



Review Article

RASAYANA WITH SPECIAL REFERENCE TO NUTRACEUTICALS: A COMPARATIVE STUDYSikha lekharu^{1*}, Khagen Basumatary²¹P. G. Scholar, ²Professor and HOD, Dept. of Samhita & Siddhanta, Govt Ayurvedic College, Guwahati, Assam, India.**KEYWORDS:** Ayurveda, *Rasayana*, Nutraceuticals.**ABSTRACT**

Concept of promoting health and preventing diseases through nutrition and special nutritional preparations has been used for millennia in Ayurveda. The concept of promotion of health through *Rasayanas* is based on Ayurveda pathophysiology and its understanding of health and physiological system imbalances that lead to disease development. The word *Rasayana* is composed of 2 words 'Ras' + 'Ayan'. The means by which one gets the excellence of *Rasa* (The nourishing fluid which is produced immediately after digestion) is *Rasayana*. These *Rasa* nourishes our body & stimulates the immunity of the body & keeps us healthy. The term *Rasayana* connotes a specific meaning 'Drugs, diet + regimens' which promote longevity by delaying aging & preventing diseases are called *Rasayana*. Impairment of circulation of this body fluids results in disease and decay. This ancient understanding is being re-introduced as "Nutraceuticals". The word is a portmanteau of nutrition and pharmaceutical and refers to the extracts of foods claimed to have a medicinal effects on human health (Defelice 2002). In order to bring a parlance among the two concepts and better understanding of the Ayurvedic concept, an comparative analysis of both the concepts has been done.

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Email: shikhalekharu@gmail.com**INTRODUCTION**

Ayurveda is a great tradition with sound philosophical, experiential and experimental basis. Increased side effects, lack of curative treatment for several chronic diseases, high cost of new drugs, microbial resistance and emerging diseases are some reasons for renewed public interest in alternative medicine. It has been postulated that by 2020 at least two thirds of the United States population will be using one or more of alternative therapeutic approach. However the progress and phenomenal success in the past 150 years or so in the field of medicine, based on a Cartesian/Newtonian biomedical model in terms of communicable diseases, emergency medicine and technology driven surgical and other procedure, has practically obliterated the importance of food and lifestyle on one's health. Our fast paced, stressful lives, processed convenience foods and over-reliance on drugs and the high tech procedure driven medical system of disease care are simply unable to deal with the chronic disease crisis and ever increasing healthcare costs (Patel 1998).

The comprehensive/integrative spirit mind body environment concepts of the Ayurvedic model (Singh, 2001, 2005) have been reappearing in many healthcare approaches to the chronic disease crisis the world is experiencing. For instance, in the United States, the emerging integrative model called 'functional medicine' is based on physiological system imbalances

rather than disease categories, drawing heavily from the concepts of the Ayurvedic healthcare model emphasizing *Dosha* (governing psycho-physiological biogenetic principles of intelligence) imbalances, diet and personal habits.

The United nation's WHO recognizing the inability of the dominant allopathic medical model to deal with ever increasing healthcare costs and epidemics of many chronic diseases. In its search for affordable and sustainable health care for the nations of the world, the WHO defines health as follows The world's wisdom on health is captured by the above prophetic pronouncement from the father of Western Medicine, Hippocrates, i.e. *food be thy medicine and medicine be thy food*. This statement on food reflects, the critical importance of food and lifestyle on one's health. The quotation, "*swatsthasya urjaskaram kinchit kinchitartasya roganut*" extending the concept, has been the basis of health promotion and disease prevention in the oldest and longest continuously practiced medical system in the world, known as Ayurveda (meaning Science of life).

This ancient understanding is being re-introduced as "Nutraceuticals" by present day healthcare provider. They recognize the fact that our heavily processed food supply, coming from crops grown with chemical fertilizers, pesticides, herbicides and often

genetically modified seeds, lacks sufficient nutrients necessary for optimum health.

The term Nutraceuticals was coined by Stephen Defelice, in 1989. The word is a portmanteau of nutrition and pharmaceutical and refers to the extracts of foods claimed to have a medicinal effects on human health (Defelice 2002). Nutraceuticals are usually contained in a medicinal format such as a capsule, tablet, powder or liquid in a prescribed dose. The term further implies that the extract or source food is demonstrated to have a physiological benefit or provide protection against a chronic diseases.

Since the passage of the US dietary supplement Health and education Act of 1994, there has been an explosion of various kinds of Nutraceuticals in terms of both food supplement and functional foods. Nutraceuticals are a multibillion dollar industry, rivaling the pharmaceutical industry many new entrepreneurs and pharmaceutical companies filed with the intention of improving their bottom line. This enthusiasm is based on epidemiological studies of the prevalence of chronic diseases in different parts of the world and of the beneficial health effects of whole foods, fruits and vegetables and probable active ingredients of these food studies and their predicted influence on biochemical pathways.

This concept of promoting health and preventing diseases through nutrition and special nutritional preparations has been used for millennia in Ayurveda. The concept is known as *Rasayana* or rejuvenation therapy and it is part of one of the eight specialties of Ayurveda. The Sanskrit roots of *Rasayana* (Rasa+Ayana) essentially refer to acquisition, movement or circulation of nutrition needed to provide nourishment to the organs, tissues and tissue perfusion.

