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Review on *Dasa Panguwa* Herbal Formula against COVID-19

Shazmin Hazari[1], Jayakody Arachchige Dona Pushpa Premakanthi Jayakody[2]

[1]Department of Applied and Natural Science, University College of Matara, Sri Lanka
[2]Department of Kaya Chikitsa, Faculty of Indigenous Medicine, Gampaha Wickramarachchi University of Indigenous Medicine, Sri Lanka

Corresponding Author: Shazmin Hazari

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ABSTRACT

The World Health Organization (WHO) declared the coronavirus disease 2019 (COVID-19) a public health emergency of global significance in 2020. In accordance with Ayurveda, the norms of disease management in epidemics are best understood in the context of "*Janapadodhwansha*" a condition in which the elements of the environment air, water, land, and seasons become vitiated and simultaneously manifest as disease in large populations (epidemics), resulting in the destruction of human habitations. As the illness is viral in origin, no effective treatment has yet been found. To end the current outbreak, an effective medication is therefore very necessary. Ayurveda as one of the oldest systems of medicine gives priority to *Āganthuja Jvara* (fever origin from extrinsic causes). The symptoms and signs of Covid-19 have many similar features with *Vāta* and *Kapha Jvara* (body humors). The current study was based on a critical analysis on *Dasa Panguwa* herbal formula that widely used in the management of fever in Sri Lanka. The formula consisted of *Acorus calamus L, Cedrus deodar*, *Coriandrum sativam, Clerondendron serratum, Fumariya parviflora, Munronia pumila, Myrica esculenta, Chlorocyperus salaamensis, Terminaliya chebuala, Zingiber officinale*. It includes *Katu* (pungent), *Tikta* (bitter), *Ushna Veerya* (hot potency) properties with *Deepana,* (enhances stomach fire), *Pāchana* (digestion) and nourishes all the tissues and enhance immunity. The formula can be suggested as most suitable for *Kapha Vāta* predominant conditions based on pharmacological properties including other pharmacological activities were studied. Furthermore, the study revealed that most of the ingredients of the formula have been effective against corona due to antiviral, immune modulatory antioxidant effects of the ingredients.

Keywords: Covid-19*, Jvara, Vāta* and *Kapha, Dasa Panguwa,*

INTRODUCTION

The infectious disease known as coronavirus disease is caused by the SARS-CoV-2 virus (COVID-19). From March 12, 2020, the World Health Organization has proclaimed it to be a continuing worldwide epidemic. The SARS-CoV-2 virus is the primary cause of Covid-19, a recently discovered viral illness that mostly affects the respiratory system. Most virus-infected people experience a mild to severe respiratory illness. People who have severe underlying medical conditions like heart or lung disease or diabetes and adults seem to be at higher risk for developing more serious complications from COVID19 illness. And currently it is recovering without the need for special care [1].

The *Charaka Samhitā, Susruta Samhitā*, and *Astānga Hrdaya Samhitā* are the three primary genuine manuscripts of Ayurveda. The *Charaka Samhitā* is the most important text in the tradition of clinical medicine among these three. Moreover, it makes it clear that these sorts of widespread epidemics or pandemics fall under the

heading of "damaging human habitats," according to the *Janapadodhwansha*. But in the case of *Janapadodhwansha* there are common elements like air, water, location, and seasons, and their vitiation results in the simultaneous emergence of illnesses with the same set of symptoms, which destroys human habitats [2, 3].

The contagious diseases are referred to in *Susruta Samhitā* as *Aupasargika Roga*, and their modes of transmission are listed as physical contact, breathing contaminated air, sharing a plate while eating, sharing a bed or chair, and sharing clothing, garlands, and paste. Examples of such illnesses include conjunctivitis, fever, consumption, skin conditions, and the other infectious diseases that are spread from person to person [4].

