

ROLE OF AMALAKI RASAYAN AS AN ANTIOXIDANT IN OXIDATIVE STRESS

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ABSTRACT

Ayurveda is the science of life. The main aim of *Ayurveda* is to maintain the health of a healthy person and to cure the diseased person. For the maintenance of the health of a healthy person, *rasayan chikitsa* is advised in *Ayurveda*. *Rasayan chikitsa* is the separate branch of *Ayurveda*, which deals with various aspects of preventive health care. In today's modern era, the incidence of lifestyle disorders like hypertension, obesity, diabetes mellitus and cardiovascular diseases increased, because of altered dietary and living patterns. Oxidative stress may be responsible for most of the diseases. Lack of dietary antioxidants supplements and generation of free radicals induces disease associated with oxidative stress. Oxidative stress is essentially an imbalance between the production of free radicals and the ability of the body to counteract or detoxify their harmful effects through neutralization by antioxidants. Free radicals contain unpaired electrons, and they are unstable and highly reactive. They donate or accept an electron from other molecules, therefore behaving as oxidants. An antioxidant is a stable molecule, enough to donate an electron to rampaging free radical and neutralize it, thus reducing its capacity to damage. Ac-

According to *Ayurveda*, *Amalaki* is the best *rasayan*, *tridoshar*. As per modern science, it contains the largest amount of vitamin C (600mg), and vitamin C has the best antioxidant property. *Amalaki rasayan* plays an important role as an antioxidant and thus relieves oxidative stress, thus helpful in the prevention of many diseases.

Keywords: *Rasayan*, antioxidant, free radicals, *Amalaki*

INTRODUCTION

Health is the state of complete physical, mental and social wellbeing and not merely the absence of disease^[1]. *Rasayan chikitsa* is beneficial for the maintenance of health. As said, that, prevention is better than cure. *Rasayan* is a substance that decreases the ageing process, increases longevity, increase mental and physical strength and destroys disease^[2].

Due to modernization, the dietary habits and living patterns of human beings are changed. People are crazier towards fast food and many people are addicted to various addictions like cigarette smoking, alcohol etc. The daily routine of the people is also changed like late-night sleep, irregular timing of food. Hence this change causes the formation of free radicals. And free radical causes many diseases like hypertension, obesity, diabetes mellitus and cardiovascular diseases.

Aim and Objectives

1. To study the concept of free radicals, oxidative stress and antioxidants.
2. To establish a relationship between *Amalaki* as a *Rasayan* and their antioxidant potential.

Material and Methods

References were collected from *Ayurveda* classics and various journals. These references are analyzed logically, and results are drawn.

Free Radicals –

A free radical is a molecular species capable of independent existence that contains an unpaired electron in an atomic orbital. Many radicals are unstable and highly reactive. They can either donate an electron or accept an electron from other molecules, therefore behaving as oxidants. The most important oxygen-containing free radicals in many disease states are hydroxyl radical, hydrogen peroxide, hypochlorite, nitric oxide radical. Major targets of free radicals in the body are nucleic acids, proteins, and lipids.

Free radicals are produced during normal essential metabolic processes in the human body and from external sources such as exposure to X-rays, ozone, cigarette smoking, air pollutants and industrial chemicals.

Oxidative Stress –

Oxidative stress is essentially an imbalance between the production of free radicals and the ability of the body to counteract or detoxify their harmful effects through neutralization by antioxidants.

Antioxidants –

An antioxidant is a molecule stable, enough to donate an electron to rampaging free radical and neutralize it, thus reducing its capacity to damage. These antioxidants delay or inhibit cellular damage mainly through their free radical scavenging property. This low molecular weight antioxidant can safely interact with free radicals and terminate the chain reaction before vital molecules are damaged. Some antioxidants such as glutathione, uric acid is produced during normal metabolism in the body. Other lighter antioxidants are found in the diet. The principal micronutrients antioxidants are vitamin C, E and beta carotene. The body cannot produce these micronutrients, so they must be supplied in the diet^[3].

Mechanism of Antioxidants Action

The first mechanism of action is a chain-breaking mechanism by which the primary antioxidant donates an electron to the free radical present in the system and the second mechanism involves the removal of reactive oxygen species (ROS) / nitrogen species inhibitors (secondary antioxidants) by quenching chain initiating catalyst [3].

Vitamin C

Vitamin C is a monosaccharide antioxidant found in both animals and plants. It cannot be synthesized in humans and must be obtained from the diet. It is a

reducing agent and can reduce and thereby neutralize ROS such as hydrogen peroxide [3]. Images of stable

molecule & free radical and antioxidant are shown in image 1 and image 2 respectively.

