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Short Communication

COLLECTION OF UPLAND RICE GERMPLASM FROM PARTS OF GUJARAT

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One hundred and ten collections of upland rice germplasm were assembled from 80 diverse sites of Anand (1), Bharuch (1), Dang (24), Kheda (10), Panchamahal (39), Surat (13), Vadodara (12) and Valsad (10) districts of Gujarat. The collections showed a wide range of variability in distribution, plant height, number of tillers, stem thickness, stiffness of straw, presence of flag leaf, panicle length, grain/panicle, glume colour, presence, length and colour of awn, size, shape and colour of grain, 1000-grain weight, aroma and maturity. Several genetically unique forms and semi wild types were collected. Cropping pattern and local uses were also recorded.

Key words : Rice, germplasm, collection

Rice being a staple food, feeds the people in comparison to any other crop in the world. It is grown in over 90 countries in the world under diverse agro-climatic situations ranging from upland to maximum water depth of six meters in India (Paroda and Malik, 1990; Gupta and Tomar, 1994). India possesses very rich genetic diversity of cultivated rice (*O. sativa*) and its progenitor species (*O. nivara* and *O. rufipogon* (Sharma and Sastry, 1965 and Sharma *et al.*, 1988). The genetic plasticity and genotypic diversity available in rice in India is quite impressive (Richharia, 1976; Sharma *et al.*, 1988; Chandel *et al.*, 1989; Paroda and Malik, 1990; Sharma and Hore, 1990, 1993 and Pandravada *et al.*, 1996). There are genotypes to suit upland, medium land, low land, deep water and saline/ alkaline conditions. Efforts made in the past to develop promising types through selection/ improvement have resulted in a number of new varieties which has caused a threat of erosion to primitive cultivars/genetic diversity. However, most of these varieties lack resistance to specific biotic and abiotic stresses. Therefore, tribal dominated upland areas in parts of Gujarat possessing rich diversity were surveyed for collection of upland paddy germplasm for future use.

The mission was jointly conducted by National Bureau of Plant Genetic Resources, and Rice Research Station, Gujarat Agricultural University, Nawagaon, Kheda, Gujarat during October 1997 (Fig. 1). In all, 110 samples of upland paddy were collected from 80 diverse sites (lying between 20°25' to 23° 10' N Latitude, 72°71 to 74°10 E Longitude and 20 to 715 m above msl) comprising Anand, Bharuch, Dang, Kheda, Panchmahal, Surat, Vadodara and Valsad districts of Gujarat. The soil ranged from pulverized, sandy, loamy and sandy loam with high to low fertility and varied from black, yellow,

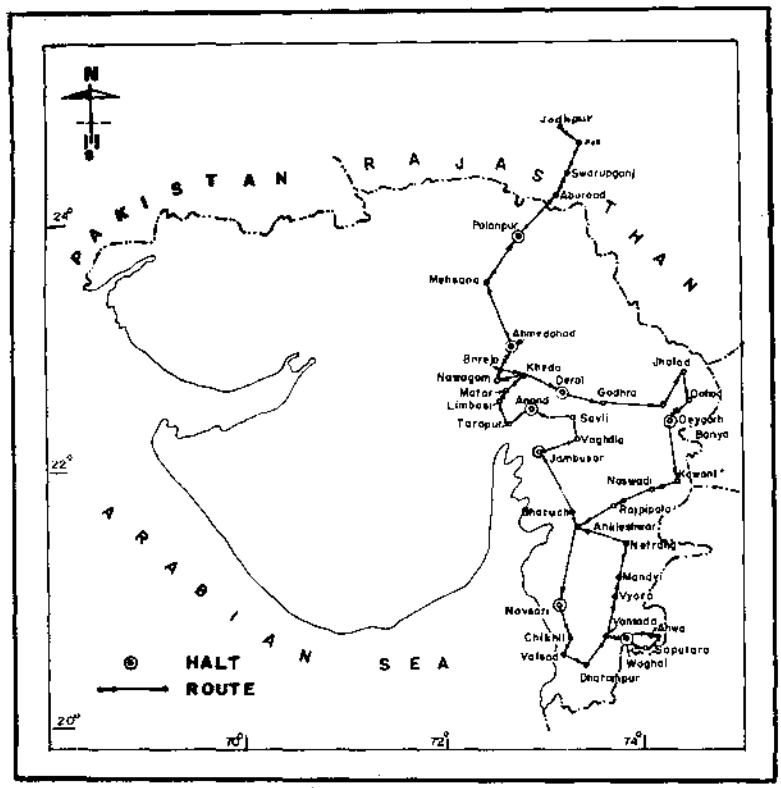

Fig. 1. Map showing route followed during collection of upland rice from parts of Gujarat