Fundamentally, Ayurveda classifies *Jvara* (fever) as *Nija* (from intrinsic causes) and *Āgantuja* [2, 3]. In conventional medicine, fever is a primary sign of numerous infectious diseases while Ayurveda assort as a main disease. The Covid-19 symptoms and indicators can be co-related with the Bhutābhisangaja (fever origin of germs) and *Vishābhisangaja Jvara* (fever of poisonous), a subtype of *Jeevanuja Jvara* (fever of microorganisms), under the *Āgantuja Jvara*, which is connected to water- or air-borne disease and are more pertinent to the *Jvara Roga* [2, 3, 5]. Several texts of Ayurveda mentioned infestations of *Krimi* which is invading tissues and result production of various diseases [2]. General term of microbes, warms and parasites is *Krimi*.

The invasion of *Āganthuja* substances causes *Āganthuja Jvara* to impact the characteristic functions of the bodily humors. The pre-symptomatic stage of *Kapahaja Jvara* and Covid-19 has a clinical appearance. According to Ayurvedic classics, *Vāta* and *Kapha Dōshas* are predominant at the initial stage of the disease and subsequently develop severe symptoms that are akin to pneumonic lung disease. *Svasanaka Jvara* (fever with respiratory system involvement) might be related to this. About the complications, the *Sannipataja Jvara* is involved [2, 3, 5].

The creation of innovative antiviral drugs can benefit greatly from the abundance of herbal medicines and purified natural ingredients. Ayurveda medicines offer significant potential to be applied both for the prevention and treatment of COVID-19. The herbs mentioned in Ayurveda are examined because they are known to be protease inhibitors and broad-spectrum antivirals. They also increase immunity to combat live COVID-19, a flu-like illness [6-12].

Antiviral and immune-modulatory properties are included in Ayurvedic medications for these types of pandemic diseases [6-12]. Among the treatment of fever *Dāru Parpata* is a very popular herbal formula which is named as a *Dasa panguwa* among the indigenous practitioners in Sri Lanka. *Acorus calami L, Cedrus deodar, Coriandrum sativam, Clerondendron serratum, Fumariya parviflora, Munronia pumila, Myrica esculenta, Chlorocyperus salaamensis, Terminaliya chebuala, Zingiber officinale*, are composed of the decoction. As per the *Sloka*, It alleviates the diseases of *Kapha* and *Vāta* origin of fever, hiccup, *Svāsa* (relieves breathing difficulties) and *Gala Roga* (throat diseases*), Kāsa* (relieves cough), *Sosha* (desiccation), *Hanu Rōga* (disease of temporal region) [13, 14].

The current study was based on a critical review regarding COVID-19 through Ayurveda perspective to address effective management protocol for the condition referring *Dasa Panguwa* decoction. The study critically analyzed the pharmacological activities of the ingredients in selected formula in the management of Covid-19.

MATERIALS & METHODS

The study was conducted in through a literature base critical analysis of existing information of *Dasa Panguwa* decoction. The literary review was referred through authentic Ayurveda classics and the review

on COVID-19 was conducted through recent scientific explanations and findings which have been published in official websites and indexed journals, articles, reports of WHO and encyclopedias (within 2019- 2022).

LITERATURE REVIEW

Review of Dasa Panguwa

Dasa Panguwa herbal formula is mentioned in *Chakradatta* (Table 1)

Table 1: Formula of *Dasa Panguwa* decoction

Scientific name	Family name	Sanskrit name	Part of use
Cedrus deodar	Conifereae	*Devadara*	Inner substance of wood
Fumariya parviflora	Fumariaceae	*Parpata*	Whole plants (leaves mainly)
Clerondendron serratum	Verbenaceae	*Bhargi*	Roots
Chlorocyperus salaamensis	Cyperaceae	*Mustā*	Rhizome
Acorus calamus L.	Araceae	*Vacā*	Rhizome
Coriandrum sativam	Umbelliferae	*Dhānyāka*	Fruits mainly
Myrica esculenta	Myricaceae	*Katphala*	Bark, fruits
Terminaliya chebuala	Combretaceae	*Haritaki*	Pericarp rind mature fruit
Zingiber officinale	Scitamineae	*Shunti*	Rhizome
Munronia pumila	Meliaceae	*Bhúnimbha*	Whole plant