The concept of promotion of health through *Rasayanas* is based on Ayurveda pathophysiology and its understanding of health and physiological system imbalances that lead to disease development. The word *Rasayana* is composed of 2 words 'Ras' + 'Ayan'. The means by which one gets the excellence of Rasa (The nourishing fluid which is produced immediately after digestion) is *Rasayana*. These Rasa nourishes our body & stimulates the immunity of the body & keeps us healthy. The term *Rasayana* connotes a specific meaning 'Drugs, diet + regimens' which promote longevity by delaying aging & preventing diseases are called *Rasayana*. Impairment of circulation of this body fluids results in disease and decay. This body fluid of good quality should not be present in adequate quantity but also it should be able to permeate (circulate) throughout the various cells of the body to provide the type of nourishment they need. *Rasayana* is a specialized type of treatment influencing the fundamental aspect of body viz.- *Dhatus*, *Agni*, *Srotamsi* & *Ojas*. The aim of *Rasayana chikitsa* boosts the *Ojas* (vital force of life) and immune system. It helps a person to maintain good health or to establish impaired or lost physical or mental health. *Ojaswi* is used to describe those people who keep good health in all seasons & all stages of life. It is like obtaining high rank in

a physical or mental fitness. *Ojas* give a bright look, sharp memory, high performance and every expected pleasure. *Rasayana chikitsa* is supposed to nourish blood, lymph, flesh, adipose tissue and semen and thus prevent freedom from chronic degenerative disorders like Arthritis + disease of senility. *Rasayana* is to improve metabolic processes which results in best possible biotransformation and produce the best quality bodily tissue and delay senility and prevent other diseases of old age. *Rasayana* which has a marked action on sexual organs are called *Vrishya* as *Shukra dhatu* is best nourished by it, *Rasayana* builds natural resistance against infection. *Rasayana* drug invigorate the body in general by sustaining the required balance between anabolism & catabolism. *Rasayana* drugs which may act as antioxidants as well as Immunomodulator may also act as anti-aging.

Rasayana and nutraceuticals, thus both as help in treating and preventing diseases, which can be understood by the *Sloka*, as mentioned by Charak in *Chikitsa sthana*. Examples of *Agastya Haritaki*, *Yograj churna*, *Sarpi guda* are given by Chakrapani which are useful for both the purposes. So, in order to bring a relation, a hypothesis has been created, that *Rasayana* helps in disease prevention and treatment by the *Prabhava* of *Rasayana* has been believed to be by increasing.

- Longevity
- Immunity
- Vitality
- Strength
- Vigour
- Anabolic effects
- Improved luster
- Mental competence
- Antioxidant effects
- Antiaging effects.

And it can be possible if the *Oja*, *Bala*, *Vyadhikshamatva* are in proper functioning, without formation of *Ama* and by following *Achara Rasayana*, as the basic physiology of *Rasayana* is believed to be

Ahara→Agni →Ahara rasa →Sapta dhatu formation → Ojhas.

Thus, corresponding to the mode of action of nutraceuticals which is basically by antioxidants and immunomodulators and the topic entitled "A comparative analysis of *Rasayana* and nutraceuticals have been done"

Material and methods

Detailed review of material available in texts of Ayurveda as well as modern literature was carried out to know the concept of *Rasayana* and nutraceuticals. Ayurvedic textual materials were referred mainly with available commentaries of the *Samhitas* for the study. Some modern books references have been collected and studied systemically.

AIMS AND OBJECTIVES

- 1) Understanding the concept of *Rasayana* in the line of prevention and treatment of diseases.
- 2) Understanding the concept of nutraceuticals in the line of prevention and treatment of diseases.
- 3) Comparative analysis of *Rasayana* and Nutraceuticals.

DISCUSSION

Rasayana therapy is as old as the Vedas because many references on RT are available in the *Atharva veda*. Extensive description of divine *Rasayana* agents like soma are available in classics. This is a procedure which is used for healthy person and through different types, it helps in building of a body which is strong and disease free. The body doesn't succumb to any external cause and where no change in the *Doshas* occur.

The main aim of Ayurveda notably begins with discourse on *Rasayana* for emphasizing the primary need of promotion of human health and prevention from ailments, before dealing with clinical management of disease. The means by which one gets the excellence of *Rasa dhatu* (the nourishing fluid) which is produced immediately after the digestion) and other seven *Dhatu*s is known as *Rasayana* or a rejuvenator.

Apart from the excellence of *Rasa*, the individual is endowed with psychic excellence, like sharp memory by virtue of rejuvenation therapy.

Rasayana tantra is the branch which deals with delaying of ageing process, increasing of intellect and strength, prolongation of life and curing of disorders. The word *Rasayana* means according to Sushruta.

- *Vayasthapanam*
- *Ayurvedhabala karam*

➤ *Roga apaharanam*

Acharya Arundatta commentary on A.H.U.39/2, states that *Rasayana* is one by which *Rasa*, *Raktadi dhatu*s get benefitted through proper nourishment.

