Contact Details: **Dr. Arra Yugander**
Scientist & DBT-Ramalingaswami Faculty Fellow
Molecular Phytopathology
CSIR-Central Institute of Medicinal and Aromatic Plants
Lucknow-226015, Uttar Pradesh, India
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Telephone number: -

Professional Work Experience
- Scientist, CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow; 23.12.2024-Present
- DBT-Ramalingaswami Faculty Fellow, School of Biology, IISER TVM; 03.2024-20.12.2024
- Senior Research Associate, Heinrich Heine Universität Düsseldorf; 02.2023-02.2024
- CEPLAS Post Doctoral Scientist/Fellow, Heinrich Heine Universität Düsseldorf; 02.2022-01.2023
- Alexander von Humboldt Post Doctoral Researcher, Heinrich Heine Universität Düsseldorf; 08.2019-01.2022
- Scientist, Plant Pathology & Hybrid rice, Nath Bio-Genes (I) Ltd; 01.2019-07.2019
- Post-Doctoral Fellow, Plant Science (Prof. P.B. Kirti), University of Hyderabad; 07.2017-12.2018

University Education
- Doctoral thesis (Dr.) at the Biotechnology (Dr. Sundaram R.M. & Dr. Laha G.S.), JNTU Hyderabad; 2011-2016
- Bachelor of Education in Teaching, (Biology) Kakatiya University; 2009-2010
- Post-graduation (Botany) at the Department of Botany, Kakatiya University; 2007-2009
- Graduation (Biology), Kakatiya University, (Botany, Zoology and Chemistry); 2004-2007

Awards
- Ramalingaswami Re-entry Fellowship, Department of Biotechnology, Government of India; 2022-2023
- Best oral presentation award, ICGEPB 2022: XVI. International Conference on Genetic Engineering and Plant Biology, Italy
- Associate Fellow, Telangana Academy of Sciences, Telangana state; 2021
- Fellow, Cluster of Excellence on Plant Sciences (CEPLAS), Germany; 2019
- Fellow, Alexander von Humboldt Foundation, Germany; 2019
- DBT Research Associateship, Department of Biotechnology, India; 2017
- SERB-NPDF, Department of Science Technology, India; 2017 (Not availed)
- CSIR-Research Associateship, CSIR, India; 2017 (Not availed)
- Best poster presentation award (2016), International Conference on Emerging Biotechnologies, Kakatiya University, India

Academic Merit
- Plant Physiology, National Eligibility Test, Indian Council of Agricultural Research (ICAR), India; 2018
- Plant Pathology, National Eligibility Test, Indian Council of Agricultural Research (ICAR), India; 2014
- Life Sciences, State Eligibility Test, Osmania University, Andhra Pradesh, India; 2012

Rice varieties developed and released in India
- DRR Dhan 58, high yielding, salinity tolerant, bacterial blight resistant, and fine grain rice variety; 2022
- DRR Dhan 59, high yielding, bacterial blight resistant, and fine grain rice variety; 2022
- DRR Dhan 60, high yielding, low phosphorous tolerant, bacterial blight resistant, and fine grain rice variety; 2022
- DRR Dhan 53, high yielding, bacterial blight resistant, and fine grain rice variety (**from my thesis work**); 2021

Memberships
- Member of American Society of Plant Biologists (ASPB), USA
- Member of American Phytopathological Society (APS), USA
- Life member of German Society for Plant Sciences (Deutsche Botanische Gesellschaft, DBG), Germany
- Life member of the Indian Society of Genetics and Plant Breeding (ISGPB) India.
- Member of the Indian Phytopathological Society, India

Professional Training
- Visiting Research Fellow (Dr. Albar Laurence, PHIM group), Institut de recherche pour le développement (IRD), Montpelier, France; 2023
- RNA Seq Data Analysis, organized by ECSeq Bioinformatics, Leipzig, Germany; 2022
- Good Scientific Practice for Post-Doctoral Researchers, organized by iGRAD, Heinrich Heine University, Dusseldorf, Germany; 2020

- Awareness-cum-Training Program on Protection of Plant Varieties and Farmers Rights Act 2001 and its Provisions, India; 2014
- Awareness-cum-Training on Plant variety protection, India; 2012

Editorial Contributions

- Selection committee member, student travel award applications, Plant Health Meeting, 2023, American Phytopathological Society (APS), USA.

