

## Curriculum Vitae



### Prasanta K. Subudhi

Associate Professor  
Coastal Plant Genetics

#### ADDRESS

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#### EDUCATION

Ph.D. (Genetics), Indian Agricultural Research Institute  
M.Sc. (Plant Breeding & Genetics), Orissa University of Agriculture & Technology  
B.Sc. (Agriculture), Orissa University of Agriculture & Technology

#### RESEARCH INTEREST

- Application of classical and molecular breeding & genetics for marsh plant improvement
- Analysis of complex traits specifically abiotic stress tolerance, seed dormancy, seed shattering using genomics techniques

#### RESEARCH PROJECTS

- HATCH RESEARCH PROJECT: Genetic improvement of native plant species for coastal restoration in Louisiana
- USDA-CSREES (Special Grant): Biological Approaches to Coastal Wetlands Restoration
- CREST (Coastal Restoration and Enhancement through Science and Technology): Field evaluation and selection of improved California bulrush (*Schoenoplectus californicus*) and sea oats (*Uniola paniculata*) populations for coastal restoration
- USDA-NRI-CGP: Marker-aided development and characterization of an introgression library to discover alleles for weediness: red rice as a model system
- CREST (Coastal Restoration and Enhancement through Science and Technology): Micropropagation and genetic characterization of sea oats (*Uniola paniculata*) to accelerate restoration effort

#### ACADEMIC EXPERIENCE:

- Associate Professor- Louisiana State University Agricultural Center, Baton Rouge, Louisiana, 2007 - present
- Assistant Professor-Research, Louisiana State University Agricultural Center, Baton Rouge, Louisiana, 2001 - 2007
- Post Doctoral Research Associate, Texas Tech University, Lubbock, Texas, 1996-2000
- Project Scientist, International Rice Research Institute, Philippines, 1994-1996
- Assistant Professor, Orissa University of Agriculture and Technology, India, 1991-1994

## PROFESSIONAL AND SCHOLARLY ORGANIZATIONS

Life member of Rice Genetics Cooperative (RGC), IRRI, Manila, Philippines  
Life member of Association for the promotion of DNA Fingerprinting and other DNA Technologies  
Crop Science Society of America  
American Society of Agronomy  
Sigma Xi Society  
Louisiana Association of Agronomists  
Who's Who in Agriculture Higher Education (WWAHE)

## HONORS AND AWARDS

Rockefeller Foundation rice biotechnology fellowship  
Indian Council of Agricultural Research (ICAR) Senior Research Fellowship  
Indian Council of Agricultural Research (ICAR) Junior Research Fellowship  
National Scholarship of the Government of India  
University gold medals and Shyamananda memorial gold medal for securing 1st position in 1<sup>st</sup> class in both B. Sc. and M. Sc.  
Sibananda Panda memorial gold medal for being the best student in Ag. Economics in B.Sc.  
V.S. Tilak memorial and Bajamani prize for securing highest aggregate marks in Plant Breeding, Genetics, Plant Physiology, and Agronomy courses in B.Sc.

## RESEARCH ACTIVITIES

Authored and coauthored over 40 scientific papers and book chapters. I am currently engaged in research activity that aims at development of improved plant materials in several grass species for coastal restoration using classical breeding, molecular genetics, and genomics technologies. Some significant accomplishments of my laboratory includes complete understanding of reproductive biology, germplasm characterization, salinity stress induced gene expression in smooth cordgrass (*Spartina alterniflora*), first molecular characterization of sea oats (*Uniola paniculata*) accessions of the United States. Ongoing research includes analysis of complex biological traits notably, abiotic stress tolerance in *Spartina alterniflora*, micropropagation and field evaluation of sea oats germplasm. I am also engaged in understanding the molecular basis of weedy attributes such as seed dormancy and shattering in rice model.

As a faculty member of the LSU Graduate School, I am also actively engaged in supervising graduate students. Before joining the LSU AgCenter, I have extensively researched on two model grass species, sorghum and rice. At the International Rice Research Institute, Manila, Philippines, I researched on genetic and physical mapping, DNA fingerprinting, and marker-assisted selection of agronomically important genes to improve rice productivity. Most notable accomplishments are first AFLP linkage map in rice, mapping and marker-assisted selection tool for two thermosensitive genetic male sterility genes, QTL analysis of submergence tolerance, DNA fingerprinting of cytoplasmic genetic male sterile lines, development of a simple and quick DNA isolation (miniscale) protocol, and successful marker-assisted introgression of Tungro virus and BPH (brown plant hopper) resistance to new plant type of rice. The research conducted in sorghum biotechnology at Texas Tech University resulted in identification of several quantitative loci for 'stay green', which is considered an important component trait for post-flowering drought tolerance. Near-isogenic lines for those QTL were developed to pursue physical mapping and map-based cloning.