Pharmacological review

Cedrus deodar (Devadara)

Traditional treatments for *C. deodara* include treating leprosy, asthma, ulcers, sprains, boils, and rheumatism. The majority of the 105 chemical components identified by phytochemical research from various plant sections are terpenoids and flavonoids. Crude extracts, essential oils, fractions, and isolated compounds of *C. deodara* demonstrated several significant pharmacological effects, including anticancer, antimicrobial, antifungal, analgesic, anti-inflammatory, neuro-protective, and anti-asthmatic effects [16]. Immune parameters were examined for both the cellular (phagocytosis and respiratory burst activities) and humeral (serum complement activity, anti-protease, total protein, peroxidase, bactericidal activity, and IgM level) systems [17].

Rasa (taste): *Tikta* (bitter), *Katu* (pungent). *Guna* (qualities): *Snigdha* (oily), *Laghu* (lightness). *Vipāka: Katu* (undergoes pungent taste conversion after digestion. *Veerya: Ushna* (hot potency). *Kapha Vāta Doshashāmaka* (pacify). Properties: *Kāsa Hara* (Relieves cough, *Svāsa* (relieves breathing difficulties), *Balya* (improves muscle strength), *Kantya* (relieves sore throat), *Deepana* (enhances stomach fire), *Pāchana* (helps in digestion), *Róchana* (stimulates appetite), *Hridaya* (treats heart problems), *Rasāyana* (rejuvenates the whole body), *Vayasthāpana* (prevents ageing), *Jvara* (antipyretic) [18, 19].

Fumariya parviflora (Parpata)

The whole plant is frequently utilized in traditional and folklore medical systems. The plant is well-known in traditional medical systems for its anthelmintic, diuretic, diaphoretic, laxative, stomachic, and sedative properties. It is also used in ethno pharmacology to treat liver blockage and cleanse blood. It has significant pharmacological effects, including analgesic and anti-inflammatory effects, and the investigation of neuro-pharmacological parameters, antioxidant [20], antiviral [21] and antibacterial activities. The separation of hepatoprotective and antifungal constituents from this plant was also reported newly. Hepato-protective, anti- diabetic, antipyretic effects are the findings of research [22].

Rasa: Tikta. Guna: Laghu, Vipāka: Katu, Veerya: Seeta (cold potency), *Kapha Pittashāmaka.* Indications are fever of *Kapha* origin, fever of *Pitta* origin, excessive thirst, lack of interest in food, bleeding disorders and ideal for measles [18, 19].

Clerondendron serratum (*Bhārgi*)

A slightly woody shrub with bluntly quadrangular stems and branches are found in forests in all parts of India up to an

altitude of 1500m. Root, stem and leaves are used medicinally [20].

Rasa: Katu, Tikta, Kashāya (astringent). *Guna: Laghu, Ruksha* (dryness). *Vipāka: Katu*. *Veerya: Ushna*. Pacify *Vātakapha* [18, 19]. In the Ayurvedic system of medicine it is used for common cold, chronic sinusitis, allergic rhinitis, cough and other chronic respiratory problems. It is also an excellent dry cough home remedy. It is also used by Ayurveda for relief from fever and hyper-pyrexia [19].

Pharmacological evolution on *Bhārgi* includes Antipyretic and antihistamine activities [23]. The roots were produced anti-inflammatory and antipyretic activities in animal models. The results support as a remedy for pain, inflammation and fever [24].

