

POTENTIALITY OF GENETIC RESOURCES AND THEIR CONSERVATION FOR SUSTAINABLE RURAL DEVELOPMENT

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Abstract

Nature has provided us all resources for the existence of living beings. Indiscriminate anthropogenic activities have affected the life patterns and equilibrium in the ecosystem. The consequent changes in the global climatic conditions hastened the erosion of valuable flora and fauna on the earth, causing genetic erosion in the niches of wild progenitors and relatives of the domesticated crops and animal species. The yield levels of most of the present day cultivars have reached a plateau and their genetic base was very narrow. This demands mobilization and induction of fresh genes from the wild species for specific traits such as yield, improved quality traits, tolerance to waterlogging, tolerance to several pest/diseases, drought and cold stress etc. There is an urgent need for conservation of wild and primitive animal/plant forms for their evaluation, characterization, identification of desirable traits/genotypes and their documentation and dissemination of information to users. The specific genes and genotypes useful in augmentation of the domesticated gene pools for broadening the genetic-base in the genetic improvement programs in certain important species are discussed. Globally, changing climatic conditions are effecting the agro-eco systems, thereby our food web, which may cause food shortages and starvation in the long run particularly in under developed countries. Advancing modern methods and techniques such as genome/gene sequencing, CRISPR Cas technology is a simple yet powerful tool for editing genomes. These technologies could help in the use of appropriate genetic resources for their development of adaptive genotypes to various biotic and abiotic stress factors, which could lead to sustainable crop/animal production and productivity. All the available genomic resources with significant varieties/lines from farmer's field, national and international collection centers must be conserved either *in situ*, *ex situ* or in any other forms for the present and future generations. This is needed to meet the sustainable developmental goals of the globe and for a sustainable rural development in the years to come.

Key words: Conservation, Genome, Productivity, Rural development, Variability, Yield

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Abstract

Nature has provided us all resources for the existence of living beings. Indiscriminate anthropogenic activities have affected the life patterns and equilibrium in the ecosystem. The consequent changes in the global climatic conditions hastened the erosion of valuable flora and fauna on the earth. There is an unprecedented genetic erosion in the niches of valuable wild progenitors and relatives of the domesticated crops and animal species. The yield levels of most of the present day cultivars have reached a plateau and their genetic base was very narrow. This demands mobilization and induction of fresh genes from the wild species for specific traits such as yield, improved quality traits, tolerance to water logging, tolerance to several pest/diseases, drought and cold stress etc. There is an urgent need for conservation of wild and primitive animal/plant forms for their evaluation, characterization, identification of desirable traits/genotypes and their documentation and dissemination of information to users. The specific genes and genotypes useful in augmentation of the domesticated gene pools for broadening the genetic-base in the genetic improvement programs in certain important species are discussed. Globally, changing climatic conditions are effecting the agro-eco systems, thereby our food web, which may cause food shortages and starvation in the long run particularly in under developed countries. Advancing modern methods and techniques such as genome/gene sequencing, CRISPR Cas technology is a simple yet powerful tool for editing genomes. These technologies could help in the use of appropriate genetic resources for their development of adaptive genotypes to various biotic and abiotic stress factors, which could lead to sustainable crop/animal production and productivity. All the available genomic resources with significant varieties/lines from farmer's field, national and international collection centers must be conserved either *in situ*, *ex situ* or in any other forms for the present and future generations. This is needed to meet the sustainable developmental goals of the globe and for a sustainable rural development in the years to come.

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