So, *Rasayana* is the one-

- Which wards off *Jara* as well as *Vyadhi*. The one which cures *Jara* and *Vyadhi*, stabilizes youthfulness, increases acuity of *Chakshu* etc. *Indriyas* and nourishes the whole body is known as *Rasayana*.
- *Gangadhara* while commenting on Ch.Su. 30/15 says that *Rasayana* is one which causes continuous nourishment to *rasa* etc. *Dhatu*s, thereby replenishing them.
- According to Harita Samhita Pratham khanda 2/22, *Rasayana* is that process by which there will be stability of body, all type of sensory and motor organs and no greying of hairs, wrinkling and baldness.
- Dalhana commenting on Su.Chi. 27/1-2 says that
 1. *Vardha*: means which increases
 2. *Sthapaka*: means which stabilizes and
 3. *Apraptaprapaka*: Means which give additional endowments

So, here *Vardhaka* is nothing but *Ayurvedhaka* i.e. prolongation of life span. *Sthapaka* stabilizes the youth of an individual by improving health status and increasing body immunity against ailments. *Apraptaprapaka* means fulfilling the nourishment needed thereby increasing body tissue elements resulting in increased immunity and person will be endowed with additional features. All these 3 here serves the purpose of *Swasthyarakshana*.

Following table shows the comparison of the effect of *Rasayana* given in the *Brihatrayee*

Effect of <i>Rasayana</i>	Acharya Charaka	Acharya Sushruta	Astanga Hridaya
Arogya	+	-	+
Deerghaayu	+	+	+
Tarunyavaya	+	+	+
Smriti	+	-	+
Medha	+	-	+
Prabha	+	-	+
Varna	+	-	+
Swara	+	-	+
Dehabala	+	+	+
Indriyabala	+	-	+
Vaksiddhi	+	-	+
Pranati	+	-	+
Kanti	+	+	+
Virya	-	+	-
Odarya	-	+	-
Vrishyula	-	-	+

Nutraceuticals

Nutraceuticals is a broad umbrella term that is used to describe any product derived from food sources with extra health benefits in addition to the basic Nutritional value found foods. The word Nutraceutical was first coined by Dr. Stephen Defelice (2007) who defined it as a substance that is a food or a part of food

and provides medical and health benefits, including prevention and treatment of diseases. He tried to indicate a synergy between nutrients & pharmaceuticals. Nutritional studies are now focusing on the examination of foods for their protective and disease preventing potential (Nicole et.al. 1999), instead of negative

attribute such as micro organisms count, adulterants fatty acid and inorganic pollutant concentration (kaur & Kapoor 2001).

Some of the most common ways of classifying Nutraceuticals can be based on food sources, mechanism of action, chemical nature etc.

Dietary fibres	Mostly cellulose, hemicellulose, gums Foods rich are fruits, oats, barley and beans
Probiotics	Used in lactose intolerance, acute diarrhea and antibiotic induced GI disorders
Prebiotics	Anti tumour properties Stimulation of intestinal immune system Reduction of constipation.
Selenium	Helps in production of glutathione peroxidase, protects cells against ROS and RNS.
Antioxidant vitamins (Vit C, E, carotenoids)	Helps in prevention of oxidative reactions leading to several degenerative diseases.
Polyphenols (flavonoids)	Antioxidant, anti-inflammatory, cardioprotective properties and in prevention of neurodegenerative disorders and Diabetes mellitus.
Spices	Antioxidative, anti-inflammatory, immuno modulation on cells.

Nutraceuticals in the treatment of various diseases

Nutraceuticals	Disease conditions
Antioxidants	Parkinson’s disease, Alzheimer’s disease Huntington’s disease (chintalal et.al. 2013)
Phosphatidylserine	Mental health and age related mental disorders (Hager et.al. 2001)
Conjugated linolenic acid, capsaicin, <i>momordica charana</i> and psyllium ber	Treats obesity (Kasbia 2005)
Glucosamine and chondroitin	Helps in repairing and formation of cartilage and hence treats osteoarthritis conditions (Jonathan clue, 2010)
Black and Green tea, soy and fish oil	Heart disease like chronic heart disease (Lockwood Brain 2007)
a) Docosahexaenoic acid b) Lipoic acid	a) In neurovisual development and Gestational diabetes (Thomas et.al.2006) b) Treatment and prophylaxis of diabetic neuropathy and other complications (coleman et.al. 2001)
Blueberry, green tea, catechin, carnosine and vitamin D	Proliferation of human haematopoietic progenitor cells and hence in stem cell therapy (Bickford et.al. 2006)
Carotenoids, Flavonoids and silymarin	Induces apoptosis and prevents cancerous conditions (Alejandro & Kuang, 2004)
Tea, soy, isoflavones, glucosamine, melatonin etc.	Helps in improvement of skin conditions (Lockwood Brain 2007)

NICHE AREAS FOR NUTRACEUTICALS

- People believing more in prevention than a cure: This comprises a large part of the population who is worried about their health. This is a learned group that understands that, because of their genetic system, they can expect some hereditary disease. They want to avoid these diseases or at least lessen the severity of these diseases, such as diabetes, hypertension, and arthritis. Unfortunately, the allopathic medicines have always concentrated on curing the diseases, and there are no specific drugs available for the prevention of such disease, mostly caused by one’s lifestyle and genetic history.
- People who have chronic disease and have found no solution in allopathic medicines: This is another group in which nutraceuticals products find their usefulness
- Pediatric and geriatric patients: this is another group that finds nutraceuticals beneficial.
- Economically challenged patients: Nutraceuticals, if made available at cheaper or reasonable prices, will create a large clientele.

Conceptual understanding of the two concepts

The extent of research done on the subject nutraceuticals with wide acceptance of its role either by their immunity boosting property or by their antioxidant properties of most of the drugs either herbs or minerals or combination of both, which thereby helps in maintaining a healthy body and curing diseases as most of chronic diseases are because of the oxidative stress.

