

Biographical Sketch

Madan Kumar Bhattacharyya

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<http://scholar.google.com/citations?user=ZSvP6SsAAAAJ&hl=en>

EDUCATION

1987	Ph.D., Plant Sciences	University of Western Ontario	Canada
1978	M.Sc., Olericulture	Punjab Agricultural University	India
1975	B.Sc., (Ag.)	Assam Agricultural University	India

PROFESSIONAL EXPERIENCE

2014-present	Professor	Department of Agronomy, ISU
2003-2014	Associate Professor	Department of Agronomy, ISU
2000-2003	Assistant Professor	Department of Agronomy, ISU
1997-2000	Associate Scientist	Noble Foundation
1996-2000	Adjunct Assistant Professor	Oklahoma State University
1991-1996	Assistant Scientist	Noble Foundation
1990-1991	Postdoctoral Fellow	Noble Foundation
1987-1990	Higher Scientific Officer	John Innes Institute
1983-1987	Graduate Assistant	University of Western Ontario
1980-1982	Assistant Professor	Assam Agricultural University
1978-1980	Senior Research Assistant	Assam Agricultural University

HONORS AND AWARDS

1971-1975.1	Indian Council of Agricultural Research Scholarship
1975	University Gold Medal for obtaining first position in B.Sc. (Ag.)
1975-1978	IDA Fellowship
1983-1987	Canadian Commonwealth Scholarship
1983	Ruth Horner Arnold Fellowship
2015-2018	PSI Faculty Fellow

TEACHING EXPERIENCE:

Bhattacharyya taught Plant Genetics (Agron527) and teaches Applied Molecular Genetics & Biotechnology (Agron524) courses to graduate students.

EDITORIAL BOARD MEMBER/ASSOCIATE EDITOR

- Associate Editor - BMC Plant Biology, 2009-
- Associate Editor - BMC Plant Biology, 2010-
- Editorial Board member - Molecular Biotechnology, 2008 –
- Review Editorial Board - Agricultural Biol. Chemistry, Frontiers in Chemistry, 2014 –

PANEL MEMBER

NSF Panel Member, Physiological and Structural Systems Cluster, April 30 – May 1, 2015

CURRENT GRANT AWARDS

- 2016 **Bhattacharyya M.K.** and 14 PIs. Transgenic Approaches in Managing Sudden Death Syndrome in Soybean. USDA, NIFA FY 2013 – 2018. \$5,358,680. For Bhattacharyya M.K., \$1,991,651.
- 2016 **Bhattacharyya M.K.** Predictive phenomics for developing climate resilient crop plants. PSI Faculty Fellow; PSI 2015-2016 -\$100,000.
- 2016 Baumbach J. and **Bhattacharyya M.K.** Investigation of the role of a fungal polyamine oxidase in the soybean-*F. virguliforme* interaction. AFRI-NIFA-USDA. FY2016-2017. \$79,000.

PATENT AWARDS AND INVENTIONS

Patent Award

- Bhattacharyya, M.K.** (2007) “*Rps1-k* Gene Family, Nucleotide Sequences, and Proteins.” U.S. Patent No. 7,256,323 - Issued 8/14/2007.
- Bhattacharyya, M.K.** (2010) “*Rps1-k* Nucleotide Sequence and Proteins.” Patent number 7,696,410 - Issued 4/13/2010.
- Bhattacharyya, M.K.** (2011) “Metacaspase II in Engineering Soybean for Disease Resistance.” Patent number 7,943,825 - Issued 5/17/2011.
- Bhattacharyya, M.K.**, Li, S. (2012) "Compositions and Methods for Enhancing Disease Resistance in Plants." US Patent 8,173,794 - Issued 5/8/2012.

Patent Application and Disclosures Field

- Bhattacharyya, M.K.**, and Sumit R. (2014) Identification and Application Arabidopsis Nonhost Resistance Gene(s) in Creating Disease Resistant Soybean Cultivars. U.S. Appl. No. 13/783,682 - Filed 3/4/2012.
- Bhattacharyya, M.K.** and Pudake, R. (2012) “Modification Of Plants For FvTox1-Interacting Protein Carbonic Anhydrase To Enhance Foliar SDS Disease Resistance And Improve Yield.” USSN 61/479,464 – Filled 4/27/2012.
- Bhattacharyya, M.K.**, Brar, H. (2011) “Use of plant antibodies in fighting pathogen toxin-induced plant diseases such as SDS in soybean.” USSN 61/455,686 - Filed 10/25/2011.
- Bhattacharyya, M.K.**, Xu, M. and Palmer, R. (2009) “Transposable Elements in *Glycine max* And Methods of Use." USSN 12/533,792 - Filed 7/31/2009.
- Bhattacharyya, M.K.**, (2011) Engineering Crop Species for Nematode Resistance. ISURF#03624 – Filled 04/28/2011.
- Bhattacharyya, M.K.**, Sahu, B.B. (2012) “A Soybean Promoter Induced by Pathogen Infection. ISURF#03712 –Filled 5/25/2012

