

Ravi V. Mural

UNL, Lincoln, NE | +1 501-413-0186 | rmural2@unl.edu | www.linkedin.com/in/ravi-mural/

CAREER OBJECTIVE

Seeking a challenging and rewarding scientist position at a premier research organization where I can utilize my skills and expertise to contribute significantly to the field and drive the organization's goals while continuously developing my own abilities.

PROFESSIONAL SUMMARY

- Trained in multidisciplinary skills including breeding, quantitative genetics, big data analytics, plant physiology, molecular biology, functional genomics, and computational biology.
- Extensive experience in genomic, multi-environment, multi-trait data assessments for a variety of crops including corn, sorghum, rice, pearl millet, proso millet, soybean, sunflower, and chili.
- Demonstrated ability to effectively collaborate and manage multiple interdisciplinary projects with a diverse team of researchers from various academic, cultural, and global backgrounds. This includes international collaboration with teams in the United States, India, and the Philippines.
- Strong communication skills and have a track record of publishing in peer-reviewed journals, with several articles already published and several more in progress.

EDUCATION:

- Doctor of Philosophy (**PhD**) in Agronomy and Horticulture, Specialization in Plant Breeding and Genetics, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, 2019.
- Master of Science (**MS**) in Applied Biosciences, Department of Biology in Applied Sciences, University of Arkansas at Little Rock, 2014.
- Master of Science (**MS**) in Genetics and Plant Breeding, Department of Genetics and Plant Breeding, University of Agricultural Sciences, Bangalore, India, 2009.
- Bachelor of Science (**BS**) in Agriculture, University of Agricultural Sciences Dharwad, India, 2007.

PROFESSIONAL EXPERIENCE:

1. **Research Assistant Professor**, University of Nebraska-Lincoln (2022 – present)
 - Managing and leading a large research team, including postdoctoral researchers, technicians, graduate students, and undergraduate researchers, to ensure smooth and efficient operation
 - Conduct research focused on the development and improvement of crop plants for commercial use through genomics, quantitative genetics, and breeding approaches
 - Currently working on sorghum and maize quantitative genetics, genomics, and genotype by environment interactions

- Future plans are to extend research and breeding efforts to the commercial utility of various other cereal, millets and or legume crops
2. **Postdoctoral Researcher**, University of Nebraska-Lincoln (2019 - 2022)
 - Conducted research to understand what a large data set (high-density phenotype and genotype) tells us about various biological functions
 - Utilized quantitative genetics methods and computational approaches to analyze the genetic basis of the association between genomic regions and numerous phenotypes in sorghum, maize, rice, and pearl millet
 - Results and methodologies of my research can be extended to other related crop species to facilitate crop improvement
 3. **Graduate Research Assistant**, University of Nebraska-Lincoln (2014 - 2019)
 - Conducted research to identify genomic regions associated with seed compositional traits and a balance of seed oil and protein concentration in soybean using Molecular Inversion Probes (MIPs)
 4. **Teaching Assistant** University of Arkansas at Little Rock (2013 - 2014)
 5. **Graduate Research Assistant**, University of Arkansas at Little Rock (2011 - 2013)
 - Conducted research on identification and characterization of genes involved in tomato immunity, particularly the roles and molecular mechanisms of the ubiquitination system in regulating defense responses in plants
 6. **Senior Research Fellow** University of Agricultural Sciences (2010 - 2011)
 - Conducted research on identification of DNA markers for enhanced protein content and development of QTL Introgressed genotypes for high protein content in rice as part of a DBT (Dept. of Biotechnology, New Delhi, India) funded project
 7. **Senior Research Fellow** University of Agricultural Sciences (2009 - 2010)
 - Conducted research on development and identification of Anthracnose and Fusarium wilt tolerant CMS based hybrids in chili through conventional and molecular approaches
 8. **Graduate Research Assistant** University of Agricultural Sciences (2009)
 - Conducted research on heterosis and combining ability studies in Quality Protein Maize (*Zea Mays* L.) as part of MS in Genetics and Plant Breeding program
 9. Undergraduate research assistant (2003 - 2007)

