

Dhanya Varga WSR to Health Importance of Finger Millet (*Eleusine Coracana*)

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ABSTRACT

Finger millet (*Eleusine coracana*), commonly known as Ragi or Nachni, has been used in diet for centuries because of its nutritional and medicinal value. In recent years, there has been increasing interest in Ragi due to its high calcium, fibre, iron, and antioxidant content. These nutrients helps in maintaining bone health, regulating blood sugar levels, and supporting digestion. Ayurveda also considers Ragi useful when eaten as an individual's digestive system and body constitution. This paper talks the nutritional properties and Ayurvedic importance of finger millet by comparing traditional concepts with modern science. It also highlights the role of Ragi in preventing and managing the disorders such as diabetes, obesity, and cardiovascular diseases.

Keywords: Finger millet, Ragi, Ayurveda, Functional food, Nutrition, Lifestyle disorders.

INTRODUCTION

Millets is an integral part of Indian diet from ancient times. Among them, finger millet (*Eleusine coracana*) has a special place because of the adaptability, nutritional richness, and therapeutic potential. In Ayurveda, *Dhanya varga* (group of cereals) is taken as an essential for sustainable life, strength, and immunity. Ragi is traditionally eaten by children, adults, and elders, because of their bone health, stamina, and digestion.

With increasing amount of diabetes, obesity, osteoporosis, and cardiovascular diseases, the interest in traditional grains like Ragi. Modern dietary patterns depends heavily on refined cereals, whereas millets have better fibre and micronutrient. For this, finger millet is being found out that it is not only as a staple food but also as a functional food with many health benefits.

Ayurvedic Properties Of Ragi:

RASA (Taste)-Ragi has *Madhura Rasa* (sweet taste), which helps in nourishing and helps in tissue growth (*Dhatu Poshana*).

GUNA (Qualities)-It is considered as *Guru* (heavy) and *Snigdha* (unctuous) in nature, helping to satisfy and release sustained energy.

VIRYA (POTENCY)-Ragi is known as *Sheeta Virya* (cooling in potency), and it is useful in *Pitta Dosha* when eaten properly.

Dosha Karma

- Helps in *Pitta* for its cooling and nourishing nature.

- Supports *Vata* when made with ghee or warming auxiliary.
- Over intake may cause *Kapha* for its heaviness.

Nutritional Composition:

Ragi is nutritionally better than others used cereals. It is rich in dietary fibre, carbohydrates, plant-based protein, and essential amino acids. It is also a source of calcium, iron, magnesium, and phosphorus. It is naturally gluten-free, Ragi is useful for individuals with gluten.

Health Benefits Of Ragi:

1. Digestive Health:

The high fibre content of Ragi helps to supports proper bowel movements and prevent constipation. From an Ayurvedic point of view, it try in reducing in *Ama* (metabolic toxins) when taken in light and warm preparations.

2. Regulation of Blood Sugar Levels:

Ragi has a low glycaemic index, which helps to absorb glucose slow and helps to keep blood sugar levels stable. This property makes it useful in the dietary management of *Madhumeha* (diabetes mellitus). Studies shows that presence of polyphenols and dietary fibre in finger millet slow downs carbohydrate digestion and reduces postprandial glucose spikes.

3. Bone and Musculoskeletal Health:

Ragi is rich in calcium, helping in the bone mineralisation and prevention of osteoporosis. Its regular intake is useful during childhood, pregnancy, and old age to help maintain skeletal strength.

4. Cardiovascular Health:

Dietary fibre and magnesium present in Ragi help regulate lipid levels and blood pressure. These features helps to reduce the risk of atherosclerosis and other cardiovascular disorders.

5. Weight Management:

Due to its high satiety value and slow digestion, Ragi helps in maintaining appetite and reduces in risk of overeating. This makes it a helpful dietary component in obesity and metabolic syndrome.