- **Arra Y.**, Devanna B.N & Maganti S.M (2023). Plant Breeding Innovations - CRISPR as a Powerful Weapon for Agricultural Crops. Frontiers in Genome Editing. https://www.frontiersin.org/research-topics/51670/plant-breeding-innovations---crispr-as-a-powerful-weapon-for-agricultural-crops#overview.

List of projects

S. No	Funding Agency	Role	Duration	National/ International	Total budget
1	Department of Biotechnology (DBT) New Delhi, India	Principal investigator	2017-2019	National	1254400 (INR)
2	Alexander von Humboldt Foundation (AvH) Bonn, Germany	Principal investigator	2019-2022	International	106100 (Euro)
3	Cluster of Excellence on Plant Science (CEPLAS), Dusseldorf, Germany	Principal investigator	2022-2023	International	89376 (Euro)
4	Department of Biotechnology (DBT) New Delhi, India	Principal investigator	2024-2027	National	8316000 (INR)

Publication List

Loo E.P.I., Szurek B, **Arra Y**, Stiebner M., Bucholzer M, Devanna B.N., Vera Cruz C.M & Frommer W.B (2024). Closing the information gap between the field and scientific literature for improved disease management- with a focus on rice and bacterial blight. *Molecular Plant-Microbe Interaction.* doi.org/10.1094/MPMI-07-24-0075-FI

Arra Y., Loo E.P.I., Stieber M., Devanna NB., & Frommer W.B. (2024). A step-by-step protocol for crossing and marker-assisted breeding of Asian and African rice varieties. *Bio-Protocol*. doi:10.21769/BioProtoc.5069

Arra Y., Auguy F., Stiebner M., Chéron S., Wudick M.M., Miras M., Schepler-Luu V., Kohler, S., Cunnac S., Frommer W.B. & Albar L (2023) *Rice Yellow Mottle Virus* resistance by genome editing of the *Oryza sativa* L. *ssp. japonica* nucleoporin gene *OsCPR5.1* but not *OsCPR5.2*. *Plant Biotech. J.* 22:1299-1311 doi.org/10.1111/pbi.14266

Sinha P., Kumar TD., Shaik H.M., Solanki M., Gurumoorthy G., Das A., Miriyala A., Gonuguntala R., Punniakotti E., Muppavarapu K., Shaik M., Kumboju C., **Arra Y.,** et al. & Sundaram R.M. (2023) Fine mapping and sequence analysis reveal a promising candidate gene encoding a novel NB-ARC domain derived from wild rice (Oryza officinalis) that confers bacterial blight resistance. *Front. Plant Sci. 14:1173063.* doi.org/10.3389/fpls.2023.1173063

Luu V.T., Sciallano C., Stiebner M., Ji C., Boulard G., Diallo A., Auguy F., Char S.N., **Arra Y**., Schenstnyi K., Marcel Buchholzer M., Loo E.P.I., Bilaro A.L., Lihepanyama D., Mkuya M., Murori R., Oliva R., Cunnac S., Yang B., Szurek B. & Frommer W.B. (2023) Genome editing of an African elite rice variety confers resistance against endemic and emerging *Xanthomonas oryzae* pv. *oryzae* strains. *Elife*, 12: e84864 doi.org/10.7554/eLife.84864

Govinda P., **Arra Y.**, Gali U., Durgarani CV., V.Prakasam., Duraisamy L., Sundaram R.M., Cherupally S. & Laha G.S. (2023) Analysis of population structure of *Xanthomonas oryzae* pv. *oryzae* causing bacterial blight of rice, in Telangana and Andhra Pradesh states of India. *Australas. Plant Pathol. In revision*

