

# College of Post Graduate Studies in Agricultural Sciences

(Central Agricultural University-Imphal)

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## FACULTY PROFILE

### Dr. Wricha Tyagi

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#### Professor

School of Crop Improvement



**Ph.D. (Life Sciences)** 2004

– International Centre of Biotechnology and Genetic Engineering (ICGEB), New Delhi, India in collaboration with JNU

**Postdoctoral Research** (2004-2006) – ICGEB, New Delhi; Univ. of Hyderabad

**Postdoctoral Research** (2006-2008) – Cornell University, Ithaca, NY, USA (Plant Breeding Department)

**Specialization**

: Plant Molecular Biology/Biotechnology

**Teaching / Research Experience**

: 15 Years

### Publications summary :-

Publications Particulars	No. of Publications
<b>International</b>	38
<b>Others</b>	2
<b>Book chapters</b>	3
<b>general articles</b>	3
<b>in conferences/symposium</b>	30

### **Publications list (20 best publications)**

1. Colney L, Tyagi W, Rai M (2018) Morphological and molecular characterization of two distinct chilli cultivars from North Eastern India with special reference to pungency related genes. *Scientia Horticulturae*. 240: 1–10. doi.org/10.1016/j.scienta.2018.05.045.
2. Dutta SS, Tyagi W, Pale G, Pohlong J, C. Aochen, Pandey A, Pattanayak A, Rai M (2018) Marker–trait association for low-light intensity tolerance in rice genotypes from Eastern India. *Molecular Genetics and Genomics*. 293(6) 1493-1506.
3. Das S, Tyagi W, Rai M and Yumnam JS (2017) Understanding Fe<sup>2+</sup> and P deficiency tolerance in rice for enhancing productivity under acidic soils. *Biotechnology and Genetic engineering reviews* 33:1, 97-117.
4. Kim J, Lee H-J, Jung Y-J, Kang K-K, Tyagi W, Kovach M, Sweeney M, McCouch S, Cho, Y-G (2017) Functional properties of an alternative, tissue-specific promoter for rice NADPH-dependent dihydroflavonol reductase. *PLoS ONE* 12(8): e0183722. 10.1371/journal.pone.0183722
5. Tyagi W, Rai M (2017) Root transcriptomes of two acidic soil adapted Indica rice genotypes suggest diverse and complex mechanism of low phosphorus tolerance. *Protoplasma* 254:725–736
6. Yumnam JS, Rai M, Tyagi W (2017) Allele mining across two low-P tolerant genes PSTOL1 and PupK20-2 reveals novel haplotypes in rice genotypes adapted to acidic soils. *Plant Genetic Resources: Characterization and Utilization*; 15(3):221-229
7. Kim HJ, Jung J, Singh N, Greenberg A, Doyle JJ, Tyagi W, .... McCouch SR (2016) Population dynamics among six major groups of the species complex, wild relative of cultivated Asian rice. *Rice* 9:56.
8. Tiwari KK, Singh A, Pattnaik S et al. (2015) Identification of a diverse mini-core panel of Indian rice germplasm based on genotyping using microsatellite markers. *Plant Breeding* 134: 164-171.
9. Challam C, Ghosh T, Rai M, Tyagi W (2015) Allele mining across DREB1A and DREB1B in diverse rice genotypes suggests a highly conserved pathway inducible by low temperature. *J. Genet.* 94, 231-238.
10. Dkhar F, Rai M and Tyagi W (2014) Looking beyond *PstOL1*: marker development for two rice genes showing differential expression in P deficient conditions. *J. Genet.* 93, 573–577.
11. Challam C, Kharshing GA, Yumnam JS, Rai M, Tyagi W (2013) Association of qLTG3-1 with germination stage cold tolerance in diverse rice germplasm from the Indian subcontinent. *Plant Genetic Resources: Characterization and Utilization* 11(3); 206–211.
12. Yumnam JS, Tyagi W, Pandey A, Meetei NT, Rai M Evaluation of genetic diversity of chilli landraces from North Eastern India based on morphology, SSR markers, and the Pun1 locus. *Plant Mol Biol Rep* (2012) 30:1470-1479.
13. Tripathy MK, Tyagi W, Goswami M, Kaul T, Singla-Pareek SL, Deswal R, Reddy MK and Sopory SK Characterization and functional validation of tobacco PLC Delta for abiotic stress tolerance. *Plant Mol Biol Rep* (2012) 30:488–497.
14. Ahmed ZU, Panaullah GM, Gauch Jr H, McCouch SR, Tyagi W, Kabir MS and Duxbury JM Genotype and environment effects on rice (*Oryza sativa* L.) grain arsenic concentration in Bangladesh. *Plant Soil* (2011) 338:367–382.
15. Tung CW, Zhao K, Wright MH, Ali M L, Jung J, Kimball J, Tyagi W, .... McCouch SR Development of a research platform for dissecting phenotype–genotype associations in rice (*Oryza* spp.). *Rice* (2010) 3:205–217.
16. Zhao K, Wright M, Kimball J, Eizenga G, McClung A, Kovach M, Tyagi W, .... McCouch SR Genomic diversity and introgression in *O. sativa* reveal impact of domestication and breeding on the rice genome. *PLoS ONE* (2010) 5(3).