RESEARCH INTEREST

I have a strong interest in conducting research and pursuing a career in the field of crop improvement using a combination of plant breeding techniques, high-throughput phenotyping, high-throughput genotyping, quantitative genetics, machine learning, and computational tools for handling large data sets and conducting meta-analyses, genomic and phenomic predictions. While traditional breeding is an important part of any breeding program, the use of advanced techniques such as high-throughput phenotyping and genotyping, molecular biology, and quantitative genetics has opened up new opportunities for innovative research in crop improvement for commercial benefit. I believe in taking a holistic approach that combines both conventional and advanced techniques to improve crops for practical use.

PUBLICATION IN PROGRESS

1. Grzybowski, M. W., **Mural, R. V.**, Xu, G., Turkus, J., Yang, J., & Schnable, J. C. (2022). A Common Resequencing-Based Genetic Marker Dataset for Global Maize Diversity. *bioRxiv*. <https://doi.org/10.1101/2022.10.28.514203> (Under review in *The Plant Journal*)
2. Wei, J., Guo, T., Mu, Q., Alladassi, M. E. B., **Mural, R.**, ..., ... & Yu, J. (2022, November). Genetic Dissection of Phenotypic Plasticity in Flowering Time and Plant Height in Sorghum Under Natural Field Conditions. (Under review in *GENETICS*)
3. Torres-Rodriguez, J. V., Sun, G., Mural, R. V., & Schnable, J. C. (2022). Measurement of expression from a limited number of genes is sufficient to predict flowering time in maize. *bioRxiv*. <https://doi.org/10.1101/2022.12.12.520168>
4. Sun, G., Yu, H., Wang, P., Guerrero, M. G. L., **Mural, R. V.**, Mizero, O. N., ... & Schnable, J. C. (2022). A role for heritable transcriptomic variation in maize adaptation to temperate environments. *bioRxiv*. <https://doi.org/10.1101/2022.01.28.478212> (Under review in *Genome Biology*)
5. Delen, Y., Mural, R. V., Xu, G., Delen, S. P., Schnable, J. C., Yang, J., & Dweikat, I. (2022). Dissecting the genetic architecture of sunflower head diameter using genome-wide association study. *bioRxiv*. <https://doi.org/10.1101/2022.10.24.513623> (Under review in *The Plant Genome*)

SELECTED PUBLICATIONS:

1. **Mural, R. V.**, Sun, G., Grzybowski, M., Tross, M. C., Jin, H., Smith, C., ... & Schnable, J. C. (2022). Association mapping across a multitude of traits collected in diverse environments in maize. *GigaScience*, 11.. <https://doi.org/10.1093/gigascience/giac080>
2. Khound, R., Sun, G., **Mural, R. V.**, Schnable, J. C., & Santra, D. K. (2022). SNP discovery in proso millet (*Panicum miliaceum* L.) using low-pass genome sequencing. *Plant Direct*, 6(9), e447. <https://doi.org/10.1002/pld3.447>
3. **Mural, R. V.**, & Schnable, J. C. (2022). Can the grains offer each other helping hands? Convergent molecular mechanisms associated with domestication and crop improvement in rice and maize. *Molecular Plant*, 15(5), 793-795.. <https://doi.org/10.1016/j.molp.2022.04.003>
4. Sun, G., **Mural, R. V.**, Turkus, J. D., & Schnable, J. C. (2022). Quantitative resistance loci to southern rust mapped in a temperate maize diversity panel. *Phytopathology*, 112(3), 579-587. <https://doi.org/10.1094/PHYTO-04-21-0160-R>
5. Nadaf, H. A., Vishaka, G. V., Chandrashekharaiah, M., Rathore, M. S., Srinivas, C., & **Mural, R. V.** (2022). Biological synthesis of metal nanoparticles by microorganisms: a sustainable approach. In *Microbial Resource Technologies for Sustainable Development* (pp. 269-288). *Elsevier*. <https://doi.org/10.1016/B978-0-323-90590-9.00021-3>
6. Khan, Shakir-ul Haque,..... **Mural, R.V.**, & Kim, H. "Field Deployment of A Nanogap Gas Sensor For Crop Damage Detection." (2022). *IEEE 35th International Conference on Micro Electro Mechanical Systems Conference (MEMS)*. IEEE, 2022.**Mural, R. V.**, Grzybowski, M., Miao, C., Damke, A., Sapkota, S., Boyles, R. E., ... & Schnable, J. C. (2021). Meta-analysis identifies pleiotropic loci controlling phenotypic trade-offs in sorghum. *Genetics*, 218(3), iyab087. <https://doi.org/10.1093/genetics/iyab087>
7. Khan, S. U. H., Tope, S., Dolpati, R.,, **Mural, R.V.**, & Kim, H. (2021). Development of a Gas Sensor for Green Leaf Volatile Detection. In *2021 21st International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers)* (pp. 250-253). IEEE. <https://doi.org/10.1109/Transducers50396.2021.9495597>
8. Sun, G., **Mural, R. V.**, Turkus, J. D., & Schnable, J. C. (2021). Quantitative resistance loci to southern rust mapped in a temperate maize diversity panel. *Phytopathology*. <https://doi.org/10.1094/PHYTO-04-21-0160-R>

9. Zhou, B., **Mural, R. V.**, Chen, X., Oates, M. E., Connor, R. A., Martin, G. B., ... & Zeng, L. (2017). A subset of ubiquitin-conjugating enzymes is essential for plant immunity. *Plant Physiology*, 173(2), 1371-1390. <https://doi.org/10.1104/pp.16.01190>
10. Hamera, S., **Mural, R. V.**, Liu, Y., & Zeng, L. (2014). The tomato ubiquitin-conjugating enzyme variant Suv, but not SIUev1C and SIUev1D regulates Fen-mediated programmed cell death in *Nicotiana benthamiana*. *Plant signaling & behavior*, 9(10), e973814. <https://doi.org/10.4161/15592324.2014.973814>
11. **Mural, R. V.**, Liu, Y., Rosebrock, T. R., Brady, J. J., Hamera, S., Connor, R. A., ... & Zeng, L. (2013). The tomato Fni3 Lysine-63-specific ubiquitin-conjugating enzyme and Suv ubiquitin E2 variant positively regulate plant immunity. *The Plant Cell*, 25(9), 3615-3631. <https://doi.org/10.1105/tpc.113.117093>
12. **Mural, R. V.**, Sasalawad, R., & Hittalmani, S. (2012). Evaluation of Rice (*Oryza sativa* L.) Accessions for Growth and Yield Attributes in Aerobic Condition. *International journal of plant breeding*, 6(2), 147-149. [http://www.globalsciencebooks.info/Online/GSBOOnline/images/2012/IJPB_6\(2\)/IJPB_6\(2\)147-149o.pdf](http://www.globalsciencebooks.info/Online/GSBOOnline/images/2012/IJPB_6(2)/IJPB_6(2)147-149o.pdf)
13. **Mural, R. V.** (2012). Combining ability analysis in quality protein maize (*Zea mays* L.) for grain yield and its component traits. *Electronic Journal of Plant Breeding*, 3(2), 747-752. <http://www.ejplantbreeding.org/index.php/EJPB/article/view/491>

PROFESSIONAL ACTIVITIES

- **Peer Review Experience:** I have conducted peer review for over 50 articles in the fields of plant breeding, quantitative genetics, agronomy, and crop improvement, published in reputed journals such as Molecular Plant, Environmental and Experimental Botany, BMC Genomics, BMC Plant Biology, Plant Breeding, Crop Science, Frontiers in Plant Sciences, Agronomy, Plants, Genes, Plant Direct, Horticulture Journal, Evolutionary Bioinformatics, and Plant Phenomics.
- **Editorial:** Biochemical Genetics (2020-present), Frontiers in Plant Science (2021-present), and Frontiers in Agronomy (2021-present).

