



## In-planta expression of HT lignocellulose digesting enzymes: a green & economic strategy for advanced biofuel production

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### Abstract:

The growing demand for energy and concerns about Greenhouse gas emissions have stimulated a worldwide interest in the exploitation of lignocellulosic plant biomass, the most abundant renewable and low-cost organic raw material for production of biofuels and biomaterials. In planta expression of lignocellulose digesting enzymes is a promising approach to reduce the production costs associated with biomass pretreatments and enzymatic hydrolysis. However, this approach faces a number of challenges, including auto-hydrolysis of developing cell walls, plant growth and yield penalties, low expression levels and the limited stability of expressed enzymes at the high temperatures generally used for biomass processing to release fermentable sugars. In planta consolidated bioprocessing using hyperthermophilic (HT) lignocellulose-degrading enzymes is a promising strategy for conversion of lignocellulose into fermentable sugars because these enzymes will continue to function during the 'heat-up' phase of a steam explosion process used for lignocellulose pretreatment. The high level functional expression of recombinant HT enzymes in bioenergy feed-stocks could reduce, or even obviate, the need for exogenous enzyme additions prior to fermentation, substantially reducing the cost of the complete processing operation.

### Biography:

Dr. Bilal Ahmad Mir has completed his PhD at the age of 28 years from CSIR-Indian Institute of Integrative Medicine, Jammu and GNDU Amritsar India and Postdoctoral Studies from Genomics Research Institute, University of Pretoria, South Africa. He is the Coordinator of Department of Botany, Satellite Campus Kargil, University



of Kashmir. Dr. Mir has many national and International awards to his credit. He has published more than 30 papers in reputed journals and has been serving as an editorial board member of repute.

### Recent Publications:

- 1- Role of plants in anticancer drug discovery
- 2- Botanical, chemical and pharmacological review of *Withania somnifera* (Indian ginseng): an ayurvedic medicinal plant
- 3- Anticancer agents from diverse natural sources
- 4- Natural products as lead compounds in drug discovery
- 5- Intraspecific variation in the internal transcribed spacer (ITS) regions of rDNA in *Withania somnifera* (Linn.) Dunal
- 6- Utility of a multidisciplinary approach for genome diagnostics of cultivated and wild germplasm resources of medicinal *Withania somnifera*, and the status of new species

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