



**PROPERTIES AND UTILITY OF MADHYAMA RASNADI DECOCTION: A  
MULTIHERBAL FORMULA**

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**ABSTRACT**

Ayurveda physicians commonly use *Madhyama Rasnadi* decoction in the management of inflammatory conditions. This exploratory study aims to justify the actions and usage of *Madhyama Rasnadi* decoction by analysing its Ayurveda pharmacodynamic properties, phytochemical content and bioactivities and to find out the possible other indications. Data were collected from authentic Ayurveda texts and electronic sources and analysed into percentages according to their Ayurveda pharmacodynamics properties. Variations have been identified in terms of preparation method and the dosage of the decoction. The ingredients of *Madhyama Rasnadi* decoction predominantly have Ayurveda pharmacodynamic properties such as *Tikta Rasa*, *Laghu Guna*, *Ushna Virya* and *Katu Vipaka*. Almost all the ingredients possess *Deepana*, *Pachana*, *Rochana*, *Rakta Shodhana*, *Vatanulomana*, *Shula Prashamana* and *Mutrala* properties. The ingredients comprise various phytochemicals such as flavonoids, tannins, phenols, alkaloids and glycosides. Analgesic, anti-inflammatory, antioxidant, hypoglycemic, antimicrobial, hepatoprotective, immunomodulatory and anti-arthritis activities of the individual ingredients have been scientifically proven. It can be justified that due to its properties *Madhyama Rasnadi* decoction can be effectively used to manage inflammatory conditions like rheumatoid arthritis and also to manage degenerative and oxidative stress-related diseases. A future study is planned to analyse the variations of the phytochemical content according to the preparation method.

**KEYWORDS:** *Madhyama Rasnadi* decoction; Ayurveda Pharmacodynamic properties; Antioxidants; Phytochemicals; Bioactivities.

**1.0 INTRODUCTION**

The group of *Rasnadi* decoction is one of the popular medicaments among Ayurveda physicians in India and Sri Lanka. This group consist the decoctions of *Rasnadi Panchaka*, *Rasnadi Saptaka*, *Rasna 09*, *Rasna Dwadasha* (*Rasna 12*), *Madhyama Rasnadiya* (*Rasna 13*), *Rasna 22*, *Maharasnadiya*, *Rasna Dviguna Bhagadiya* and *Trairasnadiya*. *Rasna* is an important medicinal plant, which is widely used in the indigenous medical systems for the cardiovascular, respiratory, gastrointestinal, integumentary, haemopoietic, genito-urinary, nervous, locomotor and endocrine disorders. It has been observed that more than one species of plants be referred to under the name *Rasna*. *Pluchea lanceolata* (DC.) Oliv. & Hiern is the plant which is described in the texts as *Rasna*.<sup>[1]</sup> Medicinal plants such as *Alpinia calcarata* Rosc. and *Languas calcarata* Lodd. & Steud. (Family: Zingiberaceae) are frequently used as substitutes to *Pluchea lanceolata*.<sup>[2]</sup>

*Madhyama Rasnadi* decoction contains 13 ingredients including the rhizomes of *Rasna*, *Ghana*, *Shati* and

*Shunti*; roots of *Eranda*, *Shatavari*, *Sahachara*, *Dushparsha*, *Vasa* and *Ativisha*; stem of *Amruta*; the wood of *Devadru* and pericarp of *Abhaya*. This exploratory study aims to justify the actions and usage of *Madhyama Rasnadi* decoction by analysing its Ayurvedic pharmacodynamic properties, phytochemical content and bioactivities and to find out the possible other indications.

**1.2 Preparation of Madhyama Rasnadi Decoction**

**2.1 Ingredients**

The formula of *Madhyama Rasnadi* decoction is given in the text *Bhaishajya Ratnavali* chapter 29; under the treatment of *Amavata* [Table 1].

