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Review Article

**SHRAMAHARA MAHAKASHAYA OF CHARAKA SAMHITA – A PROMISING
 SUPPLEMENT FOR IMMUNOMODULATION – A SYSTEMATIC REVIEW**

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Abstract-

Immuno-modulation or modification of the immune responses towards wellbeing is incorporated as *vyadhik shamatva*, *swasthya* (wellbeing), *bala*(strength) and *ojas* in *Ayurveda*. *Shrama* (fatigue) is the main feature of *balakshaya* (Strength depletion), *ojahkshaya* (condition of depleting immunity) as well as *rasa*, *asthi* and *shukradhatu kshaya* (tissue depletions). Thereby, *shrama* and *vyadhik shamatva* have a coexisting relation. *Acharya Charaka* has collectively mentioned 10 drugs as *shramahara mahakashaya* which works effectively in *shrama*. Ingredients of *shramahara*

mahakashaya are rich in nutrients, antioxidants and also have proven effects on anxiety, and in immuno-modulation. Hence, this systematic review has been carried out to find the efficacy of *shramahara mahakashaya* in immuno-modulation. The study was carried out using thorough analysis of various *Ayurveda* classical texts as well as available modern literature and collected data & observations were presented in a scientific manner. The review will be beneficial to understand and to modify the host immunity according to *Ayurveda* concepts.

Key words –Immuno-modulation, anti-fatigue formula, *shramahara mahakashaya*

INTRODUCTION

The World Health Organization warned about the high rate of emergence of infectious diseases in 2007 and further specified around 40 infectious diseases that have emerged from 1970.(1)One of the main causes for the recurrence of old diseases and the occurrence of new diseases is acquired resistance of pathogens. Thereby, the powerful antibiotics gradually become hopeless. Meanwhile, the conceptual overlook of *swasthya* (wellbeing) through the holistic approach by *Ayurveda* philosophy has developed into a viable choice of the new trends; as it enriched with its' own concepts and principles for the overall wellbeing of mankind. These concepts approach the *shareera* (body) in a symbiotic way, through the natural way. This universal approach enhances host defense mechanism system via the ecosystem.

This aspect of *Ayurveda* expounds as *vyadhikshamatva*. The word *vyadhikshamatva* consists of 2 words; 'Vyadhi' the combination of unfavorable stimuli with mind and body And 'Kshamatva' 'to bear', 'to resist against disease' or 'composed to suppress excitation'. (2,3)Hence, *Vyadhikshamatva* is the protection power against diseases (*Vyadhi-balavirodhitva*) and resistance power against disease occurrence (*Vyadhi-utpadaprati bandhakatva*).(4) This concept can be co-related with the theories of immuno-modulation mentioned in conventional sciences. According to *Acarya Sushruta*, disease power (*vyadhibala*) can be nullified by the constitutional strength (*shareerabala*) of an individual. (5) Development of the constitutional strength over environmental changes is the main objective of *swasthyacikitsa* (maintenance of health). Hence, food regimen (*pathyaapthya ahara*), day and seasonal conducts

(*dinacarya and ritucarya*) have been indicated in Ayurveda. Besides that, food is considered as the best among the articles which sustain the life.(6)Accordingly, food considered as the foremost sub-pillar of the three sub-pillars of life; since it promotes *shareerabala* (strength), *varna* (complexion), and *ojas* (essence of tissues/*saptadhatu*).(7)

Occasionally, *Shareeabala* (strength of body), *vyadhikshamatva* (Immunity),and *ojas* (essence of *saptadhatu*) are synonymously being used for each other in Ayurveda.(8,9) *Acarya Sushruta* has explained *ojas* as the *karyabhava* (effect) of *karanabhava* (causative factor); *shareerabala*.(10) Strengthening *shareerabala* leads to improve *ojas*, similarly, the *vyadhikshamatva*. Ayurveda has divided 'shareerabala' of an individual into three fragments,(11)

- *Sahaja* (immunity developed from birth)
- *Kalaja* (immunity developed according to the time factor)
- *Yuktikruta* (Immunity developed from food and behaviors)

Sahajabala is inherent and *kalajabala* depends upon the age and seasonal changes of the environment. The most important

aspect among these is *yuktikrutabala*, as it can be modified by the food, various conducts and behaviors.(11) It represents the acquired immunity. As a result, the inter-linkage between food and immunity is undoubted. Hence, Ayurveda has given a great importance to food with concern to wellness of the body.

Shramahara mahakashaya (SMK) mentioned in *Charaka Samhita*, is an amazing collection of foods. It comprises 10 ingredients of nutritive fruits, and grains which are used as food in a day to day life.(12) Hence, implication of nutrition for relieving *shrama* has established. Pharmacodynamics aspect of SMK can be suggested that SMK delivers *shramahara* action by virtue of *Rasa*, since food is dominant in *rasa* (taste). On the other hand, drugs are dominant in *veerya* (potency).(13)As a result, SMK opens the pathways to safe long-term use for healthy as well as for diseased status of individuals; whereas, drugs can be used only for a short period. Hence, SMK might be an ideal source for a nutritional supplement.

