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Short Communication

GRAIN SORGHUM AND SMALL MILLET GERMPLASM COLLECTION FROM NANDURBAR DISTRICT OF MAHARASHTRA STATE

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Sorghum is the staple food of the majority of people of the predominantly tribal areas in newly constituted tribal district Nandurbar (Maharashtra). These tribals in the hills of Satpura ranges grow traditional varieties of sorghum and certain small millets. They attributed the preference to local cultivars to their good processing characteristics, acceptable quality and storability as prepared food. The local sorghum varieties like dadar are costlier than hybrids even in the neighbouring districts of adjoining Gujarat State. The present paper reports certain landraces of sorghum and small millets collected form these areas.

Key words : Sorghum, small millets, germplasm collection

The collection was undertaken in Shahada and Dhadgaon talukas of Nandurbar district (earlier Dhule). The soil of area is mainly clay. The annual rainfall ranges from 450 mm in Shahada (180 MSL) to 1000 mm in Toranmal (110 MSL) which is the highest peak in Satpuda Hills.

Morphological description and utility

Sorghum samples were classified into different races according to Harlan and Dewet (1972) and small millets were identified with help of established flora (Blatter and McCann, 1935; Cooke, 1908; and Shah, 1978). The plants were observed in the field and morphological characters were recorded. Grain samples of the cultivars were collected from farmer's store. The samples were preserved at Department of Botany, P.S.G.V.P. Mandal's College, Shahada. The morphology of the plants and grains of the collected sorghum cultivars were briefly described in table 2. Badi Jowar (VB-1) and Dadar (VB-3) were collected by ICRISAT but from other localities of Dhule district. Preliminary investigation in this laboratory showed that these two cultivars are resistant to NaCl salinity (unpublished data). Chikni (VB-5) was not available among the 37,000 and odd accessions of ICRISAT. The present collection is red grained and used only in papad making. Andheri Dadar (VB-4) however is not found with any of sorghum germplasm collection centers (Personal communication). It is close to Dadar in morphology but differs with it in making quality. It is grown for its popping qualities. It is not generally attacked by birds because the kernels are not seen from outside. They are hidden between the large red glumes. Hence the name 'Andheri Dadar'. Murthy *et al.* (1982) recorded that of the 9682 accessions screened for popping qualities, only 36 were found to be better. VB-4 must also be screened for its usefulness in breeding programmes which will help improving this quality.

Table 1. Vernacular names, sources of collection of sorghum and small millet germplasm from Nandurbar district, Maharashtra, India

Collection No	Vernacular Name	Rabi/ Kharif	Race	Village
VB-1	Badi Jowar	Kharif	Durra	Rampur
VB-2	Mani Jowar	Kharif	Candatum	Shahada
VB-3	Dadar	Rabi	Durra	Shahada
VB-4	Andheri Dadar	Rabi		Shahada
VB-5	Chikni	Kharif	Durra	Rampur
VB-6	Ramkel	Rabi	Durra	Rampur
VB-7	Varai	Kharif	*Panicum Sumatrance*	Ranipur
VB-8	Safed Sangri	Kharif	*Echinocola colonum* Var. *frumentacea*	Kotbandh-ani
VB-9	Kali Sangri	Kharif	*Echinocola*	Kotbandhani
VB-10	Banti	Kharif	*colonum* Var. *frumentacea*	Kotbandhani
VB-11	Mordhan (Mor)	Kharif	*Panicum psilopodium* Trin	Kotbandhani
VB-12	Bhagar	Kharif	*Panucun miliacium* Linn	Kotbandhani

VB-1 is a six months crop and is known to be mold resistant. Mani Jowar (VB-2) is popular among farmers as its stalk and leaves form good fodder. Cattle not only like it most but also give thick fatty milk when fed with mani jowar fodder. Looking to the sweet taste of its bread, VB-2 may be evaluated for sweet sorghum status. It may find usefulness in jaggery production as envisaged by Ghanekar (1987) and also for malt production. This is an indication of high lipid content of this cultivar. In Nandurbar district, the cultivar of Ramkel (VB-6) is restricted to Rampur Village only. It is not as popular as the other cultivars.