**Table 1: Ingredients of Madhyama Rasnadi decoction.<sup>[3]</sup>**

Sanskrit Name	Botanical name	Family	Sinhalese Name	Part Used	Proportion (g)
Rasna	<i>Alpinia calcarata</i> Roscoe.	Zingiberaceae	Heen Aratta	Rhizome	1
Eranda	<i>Ricinus communis</i> Linn.	Euphorbiaceae	Beth Erandu	Root	1
Shatavari	<i>Asparagus racemosus</i> Wild.	Liliaceae	Hatavariya	Root	1
Sahachara	<i>Barleria prionitis</i> Linn.	Acanthaceae	Katukarandu	Root	1
Dushparsha	<i>Tragia involucrata</i> Linn.	Euphorbiaceae	Vel Kahambiliya	Root	1
Vasa	<i>Adhatoda vasica</i> Nees.	Acanthaceae	Adatoda	Root	1
Amruta	<i>Tinospora cordifolia</i> (Thunb.) Miers	Menispermaceae	Rasakinda	Stem	1
Devadaru	<i>Cedrus deodara</i> (Roxb.) G. Don	Coniferae	Devadara	Wood	1
Ativisha	<i>Aconitum heterophyllum</i> Wall.	Ranunculaceae	Atividayam	Root	1
Abhaya	<i>Terminalia chebula</i> Retz.	Combretaceae	Aralu	Pericarp	1
Ghana	<i>Cyperus rotundus</i> Linn.	Cyperaceae	Kalanduru	Rhizome	1
Shati	<i>Kaempferia galanga</i> Linn.	Zingiberaceae	Hinguru Piyali	Rhizome	1
Shunti	<i>Zingiber officinale</i> Roscoe.	Zingiberaceae	Inguru	Rhizome	1

### 2.1 Method of Preparation

It is identified that there are some variations in terms of dosage and method of preparations among Ayurveda systems in India and Sri Lanka.

Paribhasha or the standard method of preparation of decoctions is mentioned in chapter 2, *Kvatha Kalpana* in Sharangadhara Samhita.<sup>[4]</sup> According to that, one *Pala* (48 g) of the coarsely powdered drug should be boiled with 16 parts (48x 16= 768 ml) of water in an earthen pot, over a mild fire till the liquid is reduced to one eighth (96 ml) of the original quantity.

However, as per the text Bhaishajya Ratnavali, another compilation related to Ayurveda drug preparations, equal parts of the aforesaid ingredients should be obtained and raised 25 g of their mixture in powder form.<sup>[5]</sup> The mixture should be decocted along with 200 ml of water until it is reduced to one fourth (50 ml).

Additionally, both Traditional and Ayurveda physicians of Sri Lanka follow another method to prepare decoctions.<sup>[6]</sup> According to that, one *Pala* (60 g) of the coarsely powdered drug is boiled with 8 *Pata* (1 *Pata*= 240 ml; 240x8= 1920 ml) of water and reduced to one eighth (240 ml).

In Ayurveda 1 *Pala* is equalised to 12 *Kalan*. But in Sri Lanka 1 *Pala* is considered as 60 g<sup>[7]</sup> while in India as 48 g.<sup>[8]</sup>

### 2.3 Dosage

The dosage of the decoction can vary according to different Ayurveda texts. In Sharangadhara Samhita it is mentioned that the *Kvatha* (decoction) should be

administered to the patient in a dose of two *Pala* (96 ml) after the previous meal completely digested. According to Bhaishajya Ratnavali, the dosage of *Madhyama Rasnadi* decoction is one *Pala* (48 ml). According to Sarartha Samgraha, 120 ml of *Madhyama Rasnadi* decoction should be given two times per day before the meal.<sup>[9,10]</sup> Sri Lankan Traditional medical practitioners also give 120 ml two times per day.

Dosage variation in Sri Lankan and Indian Ayurveda medical systems is due to the differences between measurement systems. There are two weight and measurement systems (*Mana Paribhasha*) in Ayurveda i.e. *Magadha* and *Kalinga*. Sri Lankan Ayurveda physicians use *Kalinga* system while Indians use *Magadha* system. These two systems use different units that result in dosage variations. Similarly, different preparation methods lead to concentration variations of the final decoction. The highest concentrated decoction, as well as the most palatable dosage, is mentioned in Bhaishajya Ratnavali (48 ml).

