



Dr. Asia Khatoon

Assistant Professor, IPFP

Institute of Biochemistry and Biotechnology (IBB)

University of the Punjab

Highest Qualification: Ph.D, (NIBGE), Pakistan Institute of Engineering and Applied Sciences (PIEAS) (2018)

Ph.D Thesis Title: “Development and evaluation of cotton transgenics for improved fiber traits”.

1. Selection of *expansin*, *sucrose synthase* and *aquaporin* genes based on their expression studies in cotton (*G. hirsutum*) and *C. procera*
2. Construction of cotton transformation vectors containing the *Expansin*, *Sucrose synthase* and *Aquaporin* gene cassettes.
3. Optimization of *Agrobacterium* mediated apex embryo transformation method for cotton using the constructs developed in these studies.

Research Area

Research area is Agricultural Biotechnology. Agriculture provides staple food and important cash crops. By the use of biotechnology, crops can be improved for high yield, nutritional value and water scarcity, abiotic and biotic stresses. The more focus on pulses production have to do because it provide high levels of protein, minerals, vitamins B, fibre, and low fat level. To meet the need, it is desire to import from other countries. My interest is to enhance the yield of pulses using recombinant DNA technology.

Research Experiences

1. M.Sc Research

Department of Botany, University of Agriculture, Faisalabad

Thesis Title: Effect of salinity on growth and yield of sunflower (*Helianthus annuus* L.)

2. M.Phil Research

Agricultural Biotechnology Division, NIBGE, Faisalabad

Thesis Title: Construction of *Calotropis procera* fiber cDNA library and comparison of its *Expansins* with cotton fiber *Expansin* family.

- Construction of *Calotropis procera* fiber cDNA library
- Screening and isolation of full length expansin genes from the cDNA library
- Plant expression vector construction for stable insertion of expansin genes into cotton.

Professional Research Experience

Scientific Officer, CCRI Multan (January 2001- November 2004).

- Conventional breeding for the development of new cotton lines for improvement of fiber characteristics
- Chromosomal studies on roughed plants of cotton
- Cotton tissue culture
- Maintenance of 52 species of cotton

Researcher

Worked as researcher in the MinFA project entitled, "Improvement of cotton fiber through transgenic technology" at Plant Biotechnology Division, NIBGE, Faisalabad. (June, 2007 to December 31, 2009)

- Development of cotton and *Calotropis* fiber EST's
- Screening and isolation of fiber development specific genes
- Expression profiling of *expansin* and *aquaporin* genes in cotton and *C. procera*.
- Cotton transformation with *C. procera* *expansin* and *aquaporin* genes
- Analysis of transgenes in the developing cotton calli

Research Officer

Worked as Research Officer under PARB project entitled, "Development of wheat with low phytate for increasing bioavailability of iron and zinc", at Agricultural Biotechnology Division, NIBGE, Faisalabad. This project is being

conducted with the collaboration of FCC (A chartered University), Lahore (April 2010-September 2013)

- Development of plant transformation vectors with single and double phytase gene expression cassettes
- PCR and RT-PCR for the screening of putative transgenics
- qPCR for expression analysis of transgenic lines

Patents submitted:

- 1) Aftab Bashir, **Asia Khatoon** and Muhammad Usman Aslam. (2009). *Calotropis procera PIP1* and *PIP2* genes and the coded proteins there off. Application No. 1208/2009 dated 30-12-2009.
- 2) Aftab Bashir, **Asia Khatoon** and Muhammad Chragh. (2009). *Calotropis procera TIP1* and *TIP2* genes and the coded proteins there off. Application No. 1209/2009 dated 30-12-2009.

