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BOOK OF ABSTRACTS

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genotypes of Barnyard Millet for its tolerance to abiotic stresses like salinity, alkalinity and heavy metal toxicity. The study was channelled to select the best genotypes under stress. Eight genotypes of Barnyard millet, including two checks, MDU 1 and CO (Kv)-2 were selected for the study based on duration. The genotypes included for the study were mutants, exotic collections, varieties and cultures. The genotypes were subjected to various stress conditions simultaneously *in vitro* conditions. Germination of the seeds under abiotic stress was taken as the basic character towards tolerance. The seeds were subjected to four treatment levels each of salinity, alkalinity, and two treatment levels of lead and chromium ions. The experiment was laid in Completely Randomised Design in three replications and a control was maintained. The seed germination parameters such as germination percentage, speed of germination and vigour index were used as preliminary selectors. At the end of the preliminary germination test, the genotype GECH 10 was found to be tolerant than the standard checks MDU 1 and CO (Kv) 2. All the genotypes exhibited equal germination characters under the both treatments of Lead (III). The test was performed with black gram seeds, MDU 1 under similar experimental conditions. It was found that Barnyard Millet has general tolerance towards Lead (III) than Black gram, since the mortality of seeds was higher in the latter. The genotype TNEF 199 and IEC 134 was found to perform better than others under toxic conditions of Chromium (VI). The selected genotypes were advanced for enzyme assay. GECH 10 was chosen as the selected tolerant line, MDU 1 was taken as the Standard check and IEC-106 was taken as the susceptible check. The lines were subjected to Catalase and Peroxidase assay. The enzymes were chosen since it is reported that abiotic stress tolerance is correlated with the amount of catalase and peroxidase. Seeds of the selected lines were germinated *in vitro* for 10 days under four levels of salinity. The green matter produced in the germination was taken for enzyme assay using spectrophotometric methods. In the enzyme assay, it was found that the line GECH 10 produced higher quantities of catalase and peroxidase under abiotic stress (salinity) than the standard check MDU 1 and the susceptible check IEC-106. Thus, it is concluded that the line GECH 10 is more tolerant to salinity stress than the other lines.

T-II/08

Genetic variability for salinity tolerance in barnyard millet [*Echinochloa frumentaceae* (Roxb.) Link]

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Barnyard millet (*Echinochloa frumentaceae*) has been recognized as a best option for climate resilient agriculture because of their ability to withstand salinity, drought and waterlogging conditions. The existing genetic variability for salinity

tolerance in 32 barnyard millet accessions were assessed based on the morpho-physiological parameters governing salt tolerance viz., germination percentage, relative germination rate, root length, shoot length, seedling length, vigour index, relative salt injury rate and relative water content. Under gradual increase in the intensity of salt stress, decrease in germination percentage, relative germination rate, root length, shoot length, seedling length, vigour index, relative water content and increase in relative salt injury rate was observed. Among the 32 accessions, four accessions (ACM161, ACM295, ACM331, ACM335) can withstand salinity at 250mM NaCl. The antioxidant assay also revealed that catalase and peroxidase activity increased with rise in salt level in tolerant genotypes (ACM161, ACM295, ACM335, GECH10, IEc167) but the enzyme activity in the salt sensitive genotypes (IEc134, IEc348, IEc607) declined with increase in salt concentration, when compared to control. The salt tolerant genotypes maintained higher relative water content and enzyme activity under salt stress. Hence, this may be the underlying mechanism for salt tolerance. Existence of genetic variability exhibited that these accessions can be exploited further in barnyard millet improvement for abiotic stress tolerance.

T-II/09

Harnessing little millet variability for nutritional and food security

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Little millet (*Panicum sumatrense* Roth. ex. Roem. and Schult.) also known as Kutki has been declared as one of the "Nutri-cereals" in The Gazette of India notification by Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India. Little millet is a tetraploid, self-pollinated crop and occupies primary part of the diet of the tribal people. The crop was domesticated in India (Eastern Ghats) and then spread to Nepal, Sri Lanka, Myanmar and Pakistan. Millets: the powerhouse of nutrients should be explored thoroughly since these are rich in micronutrients, essential amino acids, nutraceutical components, dietary fibre. And also exhibit anti-oxidative, gluten-free properties and low glycaemic index. Millets present immense genetic variability in terms of agro-morphological and nutritional traits along with their resilience to biotic and abiotic stresses. Comprehensive (Phenotypic, biochemical and molecular) characterization of the available germplasm is the need of the hour and is inadequate in little millet. Keeping this in mind, 1,635 little millet germplasm accessions procured from National Genebank, New Delhi were phenotypically characterized at two locations viz. Regional Station, Akola (Maharashtra) and Issapur Farm (New Delhi), ICAR-NBPGR. Variability was observed in days to 50% flowering, plant height, tiller number, flag leaf length and width, panicle length and compactness, grain colour, thousand grain weight (TGW), seed shattering and lodging response. The little millet accessions thus evaluated will form the basis of further nutritional (proximate composition, micronutrients, phytochemicals) and molecular profiling