Arra Y., Sundaram R.M., Ershad M.D., Muturaman P., Prakasam V., Maganti S.M. & Laha G.S. (2022) Understanding the variability of rice bacterial blight pathogen, *Xanthomonas oryzae* pv. *oryzae* in Andhra Pradesh, India. *J. Basic Microbiol*. 62:185-196. doi.org/10.1002/jobm.202100406

Balakrishnan D., Laha G.S., **Arra Y**., Surapaneni M., Beerelli K., Duraisamy L., Madamsetty S.P., Lella V.S.R., Sundaram R. M & Neelamraju S. (2022). Identification of novel major and minor quantitative trait loci associated with bacterial blight resistance in rice from *Oryza nivara*-derived wild introgression lines. *Plant Breed.* 141:756-770. doi.org/10.1111/pbr.13052

Madhusudan N., Beulah P., Veerendra J., Nagaraju P., Manasa Y., Sundaram R.M., Laha G.S., Anantha M.S., Barbadikar K.M, Gireesh C., Hariprasad A.S., Madhav M.S., Gobinath R., **Arra Y.**, et al. & Senguttvel P. (2022) Stacking of Pup1 QTL for low soil phosphorus tolerance and bacterial blight resistance genes in the background of APMS6B, the maintainer line of rice hybrid DRRH-3. Euphytica 218, 37. doi.org/10.1007/s10681-022-02987-0

Duraisamy L., **Arra Y.**, Laha G.S., Vijayasamundeeswari A., Basavaraj K, Balakrishnan D., Preeti., Bhaskar M., Aparna M.D & Madamsetty S.P. (2022) Assessing the molecular variability in *Ustilaginoidea virens*, the rice false smut pathogen with ISSR markers. *J. Rice Res*. 15:51-57.

Schmidt S.M., Luu V.T., Buchholzer M., **Arra Y** & Frommer W.B. (2021) Options for tackling pathogen resistance by genome editing in rice. *CAB Reviews* doi.org/10.1079/PAVSNNR20211604

Laha GS., Sundaram RM., Lella S.R.V., Madamsetty S.P., Fiyaz A.R., Senguttuvel P., Badri J., Duraisamy L., **Arra Y.**, Shaik H.M., Kumar D.T & Singh K. (2021) DRR Dhan 53 (RP-6113-Patho-BB9; IET 27294)-a high yielding, bacterial blight resistant, fine grain type rice variety. *J. Rice Res*. 14:75-76.

Sahu B., **Arra Y.,** Khare N., Lakpale N., Duraisamy L., Sundaram R.M., Madamsetty S.P. & Laha G.S. (2020) Identification of broad-spectrum bacterial blight resistance in diverse rice germplasm. *Indian J. Plant Protect*. 48:117-121.

Sahu B., Khare N., Lakpale N., **Arra Y.**, Yamini S., Singh J & Laha G.S. (2019) Evaluation of antagonistic rhizospheric fluorescent pseudomonads for the suppression of bacterial blight of rice. *J. Rice Res*. 11:46-51

Rao T., Chopperla R., Methre R., Punniakotti E., Venkatesh V., Sailaja B., Reddy R.M., **Arra Y.,** et al. & Mangrauthia S. K. (2019) Pectin induced transcriptome of a *Rhizoctonia solani* strain causing sheath blight disease in rice reveals insights on key genes and RNAi machinery for development of pathogen derived resistance. *Plant Mol. Bi*ol. 100(1-2): 59-71 doi.org/10.1007/s11103-019-00843-9

Arra Y., Sundaram R.M., Singh K., Madamsetty S.P., Hariprasad A.S., Maganti S.M. & Laha G.S. (2019) Marker assisted introgression of a major bacterial blight resistance gene, *Xa38* into a rice maintainer line, APMS 6B. *Indian Phytopatho*. 72:35-41. doi.org/10.1007/s42360-018-00111-8

Arra Y., Sundaram R.M., Singh K., Ponnuvel S., Duraisamy L., et al. & Laha G.S., (2018). Improved version of rice maintainer line APMS 6B possessing two dominant, broad spectrum resistance genes, Xa21 and Xa38 exhibits high level of resistance to bacterial blight disease. Mol. Breed. 38:100 (https://doi.org/10.1007/s11032-018-0853-7)