Germplasm

- Cianzio, S.R., Lundeen, P., Rivera-Velez, N., Gebhart., G. K., Molen, Van Der and **Bhattacharyya, M.K.** Soybean Germplasm Line AR10SDS (formerly identified as AR03-163008) ISURF #03624.
- Cianzio, S.R., Gebhart, G., Rivera-Velez, N., Lundeen, P., and **Bhattacharyya, M.K.** Soybean Variety IAR3001 Phyto/SCN Experimental Designation A95-684043BC Rps8. ISURF # 03712.
- Cianzio, S.R., Lundeen, P., Rivera-Velez, N., Gebhart., G. K., Molen, Van Der and **Bhattacharyya, M.K.** Soybean Germplasm Line AR11SDS/SCN ISURF (number to be assigned)

PUBLICATIONS (<http://scholar.google.com/citations?user=ZSvP6SsAAAAJ&hl=en>)***Published Peer Reviewed Articles*** (* indicates corresponding authors; selected publications)

- Baumbach, J., Pudake R.N., Johnson, C., Ollhoff, A., Palmer, R.G., **Bhattacharyya, M.K.*** and Sandhu, D.* (2016) Transposon tagging of a male-sterility, female-sterility gene, *St8*, revealed that the meiotic MER3 DNA helicase activity is essential for fertility in soybean. *Plant Science*, *in press*.
- Liu, M., Li, S., Swaminathan, S., Sahu, B.B., Leandro, L.F., Cardinal, A.J., **Bhattacharyya, M.K.**, Song, Q., Walker, D.R.,* and Cianzio, S.R.* (2016) Identification of a soybean rust resistance gene in PI 567104B. *Theor. Appl. Genet.*, *in press*.
- Abeyssekara, N., Matthiesen, R.L., Cianzio, S., **Bhattacharyya, M.K.**, and Robertson, A.E.* (2016) Novel sources of partial resistance against *Phytophthora sojae* in PI 399036. *Crop Science*, *in press*.
- Zhang, B., Wang, B., Morales, A.W., Scudder, J., **Bhattacharyya, M.K.**, and Ye, J.Y.*, (2016) Study of the interactions of *Fusarium virguliforme* toxin FvTox1 with synthetic peptides by molecular simulations and a label-free biosensor. *Analytical Chemistry*, *in press*.
- Abeyssekara, N.S., Desai, N., Guo, L., and **Bhattacharyya, M.K.*** (2016) The Plant immunity inducer pipelicolic acid accumulates in the xylem sap and leaves of soybean seedlings following *Fusarium virguliforme* infection. *Plant Science* 243:105–114.
- Swaminathan, S., Abeyssekara N.S., Liu, M, Cianzio, C.R. and **Bhattacharyya, M.K.*** (2015) Quantitative trait loci underlying host responses of soybean to *Fusarium virguliforme* toxins that cause foliar sudden death syndrome. *Theor. Appl. Genet.*, <http://link.springer.com/article/10.1007%2Fs00122-015-2643-5>
- Wang, B., Zhang, B, Ye, J.Y., and **Bhattacharyya, M.K.*** (2015) Identification of *Fusarium virguliforme* FvTox1-interacting synthetic peptides for enhancing foliar sudden death syndrome resistance in soybean. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0145156>.
- Abeyssekara, N.S., and **Bhattacharyya, M.K.*** (2014) Analyses of the xylem sap proteomes identified candidate *Fusarium virguliforme* proteinacious toxins. *PLoS One*. 9:e93667. doi: 10.1371/journal.pone.0093667.
- Srivastava, S.K., Brar, H.K., Fakhoury, A.M., Bluhm, B.H., Huang, X., and **Bhattacharyya, M.K.*** (2014) The genome sequence of the fungal pathogen *Fusarium virguliforme* that causes sudden death syndrome in soybean. *PLoS One* 9:e81832. doi: 10.1371/journal.pone.0081832.
- Hughes, T.J.*, O'Donnell, K., Rooney, A.P., Sink, S., Scandiani, M.M., Luque, A., **Bhattacharyya, M.K.**, and Huang, X. (2014) Genetic architecture and evolution of the mating type locus in fusaria that cause soybean sudden death syndrome and bean root rot. *Mycologia*, 106:686-697.
- Pudake, R.N., Sahu, B.B., Swaminathan, S., Leandro, L.F., and **Bhattacharyya, M.K.*** (2013) Investigation of the *Fusarium virguliforme* *fvtox1* mutants revealed that the FvTox1 toxin is involved in foliar sudden death syndrome development in soybean. *Current Genetics* DOI 10.1007/s00294-013-0392-z.