Table 2. Morphology of plants and the making quality of the grains of sorghum cultivars

Collection No.	Name	Morphology	Making Quality
VB-1	adi Jowar	2.5 to 3.5m height,flag leaf close to drooping panicle,Grain white & bold	White bread easy to digest
VB-2	Mani Jowar	1.5 to 2m height,flag leaf 30-50cm below inflorence straight panicle,grain blue and bold but with black glume	Black bread sweet in taste
VB-3	Dadar	2-3m height,flag leaf 20-30 cm from inflorence straight panicle,small pale yellow grain	Bread hard to digest
VB-4	Andheri Dadar	2-3m height,flag leaf close to infloresence straight panicle,small and yellow grain with red glume	flake making
VB-5	Chikni	2-3m height,flag leaf close to infloresence drooping panicle,red grain	Papad Making

All the samples of small millets were collected from Satpuda hills. Kotbandhani is near Toranmal while Dhadgaon is an important trading center for tribals of these hills. Safed Sangri (VB-8) and Kali Sangri (VB-9) were identified as same species (*E. colonum*). It closely resembles with the description of *Echinocloa colona* var. *frumentacea* of Blatter and McCann (1935). Patil (D. A. Patil-personal communication) opines it to be *Echinocloa stagnina.* In an earlier publication (Bhasker, 1999); it was reported as *E. stagnina.* Further confirmation is needed. The only morphological difference between these two is the seed colour. Safed Sangri is white seeded while the latter is black seeded. Cytological and chemical analyses are, however, needed to establish their taxonomic relationship. These two small millets are not seemed to be cultivated elsewhere; either

in Maharashtra or in the adjoining tribal areas of Gujarat and Madhya Pradesh. Mordhan (VB-11) is cultivated in Kotbandhani and Dhadgaon. According to natives it is also cultivated in the adjoining areas of M.P. All these small millets are used to make roti or pudding, the latter is more common. Bhagar (VB-12) is eaten as pudding on fasting days by Maharashtrians in towns and cities as well. Thus it is a widely grown small millet in many parts of the state.

Flours of hybrids and local sorghums differ in their fermentation characteristics as determined by swelling volume of the batter (Subhramanian and Jambunathan, 1992). Andheri Dadar, the popping type, described in the present study seems to be a promising source for beverage industry owing to its small size, white creamy colour and medium thick pericarp. However, all these local cultivars must be screened for malt and fermentation characteristics. Studies on comparative evaluation of Dadar and Andheri Dadar and their improvement are already underway. Similar studies on other samples and small millets are required. A collaborative evaluation programme between collection centers like ICRISAT and NBPGR and analytical centers like universities and other institutions located close to the origin of the genotype would yield more fruitful results.

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REFERENCES

Blatter, S. J. and C. McCann. 1935. The Bombay grasses. p. 149 Bishan Singh Mahendrapal Singh, Dehradun, India 1984.

Bhaskar, V. V. 1999. Tribal ecology of Toranmal forest region in Satpuda Hills. *J. Eco. Env. & Cons.* 5(4): 307-311.

Cooke. T. 1965. The Flora of Presidency or Bombay No./II P. Bishan Singh Mahendrapal Singh, Dehradun.

Ghanekar, A. R. 1987. Sweet sorghum for jaggery production: problems and prospects. p 197-202. *In*: Proceedings on the National Seminar on Technology and Applications for alternative uses of sorghum (Ingle, U.M., Kulkarni, D. N. and Throat, S. S. eds.), Marathwada Agricultural University, Parbhani, Maharashtra, India.

Gopal Reddy, V. and V. D. Verma. 1996. Rabi sorghum germplasm collection in Maharashtra and adjoining areas of Karnataka. Genetic Resources Progress Report 85. International Crops Research Institute for the Semi-Arid Tropics, Andhra Pradesh, India.

Harlan, J.R. and J. M. J. de Wt. 1972. A simplified classification of cultivated sorghum. *Crop. Sci.* 12: 172-176.

Murthy, D. S., H. D. Patil, K. E. Prasada Rao and L. R. House. 1982. A note on screening the Indian sorghum collection. *J. Food Sci. and Tech.* 19: 79-80.

Prasada Rao, K. E., M. H. Mengesha and V. G. Reddy. 1989. International use of sorghum germplasm collection. *In*: "The Use of Plant Genetic Resources: p 49-47 (ADH Brown O. H. Frankel, O. R. Marshell and J. T. Williams eds.) Cambridge University Press, Cambridge.

Shaha. G. L. 1978. Flora of Gujarat State Part II p. 818 Sardar Patel University, Vallabh Vidyanagar.

Subhramanian, V. and R. Jambunathan. 1992. Laboratory procedures for evaluating rain and good quality of sorghum and pearl millet: problems and prospects. p 143-150. *In*: Utilization of sorghum and millets. (Gomez, M. L. Rooney, L. W. and Dendy, D.A.V. eds.), ICRISAT, Patanchery, A.P. 502 324, India