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Protein electrophoresis for identification of hybrids and their parents in *Sorghum bicolor* (L.) Moench

AMRAPALI A. AKHARE*, S. B. SAKHARE, P.L. KULWAL, D.B. DHUMALE AND ABHILASHA KHARKAR
Biotechnology Centre, Department of Agricultural Botany, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA (M.S.) INDIA.

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The applicability of protein markers was studied for identification of sorghum hybrid and its parents and to test the genetic purity of commercial samples. The experimental materials consisted of four sorghum hybrids Viz. CHS-14, CSH-9, CSH-19R and CSH-15R and their respective parental lines. The separation of protein on the basis of their molecular mass was performed by denaturing proteins in presence of SDS and then subjected to sodium dodecyl sulphate polyacrylamide gel electrophoresis. The hybrid CSH-14 and its parents produced distinguishing protein banding pattern by SDS-PAGE analysis of soluble proteins which was found to be useful in identifying hybrid CSH-14 from its parents and also from the other genotypes under study. No polymorphism in protein profile of hybrid CSH-19R and male parent AKR 354 was observed in the present investigation indicating limitation of SDS-PAGE analysis in CSH-19R for identification and determination of genetic purity and further study to confirm the same. However some of protein markers obtained in hybrid CSH-9 and CSH-15R showed the possibility of application of this technique to some extent for genetic purity analysis in these hybrids.

Key Words: Electrophoresis, Protein profile, SDS-PAGE, Sorghum, identification and genetic purity.

INTRODUCTION

Sorghum is fifth in worldwide economic importance among cereal crops. It is a staple food crop of millions of the poor in semi-arid tropics of Africa and Asia. In India it is third most important cereal after wheat and rice. In India, the area under high yielding cultivars of sorghum has increased from 0.7 million hectare in the early 1970's to 6.5 million hectares in the late 1990's (Anonymous 2005). Most of the area under high yielding cultivars is planted with about 70 private sector's hybrids. The green revolution was based mainly on the use of high yielding varieties and hybrids of crop plants. The success of hybrid technology depends upon the timely production and adequate supply of genetically pure hybrid seeds to the farmers. In order to determine the genetic purity, grow out tests or field test is most commonly used technique. In most of the laboratory and field tests of 'purity' and 'characterisation', it is difficult to identify the hybrid and the parental lines. It is mainly due to lack of availability of an adequate number of ideal morphological markers in several cultivars. Morphological markers are simple, quick and requires inexpensive techniques, however the number of different markers per cross is less than 10. Whereas protein markers detected as electrophoretic variants of proteins scores up to 30 different markers per cross (Singh, 2005). Proteins (Gene products) markers could be very successfully used to verify the Identity of a variety. A major advantage of using protein markers lies in their being least or not influenced by the growing environment and the fact that if a suitable protocol is standardized, it can be used with equal reproducibility at any time and any test center.

India is a signatory to the GATT (General Agreement on Tariff and Trade) agreement. With the introduction of IPR (IBR) at the global level, it has become imperative to register, characterize and prepare documentation of hybrids /varieties in seed production chain. For registration of variety/hybrid, the Government of India has enacted its 'sui generic' system called Protection of Plant Varieties and Farmers Rights Act 2001. In view of the above act the identification of cultivar has gained more importance and moreover the ability to distinguish and identify the crop varieties and hybrids is a fundamental operation in seed trade. Therefore, the present investigation was undertaken to study the possibility of applying an alternative or supportive method to determine the genetic purity and to distinguish the hybrids and parents.

MATERIALS AND METHODS

The present investigation was carried out at Biotechnology

* Author for Correspondence