

Curriculum Vitae

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Nationality: Indian

Immigration Status: American citizen since October 23rd, 2015

EDUCATION

- Ph.D. (Botany) †, University of Pune, India, 2007.
- M.S. ‡ (Agricultural Biotechnology), Assam Agricultural University, Jorhat, India, 1993.
- B.S. (Agriculture), Assam Agricultural University, Jorhat, Assam, India, 1991.

†**Thesis:** Study of inheritance and identification of molecular markers for β -carotene content in durum wheat.

‡**Dissertation title:** Characterization of plasmids from herbicide tolerant cyanobacteria.

EMPLOYMENT HISTORY

- Post-Doctoral Research Associate, Department of Soil and Crop Sciences, Colorado State University (Wheat Breeding and Genetics group of Dr. Scott Haley): 06/2012 to current. Production of double haploid plants for the wheat breeding program using wheat-maize wide hybridization.
- Post-Doctoral Research Associate, Department of Horticulture and Landscape Architecture, Colorado State University (Cancer Prevention Laboratory under Dr. Henry Thompson): 06/2010 to 06/2012. Metabolomic data analysis and growing wild wheat germplasm for cancer prevention studies in Cancer Prevention Laboratory.
- Research Assistant, Department of Soil and Crop Sciences, Colorado State University (Wheat Breeding and Genetics group of Dr. Scott Haley): 11/2009 to 05/2010. Planting, crossing wheat and harvesting seeds.
- Research Assistant, University of Nebraska Lincoln, Panhandle Research and Extension Center, Scottsbluff (wheat variety testing and genetics unit of Drs. Drew Lyon and Dipak K. Santra): 03/2009 to 10/2009. Setting up a new genetics and breeding laboratory (file management of chemical inventory, MSDS, and lab materials etc.); setting up microspore culture technique for DH production in wheat; taking care of plants in greenhouse, data collection in field.
- Post-Doctoral Research Associate and Lab Director, Department of Crop and Soil Sciences, Washington State University, Pullman, WA: 09/2007 to 02/2009.
- Establishing doubled haploid technology through microspore culture in wheat to generate

breeding lines and mapping populations; mapping *Rhizoctonia* root rot disease resistance genes in wheat using a doubled haploid population; DNA extraction; PCR based DNA markers analysis; extensive greenhouse and growth chamber experiments (disease resistance assays, etc).

- Associate in Research, Department of Crop and Soil Sciences, Washington State University, Pullman, WA: 01/2004 to 08/2007.
- Research Associate II, Department of Agronomy, Iowa State University, Ames, IA: 04/2001 to 11/2002. Genome mapping of important agronomical traits in alfalfa, including genotyping of mapping populations using RFLP and AFLP markers.
- Ph. D. Student, Department of Genetics, Agharkar Research Institute, Pune, India: 02/1995 to 10/2000. Worked on wheat breeding, inheritance of β -carotene, identification and mapping of QTLs for β -carotene in durum wheat using DNA markers.
- Project Assistant, Department of Plant Sciences, Regional Research Laboratory, Jorhat, Assam, India: 12/1993 to 01/1995. Worked on biological control of rice diseases.

PUBLICATIONS

Recently submitted:

1. Meenakshi Santra^{*}, Hong Wang, Scott Seifert and Scott Haley (2015, October) Doubled haploid laboratory protocol for wheat using wheat-maize wide hybridization (Haley (a book chapter submitted to www.springer.com).

Published:

2. **R. Khound**, M. Santra, P.S. Baenziger, D.K. Santra (2013). Effect of Cold-Mediated Pretreatment on Microspore Culture in Winter and Spring Wheat. *American J. of Plant Sciences*. 4: 2259-2264
3. **Santra M.**, S. B. Matthews, and H. J. Thompson. (2013). Development of a core collection of *Triticum* and *Aegilops* species for improvement of wheat for activity against chronic diseases. *Agriculture & Food Security* 2013, 2:4
4. Matthews S.B., **M Santra***, M. M. Mensack*, P. Wolfe, P. F Byrne, and H. J. Thompson. (2012). Metabolomic Characterization of A Diverse Collection of Wheat Lines using High Performance Liquid Chromatography Coupled with Time-Of-Flight Mass Spectroscopy. *PLOS ONE*. www.plosone.org. August 2012 Volume 7, Issue 8 | e44179. *Equal authorship.

