

Heritage Rice: A Treasure Trove of Medicinal Compounds

ABSTRACT: Heritage rice refers to the traditional rice varieties that have been grown and consumed for centuries, often by indigenous communities. Based on the culinary need, flavour and availability, rice varieties were chosen by the people. These rice strains have adapted to local climates and environmental conditions, resulting in a wide range of genetic diversity. Recent studies have shown that heritage rice varieties contain a variety of medicinal compounds that can provide various health benefits. These include antioxidants, anti-inflammatory agents, antimicrobial agents, and anti-cancer compounds. The medicinal properties of heritage rice are attributed to their unique genetic makeup, as well as the growing conditions and cultural practices of the communities that cultivate them. Processing plays a major role adding nutrition to the rice because compared to ordinary polished rice, unpolished rice has additional biochemical components like polyphenols, phytochemicals, antioxidants, vitamins and minerals. Apart from medicinal properties these traditional varieties help in overcoming malnutrition which is a major problem in developing countries.

Keywords: Heritage rice, Traditional rice varieties, Medicinal properties of heritage rice and Nutritional properties of heritage rice

INTRODUCTION

Rice is an important food crop next to wheat and is a staple food for more than two third of the world's population. Among the rice species, Asian rice varieties (*Oryza sativa* L.) accounts about 80% of world's total rice production. More than half of world's population relies on it as one of their main sources of energy, fibre, antioxidants, complex vitamins and minerals essential for life (Savitha, Kumari 2016). Rice is rich in genetic diversity with more than two lakh varieties in India until 1970s which was lost due to the arrival of modern high yielding varieties, hybrids and engineered rice developed after green revolution. In recent days these traditional varieties are being revived for its nutritional values, medicinal values and unique aroma. Traditional rice varieties are rich in nutrients like vitamin D, riboflavin, thiamine, glutamic acids, minerals like calcium, magnesium, phosphorous and high in fibre. Presence of oryzanol, a molecule that reduces fat production in the body and low sugar, fat and gluten content make them a great diet for diabetics and hypertension people. The medicinal properties of traditional rice are attributed to their unique genetic makeup, as well as the growing conditions and cultural practices of the communities that cultivate them. For example, some traditional rice varieties are grown using organic farming methods, resulting in lower pesticide residues and higher nutrient levels. Additionally, the consumption of heritage

rice is often accompanied by traditional cooking methods and spices, which further enhance their health benefits.

Traditional rice has been used for medicinal purposes in India for thousands of years and has been mentioned in various ancient texts. In the Charaka Samhita, one of the foundational texts of Ayurveda, black rice known as "Mahakar" is believed to have cooling properties that can help alleviate heat-related illnesses such as fever and diarrhea. It is also believed to have anti-inflammatory properties that can help reduce inflammation in the body. The Sushruta Samhita, another important Ayurvedic text, red rice known as "Raktashali" is believed to have astringent properties that can help treat conditions such as diarrhea and dysentery. It is also believed to be beneficial for the liver and the eyes. Although traditional rice has nutritional and medicinal properties, it has been easily replaced by other foods. Therefore, there is a need to review and spread their properties.

NUTRITIONAL PROPERTIES

Traditional rice varieties retain its bran layer containing vitamins, minerals and fibres whereas white polished rice losses 8-10 % of its bran. Rice is the major source of carbohydrate which is broken down to glucose to provide energy for physical activities and fuel the brain. Traditional rice has low glycemic index hence starch digestion

takes place slowly. It prevents the body from building up cholesterol levels due to the presence of good amount of oryzanol content and lesser fat content. Apart from carbohydrates, proteins and fats, these are also good sources of minerals and vitamins such as niacin, riboflavin, thiamine, iron, calcium, vitamin D and high fibre content. Apart from providing essential nutrients, it has the capacity to strengthen the body by eliminating the toxic metabolites, improve body elements, revitalize energies and preventing premature aging and skin diseases.