- Geiser, D.M.*, Aoki, T., Bacon, C.W., Baker, S.E., **Bhattacharyya, M.K.** et al. (2012) One Fungus, One Name: Defining the genus *Fusarium* in a scientifically robust way that preserves longstanding use. *Phytopathology*, <http://dx.doi.org/10.1094/PHYTO-07-12-0150-LE>.
- Sumit, R., Sahu, B.B., Xu, M., Sandhu, D., and **Bhattacharyya, M.K.*** (2012) Arabidopsis nonhost resistance gene *PSSI* confers immunity against an oomycete and a fungal pathogen but not a bacterial pathogen that cause diseases in soybean. *BMC Plant Biology*, 12:62. **(Highly Accessed)**
- Brar, H.K. and **Bhattacharyya, M.K.*** (2012) Expression of a single-chain variable-fragment antibody against a *Fusarium virguliforme* toxin peptide enhances tolerance to sudden death syndrome in transgenic soybean plants. *Mol Plant Microbe Interact.* 25:817-824. **(Front Cover Article)**
- Sahu, B.B., Sumit, R., and **Bhattacharyya, M.K.*** (2012) Sequence based polymorphic (SBP) marker technology for targeted genomic regions: its application in generating a molecular map of the *Arabidopsis thaliana* genome. *BMC Genomics*, 13:20 doi:10.1186/1471-2164-13-20. **(Highly Accessed)**
- Yang, H., Qiao, X., **Bhattacharyya, M.K.**, and Dong, L.* (2011) Microfluidic droplet encapsulation of highly motile single zoospores for phenotypic screening of an antioomycete chemical. *Biomicrofluidics*, 5: 044103.
- Brar H.K., Swaminathan S., and **Bhattacharyya M.K.*** (2011) The *Fusarium virguliforme* toxin FvTox1 causes foliar sudden death syndrome-like symptoms in soybean. *Mol. Plant-Microbe Interact.*, 24: 1179-1188.
- Schmutz, J., Cannon, S.B., Schlueter, J., Ma, J., Hyten, D., Song, Q., Mitros, T., Nelson, W., May, G.D., Gill, N., Peto, M., Goodstein, D., Thelen, J.J., Cheng, J., Sakurai, T., Umezawa, T., Du, J., **Bhattacharyya, M.K.**, Sandhu, D., Grant, D., Joshi, T., Libault, M., Zhang, X-C., Xu, D., Futrell-Griggs, M., Abernathy, B., Hellsten, U., Berry, K., Grimwood, J., Wing, R.A., Cregan, P., Stacey, G., Specht, J., Rokhsar, D. Shoemaker, R.C, and Jackson S.A.* (2010) Genome sequence of the paleopolyploid soybean (*Glycine max* (L.) Merr.). *Nature*, 463:178-83.
- Xu, M., Brar, H., Grosic, S., Palmer, R., and **Bhattacharyya, M.K.*** (2010) Excision of an active CACTA-like transposable element from *DFR2* led to variegated flowers in soybean. *Genetics*, 184:53-63.
- Sandhu, D., Tasma, M.I., Frasch, R. and **Bhattacharyya, M.K.*** (2009) Systemic Acquired Resistance in Soybean is regulated by Two Proteins, Orthologous to Arabidopsis NPR1-*Phytophthora sojae* interaction. *BMC Plant Biology*, 9:105. **(Highly Accessed)**
- Tasma, I.M., Brendel, V., Whitham S.A., and **Bhattacharyya, M.K.*** (2008) Expression and Evolution of the Phosphoinositide-specific Phospholipase C Gene Family in *Arabidopsis thaliana*. *Plant Physiology and Biochemistry* 46:627-637.
- Gao, H., and **Bhattacharyya M.K.*** (2008) The soybean-Phytophthora resistance locus Rps1-k encompasses coiled coil-nucleotide binding-leucine rich repeat-like genes and repetitive sequences. *BMC Plant Biol.* 8:29.
- Ji, J., Scott, M.P., and **Bhattacharyya, M.K.*** (2006) Light is essential for degradation of ribulose-1,5-biphosphate carboxylase-oxygenase large subunit during sudden death syndrome development in soybean. *Plant Biology* 8:597-605.
- Gao, H., Narayanan, N., Ellison, L., and **Bhattacharyya, M.K.*** (2005) Two classes of highly similar coiled coil-nucleotide binding-leucine rich repeat genes isolated from the *Rps1-k*

