Chapter 6

Breeding for Improving Human Nutrition and Grain Quality through Biofortification of Traditional Land Races and Improved Cultivars in Rice (Oryza sativa L.)

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ABSTRACT

Rice (Oryza sativa L.) which belongs to the family poaceae, is the life and the prince among cereals as this unique grain helps to sustain two thirds of the world’s population. India have traditionally been used or rice cultivation due to availability of water and conductive soil (Nadesa panic). Rice was grown in 155.30 million hectares and around 600 million tonnes of rice harvested each year globally. About 114 countries produce rice with China and India supporting 50 per cent of total production. India stands first in area under cultivation (41.85 mha) and ranks second in production, where as China ranks first in production with just half of the area. India’s production is 89.13 million tonnes with a productivity of 2130 kg/ha. Among the rice producing states of India, Tamil Nadu ranks sixth in production (6.53 mil-
Iron deficiency anemia is by far the most common micronutrient deficiency in the world affecting more than two billion people. Zinc deficiency is more extensive in developing countries where more than 60 per cent of the population is at risk. Zinc deficiency in grown up children and adolescent males causes retarded growth and dwarfism, retarded sexual development, impaired sense of taste and poor appetite and mental lethargy (Walker & Black, 2007). Coloured rice (black and red) are rich in minerals (iron and zinc) polyphenols and have antioxidant properties. Though the red of the grain colour is confined to the bran layer, a tinge of red remains even after a high degree of milling. The colour of the bran ranges from light to dark red. The zinc and iron content of red rices is 2-3 times higher than that of white rices.

Ayurveda considered red rice (rakta shali) the best among the shali varieties of rice. Red rices were highly valued as they had the power to redress the imbalance in the tridosha (the cornerstone of ayurvedic medicine is the concept of doshas. ‘Laicha’ rice of Chattisgarh and ‘Navara’ rice of Kerala are the medicinal rice varieties that had been evidently treating diseases like chronic gastritis and peptic ulcer for a long time. The ‘Bhat moori’ of Tamil Nadu which cures anemia and enhances blood circulation in women after child birth, contains folic acid which helps in the assimilation of dietary iron. Parmai-sal of West Bengal has special nutritive properties for strength, Kabiraj-sal of Orissa is fed to convalescing patients to quicken the recovery (Rajukkannu et al, 2009). Among the cereals, rice is a major crop of this region with considerable variability in duration, adapting to various agro-climatic and cultural situations and seasons, seed coat colour, shape, size, pigmentation of plant parts, plant height, tillering, lodging, grain, cooking quality and aroma (Latha et al, 2013). Considering that the highest antioxidant activity due to the presence of polyphenols in red rices than in white rices, red rices offer great hope for health conscious consumers.
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