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Research Article

A CRITICAL ANALYSIS OF PROPERTIES OF MAHADALU ANUPANA IN AYURVEDIC AND MODERN ASPECT IN THE MANAGEMENT OF VATA VYADHI

Ranasinghe R.L.D.S*, Ediriweera E.R.H.S.S

Department of Kaya Chikitsa, Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sri Lanka

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*Corresponding Author: **R.L.D.S Ranasinghe**

Medical officer, Post Graduate Scholar, Department of Kaya Chikitsa, Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sri Lanka

ABSTRACT

In traditional Sri Lankan medical system drugs are given orally with some vehicles called Anupana. Anupana is a substance which is used in conjunction with the drug to enhance its effects. Mahadalu Anupana of Chandra Kalka is a type of Dalu Anupana which is quite popular among traditional medical fraternity. The present review is directed towards compilation of the pharmacological attributes of medicinal plants used in Mahadalu Anupana. It is widely used in diseases such as Pakshaghata, Akshepa, and Apasmara. Tender leaves of *Citrus aurantifolia*, *Citrus sinensis*, *Vitex negundo*, *Solanum surattense*, *Atalantia ceylanica*, *Citrus reticulata*, *Adhatoda vasica*, *Abrus precatorius*, *Acalypha indica*, *Caesalpinia bonduc*, seeds of *Caesalpinia bonduc* and bulb of *Allium sativum* are pounded together, made into boluses, steamed and juice is squeezed out. *Santalum album*, seeds of *Strychnos potatorum* are rubbed on a stone with a little water. The resulting cream is mixed with breast milk, honey, sugar, ghee and juice of *Citrus aurantium*. A small quantity of this mixture is added to aforesaid extraction. According to Ayurvedic pharmacodynamic properties, Mahadalu Anupana pacifies vitiated Vata Dosha due to Madhura Rasa, Snigdha Guna, Ushna Veerya and Madhura Vipaka. Having Laghu Guna, Ruksha Guna and Katu Vipaka, it also pacifies vitiated Kapha Dosha. It also has properties of Vedana Sthapana, Deepana, Jvaraghna, Mutrakaraka and Sroto shodhana. Ingredients of the Mahadalu Anupana contain alkaloids, flavanoides, glycosides, tannin and volatile oils. Hesperidin a type of Glucoside prevents capillary bleeding and isoflavanquinones inhibits platelet aggregation. Further, plant extracts of Mahadalu Anupana are found to possess antioxidant, anti-inflammatory, anti-cholinergic, anti-carcinomic, antimicrobial, diuretic and hypoglycaemic properties. Due to its Ayurvedic pharmacodynamic properties, phytochemicals and scientifically proven bioactivities, Mahadalu Anupana can be used effectively in the management of Vata Vyadhi.

Keywords: Mahadalu Anupana, Pakshaghata, Sroto shodhana, Antioxidants, Phytochemicals

INTRODUCTION

The history of the traditional Sri Lankan medical system is as ancient as the civilisation of the island. It was handed down from generation to generation and in the course of time it became a part and parcel of Ayurveda. It has cured the world for many millennia and it mainly use plant and herbal preparations for the treatment. The word meaning "Anupana" is considered as "a fluid vehicle for medicine"¹ when administrating drug preparations such as Kalka (Paste) and Vati (Pills). Chandra Kalka is Sri Lankan Traditional preparation which is widely used in treatment of Vata Vyadhi especially for Pakshaghata (Hemiplegia). Sri Lankan traditional physicians prescribe Chandra Kalka with Mahadalu Anupana. Pakshaghata is one among the eighty Vata Vikaras

and being one among Mahagadas, is capable of making Cheshtahani, Karmendriya Kriyahani of the person². The word Pakshaghata reveals the definition that Paksha means half of the body and Aghata means loss or injury³. Pakshaghata can be correlated with Hemiplegia where stroke may be the main etiological factor. Hemiplegia is a disease with paralysis of one side of the body⁴. The term stroke is used to describe an abrupt loss of function of some parts of the central nervous system due to vascular lesions.

Chandra Kalka with Mahadalu Anupana is highly effective in the management of Pakshaghata. So far, no scientific study has been conducted to understand the reaction on Pakshaghata through Ayurvedic pharmacodynamic properties, phytochemicals and bioactivities of the ingredients of Mahadalu Anupana. Hence present study was undertaken.

