



The Performance of *Kavuni* Rice in the Western zone of Tamil Nadu

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Received: 25th February 2020; Accepted: 30th May 2020

Abstract

Field experiments were carried out at wetland farms of Tamil Nadu Agricultural University, Coimbatore during *Navarai* and *Samba* seasons with *Red Kavuni* and *Black Kavuni* rice which is indigenous and medicinal rice type to find the feasibility of cultivation of *Kavuni* rice under irrigated rice ecosystem in the western zone of Tamil Nadu. *Red Kavuni* and *Black Kavuni* recorded grain yield of 3,171 and 2,576 kg ha⁻¹ respectively. *Red Kavuni* recorded higher straw yield of 7,470 kg ha⁻¹, but was on par with *Black Kavuni* showing 7,030 kg ha⁻¹. *Black Kavuni* recorded higher amylose content of 20.8 per cent, total phenol content of 11.83 mg/100g and protein of 6.82 per cent and β -carotene of 420.37 μ g/100g. The two *Kavuni* rice types, viz., *Red Kavuni* and *Black Kavuni* can be suggested for cultivation in the western zone of Tamil Nadu and also in rice belts districts of Tamil Nadu and it would be more profitable with the small and marginal farmers.

Key words: *Kavuni* landrace, rice, performance, western zone

Introduction

In Asia, more than two billion people are getting 60-70 per cent of their energy requirement from rice and its derived products. (FAO, 2013). Many rice varieties with medicinal value are cultivated and used in certain pockets in states of Karnataka, Madhya Pradesh, Kerala, Tamil Nadu, Uttar Pradesh, Himachal Pradesh and Western Ghats. These rice types, being the local land races is exploited by the rural folks to treat skin disease, blood pressure, fever, rheumatism, lactation and used also as a health tonic. Some of the rice landrace types are used in *sidda* and *ayurvedic* medicine preparations. Research on exploring the nutritional value of traditional rice varieties with its inherent medicinal values needs encouragement and proper documentation.

Kavuni is a rice variety type native to Tamil Nadu, cultivated in certain pockets of Thanjavur, Thirunelveli, Kanniyakumari districts and is basically of two types viz., *Black Kavuni* and *Red Kavuni* (Valarmathi *et al.* 2015). These rice landraces are highly nutritive and are rich in minerals like potassium, sodium, calcium, micronutrients like iron and zinc. They also

contain higher proteins, carbohydrates and vitamins like thiamine, riboflavin and niacin. Though there is no scientific data on the medicinal properties, they are being used in Ayurveda for treating diseases like arthritis, skin diseases and neurological problems. Hence, the present study was planned to find the feasibility of cultivation of *Kavuni* rice under irrigated rice ecosystem in western zone of Tamil Nadu.

The field experiments were carried out at wetland farms of Tamil Nadu Agricultural University, Coimbatore during *Navarai* (Dec Jan) and *Samba* (Aug -Sep) seasons, the major rice cultivation seasons of Tamil Nadu state. The location of the trial area is situated at 11°N latitude, 77° E longitude and at an altitude of 426.7m above mean sea level. All other package of practices was carried out as per the recommendation of CPG (2012). Five sample hills (plants) were selected randomly in the net plot area, and tagged for recording biometric observations. The experiment was conducted with *Red kavuni* and *Black Kavuni* rice variety which is indigenous and medicinal rice variety in Tamil Nadu. Observations were recorded on growth parameters like plant height, tillers, dry matter production and Leaf Area Index.

The yield attributes *viz*; productive tillers, spikelet number, filled grains, grain yield, and straw yield were recorded at the time of harvest. The data were subjected to statistical analysis by following standard statistical methods (Gomez and Gomez, 1984). The bio-chemical parameters like amylose per cent, total phenol content, total protein and β - carotenes were recorded on samples taken from another field trial with kavuni rice conducted for four consecutive years (2013-17).

The growth parameters like plant height, tillers and dry matter production were found higher in Red *Kavuni* compared to Black *Kavuni*. Red *Kavuni* recorded more plant height (127.45 cm), tillers per m² (538), leaf area index (5.87) at flowering stage and dry matter production of 11.31 t/ha (Table 1). Among the yield attributes, Red *Kavuni* recorded the maximum number of productive tillers m⁻² (404), total spikelets panicle⁻¹ (119) and filled grains panicle⁻¹(94).