17. Rajagopal D, Agarwal P, Tyagi W, Singla-Pareek SL, Reddy MK and Sopory SK *Pennisetum glaucum* Na<sup>+</sup>/H<sup>+</sup> antiporter confers high level of salinity tolerance in transgenic *Brassica juncea*. *Mol. Breeding* (2007) 19: 137-151.
18. Tyagi W, Singla-Pareek SL, Nair S, Reddy MK, Sopory SK A novel isoform of ATPase c subunit from pearl millet that is differentially regulated in response to salinity and calcium. *Plant Cell Rep* (2006) 25:156-163.
19. Tyagi W, Rajagopal D, Singla-Pareek SL, Reddy MK, Sopory SK Cloning and regulation of Stress-inducible c subunit of vacuolar H<sup>+</sup> ATPase gene from *Pennisetum glaucum* and characterization of its promoter that expresses in shoot hairs and floral organs. *Plant Cell Physiol* (2005) 46(8): 1411-1422.
20. Tyagi W, Rai M, and Dohling A Haplotype analysis for locus in rice genotypes of north eastern and eastern India to identify suitable donors tolerant to low phosphorus. *SABRAO Journal of Breeding and Genetics* 44 (2012) (2) 398-405.

## PROJECTS :-

### Externally Funded Projects :-

#### (a) Ongoing Projects (1 No.) (as Principal Investigator)

Sl. No.	Title of the project	Agency	Period	Grant /Amount Mobilized (Rs. Lakh)
1.	Understanding phosphorus deficiency and iron toxicity tolerance in rice under acidic soils of North East Hill Region (PI)	DBT, GOI	3 years 2017 to 2020	122.08

#### (b) Completed (7 No.s) (as Principal Investigator)

Sl. No.	Title of the project	Agency	Period	Amount Mobilized (Rs. Lakh)
1.	Bioprospecting of genes and allele mining for abiotic stress tolerance (CCPI)	NAIP, ICAR	5 years (2009-14)	210.0
2.	Phenomics of moisture deficit and low temperature stress tolerance in rice (CCPI)	NASF, ICAR, GOI	5 years (2011-2015)	168.57
3.	Development of pod borer resistant transgenic pigeon pea and chickpea (CCPI)	NASF	6 years (2011-2017)	69.041

4.	Generation of early maturing and low moisture tolerant mutants in <i>Brassica campestris</i> (PI)	BRNS, BARC, GOI	3 years (2014-17)	22.2
5.	Collection and genetic diversity analysis of chilli germplasm from North-Eastern India (PI)	IRP, CAU (Imphal)	1 yr	0.675

**Legend :-**

**DBT** = Department of Biotechnology, GOI;

**NASF** = National Agricultural Science Fund (Formerly National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA), ICAR, GOI;

**BRNS** = Board of Research in Nuclear Sciences, Dept. of Atomic Energy (DAE), BARC) GOI