***Chlorocyperus salaamensis* (*Mustā*)**

Chlorocyperus salaamensis has found in tropical, subtropical and temperate regions. The tuber part of *Chlorocyperus salaamensis* is widely used in traditional medicine around the world to treat digestive disorders, wounds, boils and improves milk secretion in lactating woman and is an excellent immune modulator.

Ethyl acetate extract and two crude fractions, solvent ether and ethyl acetate of *C. rotundus* has evaluated for several pharmacological and biological activities including anti-inflammatory, anti-diabetic, anti-diarrheal, cyto-protective, anti-mutagenic, antimicrobial, anti-bacterial, anti-oxidant, cytotoxic and apoptotic, anti-pyretic and analgesic activities have studied for this plant [24-27].

Rasa: Katu, Tikta, Kashaya. Guna: Lagu, Ruksha. *Vipāka: Katu. Veerya: Seeta. Kapha Pittashāmaka*. It attributes *Lekhana* (creeping out), *Jvaragna*, *Kaphagna* various types of *Vāta Roga*, pain killer, good appetizer, increase digestive power, easy for digestion, *Grāhi*, anthelmintic improves the sweet, [17, 18].

***Acorus calamus L.* (*Vacā*)**

Acorus calamus Linn (Acoraceae) is used to cure a variety of illnesses, including neurological, gastrointestinal, respiratory, metabolic, renal, and liver issues. In addition to suggesting prospective areas for more research, the goal of this work is to present a thorough and current report on its ethno medicinal usage, phyto-chemistry, and pharmaco-therapeutic potential. This herb's 145 components, including phenylpropanoids, sesquiterpenoids and monoterpenes, have been extracted and identified. The bio-potential of its many extracts and active ingredients, including those that are anticonvulsant, depressive, antihypertensive, anti-inflammatory, immune-modulatory, cardio-protective and neuro-protective, is well supported by compelling research [28]. Both roots and leaves of *A.calamus* have shown antioxidant, antimicrobial, antifungal and insecticidal activities [29].

Rasa: Katu, Tikta. Guna: Lagu, Teekshna. Vipāka: Katu. Veerya: Ushna. Kapha-Vāta hara

Mainly action on digestive system: *Pāchana, Deepana, Krimighna* (anti microbes and anthelmintic), *Arshogna* (anti-hemorrhoid), *Shula Prashamana* (pain killer) and *Anulomana*. Action on respiratory system: *Kantya, Svāsa Kāsahara* [18, 19].

Coriandrum sativam (Dhānyāka)

In traditional medicinal systems, the seeds are used for health attributes such as improving diseases related to the gastro-intestinal tract and diabetes. Another study demonstrated that the extract made from coriander seeds has been used as a protective agent for gastric mucosa, Antioxidant, antibacterial, antifungal, anti-diabetic, hepato-protective, and anti-hyperlipidemia activities are composed of the plant [30-31].

Rasa: *Tikta, Madura* (sweet), *Kashāya*. Guna: *Lagu, Snigdha. Vipāka: Madura. Veerya: Ushna.* Pharmacological actions of *Coriandrum sativam* are *Deepana, Pācana, Grāhi* (absorbent), *Tridoshana* (pacify three humors), *Mutrala* (elevate urine), *Caksusya* (good for eye diseases), *Hrdya*. Indications:

Jvara, Dāha (body heat), *Trushna*, *Chardi* (emetic*), Kāsa, Svāsa*, *Krimi*. Key applications: in dyspeptic complaints, loss of appetite [18, 19].

Myrica esculenta (Katphāla)

Myrica esculenta (Myricaceae), the roots have traditionally been used to cure bronchitis, asthma, fever, chronic bronchitis, diarrhea, rheumatism, and inflammation; the flowers have traditionally been used to treat earaches, diarrhea, and paralysis. The existence of several bioactive phyto components, including phenolic chemicals, alkaloids, glycosides, triterpenoids, and volatile oils, was discovered by phytochemical examinations of the various plant sections. The plant is also said to possess a wide range of important pharmacological properties, including those for analgesic, anxiolytic, anti-allergic, anti-diabetic, antimicrobial, antihypertensive, antiulcer, antioxidant, immune-modulatory, and neuro-protective effects. Anti-inflammatory evaluated by using various animal models [32]. Anti-asthmatic is importance of this plant in medicine [34-36].

