those present in the five herbal ingredients by co-TLC of the EtOAc extracts of *P. longum*, *Z. officinale*, *P. nigrum*, *Aconitum Sp.* and *Dryopteris fillix* –mix (fig) Further TLC of the CHCl₃ extract of the medicine on comparison with the EtOAc extract of *Aconitum sp.* Afforded two Dragendorff's

positive spots (Fig C, tract 7) which confirmed the identity of *Aconitum sp.*

The literature survey reveals that these chemical are reported to have various therapeutic effect 9-12. Thus the activity of the medicine may be due to the presence of these compounds. Though modern techniques like HPTLC, spectrophotometry etc. would help to evolve more parameters, the data presented above can be considered for prescribing standards to this medicine

Conclusion

Chemical analysis of *Civanar amirtam* has been carried out. Identification of various chemical constituents present in the plant drugs using TLC technique by comparison with authentic chemicals and estimation of inorganic ions along with the physicochemical data established the presence of each ingredient. The data presented can be considered to lay down standard.

Acknowledgement

The authors are thankful to Dr. V.N Pandey, Director, Central council for research in Ayurveda and Siddha, New Delhi. For financial support and Dr. R.Bhima Rao, Project Officer Drug standardization research Unit (Siddha) for providing facilities.

Table -2
Analytical data of *Civanar amirtam*

Parameters	Value (% w/w)
Loss on drying at 110°C	9.30
Loss on ignition	83.86
Acid insoluble ash	0.61
Water insoluble ash	4.33
Alkalinity of water soluble ash	0.40 cc of 0.1N HCL/g
<u>Exhaustive extraction</u>	
Hexane	10.19
Benzene	10.77
Chloroform	11.98
<u>Solubility</u>	
Alcohol (90%)	12.08
Water	15.03
Volatile matter	0.332
Total alkaloids	4.108
Piperine	3.7
<u>Assay</u>	
Mercury	6.1
Borax	5.79
Arsenic	3.2
Total sulphur	14.11
Free sulphur	4.71

Fig.