**FREE RADICAL
AND NORMAL MOLECULE**

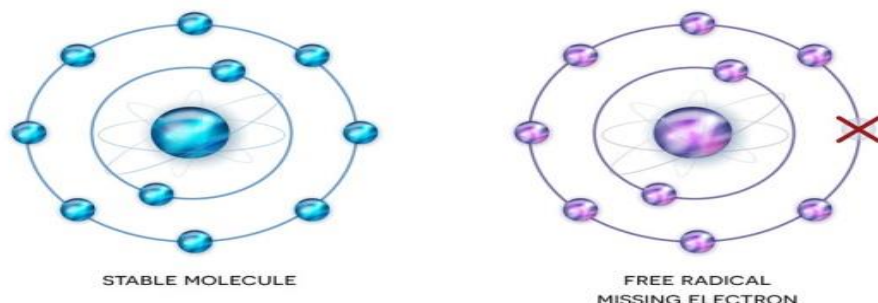


Image 1 - Stable & free radical

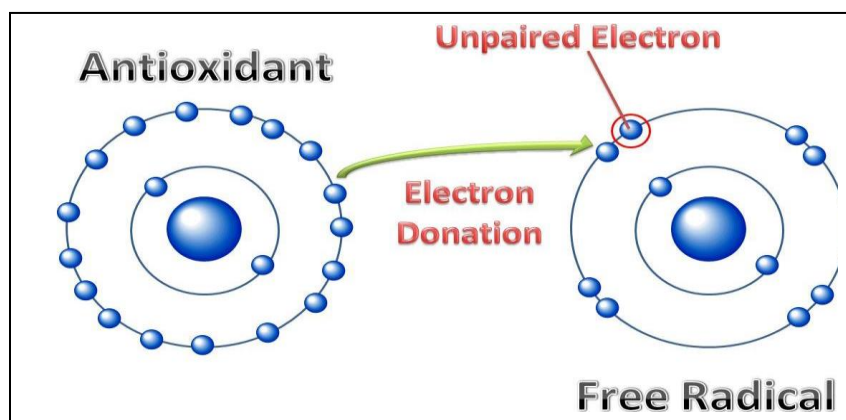


Image 2 – Antioxidant

Amalaki

Latin name – *Embelica officinalis*

Family – Euphorbiaceae

English name – Indian gooseberry

Sanskrit name – *Amlaki, dhatri, shiva, amruta, sriphal.*

Hindi name – *Amla*

Rasa – *Madhur, amla, kashaya, katu, tikta.*

Veerya – *Sheeta*

Vipak – *Madhur*

Guna - *Ruksha*

Doshaghnata – *Tridoshnashak*

Upuyktang – *Fruit*

Functions of Amalaki

In *Ayurveda*, *Amalaki* is indicated in the treatment of *Kushtha, Gulma, Udavarta, Shoth, Pandu, Arsha, Grahanidosha, Puranvishamjwar, Hrudrog, Shiro-rog, Atisar, Arochak, Kasa, Prameha, Anaha, Vaivarnya, Vaiswarya, Tamak-Shwas, Chardi, Klaibya, Strotovibandha, Raktapitta.* *Amalaki* fruit has many health benefits, and it is used as a principle in many *ayurvedic* preparations from ancient times. It is one of the best *Rasayan* [4].

Amalaki is one of the medicinal plants and is a rich source of antioxidants. Now a day it is used in a wide number of forms like; health drinks, candy, pickles,

chutney, jams etc. It is a nutritionally and medicinal-

ly important fruit due to its high vitamin C content.

Nutritive values of Amalaki per 100gm [5]

Macronutrients		Micronutrients		Minerals	
Moisture	81.8%	Vitamin C	600mg	Calcium	50mg
Fibre	3.4%	Vitamin B1	0.03mg	Phosphorus	20mg
Carbohydrates	13.7g	Vitamin B2	0.01mg	Iron	1.2mg
Proteins	0.5g	Vitamin B3	0.2mg	Folic acid	-
Fat	0.1g	Vitamin A	9mg	Energy	58kcal

DISCUSSION

Rasayan drugs are used for the maintenance of the health of a healthy person and to cure the diseased person. Also, they have antioxidants activity and suppress the activity of oxidative stressors, therefore reducing the production of free radicals. They create longevity, intellect, health, improve memory, strength, youthfulness, complexion, the luster of skin [6].

Antioxidants play an important role in age delaying and the prevention of diseases. In *Ayurveda*, different types of *Rasayana* formulations are described. Among them, *Amalaki* is the best *Rasayan*. It is *tridosahara*. Due to the presence of *amla rasa* in *Amalaki* it is *vata shamak*; due to *madhur rasa* and *sheeta guna*, it is *pittashamak* and due to *kashaya rasa & ruksha guna* it is *kaphashamak* [7]. As per modern science, it has the best antioxidant property which is due to the presence of vitamin C.

CONCLUSION

Amalaki rasayan plays an important role as an antioxidant and thus it relieves oxidative stress, hence helpful in the prevention of many diseases.

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