## LIST of PUBLICATIONS

### 2007

- Kang, M.S., P.K. Subudhi, N. Baisakh, and P.M. Priyadarshan. 2007. Crop Breeding Methodologies: Classic and Modern. *In: Breeding Food Staples*, M.S. Kang and P.M. Priyadarshan (ed.), Blackwell Publishing (in Press).
- Ryan, A.B., B.C. Venuto, P.K. Subudhi, S.A. Harrison, R.A. Shadow, X. Fang, M. Materne, and H. Utomo. 2007. Identification and Genetic Characterization of Smooth Cordgrass for Coastal Wetland Restoration. *J of Aquatic Plant Management* (in press).
- Harris, K., P.K. Subudhi, A. Borrell, D. Jordan, D., D. Rosenow, H. Nguyen, P. Klein, R. Klein, and J. Mullet. 2007. Sorghum stay-green QTL individually reduce post-flowering drought-induced leaf senescence. *J. Exp. Bot.* 58:327-338.
- Harrison, S.A., N. Baisakh, M.D. Materne, C. Knott, P. K. Subudhi, and H. Utomo. 2007. Breeding native coastal plants for use in coastal wetland reclamation and preservation. *Louisiana Agriculture* 50 (2):18-19.
- Subudhi, P.K., N. Baisakh, D.M. Sahoo, S.A. Harrison, M.D. Materne, and H. Utomo. 2007. Sea oats: micropropagation aids in coastal restoration. *Louisiana Agriculture* 50 (2):20.
- Subudhi, P.K., N. Baisakh, S.A. Harrison, M.D. Materne, and H. Utomo. 2007. Plant genetic diversity: Essential for a dynamic Louisiana coast. *Louisiana Agriculture* 50 (2):21.
- Utomo, H.S., M.D. Materne, S.A. Harrison, P. K. Subudhi, N. Baisakh. 2007. Improved marsh plants and seed-based propagation. *Louisiana Agriculture* 50 (2):22-23.

### 2006

- Subudhi, P.K., T. Sasaki, and G.S. Khush. 2006. Rice. *In: Genome Mapping & Molecular Breeding in Plants*, pp 1-78, C.R. Kole (ed.), Springer-Verlag GMBH, Tiergartenstr. 17, 69121 Heidelberg, Germany.
- Baisakh, N., P.K. Subudhi, and N.P. Parami. 2006. cDNA-AFLP analysis reveals differential gene expression in response to salinity in a halophyte *Spartina alterniflora* Loisel. *Plant Science* 170:1141-1149.

### 2005

- Subudhi, P.K., N.P. Parami, S.A. Harrison, M.D. Materne, J.P. Murphy, and D. Nash. 2005. An AFLP-based genetic survey of sea oats (*Uniola paniculata*) accessions of the United States. *Theor. Appl. Genet.* 111: 1632-1641.

### 2004

- Fang, X., P.K. Subudhi, B.C. Venuto, and S.A. Harrison. 2004. Mode of pollination, pollen germination, and seed set in smooth cordgrass (*Spartina alterniflora*, Poaceae). *Intl. J. Plant Sci.* 165(3):395-401.
- Fang, X., P.K. Subudhi, S.A. Harrison, B.C. Venuto, and A. Ryan. 2004. Influence of flowering phenology on seed production in smooth cordgrass (*Spartina alterniflora* Loisel.). *Aquatic Bot.* 80:139-151.
- Subudhi, P.K. and H.T. Nguyen. 2004. Genome mapping and genomic strategies for crop improvement. pp 403-451. *In: Physiology and Biotechnology Integration for Plant Breeding*, Henry T. Nguyen and Abraham Blum (eds.), Marcel Dekker, Inc., New York.
- Pathan M.S., P.K. Subudhi, B. Courtois and H.T. Nguyen. 2004. Molecular dissection of abiotic stress tolerance in sorghum and rice: A case study, pp 525-569. *In: Physiology and Biotechnology Integration for Plant Breeding*, Henry T. Nguyen and Abraham Blum (eds.), Marcel Dekker, Inc., New York.

### 2003

- Subudhi, P.K., N. Parami, A. Ryan, and S. Harrison. 2003. Rescuing the coast with biotechnology. *Louisiana Agriculture* 46 (4):42-44.