Relation between Rasayana and nutraceuticals:

Rasayana have their origin in plants and minerals and have played important roles in health promotion and maintenance in Ayurveda. Traditionally *Rasayana* drugs are used against a plethora of seemingly disease disorders with no pathophysiological connection according to modern medicine. *Rasayana* therapy is a boon to mankind. Different *Rasayana* has been explained in the classics which are helpful not only to preserve the health but also to get rid of diseases.

Charaka has said that - a *Bhesaja (ausadh)* is of 2 types - One which helps in the development or increasing of the *Bala (urja)* of a person and secondly the ones which are helpful in the treatment of the disease.

Now the one i.e. which helps in the development or increase of the *Bala (urja)* are the ones, which helps in the non-occurrence of a disease i.e. it works as a preventor of disease-Prevention aspect and second one which helps in the removal of the disease works in the treatment Curative aspect.

Charaka further says that, in *Charak chikitsasthana Rasayana* 1st pada, 5-6 sloka the medicines which are meant for increasing Urja are both *Rasayana* and *Vajikarana*.

The second category i.e. *Artasya rognut* are useful for treatment of the disease.

Both categories of medicine however are useful both the purpose.

Chakrapani has classified that *Rasayana* drugs can useful for both preventive as well as therapeutic aspect. The word *prayah* denotes extensiveness (*Bahulata*).

The word *Prayah* indicate that according to Chakrapani that for a healthy person the *Urjashara Ausadha* acts both as a *Sukravardhaha* and as a *Rasayana*. Further it also indicates that as the word *Prayah* is

We can thus, understand that *Rasayana* are those drugs or substances which not only helps in treating a disease, but can also be helpful in preventing a disease. And on this basis they can be compared with the term Nutraceuticals.

related it means that those medicine, which act as a *Rasayana* for a healthy person, acts in both treatment of a disease as well as in prevention of a disease.

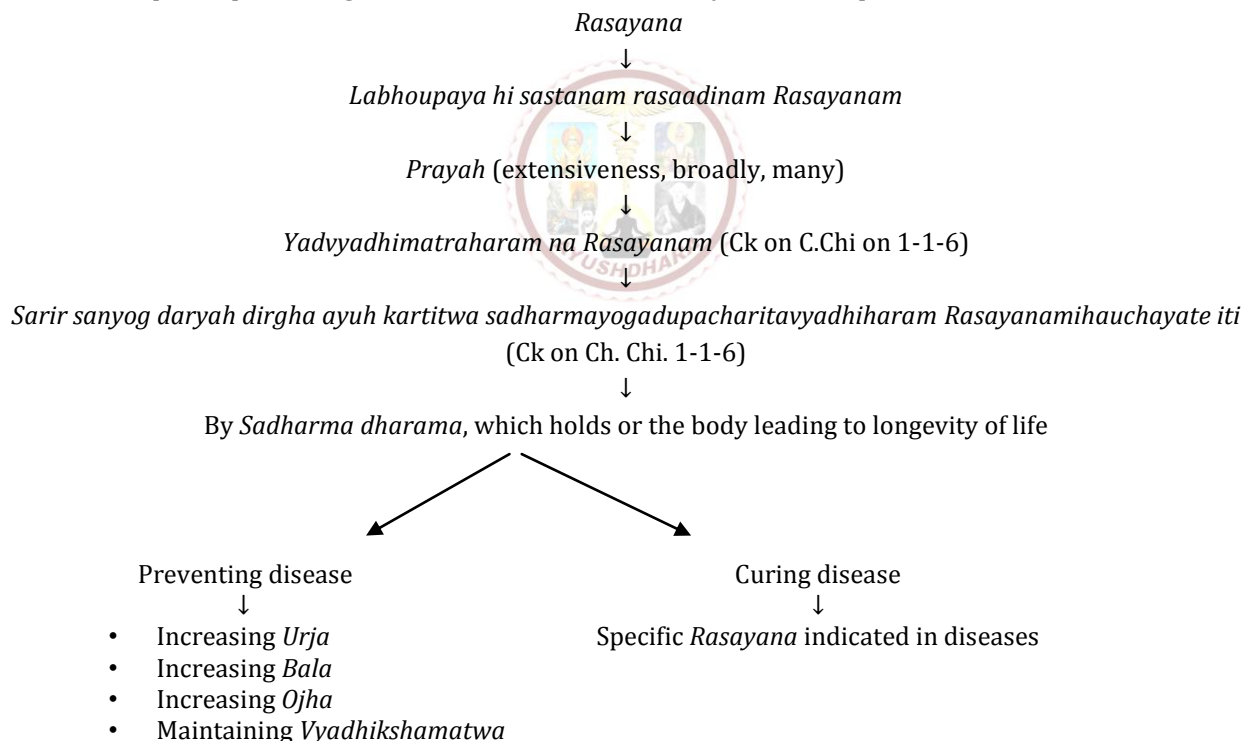
The second part of the *Sloka* i.e. chi. 1/1-4, that is these category which are useful for treatment of a disease,- helps in treating *Jwara* etc. and also act as a *Rasayana*.

