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## Review Article

### Save the Red Rice: A Unique Gift of Nature

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Abstract	Keywords
This article provides a brief review on the importance and uses of red rice varieties in India. Red rice ( <i>Oryza sativa</i> L.) is red in colour and nutritionally very rich. Now-a-days, the red rice varieties are not used as common rice and are neglected of various reasons. Comparing to much liked 'white-polished rice' red rice is having higher iron and fibre contents. It is the right to bring the importance of red rice variety so as to get beneficial traits from it.	Nutrition <i>Oryza sativa</i> Red rice

## Introduction

Mother Nature has created a vast diversity of flora and fauna on the earth. Each and every minute organism, wild species and strange being has its pivotal role and position in the maintenance of complex ecosystem. In spite of the fact that nowadays a great deal of stress is laid on preserving this diversity and utilising it aptly; however, little success has been achieved in this direction.

People's preference for the food grains with clean and polished surfaces having appealing aroma and smooth texture leading to neglecting the many healthy and nutritious crops. Due to this tendency of present consumers farmers are forced to grow a limited and marketable bunch of crops. This trend is

affecting rice - the staple food of half of the world, to a great extent.

Rice is the other name of food for Asian countries. It is an important source of carbohydrates, energy and protein in human diet. In the traditional growing areas of Asia, rice varieties of various colors like red, purple, black, brown, yellow, and green have been cultivated and consumed. The coloured rice was preferred in earlier days due to taste and medicinal value. However, due to plant introduction and commercialisation of agriculture, colored rices are remaining unrecognized. Red rice is one of the prominent victims of this partiality. Hence in the present article, the importance of red rice variety has been highlighted.

## Characteristics of red rice

Red rices have a red bran layer. The color of the bran ranges from light to dark red. The bran layer contains polyphenols and anthocyanin, and possesses antioxidant properties. The red rices are a richer source of protein, zinc and iron than white rice (Table 1).

## Uses and improvement in red rice varieties

Ancient Indian literature Charaka Samhita, authored by great charaka mentioned rice with red husk and grain as the best: efficacious and subdues the diseases. Wild red nivara rice had made it's mark in

Agni Purana (900 AD), the Vishnu Purana (200 AD) and the Garuda Purana as it delays thirst, arrests perspiration and highly restorative.

Today also in some pockets of our country people consume red rice due to the health benefits enclosed in its grain. In Himachal Pradesh it is consumed to cure blood pressure and fever. Women in Tamil Nadu consume it during lactation. In Uttar Pradesh it is used for treating leucorrhoea and abortion complications while in Karnataka it is preferred for coolness and as tonic. The red rice yeast (prepared by fermenting yeast *Monascus purpurea* over red rice) is a popular cholesterol-lowering product over the world (Chaudhary and Tran, 2001).

**Table 1. Nutrient contents of rice varieties.**

Type of rice	Protein (g/100g)	Iron (mg/100g)	Zinc (mg/100g)	Fiber (g/100g)
White – polished	6.8	1.2	0.5	0.6
Brown	7.9	2.2	0.5	2.8
Red	7	5.5	3.3	2.0
Purple	8.3	3.9	2.2	1.4
Black	8.5	3.5	-	4.9

Source: FAO (2004)

Red rice varieties were prevalent in the South, East, and the hilly tracts of the Northeast and West India. The cultivars showed high tolerance to unfavourable conditions of poor soil, deep water and mountainous terrain. In areas of Kerala, Tamil Nadu, Karnataka, Bihar, Orissa, Bengal, Madhya Pradesh, and the north-eastern states it was cultivated in conditions such as deep water, drought, sandy soils, salinity, and cold. Due to hardness of red rice, it has been used in various breeding and genetic improvement programme of white rice.

The red landraces like Ptb 18, Ptb 19, Ptb 21, and Ptb 33, with broad-spectrum resistance to the brown plant hopper, have been used in resistance breeding programs all over the world. The *nivara* rices have been used as sources of resistance to insect pests and viral diseases; Lalnakanda has been used as a drought resistance donor. Ptb 10 has been used for high photosynthetic activity. However, the true potential of red rice remained untapped due to the introduction of high yielding varieties and consumer preference for white rice.

Since the advent of green revolution and emergence of white rice as favourite in masses, the red rice

started disappearing from plates and fields. In USA, red rice is often referred as the 'Red Menace' considering it as a weed and "fat beggars", as they accept what is offered and thrive on it. In India, it is the poor who consume red weedy rice varieties. Nowadays red weedy rices are not counted in quality rices and are separated and mixed with the low-grade rice by the traders. In some areas, specific weedy rices are left at the time of harvesting, and are later collected. The germplasm accession of colored rice in India is also very disappointing. In an evaluation program for biotic stresses conducted on around 12,750 entries under the auspices of the Directorate of Rice Research (Hyderabad, India), 28.31% of the entries were colored rices. Of these, 10.48%, 9.41%, and 8.40% had red, brown, and purple pericarps (Anonymous, 1998). The collection of the Central Rice Research Institute (CRRI), Cuttack, Orissa) of 2,960 entries, mainly from the eastern states of India, had a relatively higher number of red rices. Of 20% colored rices, 17.40%, 3.44%, and 2.50% were red, purple, and brown rices, respectively (Dikshit et al., 2004). At this point of time germplasm exploration, collection and conservation can play a key role for the survival of red rice.

The value of red rice can only be recognized by the health conscious consumer of our country. Although the scientific community is totally aware of its wonders as a source of minerals, proteins, antioxidants and resistant genes for various diseases and pest yet alone they cannot make a worthy mark without an immense market demand. The red rice must continue its journey as a gift of nature rather than ending as weedy and wild rice.

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