### 2.4 Anupana

In Ayurveda medicine, decoctions are usually administered with *Anupana*. As mentioned in Bhaishajya Ratnavali, *Madhyama Rasnadi* decoction should be given with *Rubu Taila* (*Eranda Taila*/castor oil) however, its amount is not given. According to *Kvatha Paribhasha*, when *Taila* is added to the *Kvatha* as *Anupana*, its amount should be one *Karsha* (10 ml). Therefore, the suggested amount of *Rubu Taila* is 10 ml.

### 2.5 Indications

According to the text, Bhaishajya Ratnavali, *Madhyama Rasnadi* decoction can be prescribed in the diseases such

as *Sama Roga*, *Vata Roga*, *Shula* in *Jangha*, *Uru*, *Trika*, *Parshva*, *Prushtha*, *Jathara Pradesha* and *Krodha*.

vitiated *Dosha*. *Rasa*, *Guna*, *Virya*, *Vipaka* and *Dosha Karma* of these ingredients are given in table 2.

## 2.0 Properties of Madhyama Rasnadi decoction

### 3.1 Ayurveda Pharmacodynamic Properties of the Ingredients

Ingredients of *Madhyama Rasnadi* decoction have various properties, which are capable of mitigating

**Table 2: Ayurveda Pharmacodynamic Properties of the Ingredients.**

Ingredient	Rasa	Guna	Veerya	Vipaka	Dosha Karma
Rasna	Katu	Laghu, Ruksha, Tikshna	Ushna	Katu	Kapha, Vata Shamaka <sup>[11]</sup>
Eranda	Madhura, Tikta, Katu, Kashaya	Guru, Snigdha, Tikshna, Sukshma	Ushna	Madhura	Kapha, Vata Shamaka <sup>[12]</sup>
Shatavari	Madhura, Tikta	Guru, Snigdha	Sheeta	Madhura	Vata, Pitta Shamaka <sup>[13]</sup>
Sahachara	Tikta, Madhura	Laghu, Snigdha	Ushna	Katu <sup>[14]</sup>	Kapha, Vata Shamaka <sup>[14]</sup>
Dushparsha	Tikta, Katu	Laghu, Snigdha	Sheeta	Katu	Kapha, Vata Shamaka <sup>[15]</sup>
Vasa	Tikta, Kashaya	Laghu, Ruksha	Sheeta	Katu	Kapha, Pitta Shamaka <sup>[16]</sup>
Amruta	Tikta, Kashaya	Guru, Snigdha	Ushna	Madhura	Tridosha Shamaka <sup>[17]</sup>
Devadaru	Katu, Tikta	Laghu, Snigdha	Ushna	Katu	Kapha, Vata Shamaka <sup>[18]</sup>
Ativisha	Katu, Tikta	Laghu, Ruksha	Ushna	Katu	Kapha, Vata Shamaka <sup>[19]</sup>
Abhaya	Kashaya, Amla, Katu, Tikta, Madhura	Laghu, Ruksha	Ushna	Madhura	Kapha, Vata Shamaka <sup>[20]</sup>
Ghana	Katu, Tikta, Kashaya	Laghu, Ruksha	Sheeta	Katu	Kapha, Pitta Shamaka <sup>[21]</sup>
Shati	Katu, Kashaya, Tikta	Laghu, Teekshna	Ushna	Katu	Kapha, Vata Shamaka <sup>[22]</sup>
Shunti	Katu	Laghu, Snigdha	Ushna	Madhura	Kapha, Vata Shamaka <sup>[23]</sup>