For example,

- a) *Sarpiguda*- Useful in treating *Kshtashina*.
- b) *Yograj churna* - In *Pandu roga* is in the form of a *Rasayana*.
- c) *Agastya Haritaki*- useful in treating *Kasa* used as a *Rayasana*

Some, authors say that-

- a) Those medicine which cures only disease are not *Rasayana*.
- b) They are *Rasayana*, only because they helps in complaining with the body with *Drihata* for longevity, on the basis of its *Sadharana dharm*, is thus curing the disease- they act as *Rasayana*.



As we have already done the literary research a similarity is tried to be established between

Rasayana ↔ Nutraceuticals

- 1) On the mode of action
- 2) *Rasayana* drugs as antioxidants
- 3) Role of *Rasayana* as immunomodulators

Thus,

1) ON THE MODE OF ACTION

Nutraceuticals as a whole do not have a particular mode of action. But as per the researches going on and looking into its vast area of action, the mode of action of nutraceuticals can be understood broadly. Nutraceuticals covers most of the therapeutics area such as anti-arthritis, cold and cough sleeping disorders, digestion and prevention of certain cancers.

Showing are major nutraceuticals with its therapeutic areas (mode of action)

Antioxidants	Functions Attributed to Antioxidant Capacity
Vitamin A	Protects cellular membrane, prevents glutathione depletion, maintains free radical detoxifying enzymes systems, reduces inflammation
Vitamin E	Protects cellular membranes, prevents glutathione depletion
Vitamin C	Protects DNA, RNA, proteins and lipids, aids in regenerating Vitamin E
Carotenoids	Free radical scavengers
Lipoic acid	Free radical scavenger, aids in regeneration of Vitamin C and E
Phenolic acids	Free radical scavengers, protect cellular membranes
Selenium	Cofactor of free radical detoxifying enzymes, maintains glutathione levels, aids in regeneration of vitamin C

Likewise for *Rasayana* which is similar to the nutraceuticals do not have any particular mode of action, but among the many hypothesis it has formulated that the *Rasayanas* act via.

- ❖ *Agni*
- ❖ *Rasa*
- ❖ *Srota*

Apart from these if we do a through understanding of how the different drugs act basically it can be divided into two classes-

- a) Physical and
- b) Pshychological via the PNI axis

1) Physical Ayurveda emphasizes *Prakriti* or body constitution. In Ayurveda, different food are said for people belonging to different phenotypes (*Vatik, Paittik, Kaphaja* form seven type of *Prakriti*). This is essential for human health for promoting health and curing disease.

Food prescribed for people of different *Prakriti*

	<i>Vata</i>	<i>Pitta</i>	<i>Kapha</i>
Rasa	Sweet sour salty	Sweet bitter astringent	Sweet sour salty
Cereals	Rice, wheat, oats, ragi	Rice wheat oat barley	Rice corn oats barley
Pulses	Green gram soyabean	Green gram, black gram	Red kidney beans, Horse gram
Vegetables	Carrot beetroot radish	Cabbage cauliflower broccoli cucumber	Leafy greens bitter gourd, brinjal, lady's finger
Fruits	Banana berries, grapes mango, papaya	Apple avocado guava pomegrante	Apple pear cherries fig peaches
Spices	Coriander fenugreek turmeric mustard	Cardamon, Cinnamon, fresh ginger	Black pepper, Chilly, cumin

2) **Pshychological:** *Medha* means intellect and/or retention and *Rasayana* means therapeutic procedure or preparation that on regular practice will boost nourishment, health, memory, intellect, immunity and hence longevity. *Medhya Rasayana* is a group of 4 medicinal plants that can be used singly or in combinations. They are.

- ❖ *Mandukaparni* (*Centella asiatica* Linn.),
- ❖ *Yastimadhu* (*Glycirrhzia glabra* Linn.),
- ❖ *Guduchi* (*Tinospora cordifolia* (Wild) Miers)

and *Shankhapushpi* (*Convolvulus pleuricaulis* Chois)

Yet in practice few more are mentioned elsewhere in the Ayurveda classical textbooks. They are

- ❖ *Aindri* (*Bacopa monniera*)
- ❖ *Jyotishmati* (*Celastrus panniculata*)
- ❖ *Kushmanda* (*Benincasa hispida*)
- ❖ *Vacha* (*Acorus calamus*)
- ❖ *Jatamamsi* (*Nardostachys jatamamsi*)

Recent Advancements In The Field Of Research Shows

Plant	Active ingredient	Action
<i>Mandukaparni</i>	➤ Saponin ➤ Polyphenols and flavonoids	➤ Neuroprotectives, brain growth promoter. ➤ Potent anti oxidant and terminate free radicals.
<i>Yastimadhu</i>	➤ glycyrrhizine, flavonones	➤ Improves antihypoxic effects. ➤ Efficient brain tonic.
<i>Guduchi</i>	➤ Alkaloids glycosides, sterols	➤ Cognitive enhancement ➤ possess learning and memory enhancing
<i>Shankhapushpi</i>	➤ microphylllic acid	➤ Neuroprotective and intellect promoting activity
<i>Aindri (brahmi)</i>	➤ Bacosides	Nootropic
<i>Jatamamsi</i>	➤ terpenoid ester, nardostachysin	hysteria, epilepsy, and convulsions
<i>Kushmunda</i>	flavonoids, saponins and steroids	preventive effect on colchicine induced Alzheimer's disease
<i>Jyotishmati</i>	Terpenoids	Nootropic
<i>Vacha</i>	Alkaloids	Anticonvulsant, Sedative

Based on the classical reference the mode of action of *Rasayana* can be on the basis of prevention and treatment of diseases.