MEDICINAL PROPERTIES OF SPECIFIC VARIETIES

India is known for its rich and diverse rice varieties that are integral to its cuisine and culture but exact number of traditional rice varieties is not

clear and may vary based on different resources. In general, consuming traditional foods reduces health problems and diseases like arthritis, obesity, dehydration, diabetes mellitus, food poisoning, dehydration, cardiac problem, etc. since traditional rice varieties are unpolished, they contain more bioactive compounds like flavonoids, polyphenols, and anthocyanins than polished rice, which has antioxidant, anticancer, anti-inflammatory, antidiabetic, and anti-aging properties. In addition, they are used to treat many ailments like leukorrhea, gastrointestinal disorders, hypertension, stroke and rheumatism and also increases milk secretion in lactating mothers. Table 1 shows the medicinal properties of few familiar traditional varieties. Table 2 shows the properties of some unfamiliar traditional rice varieties mentioned in ayurvedha.

Table 1: Medicinal properties of few familiar traditional varieties

S.No.	Variety name	Medicinal use	Reference
1	Rakthashali	Pacify body humor; good for ulcer and fever; improve eyesight, voice, skin, and health; increases fertility; act as a spermatophytic, diuretic, tonic, and cosmetic.	(Ahuja et al., 2008; Bhat & Rair, 2015; Priya et al., 2019)
2	Sali	Treat fractures and burns.	(Balasubramanian et al., 2019)
3	Navara	Treat paralysis, cervical spondylitis, psoriasis, rheumatoid arthritis, skin lesions, neuromuscular disorder; weaning food for underweight babies; reduce stomach ulcer, snakebite, and backache	(Deepa et al., 2008)
4	Kafala	Used to treat abortion complications and leucorrhoea.	(Balasubramanian et al., 2019)
5	Kalanamak	Phytoconstituents and free radical scavenging ability, productively controls tumor growth and breast cancer, improves eye health, improves body weight and reduces chronic inflammation.	(Banerjee et al., 2019)
6	Kichili samba and Seeraga Samba	Antimicrobial, antifungal and antiretroviral properties, anti-inflammatory for peptic ulcers, antidiabetics, boosts immune system and strengthen muscles.	(Bakun et al., 2021)
7	Kattuyanam	Treat anemia, neurodevelopment	(Pushpam et al., 2019)
8	Karunguruvai	Treat leprosy, chickenpox, elephantiasis, cholera, venomous bites.	(Ortansa et al., 2020)
9	Mapillai samba	treat gastrointestinal tract disorders like irritable bowel syndrome, ulcerative colitis, and radiation proctitis.	(Ashokkumar et al., 2020; Załęski et al., 2013)
10	Kavuni	Treat anemia, diabetes, mellitus, stress disorder,	(Meera et al., 2019;

		osteoporosis and many biological functions like antioxidant, antiviral, antifungal, and antibacterial activity.	Valarmathi et al., 2014)
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Table 2. Medicinal properties of few unfamiliar traditional varieties

S.No.	Variety name	Properties
1	Annamazhgi	Wards off all diseases and regulates deranged pitta.
2	Irkku samba	Good for offering prayer and to feed the noble.
3	Kalundai samba	Enhance physical strength and stamina.
4	Kaadai samba	Strengthen the body and cures urinary tract infections like burning micturition.
5	Kaalaan samba	Wards off diseases caused by derangement of vaatha.
6	Gundu samba	Suppresses pitta
7	Kodai samba	Regulates all three doshas
8	Korai samba	Provides a cool feel and controls Pitta, it cures urinary tract diseases and controls pruritis.
9	Seetha bogam	Provides strength, complexion and improves spermatogenesis
10	Chensamba	Controls excessive appetite, cures itching, pyoderma and wounds.
11	Puzhugu samba	Ability to quench thirst and hunger and strengthens the body, removes fatigue and provides a pleasant feel.
12	Manakathai	Controls skin diseases, helps in poison bites, heals ulcers if one takes this variety regularly.
13	Malligai samba	Nourishment, strength and growth, prevents dermatitis.
14	Milagu samba	Improves appetite, regulates thirst, gives a pleasant feel, wards of many diseases.
15	Maisamba	Regulates deranged vaatha and Pitta, Cures fever, vomiting, ingested toxins and removes ageusia, anorexia.
16	Kundumanisamba	Regulates deranged vaatha and alleviates a lot of diseases.
17	Vaalaanarici	Suppress anorexia –loss of taste but improves complexion, adds weight. But in order to get proper nourishment and improve spermatogenesis use judiciously.