Table 1: Bio -metric and yield parameters of *Kavuni* Rice

<i>Kavuni</i> Rice (Type)	Black <i>Kavuni</i>	Red <i>Kavuni</i>
Growth parameters		
Plant height (cm)	118.8	127.5
Tillers per m ²	443	538
Leaf Area Index (flowering stage)	4.31	5.87
Dry matter production (t/ha)	11.00	11.31
Yield attributes		
productive tillers m ⁻²	350	404
total spikelet panicle ⁻¹	114	119
filled grains panicle ⁻¹	86	94
Yield Parameters		
Grain yield (kg/ha)	2,576	3,171
Straw yield (kg/ha)	7,030	7,470
	Grain yield	Straw yield
SEd	204.80	117.81
CD (P=0.05)	614.03	458.71

These results were similar to the findings of Chowdhury *et al.* (1993) who stated that effective tillers hill⁻¹ varied with the landrace rice variety. In the present study, Red *Kavuni* and Black *Kavuni* recorded grain yield of 3,171 and 2,576 kg ha⁻¹, respectively. However, the average yield at farmers' fields have been reported to range from 700 to 1200 kg/ha in the traditional rice growing tracts of Tamil Nadu (Ashraf and Subbalakshmi, 2017). Red *Kavuni* recorded higher grain yield (3171 kg/ha) compared to Black *Kavuni*. Red *Kavuni* also recorded higher straw yield of 7,470 kg ha⁻¹ but was on par with Black *Kavuni* (7,030 kg ha⁻¹). Black *Kavuni* recorded higher amylose content of 20.8 per cent, total phenol content of 11.83 mg/100g and protein of 6.82 per cent and β -carotene of 420.37 μ g/100g (Table 2).

Table 2. Bio-chemical parameters of *Kavuni* rice

Parameter	Black <i>Kavuni</i>	Red <i>Kavuni</i>
Amylose content (%)	20.2	19.9
Total phenol content (mg/100g)	14.79	12.69
Total protein content (%)	6.87	5.83
The β - Carotene (μ g /100g)	288.91	208.59

Thus, Red *Kavuni* rice recorded enhanced growth characters and yield attributes compared to Black *Kavuni* rice. Black *Kavuni* has been reported to show higher amylose per cent, total phenol content, total protein content and β - carotene (Savitha and Usha, 2016). These two varieties can be suggested for cultivation in the western zone of Tamil Nadu and also in districts of rice belts of Tamil Nadu. The study also revealed that the traditional rice varieties recorded high grain quality characteristics with medicinal and nutritional properties which needs to be examined and validated along with the popularization of these traditional rice types.

References

- CPG, 2012. Crop Production Guide. Directorate of Agriculture, Chennai and Tamil Nadu Agricultural University, Coimbatore.
- FAO, 2013. Food and Agriculture Organization. FAOSTAT Database FAO, Rome.



- Chowdhury MJU, Sarkar MAR and Kashem MA. 1993. Effect of variety and number of seedlings per hill on the yield and yield components on late transplanted *Aman* rice. *Bangladesh Journal of Agricultural Sciences*, 20 (2): 311-316.
- Mohammed Ashraf and Subbalakshmi Lokanadan. 2017. A review of rice landraces in India and its inherent medicinal values – The nutritive food values for future. *International Journal of Current Microbiology and Applied Sciences*, 6(12): 348-354
- Gomez KA and Gomez AA. 1984. Statistical procedures for agricultural research (2nd Ed.). A Wiley Interscience Publication, NY, USA.
- Savitha P and Usha Kumari R. 2016. Indigenous knowledge of traditional landraces in rice (*Oryza sativa* L.) insitu conservation of Tamil Nadu, India. *Indian Journal of Traditional Knowledge*, 15 (2): 312-329.
- Valarmathi R, Raveendran M, Robin S and Senthil N. 2015. Unraveling the nutritional and therapeutic properties of ‘Kavuni’ a traditional rice variety of Tamil Nadu. *Journal of Plant Biochemistry and Biotechnology*, 24: 305-315