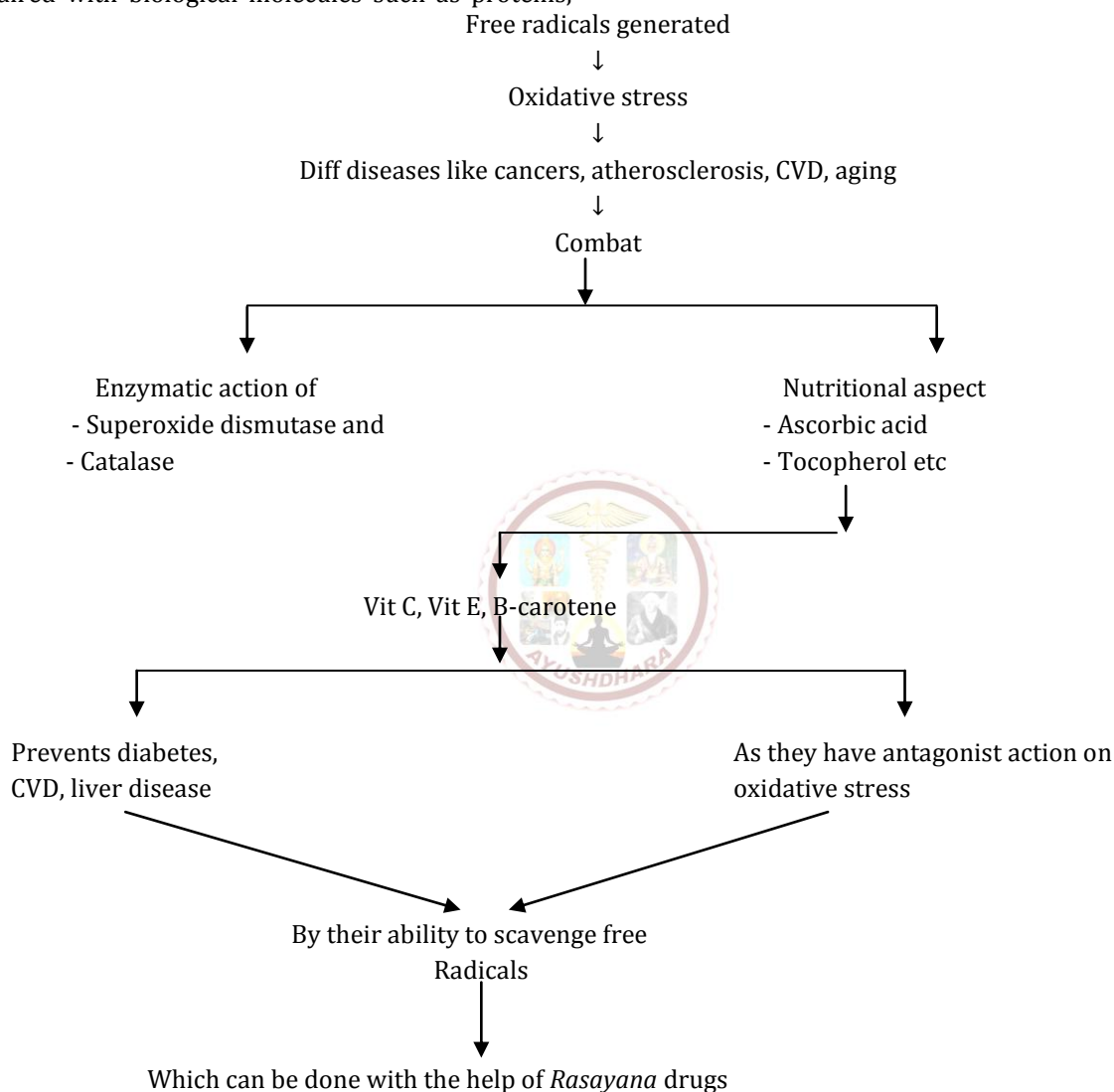
- a) *Naimitika Rasayana (Vyadhi nimitta)* – treatment based
- b) *Ajasrika Rasayana* – preventive based.
- c) *Kamyra Rasayana* – both

2) Rasayana Drugs as Antioxidants

Free radicals generated in body due to the various biochemical procedures and these free radicals may paired with biological molecules such as proteins,

lipids and nucleic acid which damage paired macromolecules and leads various diseases associated with oxidative stress such as; cancers, atherosclerosis, inflammatory diseases, cardiovascular diseases and aging.

Antioxidants are substances which reduce this type of oxidative damage, vitamin such as; vitamin C, Vitamin E and beta carotene act as antioxidants. These antioxidants prevent diabetes mellitus, heart disease, liver disease, auto-immune disorders and cancer.



The following chart shows how free radicals can be treated by Rasayana drugs

Now, the *Rasayana* drugs also offer other benefits to *Rasadi Dhatus*. Ayurveda described various plants as *Rasayanas* such as; *Amlaki*, *Ashwagandha*, *Yashtimadhu* and *Guduchi*. These drugs enhances nutritional intake and qualities of *Dhatus* which leads longevity, improve strength and *Ojabala*. The *Rasayana* drugs offer relief in stress, fatigue, early symptoms of

ageing and auto immune diseases. The antioxidant potential of *Rasayana* drugs possess benefits like; *Vayasthapana* (delaying ageing), *Balakara* (strengthen the body) and *Roga-apaharana* (improve immunity). Some of the important *Rasayana* drugs are reviewed in detail for their antioxidant property.