Rasa: Tikta, Kasāya, Katu. Guna: Teekshna. Veerya: Ushna. Vipāka: Katu. Pacifies *Vāta* and *Kapha*, promotes *Pitta*. *Kapha Nissāraka* (mucus expel put), *Svāsa Hara*. *Deepana, Grāhi, Nādi Balakāraka*. *Mutra Sangrāhi* is the properties of the *Katphāla* [17, 18].

Terminaliya chebuala (Haritaki)

Large trees, 60-80 feet height, rust color or silvery very hard trunk, hairs over young branches [26]. Traditionally it has been used as a popular folk medicine for homeostatic, antitussive, laxative, diuretic and cardio tonic treatments. Recent studies showed that it has also been used as anti-diabetic, antiviral, cardio-protective, anti-cancer; antioxidant, free radical scavenging and hypo-lipidemic agent [35, 36] and further antibacterial, antiviral activities are composed of the herb. [37-39].

Rasa: Kasāya mainly, *Pancharasa. Guna: Lagu, Ruksha. Vipāka: Madura. Vìrya: Ushna. Prabhava: Tridoshashāmaka.* It includes *Anulomana, Rasāyana, Prajasthāpana* (help for retaining the baby in womb), *Lekhana, Caksusya, Hrdya actions*. Key application is, use for constipation, respiratory problems [18, 19].

Zingiber officinale (Shunti)

Ginger is 2-4 foot tall perennial with grass like leaves. Rhizome is stout and tuberous. Stem: erect, leafy stem. Leaves: narrow, linear, lanceolate, 1-2cm wide and glabrous. Inflorescence is a spike. Flowers are greenish with a small dark purple or purplish black stamen. Fruit: dehiscent capsule and oblong [27, 28]. The main pharmacological actions of ginger and compounds isolated therefrom include immuno-modulatory, anti-tumorigenic, anti-inflammatory, anti-apoptotic, anti-hyperglycemic, anti-lipidemic and anti-emetic actions. Ginger is a strong anti-oxidant substance and may either mitigate or prevent generation of free radicals [40, 41]

Rasa: Katu. Guna: Lagu, Snigdha. Veerya: Ushna. Vipāka: Madura. Kapha Vātashāmaka. Dry ginger alone or with other medicines is used for fever, diarrhea, and loss of appetite, indigestion, mal-absorption syndrome, hiccough and bronchial asthma, cough [18, 19].

Munronia pumila (Bhúnimbha)

It is a small hardly perennial shrub, with a short stem about 5-10cm ling with crowded hairy pinnate leaves with long petioles [15]. Potent inhibition of 5-LO and mPGES-1 activity, without concomitant antioxidant activity and cytotoxic effects, rationalizes the ethno-pharmacological use of *M. pumila* as anti-inflammatory remedy [42].

Rasa: Tikta. Guna: Lagu, Ruksha. Veerya: Seeta. Kapa Pittanāshaka. Systematical actions are *Deepana, Āmapāchana, Krimìgna, Rakthashódana, Kāsa Svāsa Hikka*. Key application: thermo regulation (especially *Jeernajvara* and *Vishamajvara*). It can be used for fevers, dysentery, general pains, swellings, hemorrhoids, eczemas,

coughs, asthma, blood disorders, vomiting, and malaria and purifies blood [18, 19].

DISCUSSION

Covid-19 with the testing for acceptable formulae in various medical disciplines, viral illness is continually expanding over the world. Several notions are illustrated in Ayurveda for this illness. Ayurveda mentions *Janapadodhwansha*, *Aupasargika Roga*, and bodily humor principles for perspective control. *Arundatta*, *Ashtānga Hridaya* and *Chakrapani* commentator notes that while blood infections are absolutely invisible to the human eye, their presence is explained for the *Sleshmaja Krimi* notion.

