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Biofortification and genomics approaches to improve quality of nutriceal pearl millet

Supriya Ambawat
Agriculture University, India

Pearl millet [*Pennisetum glaucum* (L.) R. Br.] is an important staple food grown on more than 26mha in the arid and semiarid tropical regions of Asia, Africa, and Latin America. In India, it is the fourth most widely cultivated crop with an average production of 9.73mt. It has high nutrition value and rightly termed as nutriceal as it is rich in protein, essential fatty acids, dietary fiber, vitamins, minerals such as calcium, iron, zinc, potassium, and magnesium. It helps in rendering several health benefits but its direct consumption as food has significantly declined over the past three decades due to various reasons. In this context, it is important to raise awareness of its nutritional value and reorient the efforts to generate demand through

value-addition and quality improvement. Biofortification is a cost-effective process of nutrient fortification using modern breeding, transgenic approaches, improved agronomy, and microbiological interventions. In addition, molecular tools and genomic studies are also promising approaches as they have enormous potential to improve the efficiency and precision of conventional breeding. In India, through ICAR- All India Coordinated Research Project on Pearl millet, we are developing various bio fortified hybrids rich in Fe and Zn and using MAS strategies and genomics tools, Fe-Zn QTL location has been identified and Improved HHB 67 has been released. Further, genomic positions of significantly associated SSR markers with grain iron and zinc content in the consensus map is being identified and research is in progress towards mapping QTLs for flour rancidity. With the advancement in next-generation sequencing (NGS) and molecular profiling technologies

identification and tagging of genes underlying a trait in the genome has become possible. Recently, the whole genome sequencing of pearl millet has been carried out and the draft genome and resequencing data will help researchers better understand the trait variation while advancing genetic improvement of the crop. Thus, development and application of novel approaches such as biofortification, marker-trait associations, genomic selection tools, NGS and GBS need to be intensified to accelerate the genetic gain targets for improvement of pearl millet.

Biography

Supriya Ambawat has completed her PhD in Biotechnology and Molecular Biology from CCS HAU, Hisar, Haryana- India. Presently she is working as an Assistant Professor (Plant Biotechnology) at Agriculture University, Jodhpur, Rajasthan, India. Her research area focuses mainly on crop improvement using genomics and molecular breeding approaches. Two well-saturated high-density linkage maps were constructed by her in pearl millet where DArT markers were mapped for the first time in pearl millet in the world. She has received many academic awards and has published more than 55 publications in various national and international journals of high repute and high impact factor.

supriya_bmb@yahoo.co.in