### 3.2 Other Actions of the Ingredients

**Table 3: Other Actions of the Ingredients.**

Ingredient	Other Actions
Rasna	Sheeta Prashamana, Nadi Balaprada, Uttejaka, Rochana, Deepana, Anulomana, Shvasahara, Vajikara <sup>[11]</sup>
Eranda	Shothahara, Vedana Sthapana, Hrudyaya, Deepana, Bhedana, Kapha Nissaraka, Mutra Shodhana, Vrushya, Medhya, Balya, Angamarda Prashmana, Vishaghna, Svedajanaka, Jvaraghna <sup>[12]</sup>
Shatavari	Deepana, Anulomana, Grahi, Shothahara, Vedana Sthapana, Nadi Balakaraka, Balya, Rasayana, Daha Prashamana, Mutrakaraka <sup>[13]</sup>
Sahachara	Shothahara, Vedana Sthapana, Nadi Balaprada, Deepana, Pachana, Svedajanaka, Vishaghna, Jvaraghna, Shukra Shodhana <sup>[14]</sup>
Dushparsha	Bala Vardhaka, Vishaghna, Rochana, Svedajanaka, Jvaraghna, Deepana <sup>[15]</sup>
Vasa	Shothahara, Vedana Sthapana, Jantughna, Stambhana, Rakta Shodhana, Svedajanaka, Jvaraghna <sup>[16]</sup>
Amruta	Vedana Sthapana, Deepana, Pachana, Vatanulomana, Rakta Shodhaka, Hrudyaya, Vrushya, Trushna Nigrahana <sup>[17]</sup>
Devadaru	Shothahara, Vedana Sthapana, Deepana, Pachana, Krimighna, Rakta Prasadana, Hrida Uttejaka, Mutra Janaka, Sveda Janaka, Jvaraghna <sup>[18]</sup>
Ativisha	Rakta Shodhana, Rakta Shamaka, Shothahara, Vedana Sthapana, Deepana, Pachana, Vajikarana, Jvaraghna, Medaghna <sup>[19]</sup>
Abhaya	Vedana Sthapana, Shothahara, Nadi Balakaraka, Medhya, Rasayana <sup>[20]</sup>
Ghana	Sveda Janaka, Jvaraghna, Deepana, Pachana, Nadi Balakaraka, Medhya, Balya, Rakta Prasadana, Mutrala, Vishaghna <sup>[21]</sup>
Shati	Shothahara, Vedana Sthapana, Pachana, Rochana, Shula Prashamana, Grahi, Rakta Shodhana, Uttejaka <sup>[22]</sup>
Shunti	Shothahara, Vedana Sthapana, , Sheeta Prashamana, Nadi Uttejaka, Deepana, Pachana, Rochana, Vatanulomana, Shula Prashamana, Jvaraghna, Rakta Shodhana, Vrushya, Balya <sup>[23]</sup>

### 3.0 Phytochemicals and Bioactivities of the Ingredients

Several Phytochemicals have been isolated from each ingredients of *Madhyama Rasnadi* decoction [Table 4].

#### 4.1 Phytochemicals of the Ingredients

Phytochemicals are chemical compounds that occur naturally in plants, which possess different bioactivities.

**Table 4: Isolated Phytochemicals of the Ingredients.**

Ingredient	Phytochemicals
<i>Rasna</i>	Flavonoid, Terpenoid, Steroid, Phenol, Tannin, Proteins, Carbohydrates <sup>[24]</sup>
<i>Eranda</i>	Alkaloids, Steroids, Flavonoids, Glycosides, Phenolics, Ricinine <sup>[25]</sup>
<i>Shatavari</i>	Steroidal saponins (Shatavarins I–IV), Essential oils, Asparagine, Arginine, Tyrosine, Resin, Racemosol, Kaempferol, Asparagamine <sup>[26]</sup>
<i>Sahachara</i>	Alkaloids, Flavonoids, Steroids, Saponins, Coumarin, Tannin, Lignin <sup>[27]</sup>
<i>Dushparsha</i>	Tannin, Flavonoids, Steroids, Saponins, Alkaloids, Terpenoids, Phenols <sup>[28]</sup>
<i>Vasa</i>	Vasicine, Vasicinone, Vasicine acetate and 2-acetyl benzyl amine <sup>[29]</sup>
<i>Amruta</i>	Tinosporin, Furanoid deterpine, Giloin, Giloinin, Berberin, Waxy substance <sup>[30]</sup>
<i>Devadaru</i>	Wikstromal, Matairesinol, Dibenzylbutyrolactol, Berating, Isopimpillin, Lignans 1, 4 diaryl butane, Isohemacholone, sesquiterpenes LIII: Deodarone, Atlantone, Deodarin, Deoardione, Limonenecarboxylic acid, $\alpha$ -himacholone, $\beta$ -himacholone, $\alpha$ -pinene, $\beta$ -pinene, Myrcene, cedrin, Taxifolin, Cedeodarin, Dihydromyricetin, Cedrinol <sup>[31]</sup>
<i>Ativisha</i>	Alkaloids, Terpenoid-alkaloid complex, Lipids, Calcium oxalate <sup>[32]</sup>
<i>Abhaya</i>	Gallic acid, Tannic acid, Chebulinic acid, Myrobalanin <sup>[33]</sup>
<i>Ghana</i>	Essential oil, Fat, Sugar, Alkaloids, Albuminous matter, Alpha cyperone, Rotundine A, B and C <sup>[34]</sup>
<i>Shati</i>	Methylcinnamate, Carvone, Eucalyptol pentadecane, 3-carene, Camphene, Borneol, cineol, Kaempferol, Kaempferide, Cinnamaldehyde, p-methoxy-cinnamic acid, Ethyl cinnamate <sup>[35]</sup>
<i>Shunti</i>	Zingerone, Shogaol, Camphene, Phellandrene, Zingiberene, Cineol, Borneol, Gingerol, Gingerin, Resins, Geraniol <sup>[36]</sup>

