



USE OF PHYSICO-CHEMICAL PROPERTIES, CHROMATOGRAPHIC AND SPECTROPHOTOMETRIC MEASUREMENTS IN THE STANDARDIZATION OF SRI LANKAN POLY HERBAL FORMULATION “MAHA VARTHAKAVA WATEE”

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ABSTRACT

The efficacy and quality of commercially manufactured “Maha Varthikava watee” preparations may differ from its authentic preparation prepared as per original recipe. Therefore, a study was carried out to investigate whether the physico-chemical properties, HPLC and UV chromatographic and spectrophotometric measurements can be used for standardization of the above drug.

Purified herbals used in the original recipe of “Maha Varthikava watee”, were finely powdered and mixed. The mixture was ground together with three juices extracted from leaves of three different species and bee’s honey to make pills. Five commercial samples purchased from the market were compared with the authentically prepared samples. Physical properties, chemical properties and chromatographic and spectrophotometric measurements were considered as tools for standardization. For the HPLC and UV spectrophotometry, ethanol extraction was used. Data were analyzed at 0.05 significant levels. No significant differences were observed in any commercial samples with regard to fiber content, acid insoluble ash, dichloromethane extract, ethyl acetate extract and methanol extract while the weight of pills was significantly different. The pH values and loss on drying were significantly different only in two commercial samples. Specific gravity and ash values were found to be different only in one sample. Hexane extract value was significantly different in one sample.

In HPLC chromatograms, one main peak was more prominent in three commercial samples. In UV spectrophotometric measurement, two commercial samples had a λ max of 287-290 nm while other three samples had a λ max of 340-345 nm. Hence, these measurements can be used for the standardization of “Maha Varthikava watee”.

Key words: Maha Varthikawa, Watika Prakaranaya, HPLC, Spectrophotometry, Sri Lankan medicine.

INTRODUCTION

In Ayurvedic and Indigenous medicinal systems, great emphasis was given to complete knowledge of drugs including identification, procurement, processing and applications. In ancient times physicians used to prepare drugs by themselves according to the need of different patients. Therefore, there were no concerns over the drug standardization¹; however, the situation has changed very fast with time. The growing population and their life style, industrialization etc, have forced physicians to depend mainly on market preparations, which on the other hand affected the quality of these formulations drastically². Among the factors that affect the quality of drugs, the authenticity of raw materials and ingredients, process standards, proper storage practices are of primary significance. Therefore, standardization of drugs has become a long felt need in the herbal drug industry.

Quality assessment and standardization of complex herbal formulations are multifaceted due to the synergistic effect of constituent components. The main problem in poly herbal formulation is that the presence of each ingredient in desired condition has to be ensured. Modern techniques based on physical, chemical, spectrophotometric and biological parameters can be used to achieve the prerequisites of standardization.

“Maha Varthikava watee” is an effective and widely used poly herbal specific formulation in Sri Lanka, mentioned long ago in the authenticated book called “Watika Prakaranaya” which was first published in 1879. This poly

herbal formulation consists of twenty nine herbal ingredients in pill form⁴. It has multifaceted action in all type of gastro intestinal tract disorders. Due to lack of proposed modern pharmacopeia standards for processing of “Maha Varthikava watee” using traditional methods, the drug prepared may not have the desired quality and it may vary from batch to batch. The standardization guidelines for herbal products provided by World Health Organization (WHO) and the Indian pharmacopeia standards have been followed in this study.

MATERIALS AND METHODS

“Maha Vartikawa Watee” is a poly herbal formulation that contains 29 herbal ingredients⁵. They are *Cuminum cyminum* L. [Fr.]⁶, *Nigella sativa* L. [Sd.]⁷, *Allium sativum* L. [Bl.]⁸, *Trachyspermum ammi* (L.) Sprague. [Fr.]⁹, *Trigonella foenum-graecum* L. [Fr.]¹⁰, *Zingiber officinale* Rosc. [Rz.]¹¹, *Ferula assa-foetida* L. [Ex.]¹², *Piper nigrum* L. [Fr.]¹³, *Piper longum* L. [Fr.]¹⁴, *Solanum virginianum* L. [Rt.]¹⁵, *Terminalia chebula* Retz [P.]¹⁶, *Terminalia bellarica* (Gaertn) [P.]¹⁷, *Phyllanthus emblica* L. [P.]¹⁸, *Syzygium aromaticum* (L.) Merr. & Perry. [Fl.bd.]¹⁹, *Myristica fragrans* Houtt. [Ar.]²⁰, *Myristica fragrans* Houtt. [Sd.]²⁰, *Fumaria parviflora*, Lamk. Sow [Pl.]²¹, *Caesalpinia bonduc* (L.) Roxb. [Sd.]²², *Carum cavi* L. [Fr.]²³, *Cinnamomum verum* J.Presl [St.Bk.]²⁴, *Acorus calamus* L. [Rz.]²⁵, *Seasamus indicum* L. [Sd.]²⁶, *Brassica juncea* (L.) Czern.[Sd.]²⁷, *Embelica ribes* Burm.f. [Sd.]²⁸, *Santalum album* L. [Ht.Wd.]²⁹, *Acacia chundra* Willd.