Accordingly, this study aims to elucidate the utility of SMK in immuno-modulation through its' conceptual co-relation and logical analysis (*anumana* and *yukti*) upon

the properties of ingredients (*dravya swalakshana*). (14)

MATERIALS AND METHOD

Thorough and systemic review of the ingredients of SMK and concept of *shramahas* been done from Ayurveda classical texts and available scientific literature. Further, compiled data was tabulated upon the properties (*dravya swalakshana*), and analyzed according to the inference action (*anumana*) and logical therapeutic (*yukti*) outcomes pertinent to the concept of immuno-modulation. Hence, the study is comprised of 02 parts.

1. Review of the properties and actions of SMK ingredients in the context of immuno-modulation
2. Application of SMK drugs as food supplements for immuno-modulation

RESULTS AND ANALYSIS

1. Study the properties and actions related to the ingredients of SMK in the context of immuno-modulation

There are ample of diets (*ahara*), conducts (*vihara*) & medicines (*aushadhi*) are mentioned in the form of daily (*dinacarya*) and seasonal regimens (*ritucarya*) for alleviating *shrama*. Diets like alcoholic preparations (*sura, madya*), conducts like bathing (*snana*), foot massage (*padaabhyanga*) are specifically mentioned as *shramaharacikitsa* by the ancient *acaryas*.

Yet, *Acarya Charka* has given a wonderful collection of foods as SMK. This illustration can be interpreted as the usage of functional food in Ayurveda. Health benefits of these ingredients beyond their nutritional value can be the most probable cause for this intention. Consequently, it is worth being study the properties of SMK to identify the principles of functioning.

Table 1 - Shramahara mahakashaya with botanical sources and properties

	Drugs	Rasa	Guna	Virya	Vip aka	Dosha karma	Probable pharmacological properties related to immunity

1	<i>Draksha</i> (<i>Vitis vinifera</i> L.)	M	Gu, sni	Sita	M	VP shamaka	hrdya, vrishya, cakshushya, kshata kshyahara, santarpaniparam
2	<i>Kharjura</i> (<i>Phoenix dactylifera</i> L.)	M Ks	Gu, sni	Sita	M	VP shamaka	Bala sukrakari, hrdya, kshata kshyahara, tushti pushtida sukralam
3	<i>Priyala</i> (<i>Buchanania lanzan</i> Spreng.)	M	Gu, sni	Shita	M	VP shamaka	vrishya, balya, hrdya
4	<i>Badara</i> (<i>Ziziphus jujuba</i> (L)H. Karst.)	A, M, Ks	Gu, sni	Shita	M	VP shamaka	vataghna, brimhana,
5	<i>Dadima</i> (<i>Punica granatum</i> L.)	M Ks, A	La, Sni	Anush na	M	VPK shamaka	hrdya, medhya, kanthasya rogaghna
6	<i>Phalgu</i> (<i>Ficus carica</i> L.)	M	Gu, sni	Shita	M	VP shamaka	Tarpana, brimhana, vajikarana
7	<i>Parushaka</i> (<i>Grewia asiatica</i> L.)	M, A, Ks	La	Shita	M	VP shamaka	Brimhana
8	<i>Ikshu</i> (<i>Saccharum officinarum</i> L.)	M	Gu, sni	Shita	M	VP shamaka	Vrishya, kaphaprada, hridya, brimhana
9	<i>Yava</i> (<i>Hordeum vulgare</i> L.)	M, Ks	Ru, Gu	Shita	M	KP shamaka	Sthairya, agni varnakari

10	<i>Shashtika shali</i> (<i>Oryza sativa L.</i>)	M, Ks	Gu,Sni	Shita	M	P <i>shamaka</i>	<i>Balya, sthanya,</i> <i>pushtimedha,</i> <i>kaphaprada</i>
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According to the table 1, which explains the properties of ingredients of SMK, the collective properties of SMK can be inferred as follows,

- *Rasa – madhura rasa* (sweet taste)
- *Guna – guru* (heavy), *snigdha* (unctuous) properties
- *Veerya- sheeta veerya* (cold in potency)
- *Vipaka – Madhura* (Sweet)
- *Dosha karma – vata, pitta shamaka* (pacify *vata* and *pitta dosha*)
- *Anya karma – balya* (strengthening), *hridaya* (beneficialfor heart), *vrishya* (aphrodisiac), and *rasayana* (rejuvenating)