red, brown to mixed type. Biased, random and bulk sampling procedures were followed for collecting at least 10 panicles at each site. Passport data were recorded alongwith important plant characters, viz., panicle length, panicle type, glume colour, kernel size and colour; length and colour of awn and 1000-grain weight (g).

A wide range of variability was noticed in distribution, plant height, number of tillers, foliage colour, presence of flag leaf, internodal distance, stem thickness, stiffness of straw, panicle size (Fig. 2), grains per panicle (26.67-301.67) glume colour (Fig. 3); presence, length (10.67-37.00 cm) and colour of awn; size, shape and colour of grains (Fig. 4); 1000 grain weight (15.12-33.87 g) maturity and presence of aroma. Extra long glume with bold flat grains were prominent in a local cultivar *Chawara* collected from Valsad district. The most predominent landraces/local cultivars collected are given in Table 1. A few collections of semi-wild types (possessing tall erect plant habit, black awns and highly shattering grain behaviour) were collected which mimic the cultivated landraces till it matures, but due to its brittle rachis, grains shatter and provide a natural mechanism for its survival and perpetuation.

Interesting variability in upland rice landraces induced *Gutaniyo, Karjo*, and *Sathi* (early), *Dalaki* (very late), *Bangalo* (very attractive plant type), *Dabla* and *Futiya* Landraces with medium tall plant type and bold and flat grains were found to be well adopted to upland areas of Dang and Panchmahal districts respectively. Among scented types, *Bangalo, Dhanar, Kolpi, Panijal* and *Thumbaki* landraces were prominent. Landraces *Bhujhvalia Bhat, Dholi Dangar* and *Sathi* (medium tall and erect cultivars) possessed medium long grains and fairly high grain yield potential *Chikni Bhat* has the highest number of grains per panicle

(301.67) and the lowest 1000 grain weight (15.12 g.) *Jhadaki Dangar, Kosuri* and *Lal Kamod* possessed tall, erect plant habit, dark brownish black awns and highly shattering behaviour, while *Kali Dangar, Karjo, Kosuri* and *Ratiya Dhan* had a flag leaf to protect grains from bird damage.

Table 1. Local names of landraces/local cultivars of rice germplasm collected from different districts of Gujarat

Districts	Local names/Landraces/Local cultivars of rice germplasm
Anand	*Desi Bhat*
Bharuch	*Desi Bhat*
Dang	*Altiya, Bangalo, Bhujhavalia, Bhat, Dabual, Dabohal, Futiva, Geton, Halaki Kauchi, Hari Bangalo, Indrani, Jaware, Kajal Hari, Karajo, Kal Kundiya, Kirli, Khadasi, Khadsia, Kolpi, Pejje, Podhari, Tulasya.*
Kheda	*Ankalo, Chocolate, Desi Dangar, Masuri, Saket, Sathi, Sukhwel, Ubhi Dangar.*
Panchmahal	*Ausi, Dabla, Dadricolon, Daulatpuri, Des Dangar, Desi Sathi, Dholi Dangar, Hathi, Jhadaki Dangar, Hathi, Jhadaki Dangae, Kali Dangar, Kalinga, Kansaravay, Khasariya Dhanasar, Kosuri, Lakshari, Lakshari Bhuri, Lakshari Sona, Lal Dangar, Lal Kamod, Nanisal, Rata Chawal, Rati Kamod, Ratiya Dangar, Satiya Dangar, Sutarsal, Vardala, Vijalpuri.*
Surat	*Akoli Bhat, Barihai, Cholli Desi, Dalaki, Dhanar, Dholi Bhat, Ekdandi, Gutniyo, Jhini Sathi, Jodohllio, Kada, Panjiial, Sathi.*
Vadodara	*Batli Bhat, Dhanpari, Kali Chundari, Kali Dangar, Rati Dangar, Thumbaki.*
Valsad	*Chawara, Dang Bhat, Dholi Bhat, Ekangre, Futiva, Kada Bhat, Markolin, Taichun*