### 2002

- Sanchez, A.C., P.K. Subudhi, D.T. Rosenow, H.T. Nguyen. 2002. Mapping QTLs associated with drought resistance in sorghum (*Sorghum bicolor* L. Moench). *Plant Mol. Biol.* 48(5):713-726.
- Subudhi, P.K., H.T. Nguyen, M.L. Gilbert, and D.T. Rosenow. 2002. Sorghum Improvement: past achievements and future prospects, pp 109-159. *In: Crop improvement, Challenges in the twenty-first century*, M.S. Kang (ed.), Food Products Press, 10 Alice Street, Binghamton, New York.

## 2001

- Kebede, H., P.K. Subudhi, D.T. Rosenow, and H.T. Nguyen. 2001. Quantitative trait loci influencing drought tolerance in sorghum (*Sorghum bicolor* L. Moench). *Theor. Appl. Genet.* 103:266-276.
- Harrison, S.A., T.P. Croughan, M.D. Materne, B.C. Venuto, G.A. Breitenbeck, M.A. Cohn, X. Fang, A. Ryan, R.W. Schneider, R.A. Shadow, P. Subudhi, and H. Utomo. 2001. Improving native plants to protect and preserve Louisiana's coastal marshes. *Louisiana Agriculture* 44 (3):4-6.

## 2000

- Dong, N.V., P.K. Subudhi, P.N. Luong, V.D. Quang, T.D. Quy, H.G. Zheng, B. Wang, and H.T. Nguyen. 2000. Molecular mapping of a rice thermosensitive genetic male sterility gene using AFLP, RFLP and SSR techniques. *Theor. Appl. Genet.* 100:727-734.
- Subudhi, P.K. and H.T. Nguyen. 2000. Linkage group alignment of sorghum RFLP maps using a RIL mapping population. *Genome* 43:240-249.
- Xu, W., P.K. Subudhi, O.R. Crasta, D.T. Rosenow, J.E. Mullet, and H.T. Nguyen. 2000. Molecular mapping of QTLs conferring stay-green in grain sorghum. *Genome* 43:461-469.
- Subudhi, P.K., D.T. Rosenow, and H. T. Nguyen. 2000. Quantitative trait loci for the stay-green trait in sorghum (*Sorghum bicolor* L. Moench): consistency across genetic backgrounds and environments. *Theor. Appl. Genet.* 101:733-741.
- Subudhi, P.K., and H.T. Nguyen. 2000. Biotechnology-New Horizons, pp. 349-397, *In: Sorghum: Origin, History, Technology, and Production*, C. Wayne Smith and R.A. Frederiksen (eds.), John Willey and Sons, New York, NY.

## 1999

- Subudhi, P.K. and N. Huang. 1999. RAPD mapping in a doubled haploid population of rice (*Oryza sativa* L.). *Hereditas* 130:41-49.
- Lang, N.T., P. K. Subudhi, S.S. Virmani, D.S. Brar, G.S. Khush, Z. Li, N. Huang. 1999. Development of PCR-based markers for thermosensitive genetic male sterility *tms3(t)* in rice. *Hereditas* 131:121-127.
- Subudhi, P.K., G. Magpantay, D.T. Rosenow and H.T. Nguyen. 1999. Mapping and marker-assisted selection to improve stay green trait in sorghum for drought tolerance, pp. 183-191. *In: Genetic improvement of rice for water-limited environments*, B. Hardy, O. Ito, and J.C. O'Toole (eds.), 1-3 December 1998, Los Banos, Philippines: International Rice Research Institute.

## 1998

- Subudhi, P.K., S.S. Virmani and N. Huang. 1998. A TGMS linked nuclear DNA marker as originated from the mitochondrial genome in rice (*Oryza sativa* L.). *Heredity* 80:285-292.
- Subudhi, P.K., S. Nandi, C. Casal, S.S. Virmani and N. Huang. 1998. Classification of rice germplasm: III. High resolution fingerprinting of cytoplasmic genetic male sterile (CMS) lines with AFLP. *Theor. Appl. Genet.* 96:941-949.