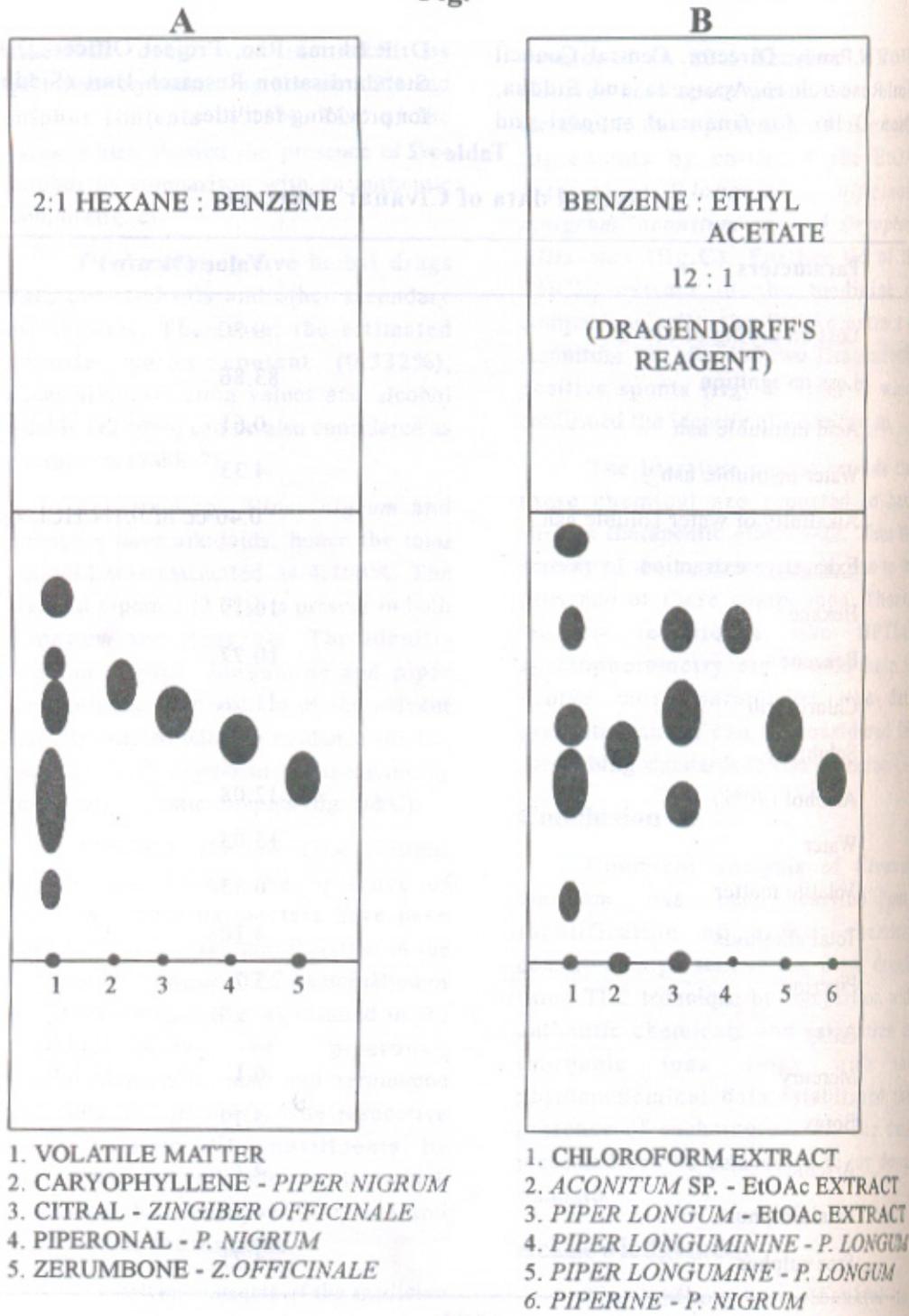
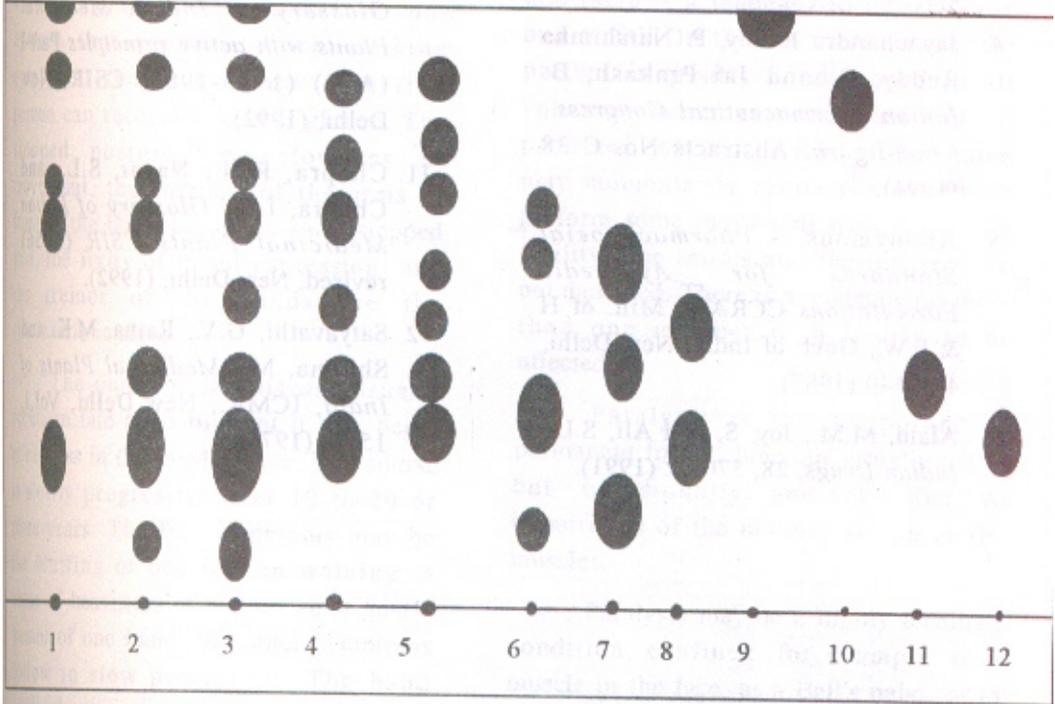


FIG. C

10:1 BENZENE : ETHYL ACETATE



- | | |
|---|--|
| 1. HEXANE EXTRACT | 7. <i>ACONITUM</i> SP. - EtOAc EXTRACT |
| 2. BENZENE EXTRACT | 8. <i>DRYOPTERIS FILIX</i> - MAS - EtOAc |
| 3. CHLOROFORM EXTRACT | 9. SULPHUR |
| 4. <i>PIPER LONGUM</i> - EtOAc EXTRACT | 10. <i>PIPER LONGUMININE</i> |
| 5. <i>ZINGIBER OFFICINALE</i> - EtOAc EXTRACT | 11. <i>PIPER LONGUMINE</i> |
| 6. <i>PNIGRUM</i> - EtOAc EXTRACT | 12. <i>PIPERINE</i> |

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