The tribals of Dang, Surat and Vadodara districts grow upland paddy alongwith other crops like castor, cotton, minor millets (*Eleusine* spp., *Panicum* spp.), *Sesamum indicum*, legumes (pigeonpea, urid) either mixed or in alternate rows with very poor to average agronomic practices and select only those landraces/ types

Fig. 2. Variability in size, shape and number of grains in panicles of rice landraces

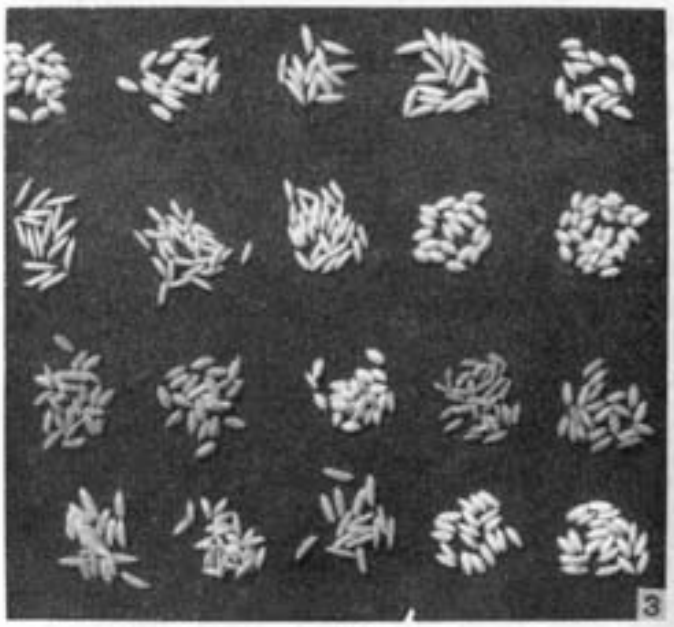

Fig. 3. Variability in size and shape of glumes in rice landraces

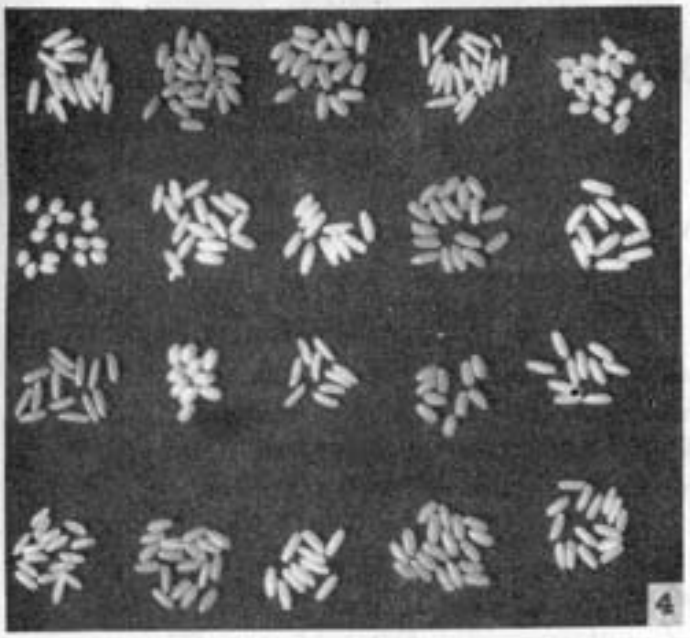

Fig. 4. Variability in size and shape of grains in rice landraces

that fitted well in their dryland/rainfed farming system to produce for their requirement.

Ethnobotanical considerations

Rice is staple diet of tribal people of Dang, Panchmahal, Surat, Vadodara and Valsad districts of Gujarat. It is cooked by boiling in water and eaten mostly with cooked pigeon pea and urad dal, vegetables or meat. Several local dishes are prepared like *Roti, Khichadi, Papari, Rāb, Poua* and *Churmure*. The hot and liquid *Rāb* (rice flour mixed in butter milk, kept overnight in earthen pot and then heated to boil) is given to patient in cure cold, cough and fever during winter.

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