- locus encode *Phytophthora* resistance in soybean. *Mol. Plant-Microbe Interact.* 18:1035-1045. **(Front Cover Article)**
- Sandhu, D., Gao, H., Cianzio, S., and **Bhattacharyya, M.K.*** (2004) Deletion of a disease resistance nucleotide-binding-site leucine-rich-repeat-like sequence is associated with the loss of the *Phytophthora* resistance gene *Rps4* in soybean. *Genetics* 168:2157-167.
- Kasuga, T., Salimath, S.S., Shi, J., Gijzen, M., Buzzell, R., and **Bhattacharyya, M.K.*** (1997) High resolution genetic and physical mapping of molecular markers linked to the *Phytophthora* resistance gene *Rps1-k* in soybean. *Mol. Plant-Microbe Interact.* 10:1035-1044. **(Front Cover)**
- Shi, J., Dixon, R.A., Gonzales, R.A., Kjellbom, P., and **Bhattacharyya, M.K.*** (1995) Identification of cDNA clones encoding valosin-containing protein and other plant plasma membrane-associated proteins by a general immunoscreening strategy. *Proc. Natl. Acad. Sci. USA* 92:4457-4461.
- Shi, J., Gonzales, R.A., and **Bhattacharyya, M.K.*** (1995) Characterization of a plasma membrane associated phosphoinositide-specific phospholipase C from soybean. *Plant J.* 8:381-390. **(Front Cover Article)**
- Bhattacharyya, M.K.***, Stermer, B.A., and Dixon, R.A. (1994) Reduced variation in transgene expression from a binary vector with selectable markers at the right and left T-DNA borders. *Plant J.* 6:957-968.
- Bhattacharyya, M.K.**, Smith, A.M., Noel Ellis, T.H., Hedley, C., and Martin, C. (1990) The wrinkled-seed character of pea described by Mendel is caused by a transposon-like insertion in a gene encoding starch-branching enzyme. *Cell* 6:115-122. **(Front Cover Article)**

INTERNATIONAL INVITED PRESENTATIONS (from 2013)

- Bhattacharyya, M.K. (2016) The *Tgm9*-induced indexed insertional mutant collection to conduct community-based reverse genetic studies in soybean. Plant & Animal Genome XXIV, Town & Country Convention Center, San Diego, CA, January 9-13, 2016.
- Bhattacharyya, M.K. (2016) Identification of defense-related proteins in the root necrotic mutant *rn1* in soybean. Plant & Animal Genome XXIV, Town & Country Convention Center, San Diego, CA, January 9-13, 2016.
- Bhattacharyya, M.K. (2015) Transgenic approaches in managing diseases in soybean. Agri-Biotechnology Summit, Hyderabad, India, October 19-21, 2015.
- Bhattacharyya, M.K. (2015) Transgenic approaches in managing diseases in soybean. 2nd International Conference on Frontiers in Biological Sciences (InCoFIBS-2015), 22-24 January, 2015, Rourkela, Odisha, India.
- Bhattacharyya, M.K. (2015) "Arabidopsis nonhost resistance for enhancing disease resistance in soybean." Plant Interactions with Pests and Pathogens Workshop. Plant & Animal Genome XXIII, Town & Country Convention Center, San Diego, CA, January 10-14, 2015.
- Bhattacharyya, M.K. (2014) Novel management approaches: managing diseases in soybean. SOYCON-2014 International Soybean Research Conference. Indore, India, 22-24 February, 2014.
- Bhattacharyya, M.K. (2014) Novel management approaches: managing diseases in soybean. IIT, Guwahati, February 17, 2014.
- Bhattacharyya, M.K. (2014) Molecular characterization of a mutant soybean population induced by an endogenous transposable element, *Tgm9*. The International Plant & Animal Genome XVII Conference, Town & Country Convention Center, San Diego, CA, **January 11, 2014.**
- Bhattacharyya, M.K. (2013) "Fvtox1 is a major virulence factor that causes foliar sudden death

syndrome in soybean.” BIT’s 3rd Annual World Congress of Agriculture-2013. Hangzhou, China, September 23-25, 2013.

Bhattacharyya, M.K. (2013) “Arabidopsis nonhost disease resistance for improving disease resistance in soybean.” Lilongwe University, Lilongwe, Malawi, Africa, July 1, 2013.

Bhattacharyya, M.K. (2013) “The role of a proteinacious toxin in developing the sudden death syndrome disease in soybean.” Chitedze Research Station, Lilongwe, Malawi, Africa, June 28, 2013.

Bhattacharyya, M.K. (2013) The Arabidopsis thaliana *PSSI* Gene Confers Nonhost Resistance Against two Soybean Pathogens, *Phytophthora sojae* and *Fusarium viguliforme*. The First International American Moroccan Agricultural Sciences Conference. Rabat, Morocco. March 18 – 19, 2013.