Arra Y., Sundaram R.M., Singh K., Duraisamy L., Lella S.R.V., et al. & Laha G.S. (2018) Incorporation of the novel bacterial blight resistance gene *Xa38* into the genetic background of elite rice variety Improved Samba Mahsuri. *Plos One*, 13(5): e0198260 (doi.org/10.1371/journal.pone.0198260)

Balachiranjeevi C., Bhaskar N.S., Vipparla A., Harika G, Mahadev H.K.S., Shaik H.M., Dilipkumar T, Miryala A, Kale R., **Arra Y.**, et al. & Sundaram R.M. (2018) Marker-assisted pyramiding of two major broad-spectrum bacterial blight resistance genes, *Xa21* and *Xa33* into an elite maintainer line of rice, DRR17B. *Plos One* 13(10): e0201271. doi.org/10.1371/journal.pone.0201271

Rekha G, Abhilashkumar V, Viraktamath B.C, Pranathi K., Kousik M.B.V.N., Laxmi P.B., Backiyalakshmi C., Pragya S., Kale R, Shaik H.M., Bhaskar S., Balachiranjeevi C., Swapnil K, Harika G, Punniakotti E, Miryala A, Dilipkumar T, **Arra Y.**, et al. & Sundaram R.M. (2018) Marker-assisted improvement of blast resistance of the popular, high yielding, fine-grain type, bacterial blight resistant rice variety, Improved Samba Mahsuri. *J. Plant Biochem. Biotechnol.* 27, 463-472 doi.org/10.1007/s13562-018-0455-9

Arra Y., Sundaram R.M., Duraisamy L., Shaik H.M., Prakasam V, et al. & Laha G.S. (2017) Virulence profiling of *Xanthomonas oryzae* pv. *oryzae* isolates, causing bacterial blight of rice in India. *Eur. J. Plant Pathol*. 149:171-191. doi.org/10.1007/s10658-017-1176-y

Govindu P., Gali U., **Arra Y.**, Durgarani C.V., Cherupally S., et al. & Laha G.S (2017) Biochemical characterization of *Xanthomonas oryzae* pv. *oryzae* isolates collected from Telangana and Andhra Pradesh. *Indian J. Plant Protec.* 45(2):193-199.

Govindu P., Durgarani C.V., Gali U., **Arra Y.**, Cherupally S., et al. & Laha G.S (2017) Multi-location evaluation of gene pyramided lines of MTU 1010 and JGL 1798 against bacterial blight of rice. *Indian Phytopatho*. 70:287-293.

Abhilashkumar V., Balachiranjeevi C., Bhaskar N.S., Rambabu R., Rekha G., Harika G., Hajira SK., Pranathi K, Vijay S., Anila M., Swamy M.H.K., Kousik M., **Yugander A.**, et al. & Sundaram R.M. Marker-assisted improvement of the elite restorer line of rice, RPHR-1005 for resistance against bacterial blight and blast diseases. *J. Genet.* 95 (4):895-903 (https://doi.org/10.1007/s12041-016-0711-5)

Abhilashkumar V., Balachiranjeevi C., Bhaskar N.S, Rambabu R., Rekha G., Madhavi K.R., Harika G., Vijay S., Pranathi K., Hajira S.K., Srivastava A., Swamy M.H.K., Anila M., **Yugander A.**, et al. & Prasad M.S (2016) Marker-assisted introgression of the major bacterial blight resistance gene, *Xa21* and blast resistance gene, *Pi54* into RPHR-1005, the restorer line of the popular rice hybrid, DRRH3. *J. Plant Biochem. Biotechnol.* 25 (4):400-409. https://doi.org/10.1007/s13562-016-0352-z

Hajira SK., Sundaram R.M., Laha G.S., **Yugander A.**, Balachandran S.M., et al. & Swamy M.H.K (2016) A Single-tube, functional marker based multiplex PCR assay for simultaneous detection of major bacterial blight resistance genes in rice, *Xa21*, *xa13* and *xa5*. *Rice Sci.* 23 (3):144-151. doi.org/10.1016/j.rsci.2015.11.004