5. Das B.K., **M. Santra**, A. Hazen, P. S. Baenziger, and **D. K. Santra** (2012). Microspore culture for production of doubled haploid (DH) plants of Nebraskan winter wheat (*Triticum aestivum* L.) cultivars. Annual Wheat Newsletter. 58:242-244.
6. **Santra M.**, N. Ankrah, D.K. Santra and K. K. Kidwell (2012) An improvement of wheat microspore culture technique for the production of doubled haploid plants. Crop Sci. 52:2314–2320.
7. Santra D. K., **M. Santra**, R. E. Allan, and K. K. Kidwell (2009). *Vrn-1* allele composition of spring wheat germplasm from the US Pacific Northwest based on genetic segregation and DNA marker analyses. Plant Breeding 128(6):576-584.
8. Santra D. K., **M. Santra**, X. Chen, K.G. Campbell and K.K. Kidwell. (2008). Mapping QTL for high temperature, adult plant resistance to stripe rusts in wheat (*Triticum aestivum* L.). Theor. Appl. Genet. 117:793-802.
9. **Santra M**, V.S. Rao, and S.A. Tamhankar (2006). Biochemical estimation of beta carotene in Indian Durum varieties . Wheat Inf. Serv. 102, 2006. www.shigen.nig.ac.jp/ewis.
10. **Santra M.**, D. K. Santra, V. S. Rao, S.P. Taware, and S.A. Tamhankar (2005). Inheritance of β -carotene concentration in durum wheat (*Triticum turgidum* ssp. *durum*). Euphytica 144:215-221.
11. **Santra M.**, V.S. Rao, and S.A. Tamhankar (2003). Modification of AACC procedure for measuring β -carotene in early generation durum wheat. Cereal Chem. 80: 130-131.

POSTER PRESENTATIONS

1. Shawna B. M., M. Santra, W. Jiang, Z. Zhu, H. J. Thompson. (2012). Identification of anti-cancer activity in structural components of ancestral wheat. Poster presentation In “American Association for Cancer Research annual meeting.” Chicago, IL, March 31-April 4, 2012.
2. Das B. K., **M. Santra**, A. Hazen, P. S. Baenziger, and **D. K. Santra**. (2012). Androgenic response of Nebraskan winter wheat (*Triticum aestivum* L.) varieties to isolated microspore culture for doubled haploid (DH) plant production. The 22nd International Triticeae Mapping Initiative Workshop & 4th National Wheat Genomics Committee Joint Workshop. Fargo, ND. June 25-29, 2012.
3. Das B. K., **M. Santra**, A. Hazen, P. S. Baenziger, D. K. Santra. 2012. Double Haploids in Marker-Assisted Gene Introgression in Wheat (*Triticum aestivum* L. Poster presentation In International Plant and Animal Genome Conference, January 14-18, 2012, San Diego, CA.
4. Harvey S.L., **M, Santra**, P. S. Baenziger, and D. K. Santra. 2010. Establishment of double haploid production technique using microspore culture for US Midwest wheat varieties. Poster presentation In “Joint Congress: Hard Winter Wheat Workers Workshop and National Wheat Genomic Workshop.” Lincoln, NE, March 7-10, 2010.
5. **M. Santra**, N. Ankrah, K. K. Kidwell and D. Von Wettstein. A high efficiency microspore culture technique for producing double haploid wheat plants. A poster presented to International Plant and Animal Genome Conference, January 11-15, 2008, San Diego, CA.
6. **M. Santra**, V. DeMacon, D. K. Santra, C. Steber, P. Okubara, K. Garland-Campbell and K. K. Kidwell. 2008. Genetic characterization of Rhizoctonia root rot resistance