CONCLUSION

Traditional rice varieties in India are found to have several medicinal properties due to their high nutritional content and phytochemicals and is a part of cultural heritage. These varieties are in the verge of extension due to lack of awareness and insufficient availability of scientific data. However, it is important to note that more research is needed to fully understand their medicinal properties and potential applications

FUTURE SCOPE

This article reviews the medicinal properties of heritage rice of Tamil Nadu and highlights the potential for these traditional varieties to provide natural sources of medicine. By promoting the cultivation and consumption of

heritage rice, we can support local communities, promote sustainable agriculture, and improve public health.

REFERENCES

- Ahuja, U., Ahuja, S.C., Thakrar, R., Singh, R.K. (2008). Rice—a nutraceutical. *Asian Agric-Hist.* 12 (2), 93–108.
- Ashokkumar, K., Govindaraj, M., Vellaikumar, S., Shobhana, V.G., Karthikeyan, A., Akilan, M., Sathishkumar, J., (2020). Comparative profiling of volatile compounds in popular south Indian traditional and modern rice varieties by gas chromatography-mass spectrometry analysis. *Front. Nutr.* 7, 1–13.
- Bakun, P., Goslinski, B.C.-G.T., Lijewski, S., (2021). In vitro and in vivo biological activities of

- azulene derivatives with potential applications in medicine. *Med. Chem. Res.* 30 (4), 834–846.
- Balasubramanian, A.V., Vijayalakshmi, K., Parimala, K., Sridhar, S., Subramanian, K., & Manikandan, R. (2019). Traditional rice varieties of Tamil Nadu: A source book. Centre for Indian Knowledge Systems.
- Banerjee, R., Chakraborty, A., Chowdhury, S., Ganguly, S., (2019). Medico-nutritional value and profitability of black rice - the new black gold of indian agriculture. *Sci. Agric. Allied Sect.* 3 (6), 11–16.
- Bhat, F.M., Sommano, S.R., Riar, C.S., Seesuriyachan, P., Chaityaso, T., Prom-u-thai, C., (2020). Status of bioactive compounds from bran of pigmented traditional rice varieties and their scope in production of medicinal food with nutraceutical importance. *MDPI* 1–15
- Kowsalya P, Sharanyakanth P S, Mahendran R, Traditional rice varieties: A comprehensive review on its nutritional, medicinal, therapeutic and health benefit potential, *Journal of Food Composition and Analysis*, Volume 114, (2022), 104742, ISSN 0889-1575
- Meera, K., Smita, M., Haripriya, S., Sen, S., (2019). Varietal influence on antioxidant properties and glycemic index of pigmented and non-pigmented rice. *J. Cereal Sci.* 87, 202–208.
- Ortansa, C., Ionela, S., Elena, R., Vassu, T., Corbu, V., (2020). Antimicrobial and antiadhesion activity of biosurfactants from *Rhodotorulaglutinis* grown on n-dodecane. *Rev. De. Chim.* 71 (5), 99–105.
- Priya, T.R., Nelson, A.R.L.E., Ravichandran, K., Antony, U., (2019). Nutritional and functional properties of coloured rice varieties of South India: a review. *J. Ethn. Foods* 6 (1), 1–11.
- Meera, K., Smita, M., Haripriya, S., Sen, S., (2019). Varietal influence on antioxidant properties and glycemic index of pigmented and non-pigmented rice. *J. Cereal Sci.* 87, 202–208. <https://doi.org/10.1016/j.jcs.2019.03.005>.
- Pushpam, R., Mythili, S.R., Nikitha, T.C., (2019). Medicinal rice and its medicinal values. *Int. J. Curr. Microbiol. Appl. Sci.* 8 (10), 2090–2095.
- Savitha P., Usha Kumari R., (2015). Indigeneous Knowledge of Traditional Landraces in Rice (*Oryza sativa* L.) in Situ Conservation of Tamil Nadu, India. *Indian Journal of Traditional Knowledge* Vol. 15 (2), Pg 321-329
- Valarmathi, R., Raveendran, M., Robin, S., Senthil, N., (2014). Unraveling the nutritional and therapeutic properties of 'Kavuni' a traditional rice variety of Tamil Nadu. *J. Plant Biochem. Biotechnol.* 24, 305–315.
- Załęski, A., Banaszkiewicz, A., Walkowiak, J., (2013). Butyric acid in irritable bowel syndrome. *Prz. Gastroenterol.* 8 (6), 351–353.