SYMPOSIA AND CONFERENCES ATTENDED AND TALKS GIVEN

- Plant Breeding Symposium 2016, University of Nebraska-Lincoln (Poster Presentation)
- Plant Breeding Symposium 2017, University of Nebraska-Lincoln (Poster Presentation)
- Plant Science Symposium 2018, Washington State University, Pullman (Poster Presentation)
- Genomic Science Program 2021, Washington, DC (Poster Presentation)
- 63rd Annual Maize Genetics Conference 2021 (Virtual due to Covid) (Poster Presentation)
- Third International Workshop on Machine Learning for Cyber-Agricultural Systems 2021 (Invited talk and Poster Presentation)
- 64th Annual Maize Genetics Conference 2022, St. Louis MO (Invited talk and Poster Presentation)
- Fourth International Workshop on Machine Learning for Cyber-Agricultural Systems 2022
- National Association of Plant Breeders Conference 2022, Ames, IA (Poster Presentation)

FUNDING:

- Currently serving as co-PI on several federal grants from agencies such as NSF, USDA, and ARPA-E

PROGRAMMING PROFICIENCIES

- Proficient in programming languages such as R, Python, and Unix/Linux systems
- Skilled in using computational tools like TASSEL, PLINK, bcftools, and vcftools
- Experienced with cloud computing platforms
- Proficient in using Microsoft applications

QUANTITATIVE GENETICS METHODOLOGY PROFICIENCIES

- Molecular marker development
- GWAS, QTL mapping, eQTL mapping, TWAS
- Candidate gene analysis
- Multivariate analysis
- Machine learning
- Genomic and phenomic predictions

AWARDS AND SPECIAL ACHIEVEMENTS

- Received the **People's Choice Poster Award** at the Plant Science Symposium 2018 at Washington State University.
- Awarded a **travel grant** to attend the Plant Science Symposium 2018 at Washington State University.
- Recipient of the **John D. Rickett Outstanding Graduate Student Award** at the University of Arkansas at Little Rock. Awarded the **Best Publication and Presentation Award** at the University of Arkansas at Little Rock.
- Granted **University Merit Scholarships** for every semester of my M.Sc (Genetics and Plant Breeding) at UAS Bangalore. Awarded an **Ex-Servicemen Dependents Merit Fellowship** for my master's degree. Received a **Gold Medal** for achieving the highest grades in Genetics and Plant Breeding and related courses during my B.Sc (Agriculture) degree. Awarded **University Merit Scholarships** every semester for all four years of my B.Sc (Agriculture) at UAS Dharwad. Received an **Ex-Servicemen Dependents Merit Fellowship** for my undergraduate degree. Achieved Distinction all through the academic career in agriculture.

EXTRA-CURRICULAR ACTIVITIES

- Vice-Chair of the Plant Breeding Symposium 2016 held at University of Nebraska-Lincoln
- Active member and participant in organizing events for the Indian Student Association and Agronomy and Horticulture Graduate Student Association at UNL
- Active member of the Indian Student Association and Graduate Student Association at UALR
- Volunteered in disaster relief efforts organized by the Southern Baptist Disaster Relief after a tornado struck Little Rock, AR
- Participated in a 5K color run in Little Rock, AR
- Organization committee member for the 10th AGRUNIFEST 2009 at UAS, GKVK, Bangalore, India
- Participated in the National Service Scheme (National Integration Camp) in Bijapur, Karnataka, India

Last Updated: January 2023

- Participated in state-level basketball and swimming championships during school and undergraduate studies
- Participated in various cultural, painting, and sports activities, winning numerous prizes and certificates during school, undergraduate, and masters studies

HOBBIES & INTERESTS

Swimming and playing team sports such as cricket and volleyball