- developed through EMS mutation breeding in wheat (*Triticum aestivum* L.). Agronomy Abstracts. American Society of Agronomy, Madison, WI.
7. Santra, D. K., **M. Santra**, V. DeMacon, G. Shelton, A. Carter and K. Kidwell, 2008. Application of Biotechnology to Spring Wheat Variety Improvement. In Burns, J. (ed.), Field Day at Lind, Cooperative Extension, Washington State University, Department of Crop and Soil Sciences, Technical Report.
 8. Santra, D.K., **M. Santra**, C. Uauy, X. Chen, K.G. Campbell, J. Dubcovsky and K.K. Kidwell. 2007. Identification and mapping QTL for high-temperature adult-plant resistance to stripe rust in wheat (*Triticum aestivum* L.). Agronomy Abstracts. American Society of Agronomy, Madison, WI.
 9. **Santra M.**, N. Ankrah, K.K. Kidwell and D. Von Wettstein. A poster presentation on “Microspore culture method for double haploid wheat production”. Field day poster presentation, July 12, 2007. Dept. of Crop and Soil Sciences, Washington State University.
 10. Santra D. K., **M. Santra**, V. DeMacon, G. Shelton, A. Carter and K. Kidwell 2007. Application of Biotechnology to Spring Wheat Variety Improvement. p. 21. In Burns, J. (ed.), Field Day Abstracts: Highlights of Research Progress “Novel Solutions to Traditional Problems”. Cooperative Extension, Washington State University, Department of Crop and Soil Sciences, Technical Report 07-1.
 11. Santra D. K., **M. Santra**, C. Uauy, C. Watt, K. K. Kidwell, X. Chen, J. Dubcovsky, and K. Garland-Campbell. Mapping QTL for High Temperature Adult Plant Resistance to Stripe Rust in Wheat (*Triticum aestivum* L.). Poster presented in The ASA-CSSA-SSSA International Annual Meetings (November 6-10, 2005) Salt Lake City, UT.
 12. Santra D. K., M. McClendon, **M. Santra**, V. DeMacon, G. Shelton and K. Kidwell. 2006. Application of biotechnology to spring wheat variety improvement. In Burns, J. (ed.), “Field Day Abstracts: Highlights of Research Progress”. Cooperative Extension, Washington State University, Department of Crop and Soil Sciences.
 13. Robins, J. G., D. Luth, **M. Santra**, B. Alarcon-Zuniga, H. Riday, and E. C. Brummer. Construction of a genetic map of an intersubspecific cross between *Medicago sativa* subsp. *sativa* and *Medicago sativa* subsp. *falcata*. Poster presented in International Plant and Animal Genome Conference, January 11-15, 2003, San Diego, CA.
 14. Robins, J.G., **M. Santra**, D. Luth, T.A. Campbell, and E.C. Brummer. 2003. Mapping SSRs in tetraploid alfalfa. Agron. Abstr. ASA, Madison, WI.
 15. Brummer E. C., Luth D., Robins J. G., **Santra M.**, Alarcon-Zuniga B., and Riday H. Genetic dissection of biomass production and winter hardiness in alfalfa. Poster presented in International Plant and Animal Genome Conference, January 12-16, 2002, San Diego, CA.
 16. M.D. Oak, **M. Santra**, S. A. Tamhankar, V. S. Rao and S. B. Bhosle. Effect of HMW and LMW subunits of glutenin on gluten strength in F5 recombinant inbred lines (RILs) from durum wheat cross. Poster presented in 2nd international group meeting on “wheat technologies for warmer areas. September 23-26, 2002. Agharkar Research Institute, Pune, India
 17. R.M. Patil, **M. Santra**, M. D. Oak, S. A. Tamhankar and V. S. Rao. Gluten strength in durum wheat: Heritability and molecular marker analysis. Poster presented in 2nd international group meeting on “wheat technologies for warmer areas. September 23-26, 2002. Agharkar Research Institute, Pune, India.

18. **Santra M.**, Tamhankar S.A., Deogaonkar A.M., Rao V.S., Gupta V.S. and Ranjekar P.K. Identification of molecular markers associated with beta-carotene content and grain weight in durum wheat. Proceeding of 6th International wheat conference, page 151, June 5-9 2000, Budapest, Hungary.

PROFESSIONAL EXPERTISE

- **Plant Tissue Culture:** Doubled haploid production in wheat using wheat-maize wide hybridization and microspore culture. I proudly claim the credit of setting up the double haploid laboratory at Colorado State University for wheat breeding program. I modified the protocol such a way that we can produce more than 3000 DH per year for our breeding program and our chromosome doubling efficiency is 60- 90 % compared to any other wheat double haploid laboratory in USA. Recently I got an invitation to write a book chapter on this protocol from www.springer.com.
- **Plant breeding:** Design of experiments and basic plant hybridization techniques.
- **Genomics:** Isolation of DNA from plant, bacteria, fungus, Southern blotting and hybridization, PCR, PCR cloning, and other techniques necessary for genetic engineering, genome mapping, gene tagging; different molecular marker systems viz. RFLP, AFLP, RAPD, STMS, ISSR; genetic data analysis, quantitative trait data analysis, QTL Mapping.
- **Microbiology:** Worked with bacteria, fungus, and purification of bacterial and fungal culture.
- **Bioinformatic software:** Handling software useful in genome analysis, QTL mapping, viz. Mapmaker, Q Gene, AFLP-Quantar (Licor), Gene Image, DNA and Protein sequence alignment program, Blast and Microarray, winRhizo software for root analysis, Pathway studio, and markerlynx.
- **Statistical Software:** SAS 9.1 program, Minitab, R software (beginner level), JMP, graphpad prism, Systat and SIMCA (soft independent modeling of class analogy).
- **Laboratory management:** I have trained seven students and one research associate about double haploid technology in wheat so far during 06/2012 to current year.

ADVANCED TRAINING

- **STAT 520-**Statistical analysis of qualitative data (3 credits) fall semester 2008, Washington State University (WSU), Pullman, WA.
- **STAT 530-**Applied Linear model (3 credits). SAS programming and use of Minitab. Spring semester 2008, WSU, Pullman, WA.
- **Microspore culture training:** Learning the techniques of microspore culture of wheat, maize, and Canola at University of Guelph, Ontario, Canada. July-August, 2006.
- **MBIOS 478/578-**Bioinformatics (3 credits). Fall semester 2006, WSU, Pullman, WA.
- **STAT 512-**Principles of experimental design and SAS programming (3 credits). Fall semester 2005, WSU, Pullman, WA.
- **Metabolomics:** Metabolomic data analysis at CPL, CSU.