MATERIALS AND METHODS

Data were collected from Sri Lankan traditional and Authentic Ayurvedic texts, open interviews conducted with Traditional physicians, scientific journals and using web sources accordingly. Then the collected data were analyzed.

RESULTS

Vatika Prakaranaya is a valuable Sri Lankan Traditional Medicine text which contains the description about Vati (Pills) and Kalka (Pastes). Formula of Mahadalu Anupana is tabulated below according to Vatika Prakaranaya⁵ [Table No 01].

Table 1: Ingredients of Mahadalu Anupana⁵

Botanical name	Family	Sanskrit Name	Local Name	Part Used	Proportion (g)
<i>Citrus aurantifolia</i>	Rutaceae	Nimbu	Dehi	Tender Leaves	240
<i>Citrus sinensis</i>	Rutaceae	Jambira	Dodam	Tender Leaves	240
<i>Vitex negundo</i>	Verbenaceae	Nirgundi	Nika	Tender Leaves	240
<i>Solanum surattense</i>	Solanaceae	Bruhathi	Elabatu	Tender Leaves	240
<i>Atalantia ceylanica</i>	Rutaceae	Atave jambira	Yakinaran	Tender Leaves	240
<i>Citrus reticulata</i>	Rutaceae	Naranga	Heen naran	Tender Leaves	240
<i>Adhatoda vasica</i>	Acanthaceae	Adatoda	Adatoda	Tender Leaves	240
<i>Abrus precatorius</i>	Fabaceae	Gunja	Olinda	Tender Leaves	240
<i>Acalypha indica</i>	Euphorbiaceae	Muktavarsi	Kuppameni	Tender Leaves	240
<i>Caesalpinia bonduc</i>	Fabaceae	Yakshakshi	Kumburu	Tender Leaves	240
<i>Caesalpinia bonduc</i>	Fabaceae	Yakshakshi	Kumburu	Seeds	240
<i>Allium sativum</i>	Amaryllidaceae	Lashuna	Sudulunu	Bulb	60

Method Preparation of Mahadalu Anupana⁶:

Each ingredient enlisted in Table No 01 should be pounded separately, mixed together and weighed. This mixture should be made into boluses using a piece of cotton cloth. These bundles should be heated using steam of water on low fire, and should be removed from steam when the aroma started to emit. Then 15 ml of water should be added and squeezed. The 1.5 g of paste of *S. album* (Family: Santalaceae; Shveta chandana), paste of kernel of *Strychnos potatorum* (Family: Loganiaceae; Kataka), and sugar, 2.5 ml of Bee's Honey (Madhu), juice of *C. aurantium* (Family: Rutaceae; Ambul Dodam) and breast milk, and 1.25 ml of ghee, should be added to the aforesaid extract as Prativapa.

Indications of Mahadalu Anupana⁷:

In Vatika Prakaranaya indications of Mahadalu Anupana are mentioned as following.

Fever (Jvara), Bronchial Asthma (Tamaka shvasa), Headache (Shirsha shula) and Vata Vyadhi including Pakshaghata (Hemiplegia), Apasmara (Epilepsy) and Akshepa (Convulsions).

Ayurveda pharmacodynamic properties of ingredients of Mahadalu Anupana are tabulated below [Table No. 02].

Ayurveda pharmacodynamic properties of ingredients of Prativapa of Mahadalu Anupana are tabulated below [Table No. 03].

Table 2: Ayurveda pharmacodynamic Properties of Ingredients of Mahadalu Anupana⁸⁻¹⁸

