# Dr. Ramsong Chantre Nongpiur, PhD

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Dr. Ramsong Chantre Nongpiur was born and raised in Shillong, Meghalaya. He completed his Schooling from St. Anthony's Higher Secondary Shillong and St. Edmund's College, Shillong, and went on to pursue higher education in the field of Biochemistry completing his BSc (hons) from St. Edmund's College, Shillong in 2007 and MSc from North-Eastern Hill University, Shillong in 2009. He further went on to pursue his PhD in at the School of Life Sciences, Jawaharlal Nehru University, New Delhi, and obtained his PhD in 2018. Dr. Nongpiur aspires to contribute to the sustainable food security goals of the nation through his research which focuses primarily on identifying target genes and developing methods for crop improvement with a focus on rice. Apart from academics, Dr. Nongpiur's interests lie in music and sports such as football, table tennis, cricket, badminton, and swimming while he also loves to connect with nature through activities such as hiking, camping, fishing etc. Further details regarding his academic career are provided below.

## Phd Thesis

**Title:** Understanding the signaling components of the osmotic stress response in *Oryza sativa* L.


**Abstract:** The thesis focuses on the functional characterization of a Two-component system, multistep phosphorelay, concerning the osmotic stress response in rice. The work illustrates the biochemical characterization of OsHK3b as a hybrid histidine kinase in rice. In addition, functional characterization of a response regulator, OsRR26, through a transgenic approach, revealed that OsRR26 functions downstream of OsHK3b to regulate ROS turnover through the regulation of NADPH oxidases, OsRBOHB and OsRBOHE. In addition, OsRR26 was shown to function as a negative regulator of osmotic stress tolerance in rice. Furthermore, we found that OsRR26 plays a key role in grain development and its knockdown resulted in a severe reduction in yield. In this case, increased osmotic stress tolerance was obtained through OsRR26 knockdown, but this came at the cost of yield, highlighting the interconnectivity between osmotic stress response and yield, as well as the complexities involved in the generation of abiotic stress tolerant crops.


## Fellowships/Awards:

1. Department of Biotechnology-Research Associate (North East) (DBT-RA) 2023.
2. Awarded 1st Prize for Oral Presentation under Plant Physiology and Molecular Biology Theme in National Seminar on Emerging Trends in Plant Sciences (ETPS) 2022.
3. Science and Engineering Research Board-National Post-Doctoral Fellowship (SERB-NPDF) (2019)
4. Awarded 1st place in the Lightning Talks category at the "India EMBO Symposium: Sensing and signaling in plant stress response". 2019

5. Contributed in the design and development of "Stress Tolerant Rice of Next Generation (STRONG)", for which my PhD supervisor, Prof. Ashwani Pareek was awarded the Visitors Award 2018, for BEST TECHNOLOGY, from The President of India.
6. Senior Research Fellowship from Council of Scientific and Industrial Research (India)-2013-16
7. Junior Research Fellowship from Council of Scientific and Industrial Research (India)-2011-13

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## Work/Research experience:

1. Assistant Registrar, National Law University of Meghalaya (September 2023-March 2024).
2. Department of Biotechnology-Research Associate (North East) (DBT-RA) (February 2023-Current)
3. Science and Engineering Research Board-National Post-Doctoral Fellow (SERB-NPDF) at Dept. of Botany. NEHU (July 2020-July 2022).
4. Research Scientist at Plant Stress Biology, International Centre for Genetic Engineering and Biotechnology, New Delhi (March 2019-December 2019).
5. Senior Research Fellow at Plant Stress Biology, International Centre for Genetic Engineering and Biotechnology, New Delhi (August 2018-Februrary 2019).
6. Junior Research Fellow at Plant Stress Biology, International Centre for Genetic Engineering and Biotechnology, New Delhi (December 2017-July 2018).

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## Publications:

1. **Nongpiur RC**, Rawat N, Singla-Pareek SL, Pareek A (2024) OsRR26, a type-B response regulator, modulates salinity tolerance in rice via phytohormone-mediated ROS accumulation in roots and influencing reproductive development. **Planta** 259: 96.
2. Ali A, **Nongpiur RC,** Chrungoo NK (2023) An efficient Agrobacterium-mediated transformation and regeneration protocol for aromatic black rice, *Oryza sativa L.* (cv. Chakhao Poireiton and Chakhao Amubi). **Plant, Cell, Tissue & Organ Culture** 152; 619–633.
3. Gupta BG, Sahoo KK, Anwar K, **Nongpiur RC**, Deshmukh R, Pareek A, Singla-Pareek SL (2021) Silicon nutrition stimulates Salt-Overly Sensitive (SOS) pathway to enhance salinity stress tolerance and yield in rice. **Plant Physiology and Biochemistry**, 166: 593-604.
4. Das P, Bahuguna R, Rathore R, Abbat S, **Nongpiur RC**, Sarsu F, Singla-Pareek, Pareek A. (2021) Rice mutants with tolerance to multiple abiotic stresses show high constitutive abundance of stress-related transcripts and proteins. **Australian Journal of Crop Science**, 15(09):2021, 12-21.
5. Gupta P, Yadav C, Singh D, **Nongpiur RC**, Singla-Pareek SL, Pareek A (2021). Two component mediated stress signaling in plant: a comparative profiling in monocots and dicots. In "Protein kinases and stress signaling in plants: functional genomic perspective, eds. Pandey GK". **Wiley-Blackwell**. 1-19.
6. **Nongpiur RC**, Pareek SL, Pareek A (2020) The quest for "osmosensors" in rice. **Journal of Experimental Botany**, 71(2): 595-607.

7. **Nongpiur RC**, Gupta P, Sharan A, Singh D, Singla-Pareek SL, Pareek A (2019) The two-component system: Transducing environmental and hormonal signals. In "Sensory Biology of Plants, eds. Sopory SK". **Springer publications**. 247-278.
8. Sharan A, Soni P, **Nongpiur RC**, Singla-Pareek SL, Pareek A (2017). Mapping the 'two-component system' network in rice. **Nature Scientific Reports**, 7:9287.
9. **Nongpiur R**, Singla-Pareek, Pareek A (2016). Genomics approaches for improving salinity stress tolerance in crop plants**. Current Genomics**, 17, 345-357.
10. Roy S, **Nongpiur R**, Singla-Pareek SL, Pareek A (2015). Raising stress tolerant rice through the genetic manipulation of cyclophilins. **Rice research**, 3:3.
11. Soni P, Mutant KK, Soda N, **Nongpiur RC**, Roy S, Singla-Pareek SL, Pareek A (2015). Towards Understanding Abiotic Stress Signaling in Plants: Convergence of Genomic, Transcriptomic, Proteomic and Metabolomic Approaches. In "Elucidation of Abiotic Stress Signaling in Plants", Ed. Girdhar Pandey. **Springer publications**.
12. **Nongpiur R**, Soni P, Pareek SL, Pareek A (2012). Histidine kinases in plants: Cross-talk between hormone and stress responses. **Plant Signaling and Behaviour**, 7(10): 1230–1237.

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**Presentations at national and international conferences:**

1. **Nongpiur RC**, Sharan A, Karan R, Soni P, Singla-Pareek SL, Pareek A**.** A Two-component System regulates reproductive development and tolerance to salinity in rice. National Seminar on Emerging Trends in Plant Sciences (ETPS), North Eastern Hill University (2022).
2. **Nongpiur RC**, Sharan A, Karan R, Soni P, Singla-Pareek SL, Pareek A. Two-component system phosphorelay in phytohormone and abiotic stress response of rice. India European Molecular Biology Organization (EMBO) Symposium. Sensing and signaling in plant stress response. (2019)
3. **Nongpiur RC**, Sharan A, Karan R, Soni P, Singla-Pareek SL, Pareek A. Switching off a Response Regulator switches on a response. ICGEB workshop. Plant stress biology and food security. (2019)
4. **Nongpiur RC**, Sharan A, Karan R, Soni P, Singla-Pareek SL, Pareek A. Osmotic stress response in rice: A tale of two components. 4th International Plant Physiology Congress, Satellite Meeting-2018, Worldwide Universities Network, 4th Workshop Program.
5. **Nongpiur RC**, Sharan A, Karan R, Soni P, Singla-Pareek SL, Pareek A **(Poster)**. OsRR26, a type-B response regulator functioning downstream to the sensory histidine kinase, OsHK3b, in a multistep phosphorelay is involved in salinity stress response in rice. 86th Conference of Society of Biological Chemists, Jawaharlal Nehru University (2017).
6. **Nongpiur RC**, Sharan A, Karan R, Soni P, Singla-Pareek SL, Pareek A. A two-component histidine-aspartate phosphorelay involved in the osmotic stress response in rice. Biosparks, School of Life Sciences, Jawaharlal Nehru University, 2016.
7. **Nongpiur RC**, Sharan A, Karan R, Soni P, Singla-Pareek SL, Pareek A (**Poster)**. The illusive plant osmosensor: OsHK3b as a possible candidate in rice. International Plant Physiology Conference, Jawaharlal Nehru University, 2015.

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