Rasayana drugs which possess *madhura rasa, guru, snigdha guna, sheeta veerya, madhura vipaka* may act on *rasa dhatu* by improving nutritional state or *poshaka rasa*.(15) Thereby, SMK helps to sustain the finest qualities of *dhatu*s of the body. The essence of all *dhatu*s named as *ojas*; (16) which is very essential for maintaining *vyadhikshamatva* or immunity. Similarly,

better qualities of *dhatu* provide *shareera bala*; which over again, leads to enhance immunity.(17)

SMK is comprised of fruits mostly. Thus, it enriched with vitamin C and micro-nutrients. Vitamin C is a direct-acting antioxidant. It interferes the propagation stage directly and scavenges free radicals to fight against the disease process.(18) Scientific evidence proves that the granule form of SMK has generated a high concentration of ROS (Reactive Oxygen Species) and a high percentage of DPHH scavenging activity.(19) An in-vivo study revealed that potent anti-anxiety activity apart from the anti-fatigue activity on the administration of SMK granules for 14 days.(19) Further, reduction of blood Urea Nitrogen, Lactic acid and Creatinine Kinase also established. By this means, administration of SMK has increased overall exercise capacity (*vyayama shakti*) of the animal models. (20)

Further, scientific evidence regarding the immuno-modulation has tabulated in table 2. effectiveness of SMK ingredients in

Table 2 – Reported pharmacological activities of SMK ingredients

	Ingredient	Proved pharmacological actions related to immuno-modulation
1	<i>Vitis vinifera L.</i>	Alteration immune and vascular function in mice with liver abnormalities Attenuate oxidative stress Angiogenesis High antioxidant activity (25)
2	<i>Phoenix dactylifera L.</i>	Phagocytic activity Antioxidant activity Stimulate cellular immunity system(26)
3	<i>Buchanania lanzan Spreng.</i>	Enhanced cell mediated and humeral immunity(27)
4	<i>Ziziphus jujuba (L)H. Karst.</i>	Neuroprotective activities Immuno-modulation action Hematopoietic function(28)
5	<i>Punica granatum L.</i>	Immune stimulatory action Supplementation as food formula boosted immune system(29)
6	<i>Ficus carica L.</i>	Scavenging abilities on DPHH Immunity activities(30)
7	<i>Grewia asiatica L.</i>	Increased phagocytic index and carbon clearance assay Immuno-stimulatory activity(31)
8	<i>Saccharum officinarum L.</i>	Immunotherapeutic effect Antioxidant activity

		Anti-malarial activity Anti-inflammatory activity(32)
9	<i>Hordeum vulgare L.</i>	Immunomodulatory action(33)
10	<i>Oryza sativa L.</i>	Immunomodulatory effect Increased cytotoxicity of splenic natural killer cells, Phagocytosis(34)

According to the data, most of the ingredients have capabilities to stimulate cellular as well as humoral immunity. Not only that, ingredients like *Vitis vinifera L* and *Ziziphus jujuba (L)H. Karst.* are providing protective roles on specific organs. Hence, the pharmacological potentials of these ingredients on immunity are remarkable.

2. Application of SMK ingredients as food supplements for immuno-modulation- Ayurveda perspective

Acarya Charaka has explained a unique collection of 500 decoctives in *Shadvirecana shata ashrite eya adhyaya*. Yet, he opines further as the descriptions of these decoctives are neither too exhaustive nor too brief. It gives a glimpse for the own imagination of high intelligence physicians based on *dravya swalakshana* (properties), *anumana* (inference) and *yukti* (logical analysis). (14) Hence, this study attempt to

enlighten the field of immuno-modulation through the SMK based on this statement.

1. *Dravya swalakshana* – Properties of the drugs

Conceptual aspect of Ayurveda elaborates that decrease entity can be enhanced by similar entities. In the same way, similar attributes of a *dravya* cause to increase *dravya* which has similar attributes: named as *guna samanya*. (21) Hence, SMK increases *ojas* and *praakruta kapha dosha* (*acarya Sushruta* synonymously used *ojas* and *kapha dosha* due to their similar properties). (22) Moreover, this relative improvement of *ojas* is being described by *acarya Chakrapani*. (23)

2. *Anumana* – Inference

Strong scientific evidence of SMK has shown its positive nutritional values, antioxidant capacity, anti-fatigue activity, exercise capacity and anti-anxiety activity.

Due to the relations of this evidence with immunity and related textual references as shown in table 3 and 4, SMK can delivers a

potent immunomodulatory action as shown in the table 3.