Yugander A., Ladhalakshmi D., Mangrauthia S.K., Prasad M.S., Krishnaveni D., et al. & Laha G.S. (2015) Pathogenic and genetic variation among the isolates of *Rhizoctonia solani* (AG 1-IA), the rice sheath blight pathogen. *J. Phytopathol.* 163:465-474. doi.org/10.1111/jph.12343

Bhaskar N.S., Balachiranjeevi C., Abhilashkumar V., Rekha G., Harika G., Pranathi K., Swamy M.H.K., Anila M., Hajira S.K., **Yugander A.**, et al. & Sundaram R.M (2015) Marker-assisted improvement of akshayadhan for bacterial blight and gall midge resistance. *Annals Plant Soil Res*. 17:269-272.

Balachiranjeevi C., Bhaskar N.S., Abhilash V., Akaknksha S., Viraktamath B.C., Madhav M.S., Hariprasad A.S., Laha G.S., Prasad M.S., Balachandran S.M., Neeraja C.N., Satendra M.K., Sanguttuvel P., Kemparaju K.B., Bhadana V.P., Ram T., Harika G., Swamy M.H.K., Hjira S.K., **Yugander A.**, et al. & Sundaram R.M (2015) Marker-assisted introgression of bacterial blight and blast resistance into DRR17B, an elite, fine-grain type maintainer line of rice. *Mol. Breed.* 35:151. doi.org/10.1007/s11032-015-0348-8

Yugander A., Sundaram R.M., Ladhalakshmi D., Hajira S.K., Madhav M.S., et al. & Laha G.S (2014) Pathogenic and genetic profile of *Xanthomonas oryzae* pv. *oryzae* isolates from Andhra Pradesh. *Indian J. Plant Protec* 42:149-155.

Yugander A., Ershad MD., Mutturaman P, Sundaram R.M., Madav M.S. & Laha G.S. (2014) Severe outbreak of bacterial blight of rice in East and West Godavari districts of Andhra Pradesh. *DRR News letter*, 12:5.

Gopi, Karteek., Ershad MD., Gayathri M.G., Milton M., Suneel B., **Yugander A**., et al. & Madav M.S. (2014). A new initiative to identify novel mutants from a mutagenized population of Samba Mahsuri. *DRR News letter*, 12:4.

Yugander A., Sundaram R.M., Prasad M.S. & Laha G.S. (2013) Outbreak of bacterial blight of rice in Guntur district of Andhra Pradesh. *DRR News letter*, 11:5.

Natarajkumar P., Sujatha K., Laha G.S., Viraktamath B.C., Mishra B., Srinivasarao K., Hari Y., Hajira S.K., Pranathi K., Balachiranjeevi C., **Yugander A.,** et al. & Sundaram R.M. (2011) Identification, molecular mapping and marker-assisted introgression of novel bacterial blight resistance genes from wild relatives of *Oryza*. *Indian J. Genet*.71:1-8.

Invited Speaker

- Lecture, Genome editing for development of broad-spectrum resistance to major rice diseases in African popular rice. International Conference on Food and Nutritional Security (iFANS-2023) & 44th Annual Meeting of Plant Tissue Culture Association (India) & 5th International Plant Physiology Congress, Mohali, India

PhD associate supervisor

- Prakash Kumar Maurya, School of Biology, IISER TVM; 01.08.2024-Present

Postgraduate Supervisor

- Ajas M. Khader, School of Biology, IISER TVM; 01.06.2024-Present

Graduate Supervisor

- Gizem Yilmaz (2022) Bachelor Thesis, Heinrich Heine University, Düsseldorf. Role of sugar transporters (SWEET) for *Sarocladium oryzae* virulence and disease development.

Internship

- Manonmani IISER Tirupati: 01.06.2024-31.07.2024
- Shreevennela, IISER Tirupati: 01.06.2024-31.07.2024