## 1997

- Maheswaran, M., P.K. Subudhi, S. Nandi, J.C. Xu, A. Parco, D. Yang, and N. Huang. 1997. Polymorphism, distribution and segregation of AFLP markers in a doubled haploid rice population. *Theor. Appl. Genet.* 94:39-45.
- Subudhi, P.K., R.P. Borkakati, S.S. Virmani, and N. Huang. 1997. Molecular mapping of thermosensitive genetic male sterility (TGMS) gene in rice by bulk segregant analysis. *Genome* 40:188-194.
- Huang, N., A. Parco, T. Mew, G. Magpantay, S.R. McCouch, E. Guiderdoni, J. Xu, P.K. Subudhi, E.R. Angeles, and G.S. Khush. 1997. RFLP mapping of Isozymes, RAPD, QTLs for grain shape and brown plant hopper resistance in a doubled haploid rice population. *Molecular Breeding* 3:105-112.
- Nandi, S., P.K. Subudhi, D. Senadhira, N. Manigbas, S. Sen-Mandi and N. Huang. 1997. Mapping QTLs for submergence tolerance in rice by AFLP and selective genotyping. *Mol. Gen. Genet.* 255:1-8.
- Yang, D., A. Parco, S. Nandi, P.K. Subudhi, Y. Zhu, G. Wang, and N. Huang. 1997. Construction of a Bacterial Artificial Chromosome (BAC) library and identification of overlapping BAC clones with chromosome 4 specific RFLP markers in rice. *Theor. Appl. Genet.* 95:1147-1154.
- Lang, N.T., P.K. Subudhi, S.S. Virmani, N. Huang and D.S. Brar. 1997. Development of PCR based markers for thermosensitive genetic male sterility gene, *tms3(t)* in rice. *Rice Genetics Newsletter* 14:102-103.

#### 1996

Subudhi, P.K., R.P. Borkakati, S.S. Virmani and N. Huang. 1996. Inheritance and molecular mapping of thermosensitive genetic male sterility gene in rice, pp. 601-606. *In: Rice Genetics III, Proceedings of the Third International Rice Genetics Symposium, 16-20 Oct 1995. Manila (Philippines).*

#### 1995

Subudhi, P.K. and N. Huang. 1995. Identification of genes responsible for segregation distortion in a doubled haploid population of rice by using molecular markers. *Rice Genetics Newsletter* 12:239-241.

Subudhi, P.K., R.P. Borkakati, S.S. Virmani and N. Huang. 1995. Identification of RAPD markers linked to rice thermosensitive genetic male sterility gene by bulk segregant analysis. *Rice Genetics Newsletter* 12:228-231.

Kangle, Z., P.K. Subudhi, J. Domingo, G. Magpantay and N. Huang. 1995. A rapid DNA isolation protocol for marker assisted selection in rice breeding. *Rice Genetics Newsletter* 12:255-258.

Subudhi, P.K. and P.K. Panda. 1995. Mutagen induced stress response and its implication in mutational improvement of rapeseed and mustard. *Madras Agril. J.* 82(5):357-360.

Subudhi, P.K. and R.N. Raut. 1995. Studies on early generation pollen and seed fertility in interspecific crosses of *Brassica*. *Crop Research* 10(3):291-296.

Mohapatra, D., B.K. Das, P.K. Subudhi and I.C. Mohanty. 1995. Production of inter-specific hybrids between *Oryza sativa* and *Oryza minuta*. *Current Agril. Res.* 8 (Suppl.):21-23.

#### 1994

Subudhi, P.K., and R.N. Raut. 1994. White rust resistance and its association with parental species type and leaf waxiness in *Brassica juncea* L. Czern & Coss x *Brassica napus* L. crosses under the action of EDTA and Gamma ray. *Euphytica* 74:1-7.

Subudhi, P.K. and R.N. Raut. 1994. Genetic analysis of yield and its component traits in Indian mustard (*Brassica juncea*) x Ethiopian mustard (*Brassica carinata*) interspecific crosses. *Indian J. Agril. Sci.* 64(4):171-175.

Subudhi, P.K. and R.N. Raut. 1994. Variation in resistance to leaf blight caused by *Alternaria brassicae* in interspecific crosses of *Brassica* varieties. *Indian J. Agril. Sci.* 64(7):501-503.

Panda, P.K. and P.K. Subudhi. 1994. A comparative study of chemically induced micromutational variability in M2 generation of rapeseed and mustard. *Indian J. Genet.* 54(3):269-274.

#### 1993

Subudhi, P.K., and S.K. Sinha. 1993. Mutagenic effect on growth pattern of wheat. *J. Maharashtra Agril. Univ.* 18(2):243-245.

Subudhi, P.K., and S.K. Sinha. 1993. Induced micromutation in relation to mutagen induced stress in wheat. *Gujarat Agril. Univ. Res. J.* 18(2):9-12.

Subudhi, P.K., and R.N. Raut. 1993. Inheritance of seed coat colors in oilseed *Brassica*. *J. Oilseeds Res.* 10(2):251-253.

#### 1992

Subudhi, P.K., and R.N. Raut. 1992. A note on inheritance of flower color in *Brassica juncea* x *Brassica carinata* interspecific crosses. *Orissa J. Agril. Res.* 6(3-4):159-161.

#### 1991

Subudhi, P.K., B.K. Mohapatra and S.K. Sinha. 1991. Use of pollen traits for early detection of micromutations in wheat. *Indian J. Genet.* 51(1):107-111.