#### 4.2 Bioactivities of the Ingredients

The activities of some of these phytochemicals of the ingredients of *Madhyama Rasnadi* decoction are

scientifically proven by various researches [Table 5]. However, there is no scientific evidence to confirm the presence of all the phytochemicals in the decoction.

**Table 5: Scientifically proven Bioactivities of the Individual Ingredients.**

Ingredient	Bioactivities
<i>Rasna</i>	Analgesic, Anti-inflammatory, Antioxidant, Hypoglycemic <sup>[37]</sup>
<i>Eranda</i>	Antioxidant, Antimicrobial, Analgesic, Anti-inflammatory <sup>[38]</sup>
<i>Shatavari</i>	Antioxidant, Analgesic, Anti-inflammatory, Hypolipidaemic, Hepato-protective
<i>Sahachara</i>	Antioxidant, Antidiabetic, Anti-inflammatory, Anti-arthritic, Cytoprotective, Hepato-protective, Diuretic, Antidiarrhoeal, Anti-nociceptive
<i>Dushparsha</i>	Analgesic, Anti-inflammatory
<i>Vasa</i>	Antioxidant, Anti-inflammatory, Anti-cholinergic, Hypoglycaemic
<i>Amruta</i>	Analgesic, Immunomodulatory, Antidiabetic, Hepato-protective
<i>Devadaru</i>	Anti-inflammatory, Analgesic, Anti arthritic activity
<i>Ativisha</i>	Analgesic, Anti-inflammatory, Antioxidant
<i>Abhaya</i>	Anti-inflammatory, Antioxidant, Analgesic, Anti lipid peroxidative
<i>Ghana</i>	Anti-inflammatory, Antibacterial, Free radical scavenging, $\alpha$ -glucosidase inhibitory
<i>Shathi</i>	Antioxidant
<i>Shunti</i>	Anti-inflammatory, Antioxidant, Analgesic

Alpha-cyperone, a flavonoid, inhibits coagulation, thrombus formation or platelet aggregation. Therefore, they reduce the risk of atherosclerosis. Racemosol, a flavonoid, has been proved to inhibit the pro-inflammatory activity of enzymes involved in free radical production, such as cyclooxygenase (COX), lipoxygenase or inducible nitric oxide synthases. It also improves endothelial and capillary functions.

Increased arachidonic acid levels will exacerbate symptoms in individuals suffering from joint pains or active inflammatory disease. Alpha-cyperone release antagonist effects for arachidonic acid. Phytochemicals also perform peripheral antinociceptive activities that involve inhibition of cyclooxygenase (COX) activity or Prostaglandin (PGE) synthesis as well as activation of the opioid and glutamatergic system. Ricinine, found in the roots of *Eranda* (*Ricinus communis* Linn.) is a typical central nervous system stimulant. Zingerone and

camphene as antioxidants reduce oxidative stress and scavenging activities against different free radicals. They also minimise oxidation of the lipid components. Rotundine C, an alkaloid from the rhizomes of *Cyperus rotundus* is having hypotensive action, reduce arterial blood pressure and risk of hypertension. The flavonoid, a hypoglycaemic agent, can regulate carbohydrate and glucose metabolism. Therefore, the effect of phytochemicals may help to manage inflammatory, degenerative as well as metabolic disorders in the body.