<i>Guduchi</i>	It contains alkaloid and polyphenols which offer antioxidant Potential. Zinc and copper which protect cells from oxidative damage due to their antioxidants potential.
<i>Ashwagandha</i>	<i>Ashwagandha</i> believed to maintain oxidation process by pacifying <i>Tridoshaic</i> balance. The <i>Ashwagandha</i> help to prevent premature aging due to their strong antioxidant potential.

<i>Yastiamdhu</i>	Contains phenolic compounds, flavonones and iso-flavones. <i>Yashtimadhu</i> offer cytotoxic activity and may be indicated for tumor. Free radical scavenging and antioxidant capacity of <i>Yashtimadhu</i> towards LDL oxidation established by various researchers
<i>Amla</i>	Vitamin C which offer prominent antioxidant potential
<i>Vacha</i>	The ethyl acetate extract of <i>Acorus calamus</i> was found to be potent antioxidant by inhibition of 1,1- diphenyl-2-picrylhydrazyl (DPPH).
<i>Shatavari</i>	Antioxidant compound racemofuran moderate antidiabetic activity, but it exhibits potent antioxidant potential in diabetic conditions (Govindarajan et al)

Thus,

- Antioxidants play significant role towards the delaying aging, prevention of disease and decreases risk of cancer.
- Ayurveda described various *Rasayana* drugs such as; *Amla*, *Ashwagandha* and *Guduchi*, etc. which offers prompt antioxidant potentials.
- antioxidant activity of these *Rasayana* drugs are due to the presence of constituents such as; vitamin C, carotene, riboflavin, with anolide, tanins, gallic acid and polyphenols.
- It is believed that *Rasayana* drugs increases collagen fibrin synthesis, absorption of iron and levels of natural antioxidants; dismutase,
- Catalase, Glutathione peroxidase therefore reduces risk of oxidative stress

3) RASAYANA DRUGS AS IMMUNOMODULATORS

The concept in modern scientific understanding would mean enhancement of immune responsiveness of an organism against a pathogen by nonspecifically activating the immune system using immunomodulatory

agents of plant origin. Immunomodulators are considered now as one of the most potent tools in the management of health and diseases by modern medicine. immune system is changing at a rapid pace. The more recent understanding of neuro – endocrine – immune axis or the influence of exercise, circadian rhythms, seasonal variations, different psychological states on immune system are unfolding many such issues which are bringing the modern concept closer to Ayurvedic principles of *Vyadhi-ksamatva*, *Ojas* and *Bala*. In fact, one of the therapeutic strategies in Ayurvedic medicines is to enhance the body's overall natural resistance to the disease causing agent rather than directly neutralizing the agent itself. In Ayurvedic practice, the objective of immune enhancement is achieved through the use of the *Rasayana* and *Vajikarana* therapy, following *Acar Rasayana* measures and also by use of *Ojovardhaka* remedies. *Vyadhi-ksamatwa*, as it is understood in Ayurveda has much wider implications than the term "Immunity" used in modern medicine.

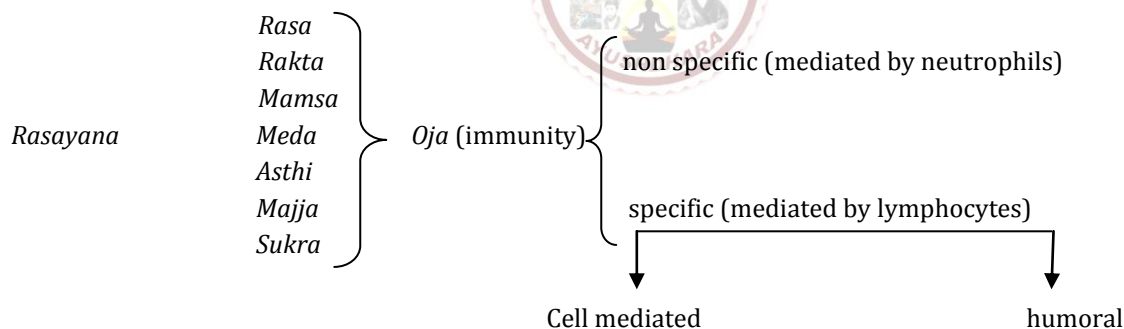


Fig : hypothesis depicting relation of Rasayana and Ojha.

Attempts may be made to develop newer methodologies for such a research focusing on the nutritional dynamics as the basis of the immunomodulatory effect of a *Rasayana* drug. These herbal *Rasayana* drugs, which are widely available in our country, have wide scope for application in the normal population for the enhancement of their immune status i.e., *Yuktikrita Bala* and prevention of various

communicable and infectious diseases, and also a as an adjunct in the therapy in the immunocompromised disease states. The concepts of *Ojas* and *Bala*, of the inherent immunological capabilities including innate immunity and acquired immunity in terms of *Sahajabala* and *Yuktikritabala* etc., playing key role in the health and disease have to be understood and appreciated by the modern immunologists.