Ingredient	Rasa	Guna	Veerya	Vipaka	Dosha Karma
<i>Citrus aurantifolia</i>	Amla	Laghu	Anushna	Madhura	Tridosha Shamaka
<i>Citrus sinensis</i>	Amla	Guru, Ushna	Ushna	Amla	Kapha, Vata Shamaka
<i>Vitex negundo</i>	Tikta, Katu, Kashaya	Laghu, Ruksha	Ushna	Katu	Kapha, Vata Shamaka
<i>Solanum surattense</i>	Madhura	Laghu, Ruksha, Tikshna	Ushna	Madhura	Kapha, Vata Shamaka
<i>Atalantia ceylanica</i>	Amla	Laghu	Ushna	Amla	Kapha, Vata Shamaka
<i>Citrus reticulata</i>	Amla	Laghu	Ushna	Amla	Kapha, Vata Shamaka
<i>Abrus precatorius</i>	Tikta, Kashaya	Laghu, Ruksha, Tikshna	Ushna	Katu	Kapha, Vata Shamaka
<i>Acalypha indica</i>	Tikta, Katu	Guru	Anushna	Katu	Kapha, Vata Shamaka
<i>Caesalpinia bonduc</i>	Katu, Tikta	Laghu, Ruksha, Tikshna	Ushna	Katu	Kapha, Vata Shamaka
<i>Allium sativum</i>	Madhura, Lavana, Katu, Tikta, Kashaya	Snigdha, Tikshna, Picchila, guru, Sara	Ushna	Katu	Kapha, Vata Shamaka
<i>Santalum album</i>	Tikta, Madhura	Laghu, Ruksha	Sheeta	Katu	Kapha, Pitta Shamaka

Table 3: Ayurveda pharmacodynamic properties of ingredients of Prativapa of Mahadalu Anupana¹⁹⁻²⁵

Substance	Rasa	Guna	Veerya	Vipaka	Dosha Karma
<i>Strychnos potatorum</i>	Madhura, Tikta, Kashaya	Laghu, Vishada, Vikashi	Madhura	Madhura	Vata Shamaka
<i>Citrus aurantium</i>	Amla	Guru, Tikshna	Ushna	Amla	Kapha, Vata Shamaka
Ghee	Madhura	Guru, Snigdha	Sheeta	Madhura	Pitta, Vata Shamaka
Bee's Honey	Madhura, Kashaya	Guru, Snigdha	Sheeta	Madhura	Vata, Pitta Shamaka
Sharkara	Madhura	Guru, Snigdha	Sheeta	Madhura	Pitta Shamaka
Breast milk	Madhura(Anurasa: Kashaya)	Laghu, Snigdha	Sheeta	Madhura	Vata, Pitta Shamaka

Ingredients of Mahadalu Anupana also have Vedana Sthapana, Ama Pachana, Deepana, Anulomana, Sroto Shodhana, Nadi Uttejaka, Nadi Balakaraka, Medhya, Hrid Uttejaka, Rasayana, Jvaraghna, Mutrakaraka, Shothahara, Kapha Nissaraka and Rakta Shodaka properties.

Ghee promotes Kapha Dosha and pacifies Vitiated Vata Dosha and Pitta Dosha. It also promotes memory, intelligence, vital fire, semen, vital essence and fat. It is curative of toxicosis, insanity, consumption and fever. It is the best of the unctuous substances²¹. Bee's Honey is provocative of Vata and pacifies Vitiated Kapha Dosha. It is heavy, cooling, sweet,

dry, astringent and curative of hemothermia²². It is the best yogavahi substance²³. Ikshu Sharkara is aphrodisiac, slightly unctuous, and beneficial to those who are emaciated. It is useful in thirst and Raktapitta²⁴. Human breast milk is vitalizing, roborant and homologous increases unctuousness²⁵. Phytochemicals of Ingredients of Mahadalu Anupana are tabulated below [Table No 04].

Some of the bioactivities of the ingredients of Mahadalu Anupana are scientifically proven. Those Bioactivities are given below. [Table No 05]