#### 4.0 Analysis of Ayurveda Pharmacodynamic Properties

Collectively the ingredients of *Madhyama Rasnadi* decoction exhibit 84.61% of *Tikta Rasa*, 69.23% of *Madhura Rasa* and 46.15% of *Katu Rasa*. None of the ingredients contains *Amla Rasa*. Ingredients are having 76.90%, 46.10% and 38.40% of *Laghu*, *Snigdha* and *Ruksha Guna* respectively. Majority of the ingredients are *Ushna* in their potency (69.23%). 61.50% of the ingredients are *Katu* in *Vipaka* while 38.40% possess *Madhura Vipaka*. While considering the effects on *Dosha*, 69.23% of the ingredients are capable of pacifying *Kapha* and *Vata Dosha* together. 15.38% of the ingredients can mitigate vitiated *Vata* and *Pitta Dosha*. 76.91% of ingredients demonstrate *Deepana* and *Vedana Sthapana* actions while 61.53% of herbs perform *Jvaraghna* action. Furthermore, 53.8% of ingredients exhibit *Pachana* action while 30.76% are *Rochana*. 46.15% of ingredients show *Rakta Shodhana* effect. 38.46% of ingredients have *Balya* action. Most of the ingredients are abundant in secondary metabolites such as flavonoids, alkaloids, tannin, steroids and phenols. Almost all the ingredients perform anti-inflammatory and analgesic activities. More than 75% of the ingredients provide the antioxidants to the decoction. Additionally, hypoglycemic, hypolipidaemic and hepatoprotective actions of these ingredients are scientifically proven.

The ability to pacify vitiated *Dosha* can be explained through *Rasa*, *Guna*, *Virya* and *Vipaka* of the ingredients. Most predominant *Rasa* of all ingredients is *Tikta*. *Tikta Rasa* is formed by the combination of *Akasha* and *Vayu Mahabhutas* (primary elements). It is easily digestible, cures anorexia, thirst and fever. It eliminates the poisons and purifies the blood. It dries up the moisture and fat. Next dominant *Rasa* *Katu* is digestive, increase hunger and improves taste. The collective effect of the ingredients of *Madhyama Rasnadi* decoction pacifies vitiated *Vata Dosha* by *Ushna Virya* and *Kapha Dosha* by *Katu Vipaka*.

Administration of *Madhyama Rasnadi* decoction is helpful to eliminate *Ama* from the body. Having *Deepana* and *Pachana* actions, *Madhyama Rasnadi* decoction directly influences the *Koshthagni* and thereby *Dhatvagni*. These properties can digest and to stop the formation of *Ama* by increasing *Jatharagni*. Thus, these ingredients are capable of removing the obstruction of

*Srotas* due to *Ama* and *Kapha*. *Ama* acts as a *Visha* (poison) in the body and produces *Jvara*. By these *Amapachaka* properties, *Madhyama Rasnadi* decoction reduces *Ama Visha* and thereby *Jvara*.

#### 5.0 CONCLUSION AND FUTURE PROSPECTS

It can be justified that the use of *Madhyama Rasnadi* decoction in a wide range of chronic or infectious diseases related to pain and inflammation as mentioned in the classical texts such as *Sama Roga* and *Vata Roga*.

*Madhyama Rasnadi* decoction can be prescribed primarily for inflammatory conditions like rheumatoid arthritis. It can be assumed that the ingredients act as disease modifying anti-rheumatic drugs as they possess analgesic and anti-inflammatory properties that response to autoantigens. Due to its properties and actions, the use of *Madhyama Rasnadi* decoction can be beneficial in the treatment of oxidative stress-related diseases like coronary artery diseases, diabetes mellitus, stroke and hypertension.

Authors have planned the qualitative and quantitative studies to analyse phytochemical content in *Madhyama Rasnadi* decoction. Further experimental studies are suggested to find out the most effective dosage and the preferred preparation method of *Madhyama Rasnadi* decoction.

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