Recent advances in drugs which are mentioned as *Rasayana*

Plants commonly used as <i>Rasayana</i>	Recent researches in its Role in immunomodulation thus helping in therapeutic and prevention
<i>Tinospora cordifolia</i>	macrophage activation property
<i>Withania somnifera</i>	Immunoprotection
<i>Curculigo orchoides</i>	Immunostimulatory effect
<i>Withania somnifera</i>	Immunoprotection
<i>Picrorhiza kurroa</i>	Immunomodulating property
<i>Emblica officinalis</i>	Immunomodulatory effects

<i>Boerhaavia diffusa</i>	Immunomodulatory effects
<i>Tinospora cordifolia</i>	Immunopotentiating property
Gold preparations	Augmentation of non specific immunity
<i>Piper longum</i>	immunomodulatory and antitumor activity
Gold	anti-anxiety and anti-depressant activity
<i>Terminalia chebula</i>	Antioxidant effect
<i>Triphala</i>	Antioxidant effect
<i>Ocimum sanctum</i>	Immunotherapeutic potential
<i>Emblica officinalis</i>	Antibacterial activities
<i>Bacopa monniera</i>	Adaptogenic effect
<i>Ashwagandha</i>	Immunostimulatory activity
<i>Piper longum</i>	Antiamoebic activity
<i>Haridradi Ghrita</i>	Immunostimulant effects
<i>Bhringraj</i>	Antiphlogistic and antiallergic
<i>Tinospora cordifolia</i> , (<i>Glycyrhiza glabra</i>),	Anticomplementary and immunostimulating activities
<i>Amalaki, Vidang and Atibala</i>	Immunostimulative
<i>Guduci (T.Cordifolia), Ashwagandha (W.Somnifera), Amalaki (Emblica officinalis) and Tulasi (Ocimum sanctum) combined.</i>	Increase in immunoglobulin levels.
	Potentiate both the cellular and humoral components of immunity

Acharya Rasayana and psychoneuroimmunology

The three main vehicles for receiving *Rasayana* therapies are *Aushadha Rasayana* (drugs and herbs), *Ahara Rasayana* (diet and nutrition), and *Acharya Rasayana* (conduct and behavior). All three are intrinsically important and should be taken together to receive the maximum therapeutic benefits, but without the proper state of mind it would be difficult to achieve and maintain health. The following review will focus on *Acharya Rasayana* therapies, which involve the psychological connection to physical health. The practice of implementing positive lifestyle routines is a cornerstone of preventative health care according to Ayurveda, and research is starting to grow in the western medical world around the importance of psychological management on physical health. A recent area of study around this is psychoneuroimmunology, which looks at the connection between the immune system and the nervous system in relation to mental health. The idea is that if the physical body is stressed from either external or internal stimuli, the nervous system will be triggered into an autonomic response that will signal a specific immune response to activate. In turn the person's emotional and mental well-being will be compromised from the physiological responses occurring in the body. This creates a potential negative feedback loop that may initiate an unhealthy cycle of reaction between the body and mind.

CONCLUSION

1. The *Rasayana* is not a drug therapy but is a specialized procedure practiced in the form of rejuvenative recipes, dietary regimens and special health promoting conduct and behavior.
2. The *Rasayana* are essentially molecular nutrients for different organs and tissues which help in sustaining the vital nutrition and assist in repair and regeneration of the system.
3. The main aim of *Rasayana* therapy is to encourage the potency and vitality. It is purpose of *Rasayana*

treatment to give strength to body, encourage health and prolonged existence on the one hand and avoid disease on other. There are adequate variety of *Ayurvedic Rasayana* drugs for the cure of different symptoms and diseases of aged people. It is possible that these may give up more and more new worthwhile remedies for improvement and treatment of many human maladies, for which no valuable cures are yet known. Now, at this time, when the whole world is trying to achieve such medicines that enhance the healthy life of individual, it is our duty to expose out the possibilities of such drug from Ayurveda. It is *Rasayana* drugs which can fulfil this desire of human being. There are a lot of *Rasayana* medicines which may ward off the effect of pollution, aging, malnutrition, disturbed food habit and obesity.

4. Ayurvedic concept of '*Rasayana*' seems not only to embody the principal aspects of new hypothesis centered on a immuno-endocrine psycho neuro axis but also to go beyond it by encompassing the entire human system with its diverse and complicated immunoendocrine pathway (Handa, 1993). It was well known to Ayurvedic physicians that the delicate cellular machinery of the body suffers from trauma, resulting in wear and tear on different body structures and the deterioration of the functional capacity. For this, procedures of revitalization and rejuvenation (*Rasayana* therapy) were adopted to increase the power of resistance to disease, these procedures retarded advancement of aging also.
5. There is also tremendous amount of reports of the plants as antioxidants under various disease conditions like diabetes, cancer, atherosclerosis and arthritis, proving that the mechanism involved may be in curing these diseases may be of antioxidants. From the study it is evident that most of the '*Rasayana*' plants possess potent antioxidant activity. '*Rasayana*' formulations in Indian traditional medicine may have antioxidant activity arising from

individual plants, and may act synergistically to prevent aging and related degenerative diseases. Further studies to isolate active principles from these plants and their pharmacological validation in terms of modern medicine will be of great medicinal importance in future.

So the emerging concept of nutraceuticals which boosts of being helpful in the prevention and treatment of diseases also have proven antioxidant activities and work as immunomodulators and it fits into the comparison drawn with the *Rasayana*.

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