



Standardization of *Amukkirai Chooranam*, a Traditional Herbal Preparation in Siddha System of Medicine

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: *Amukkirai chooranam* (*A. chooranam*) is an important traditional herbal preparation and its main component is the root powder of *Withania somnifera* Dunal (*Solanaceae*). It is the best remedy for rheumatism, weakness, stress, sleeping disorders, gastric ulcer, anaemia, etc.

Aims: The goal of this study was to standardize this traditional herbal preparation on the basis of qualitative and quantitative methods.

Study Design: Experimental laboratory study on Phytochemical and Pharmacognostic investigations.

Place and Duration of Study: The Phytochemical and pharmacognostic investigations were carried out at the Herbal Technology Section, Industrial Technology Institute (ITI), Colombo, Sri Lanka, between Jan 2012 to August 2012.

Methodology: The *A. chooranam* was prepared according to the procedure given in Traditional Text. The preparation has been standardized on the basis of macroscopic and organoleptic

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characters, physicochemical properties, phytochemical screening, fluorescence analysis, and elemental analysis, aqueous and ethanol extractive values, TLC and HPLC fingerprint analysis. Data were analysed by statistical software - Statistical Package for Social Sciences (SPSS) version 17.

Results: The present study reveals that the *A. chooranam* was light whitish brown in colour having characteristic odour with bitter taste and smooth texture. The moisture content at 105°C in *A. chooranam* was found to be 9.12±0.10%. Analytical results showed total ash, water soluble, acid insoluble and sulfated ash values of 5.76±0.09%, 2.93±0.15%, 0.63±0.04% and 1.92±0.04% respectively. The percentage yields of cold and hot aqueous extractive values (15.02±0.46 & 30.82±1.09) were greater than the percentage yield of cold and hot ethanol extractive values (03.07±0.31 & 10.00±0.22) of *A. chooranam*. Heavy metal analysis revealed that their concentrations in *A. chooranam* were below the WHO/FDA permissible limits.

Conclusion: *A. chooranam* exhibits a set of diagnostic characters, which will help to identify the standard preparation and build a monograph of the Siddha pharmacopeia of Sri Lanka.

Keywords: Amukkirai chooranam; chromatography; herbal preparation; quality control; Solanaceae; standardization; siddha medicine; Withania somnifera.

1. INTRODUCTION

The Majority of the world population depends on traditional medicine for primary health care. Plants have been extensively used as a rich source of medicine as they contain organic compounds with therapeutic value [1]. Standardization of herbal formulations is an essential factor in order to assess the quality, purity, safety and efficacy of drugs based on the concentration of their active principles. It is very important to establish a system of standardization for every plant medicine in the market, since the scope for variation in different batches of medicine is enormous [2]. The quality assurance is necessary if plant products are to fill the need for cheap and reliable medicines or if natural products are to be used as templates for new drug molecules [3].

Amukkirai chooranam is an important traditional herbal preparation and its main component is the root powder of *Withania somnifera* Dunal. It is the best remedy for rheumatism, weakness, stress, sleeping disorders, gastric ulcer, anaemia, etc [4]. The term *chooranam* (powder preparation for internal use) is applied to the powder prepared by a single or a combination of two or more herbal ingredients [5,6].

Withania somnifera (*Ashwagandha* in Sanskrit, Indian ginseng/ Winter cherry in English, and *Amukkirai* in Tamil) belongs to the family *Solanaceae*/ nightshade. Laboratory analysis has revealed over 35 chemical constituents contained in the roots of *W. somnifera*. The biologically active chemical constituents are alkaloids (isopellertierine, anferine), steroidal

lactones (withanolides, withaferins), saponins containing an additional acyl group (sitoindoside VII and VIII), and withanoloides with a glucose at carbon 27 (sitonidoside XI and X). The other alkaloids are somniferine, somnine, somniferinine, withananine, pseudo-withanine, tropine, pseudo-tropine, cuscohygrine, anferine and anhydrine. *Withania somnifera* is also rich in iron. Much of Ashwaganda's pharmacological activity has been attributed to two main withanolides, withaferin A and withanolide D [7].

Numerous studies indicated that ashwagandha possesses antioxidant, antitumor, anti-stress, anti-inflammatory, anti-ageing, hematopoetic, anxiolytic, immune-modulatory, anti-depressive, rejuvenating properties and also influences various neurotransmitter receptors in the central nervous system [8].

Roots are straight, and unbranched, thickness varying with age. Roots bear fiber like secondary roots; outer surface buff to grey-yellow with longitudinal wrinkles. Crown consists of 2-6 remains of stem base. The stem bases are variously thickened, nodes prominent only on the side from where petiole arises, cylindrical, green with longitudinal wrinkles, fracture, short and uneven, odour characteristic, and taste bitter and acrid. The transverse section of stem base shows pith, pericyclic fibres, and xylem with tracheids, fibres and starch grains [7,9].

Macroscopic analysis showed the powder of *W. somnifera* root showed brownish yellow in colour, woody smell and no taste. Microscopic analysis of the powder of *W. somnifera* roots has revealed walled parenchyma cells, fragments of thick walls