6. Antioxidant and Anti-ageing Effects:

Ragi contains natural antioxidants like phenolic compounds and flavonoids. This helps in reducing oxidative stress, delay cellular ageing, and support overall immunity.

7. Nervous System and General Vitality:

The presence of B-complex vitamins and essential minerals helps in nervous system function, reduces fatigue, and enhances physical and mental stamina.

Clinical Evidences:

Diabetes

Patients having type 2 diabetes who had been given 200 g of millet flour buns for 60 days shows decrease in fasting blood glucose, post-prandial blood glucose, serum cholesterol, serum low density lipo-protein (LDL)

serum triglycerides and very low density lipo-protein (VLDL). Serum high density lipo-protein (HDL) levels were reported to increase by 14.98 %.

Finger millet for diabetes management:

According to some research evidence, FM has intermediate glycemic index (GI) (55–69) and is helpful for lowering GI than white rice, refined wheat, standard glucose, or white wheat bread. Long-term FM use shows that it causes the lowering fasting post-prandial blood glucose levels significantly in diabetic subjects. In pre-diabetic individuals, a significant decrease in HbA1c levels was found out.

For management of diabetes, postprandial hyperglycemia has to be controlled by managing α -glucosidase and pancreatic amylase, which are chemical synthetic obstruction. FM phenols are strong obstruction of α -glucosidase and pancreatic amylase. According to the research, dietary polyphenols like catechin and ferulic acid increase insulin sensitivity, lower plasma glucose, free fatty acid, and keeps lipid metabolism stable. Dietary polyphenols and phytates helps to decrease carbohydrate digestibility. Slow digestion of carbohydrates causes slow glucose absorption, helping in regulating post-prandial glycemic response. Ragi has an intermediate GI, that is, 54–68, which is lesser than wheat GI >75.

Finger millet are based on food product, for its low GI, helps to get modest improvement in long-term glycemic and lipidemic control found that enzymes, namely α -amylase, β -amylase, and amyloglucosidase require higher amount for hydrolyzing finger millet starch because of its nature to enzymatic hydrolysis for its molecular weight and degree of crystallinity.

Dietary takes of calcium and magnesium helps reduce the risk of type-2 diabetes. The excess of these two minerals makes FM a choice of millet as a diabetic nutraceutical. The study of Pradhan et al, reported that usage of multigrain flour containing 30% finger millet lowers the plasma glucose levels. Decrease in starch digestibility and absorption are due to anti-nutritional components, namely tannins, phenolics, and phytates present in FM, which are also a reason for lowering its GI. As a rich antioxidant, FM positively affect the glycemic status by maintaining oxidative stress. FM diet fasten the dermal wound healing and delayed the onset of cataract-genesis, as noted from in-vivo studies. This additionally helps to prevent diabetic complications including delayed wound healing and, cataract changes, etc. Inhibition of collagen glycation cross-linking reports from in-vitro studies further potentiates its nutraceutical importance for managing diabetic problems.

Finger millet for cardiovascular diseases management:

CVDs account for 30% of global morbidity and mortality. Disturbance in lipid profile is taken in the form of elevated levels of total cholesterol, LDL cholesterol, VLDL cholesterol, and triacylglycerol, leading to the progression of CVDs.

