

Exploration, collection, conservation and characterisation of medicinal rice germplasm

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ABSTRACT

An exploration and collection of rice germplasm was conducted in Bastar district of Chhattisgarh state and 71 accessions were collected, of which several primitive cultivars are reported to have possessed medicinal value. The germplasm accessions were characterized and conserved ex situ both in base collection as well as in National Active Germplasm Site.

Key words: medicinal rice, germplasm, exploration and collection, Bastar

Rice varieties of therapeutic value have been known to exist and in use since ancient times. Susruta (400BC) followed by Kashiyapiya-Krishisukti (800-900AD) and Acharya Bhavamisra (15-16th Century) were some of the earliest records to mention rice varieties as having medicinal properties. The Food and Drug Administration (FDA) of USA classify currently red yeast rice as a dietary supplement for reducing blood cholesterol. Rice is used in Ayurveda system of medicine for treatment of a wide range of ailments, which include indigestion, diabetes, arthritis, epilepsy, paralysis etc. The most important among the medicinal rices is *njavara* variety of Kerala, which is traditionally used for treatment of rheumatism, arthritis, neurological problems, blood pressure and also for the relaxation and rejuvenation of weak muscles in aged people.

The concern for the herbal medicines and subsequent conservation of primitive heritage necessitated exploring a hitherto unexplored region for collection of rice germplasm with special emphasis on medicinal rice. While exploring and collecting the rice germplasm from Bastar region of Chhattisgarh state, several primitive cultivars were reported by the farmers to have possessed medicinal value (Table 1). Bastar is the southern most and major rice zone of Chhattisgarh state. It is one of the most backward, aboriginal tribe dominated regions of the country. The aboriginal tribes are cultivating the primitive cultivars from time immemorial. This region along with Jeypore tract of

Odisha has been identified as one of the secondary centers of origin of cultivated rice (Ramiah and Rao, 1953). According to Sharma *et al.* (2000), the region comprising of western Odisha, Jharkhand and Chhattisgarh is the centre of origin of aus ecotype of rice.

Table 1. Medicinal uses of selected rice varieties of Chhattisgarh

| | |
|------------|--|
| Aalcha | : The mother is fed with this rice when her child suffers from boils especially on head during hot summer, also used for treatment of pimples |
| Beisur | : The smoke of this rice husk is inhaled to get rid of headache, epilepsy, hysteria |
| Danwar | : This variety is prescribed to the weak persons to give strength |
| Garban | : This variety is eaten when there is severe pain in hand and leg |
| Karhani | : This variety is used as a medicine for paralysis |
| Laicha | : The pregnant women are fed with this variety of rice for healthy child growth |
| Leh Baddan | : This is recommended for arthritis patients |
| Bhejari | : This rice is fed to cow for quick release of placenta during calving |
| Maharaji | : This rice is fed to the mother after giving birth to the child to overcome delivery weakness |
| Mejri | : The rice mixed with niger (<i>Guizotia abyssinica</i>) is cooked and fed to the cow just after giving birth to the calf to help expel the placenta |
| Sarai phul | : This variety of rice is eaten to get rid of weakness, nausea etc. |

Table 2. Statistical parameters of medicinal rice collected from Bastar, Chhattisgarh

| Plant characteristics | Mean | Std. Deviation | Minimum | Maximum | CV (%) |
|-------------------------------|--------|----------------|---------|---------|--------|
| Leaf length (cm) | 46.49 | 9.36 | 23.20 | 68.80 | 20.14 |
| Leaf width (cm) | 1.14 | 0.16 | 0.86 | 1.86 | 13.97 |
| Days to 50 % flowering | 87.25 | 6.20 | 62.00 | 103.00 | 7.11 |
| No. of effective tillers(EBT) | 11.48 | 2.01 | 7.60 | 16.80 | 17.47 |
| Plant height (cm) | 135.64 | 23.37 | 73.40 | 168.40 | 17.23 |
| Panicle length (cm) | 22.00 | 3.14 | 14.92 | 29.20 | 14.26 |
| Days to maturity | 117.69 | 6.03 | 95.00 | 133.00 | 5.13 |
| Grain length (mm) | 9.19 | 0.65 | 7.10 | 10.40 | 7.06 |
| Grain breadth (mm) | 3.45 | 0.47 | 2.30 | 4.40 | 13.64 |
| Ratio (l/b) | 2.70 | 0.42 | 2.05 | 3.91 | 15.39 |
| 100 grain wt (gm) | 2.41 | 0.34 | 1.36 | 2.93 | 14.15 |

The Central Rice Research Institute (CRRI), Cuttack has been undertaking the exploration and collection of rice germplasm in different parts of the country making district as one unit (Singh *et al.* 2001). Rice is a pre-dominant crop in Bastar district, mostly rainfed and matures by end of November. Seventy one accessions of rice germplasm were collected during the survey.

The detailed passport information were recorded in the farmers' field itself. About 250-300 gms of seeds of each accession were deposited as voucher specimen in the medium term storage for future reference. All these collections have been given collectors' number (BCM) followed by CRRI accession number (AC). They were also deposited for the long term storage at the National Gene Bank of NBPGR, New Delhi as well as for obtaining National identity as IC number. Some of them possess medicinal values as told by the tribal farmers. This indigenous technical knowledge (ITK), however, needs to be validated by appropriate analysis of the samples.

A set of collected germplasm was grown during the following wet season at CRRI, Cuttack to document the agro-morphological characterisation and evaluation. The samples were grown in augmented block design with 3 checks. The morpho-agronomic characters for both vegetative and reproductive stages were recorded as per IRRI-IPGRI descriptor (IRRI, 1980).

Observations were recorded on quantitative characters over five randomly selected plants for statistical analysis (Table 2). The seedling height recorded at 21 days showed a great deal of variability. The key vegetative characters showed less variation and the other statistical parameters displayed high variability.

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