Table 3 – Shrama as an etiological factor (as hetu)

	<i>As an etiological factor</i>	<i>Reference</i>
1	<i>Pittaja Fever</i>	<i>Su.U.39/80</i> <i>C.Ni.1/22</i>
2	<i>Pittaja prameha (metabolic disorder due to vitiated pitta dosha)</i>	<i>Ca.Ni.4/ 24</i>
3	skin disorders	<i>Ca.Ni.5/6</i>
4	cause of discharge of pseudo pregnancy	<i>Ca.Sa.2/9</i>
5	male infertility	<i>Ca.Ci.30/161</i>
6	<i>bhagandara (ano-rectal fistula)</i>	<i>Su.Ni 4/9</i>
7	<i>Palitya roga (alopecia)</i>	<i>A.Hr.U.23/29</i> <i>Su.Ni.13/37</i>
8	<i>shrama causes thirst</i>	<i>Su.U.48/4</i>
9	<i>suppression of natural urge of shrama may leads to gulma, hridaroga and moaha</i>	<i>A.Hr. Su.4/15</i>
10	<i>aetiological factor of pandu (anaemia), sophia (generalized edema) and visarpa roga (blisters)</i>	<i>A.Hr. Ni.13/26</i>

Table 4- Shrama as lakshana (as a symptom or sign of a disease)

	<i>As a symptom or sign of a disease</i>	<i>Reference</i>
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1	suppression of thirst	<i>Ca.Su.7/21</i>
2	excessive exercise	<i>Ca.Su.7/33</i>
3	<i>Shrama</i> is an indicative factor for purification therapy	<i>Ca.Su.15/14</i>
4	<i>Asthidhatu kshaya</i> (disorders of musculoskeletal system)	<i>Ca.Su.17/67</i>
5	<i>Shukradhatu kshaya</i> (disorders of testosterone synthesis)	<i>Ca.Su.17/69</i>
6	Symptom of fever due to vitiation of <i>vata dosha</i>	<i>Ca.Ni.1/21</i>
7	prodromal and general symptom of fever	<i>Ca.Ni.1/33</i> <i>Ca.Ni.1/35</i>
8	symptom of skin disorders, <i>pandu</i> (malnutrition disorder), <i>madatyā</i> (alcoholism)	<i>Ca.Ci.7/12</i> <i>Ca.Ci.16/12</i> <i>Ca.Ci.24/102</i> <i>A.Hr. Ni.14/11</i>
9	as sign a of <i>bala vibramsha</i>	<i>Su.su.15/25</i>
9	common feature of <i>sthaulya</i> (obesity)	<i>A.Hr. Su.11/10</i>
10	<i>rasa dhatu kshaya</i> (depletion of <i>rasa dhatu</i>)	<i>A.Hr. Su. 11/17</i>
11	<i>Mamsa medhogata vata</i>	<i>A.Hr.Ni.15/11</i>
12	<i>Ojovisransa</i> (a condition of immune deficiency)	<i>Su.Su.15/25</i>

3. *Yukti* – Logical basis

Shrama occurs as a clinical feature in *dhatu kshaya* stages (table 4) *Shrama* can be manifested in the stages of *bala vibhramsha* (loss of strength), *ojovisransa* (table 4), and in numerous types of *vata* vitiated diseases. *Shrama* can be found as a symptom and as an etiological factor of various types of *vatadosha* predominant diseases. The two main causes for the vitiation of *vata dosha* are *srotus avarodha* (blockage of channels) and *dhatu kshaya* (tissue depletion).(24) Which is furnished further by the references shown in the table 3 and 4, as *shrama* is a clinical feature of *rasa*, *asthi* and *shukra dhatu kshaya*. These types of tissue depletions lead to exhaustion (*bala vibramsa*) and depletion of immunity or *ojas* as in Ayurveda. Hence, execute *shramaharacikitsa* found to be truthful in *ojah kshaya* thereby in *vyadhi kshamatva*. It confirmed further, by the study which administered SMK granules for 02 weeks; as it increased *shareerabala* and *manasikabala* in animal models.(20)

DISCUSSION

Shrama is a multidimensional concept. It occurs in the stage of *bala vibramsa*, *ojovisransa* or in immune deficiency. On the

other hand, food plays an important role in immuno-modulation. According to Ayurveda, food increases *ojas* directly, which is responsible for immunity and as well as constitutional strength of the body. SMK is a unique collection of food articles. Hence, it enters the nutritional pathways of the body, similarly as the rejuvenating drugs.

Alternatively, *shrama* is a main feature and a causative factor of depleting diseases of the body. Alleviating the cause of a disease is the foremost part of the *cikitsa* (Disease management). Hence, these drugs are beneficial for modifying immunity by relieving fatigue. Well supported medical evidence also shows this unprecedented opportunity of SMK in immuno-modulation. Thus, it is time worth suggested supplementation for enhancing host defense system of the body as it has ability to function on both *shareera* and *manasikabala*.

Hence, *acarya Charaka* mentioned that the person who wishes to get *moksha* (Eventual destination), he should build the capacity to tolerate *shrama*.(35) This indirect implication regarding the concept of *shrama*, shows the mask facet of SMK in immuno-modulation.

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