Publications:

1. **Khatoon A.**, Hussain, M. K. and Sadiq, M. (2000). Effect of salinity on some growth parameters of cultivated sunflower under saline conditions. *International Journal of Agriculture and Biology*. 2(3):210-213.
2. **Khatoon A.**, Qureshi, M. S. and Hussain, M. K. (2000). Effect of salinity on some yield parameters of sunflower (*Helianthus annuus* L.). *International Journal of Agriculture and Biology*. 2(4):382-384.
3. Anjum, Z. I. and **Khatoon, A.** (2003). Chilling effect of germination and seedling vigor of some cultivated species of *Gossypium*. *Asian Journal of Plant Sciences*. 2(3):297-299.
4. Naseer, H.M., Iqbal, N., **Khatoon A.**, Bashir A., Zafar, Y. and Malik, K. A. (2010). Molecular characterization and transcriptome profiling of EXPANSIN genes isolated from *Calotropis procera* fibers. *Electronic Journal of Biotechnology* [online]. Vol.13 No. 5, September 15, 2010, <http://www.ejbiotechnology.cl/content/vol13/issue6/full/7/7.pdf>
5. Naseer, H. M., **Khatoon A.**, Bashir A. and Malik, K. A. (2010). Effect of different antimicrobial agents on the fiber development of *in vitro* cultured cotton ovules. *Pak. J. Bot.*, 42(2): 4235-4242.
6. Bajwa, K.S., Shahid, A.A., Rao, A.Q., Kiani, M.S., Ashraf, M.A., Dahab, A. A., Bakhsh, A., Latif, A., Azmat, M., Khan, U., Puspito, A.N., **Aftab A.**, Bashir, A. and Hussain, T. (2013). Expression of *Calotropis procera* expansin gene CpEXPA3 enhances cotton fiber strength. *Australian Journal of Crop Science*. 7(2):206-212.
7. Aslam, U., **Khatoon, A.**, Cheema, H.M.N. and Bashir, A. (2013). Identification and characterization of plasma membrane aquaporins isolated from fiber cells of *Calotropis procera*. *Journal of Zheijang University SCIENCE-B*. 14(7):586-595.
8. Bajwa, K.S., Shahid, A.A., Rao, A. Q., Bashir, A., **Aftab, A.** and Husnain, T. (2015). Stable transformation and expression of *GhEXPA8* fiber expansin gene to improve

fiber length and micronaire value in cotton. *Frontiers in Plant Science* 6(838):1-13
www.frontiersin.org/Journal/Abstract.aspx?s=1277&name=plant_biotechnology&ART_Doi=10.3389/fpls.2015.00838.

9. Bacha, S., **Khatoon, A.**, Asif, M., Yuan, J. and Bashir, A. (2015). Identification and analysis of an efficient dicot constitutive promoter from tomato. *Pak. J. Bot.*, 47(3): 1115-1120.
10. Bacha, S., **Khatoon, A.**, Asif, M., Yuan, J. and Bashir, A. (2015). Deletion analysis of Susy-SI promoter for the identification of optimal promoter sequence. *Pak. J. Bot.*, 47(4): 1287-1292.
11. Iqbal, N., **Khatoon, A.**, Asif, M. and Bashir, A. (2016). Expression analysis of fiber related genes in cotton (*Gossypium hirsutum* L.) through Real Time PCR. *Pak. J. Bot.*, 48(3): 1099-1106.
12. Masood, A., Iqbal, N., Mubeen, H., Naqvi, R.Z., **Khatoon, A.** and Bashir, A. (2016). Cloning and expression analysis of alcohol dehydrogenase (*Adh*) hybrid promoter isolated from *Zea mays*. *African J. Biotechnology*, 15(42):2384-2393.
13. Abid, N., **Khatoon, A.**, Maqbool, A., Irfan, M., Bashir, A., Asif, I., Shahid, M., Saeed, A., Brinch-Pedersen H. and Malik K.A. (2017). Transgenic expression of phytase in wheat endosperm increases bioavailability of iron and zinc in grains. *Transgenic Res.* 26:109–122.
14. Naqvi, R.Z., Asif, M., Saeed, M., Asad, S., **Khatoon, A.**, Amin, I., Mukhtar, Z., Bashir, A., and Mansoor, S. (2017). Development of a Triple Gene *Cry1Ac-Cry2Ab-EPSPS* Construct and Its Expression in *Nicotiana benthamiana* for Insect Resistance and Herbicide Tolerance in Plants. *Frontiers in Plant Sciences*, 8:1-9.
15. **Khatoon, A.**, Iqbal, N., Asif, M., Cheema M. N., Saeed, S. and Bashir, A. . (2018). Comparative analysis of fiber morphogenesis genes of *Calotropis procera* and *Gossypium hirsutum*. *Int. J. Agri. Biol.* 20(2): 288-296.