FM lowers lipid peroxidation, which cuts down arteriosclerosis and provide better protection against C like strokes or heart attacks. More evidence states that a multigrain-formulated diet including FM rapidly controls lipids and exerts antioxidant mechanisms in high cholesterol-induced rat models. Phenolic components are responsible for the inhibition of oxidative stress. Soluble dietary fiber reduces the reabsorption of bile acids (biosynthesized from cholesterol) and thus decreases the LDL cholesterol levels. Ragi produces anti-hypercholesteremic metabolites named as statin, viz. pravastatin, lovastatin, etc. These metabolites blocks pathway for synthesizing cholesterol in the liver and thus inhibit cholesterol formation. The fermentation process helps to harness hyper-cholesterolemic metabolites like statin and sterol. Regular intake of recipes like Ragi Dosa, Ragi Idli, Ragi Koozh, etc., will be helpful. Statin is an enzyme that does distruction of the cholesterol biosynthetic pathway, whereas dietary sterol decreases serum LDL (unhealthy cholesterol) levels without impacting HDL (good cholesterol). High diet fiber and complex carbohydrates in Ragi decreases the bad cholesterol level. Ragi carbohydrates mainly takes starch and non-starchy polysaccharides (NSP). These NSPs are important sources of insoluble fibers. Insoluble fibers takes more time to digest, increase intestinal transit and enhance fecal bulk. Ferulic acid component of FM is described as to decrease cholesterol levels. Thus, including Ragi in diet will help to decrease the risk of atherosclerosis, hypertension etc.

Finger millet for chronic obstructive pulmonary disease management:

Exposure to air pollution, smoke, and obesity results in oxidative stress and inflammation in the lungs and blood circulation, can lead to the pathogenic processes of COPD. When taken in combination in the form of balanced dietary patterns, foods rich in antioxidant and anti-inflammatory properties are related with better pulmonary function, less lung function decline, and decrease risk of COPD. Ragi is a rich source of antioxidants that help decrease inflammation and oxidative damage. FM bran contains anti-inflammatory compounds that are used to treat asthma-like inflammatory conditions.

Finger millet for cancer management:

Prevention against cancer by incorporating healthier and protective food is very attractive strategy. Dietary decrease of tumorigenesis and spread. FM being phytochemicals and antioxidants-rich nutraceuticals, possess wide-ranging anti-carcinogenic potential by acting as attacker for free radicals and reactive oxygen species. Millets are useful overall the process of cancer initiation and progression in several tissues due to the presence of phenols, tannins, and phytate.

Mode Of Consumption In Ayurveda:

Ayurveda gives special importance to proper preparation to increase digestibility. Ragi is traditionally eaten as *Ragi Kanji*, *Roti*, *Dosa*, or *Laddoo*. The addition of ghee, ginger, cumin, or dry ginger (*Shunthi*) improves digestion and prevents heaviness. Seasonal and constitutional suitability should always be noted.

Finger millet-based food:

There is potential to process FM into recipes and beverages. The traditionally used recipes from Ragi are Idli, Mudde, Koozh, Dosa, Pittu, Adai, Idiyappam, porridge, Ladoo (Indian sweet) etc. In present days, ready-to-eat recipes made out of Ragi like cakes, cookies, biscuits, breads, chocolates, chips, Papad (crispy crackers), soups, noodles, vermicelli, and pasta are also available. The germination and fermentation processes increase statin and dietary sterols content. Hence, these processes provide scope for developing finger millet-based functional food.

DISCUSSION

The Ayurvedic description of Ragi as *Guru* and *Sheeta* is related with modern nutritional profile, mainly its high fibre and mineral content. While Ragi provides sustained energy and nourishment, its heavy nature necessitates required preparation and moderation. Individuals with *Mandagni* or *Kapha Prakriti* may experience indigestion if Ragi is eaten in excess or without suitable adjuvants.

From a preventive healthcare point of view, Ragi shows significant potential in the dietary management of lifestyle disorders like *Prameha*, obesity, and osteoporosis. The holistic Ayurvedic approach highlights not only the food but even its processing, quantity, season, and individual constitution, which gets mixed with current concepts of personalised nutrition.

CONCLUSION

Finger millet is an important traditional grain with nutritional and therapeutic value. Its rich mineral content, fibre, and antioxidant properties makes it useful in promoting general health and supporting the management of lifestyle related disorders. Ayurvedic principles also highlights the importance of eating Ragi according to an individual's digestive strength and body constitution. The understanding of Ayurveda and modern nutrition shows that Ragi can serve as a valuable functional food in contemporary dietary practices. Further research may help better establish the role in disease prevention and long-term health promotion.

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