According to *Rasādi Panchakaya*, *Dasa Panguwa* is prominent in *Tiktha*, *Katu* and *Kashāya Rasa* respectively. *Tikta, Kashāya Rasa* alleviates *Pittakapha Doshas* and vitiates *Vāta Dosha*, while *Katu Rasa* alleviates *Kapha Dosha* and elevates *Pitta Dosha*. Out of ten materials major contains are *Tikta* and *Katu Rasa* which is pacify mainly *Vātakapha*. Accordingly, *Tikta Rasa* is basically *Jvaragna, Deepana, Pāchana, Kantya,* and *Krimigna.*

Laghu, Ruksha, Teekshna, Snigdha Gurvādhi Guna are primarily present. *Laghu Guna* is predominant among them. *Laghu, Ruksha Guna* can alleviate *Kapha dosha* and vitiate *Vāta Dosha*. Also, *Laghu, Ruksha Guna* emphasizes *Agni Deepana, Āmapāchana and Langana* actions. *Ushna Veerya* is strong in this formula. *Ushna Veerya* can alleviate *Kaphavāta Doshas*.

In this formula most substances show *Katu Vipāka* that can pacify *Kapha Dosha* and predominant *Laghu, Ruksha Guna*. Therefore this formula seems to have an efficacious blending of properties with a synergetic pharmacological effect predominately alleviates *Kapha Vāta Dosha* while less show *Kapha Pitta* and *Tridoshaprashamana* properties. Hence the formula can be suggested as most suitable for *Kapha Vāta* predominant conditions based on pharmacological properties (Table 2)

Table 2 common pharmacological actions of *Dasa Panguwa*

Rasa	***Guna***	***Veerya***	***Vipāka***	***Karma***
Tikta,Katu, Kashāya	*Lagu,Ruksha, Teekshna*	*Ushna*	*Katu*	*Kapha-Vāta Shāmaka*

All ingredients together mainly action on digestive system*: Deepana*, *Pāchana*, *Róchana*, *Anulomana*, *Krimighna* and *Grāhi*. And regulate the thermo center with actions of *Jìrnajvara* and *Vishamajvara*, *Dāha Prashamana, Shula Prashamana* and *Mutrala* (elevate urine). As well as actions are in respiratory system: *Kantya, Svāsa Kāsahara. Balya*, *Hridaya*, *Rasāyana*, *Vayasthāpana* pharmacological actions emphasize complications of *Jvara*.

Modern pharmacological research has been found that practically most of the components have antiviral, anti-bacterial, immune-modulatory, anti-inflammatory, antipyretic properties and antioxidant particularly when it comes to preventing the pathological invasion of SARS-CoV-2 by inhibiting the activity of numerous biological check points. Further studies should be done to assess the clinical efficacy of *Dasa Panguwa* decoction in the management of COVID- 19.

CONCLUSION

The symptoms and signs of COVID 19 are more relevant to the *Vāta Kapha Jvara* with the *Janapadodhwansha* or epidemic in nature. The mainstay of medical therapy for *Jvara* is composed from *Katu*, *Tikta*, *Deepana*, *Pāchana* properties with *Kapha Vātashāmaka*. The herbs which have pharmacological properties like anti-inflammatory, antimicrobial, antipyretic, cardio protective effects, antiviral activities, help to improve the immune system. In the management of disease, the drugs which are predominant *Katu*, *Tikta*, *Ushna Veerya* properties and act as *Deepana*, *Pāchana* produce normal state of end product of digestion that nourishes all the tissues and enhance immunity. Furthermore, *Balya*, *Hridaya*, *Rasāyana*, *Vayasthāpana* actions are demonstrated how to treat the *Jvara* complications.

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