Table 4: Phytochemicals of Ingredients of Mahadalu Anupana²⁶⁻⁴²

Ingredient	Phytochemicals Containing
<i>Citrus aurantifolia</i>	Citric acid, Malic acid, Phosphoric acid, Volatile oil
<i>Citrus sinensis</i>	Gama limonene, Hesperidin, Iso Hesperidin, Aurantiamarin, Aurantetin, Tannin, Terpene and Geraniol
<i>Vitex negundo</i>	Alkaloid, Nishindine, An essential oil, Resin, Flavanoides, Glucoside and Carotene
<i>Solanum surattense</i>	Solanine, Solanasine, Solamargine, Arginine, Valine
<i>Citrus reticulata</i>	Sabinene, Linalool, Methyl N-methylantranilate
<i>Adhatoda vasica</i>	Vasicine, Vasicinone, Vasicine acetate, 2-acetyl benzyl amine
<i>Abrus precatorius</i>	Glycyrrhizin, Abrin, Isoflavanquinones
<i>Acalypha indica</i>	Alkaloids, Acalyphine, Triacetoneamine, Resin, Tannin, Volatile oil and Cyanogenic glucoside
<i>Caesalpinia bonduc</i>	Fixed oil, Bitter principle- Bonducin, Resinous acid, Phytosterolins, Saponin, Sucrose, Alkaloids
<i>Allium sativum</i>	Allin, Allicin, Alitin, Seordinine, Scordine, Anthocyanins & Essential oil
<i>Santalum album</i>	Volatile oil, Santalol
<i>Strychnos potatorum</i>	Brucine
<i>Citrus aurantium</i>	Volatile oil, Gum- resin, Aurantin, Ascorbic acid, 1- strachydrine

Table 5: Bioactivities of Ingredients of Mahadalu Anupana⁴³⁻⁵⁴

Bioactivity	Ingredients
Antioxidant	<i>Adhatoda vasica, Citrus aurantium, Allium sativum</i>
Anti-inflammatory	<i>Adhatoda vasica, Abrus precatorius, Caesalpinia bonduc</i>
Anti-cholinergic	<i>Adhatoda vasica</i>
Antiplatelet	<i>Abrus precatorius, Citrus aurantium</i>
Anti microbial	<i>Caesalpinia bonduc</i>
Antineoplastic, Anticarcinomic	<i>Santalum album, Allium sativum</i>
Diuretic	<i>Strychnos potatorum</i>
Hypoglycaemic	<i>Adhatoda vasica, Allium sativum</i>
Antihyperlipidaemic	<i>Caesalpinia bonduc, Allium sativum</i>

DISCUSSION

According to Ayurvedic pharmacodynamic properties ingredients of Mahadalu Anupana are capable of pacifying vitiated Vata Dosha by Madhura Rasa, Snigdha Guna, Ushna Veerya and Madhura Vipaka. It pacifies vitiated Kapha Dosha, having Tikta, Katu, Kashaya Rasa, Laghu Guna,

Ruksha Guna, Ushna Veerya and Katu Vipaka. It also pacifies vitiated Pitta Dosha due to its Madhura Rasa, Snigdha Guna, Sheeta Veerya and Madhura Vipaka. According to the pathogenesis of Pakshaghata Margavarodha, Dhaturkshaya and Marmabhighata are the main reasons for Pakshaghata. Mahadalu Anupana performs Amapachana action and eliminates Margavarodha (obstruction of channels), occurred

due to vitiated Kapha Dosha and Ama. With the influence of properties of ingredients relieve symptoms of provoked Vata in Vatavaha Srotas and Nadi such as Sandhi Shaitilya (Loosens of the joints), Cheshta Nasha (Loss of functions), Vaktardravakrata (Deviation of mouth), Gadgada (Stammering of speech), Jihva Sphurana (Fasciculation of tongue) and Swallowing Difficulties.

Over all the drugs are showing the Vata Shamaka action and may be more effective in Cerebro-vascular diseases by increasing the oxygen supply by improvement of microcirculation.

While considering the effects of Mahadalu Anupana action of Phytochemicals are also important. Hesperidin a type of Glucoside prevents capillary bleeding. Isoflavanquinones inhibits platelet aggregation. So these bioactivities would be beneficial in the management of Haemorrhagic, Thrombotic and Embolic vascular lesions leading to Hemiplegia (Pakshavadha). Abrin and Vasicine are having anti-inflammatory action; minimizes nerve damage and thereby improve the outcome of patients. Bonducin having antihyperlipidaemic action minimizes the formation of atheroma. Citric acid, Santalol and Vasicine as anti oxidants relieve oxidative stress which is leading to atherosclerosis, stroke and high blood pressure. Anti-oxidants are able to neutralize the damaging effects of free radicals.

CONCLUSION

Due to its Ayurvedic pharmacodynamic properties, Phytochemicals and Scientifically proven bioactivities Mahadalu Anupana can be used effectively in the management of Vata Vyadhi especially for Pakshaghata (Hemiplegia).

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