Dr. Raju Ram Choudhary
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EDUCATIONAL PROFILE

Qualifications	Year of Passing	University/Board	Marks (%)	Fields of specialization/ Subjects
Ph.D.	2023	CCS HAU, Hisar	81.30	Genetics and Plant Breeding
M.Sc.	2019	CCS HAU, Hisar	82.50	Genetics and Plant Breeding
B.Sc.	2017	SKNAU, Jobner	78.70	Agriculture
Intermediate (10+2)	2013	B.S.E.R. Ajmer	74.40	Hindi, English, Physics, Chemistry and Biology
High school	2011	B.S.E.R. Ajmer	75.50	Hindi, English, Mathematics, Science, Social Science, Sanskrit

RESEARCH INTERESTS

Wheat breeding for food security; Breeding for abiotic stress resistance/tolerance in crop plants; Pure line and heterosis breeding in crop plants; Development and maintenance of A, B and R lines for CMS based hybrid breeding; Molecular breeding: MAS and association mapping in crop plants

SCHOLARSHIP AND AWARDS

ICAR-PG Scholarship during M.Sc. | CCS HAU, Hisar 2017-2019
ICAR-SRF Scholarship during Ph.D. | CCS HAU, Hisar 2019-2023
Secured AIR-20 in Lifesciences CSIR-JRF (NET) | December, 2018
Best Poster Presentation Award in National Level Workshop, SKRAU,Bikaner, RJ, India
Best Poster Presentation Award in International Conference at SVVV, Indore, MP, India
Best PhD Thesis Award in 5th National Brassica Conference at RARI, Durgapura, Jaipur, India

RESEARCH EXPERINECE

- Layout, planning and conducting field experimental designs and mating designs used in Plant Breeding experiments
- Development of protocols for screening germplasm/segregating generations for various stresses in Indian mustard
- Handling the segregating generation/germplasm in offseason nursery, green house, net house, laboratory, sick plots and fields for biotic and abiotic stress resistance/tolerance breeding programs
- Maintenance of genetic purity of different genetic materials by selfing and attempt crosses to develop F_1s between contrasting mustard genotypes.
- Development of new F_1s and evaluation of F_1s hybrids for seed yield and component traits, including quality as well as different abiotic stresses *viz.*, salinity, drought and chilling tolerance.
- Development, maintenance and evaluation of A, B and R lines
- Development and maintenance of germplasm
- Assist in production of breeder seeds of released varieties
- Genotypic and phenotypic based selection of parental material and assist in data observation of different trial

- Statistical analysis, interpretation of results obtained from molecular as well as field data and technical report writing
- Dissemination of technology through interaction with farmers in the farmer fair of CCSHAU,Hisar and SKNAU, Jobner

M.Sc. Genetics and Plant Breeding **[2017 - 2019]**

Heterosis studies based upon Mori CMS system in *Brassica juncea* (L.)

CCS Haryana Agricultural University, Hisar, India

M.Sc. Thesis | Department of Genetics and Plant Breeding | PI: Dr. R. K. Sheoran

Major findings:

- Four lines, namely, MA-8812, MA-9301, MA-8701 and MA-023 and one tester, MR-38 were found the good general combiners possessing highly significant positive GCA effects for seed yield per plant and component traits.
- Crosses MA-9301 x MR-44 and MA-9705 x MR-31 were showed significant SCA effects for seed yield per plant in desirable direction.
- Only two crosses namely MA-9301 x MR-44 and MA-8701 x MR-38 showed significant economic heterosis over standard check DMH-1.

Ph.D. Genetics and Plant Breeding **[2019 - 2023]**

Population structure and genetic diversity studies for terminal heat stress tolerance in Indian mustard [*Brassica juncea* (L.) Czern. & Coss.]

CCS Haryana Agricultural University, Hisar, India

Ph.D. Thesis | Department of Genetics and Plant Breeding | PI: Dr. Ram Avtar

Major findings:

- Based on heat susceptibility index (HSI) and per cent seed yield reduction (YD%), ten genotypes, *viz.*, RH 2041, RH 2020, RH 2050, BPR 349-9, RH 2049, PM 26, RH 2034, RH 1400-2, RH 2015 and RH 1935 were observed heat tolerant at terminal stage.
- Seed yield/plant was significantly and positively correlated with plant height, number of primary branches/plant, number of secondary branches/plant, main shoot length, number of siliquae on the main shoot, siliqua length, number of seeds/siliqua, 1000-seed weight, photosynthetic rate, stomatal conductance, total chlorophyll content, and carotenoid content.
- PIC values for all polymorphic SSR markers ranged from 0.013 to 0.627, with an average PIC value of 0.31
- Population structure analysis of the Indian mustard genotypes grouped the 154 genotypes into two clusters at a maximum likelihood value of delta K =2.
- A total of 29 and 33 significant marker-trait associations were identified by the MLM (Q + K) method at a significant threshold value of $P \leq 0.005$ in timely and late-sown environments, respectively.
- Under terminal heat conditions, a total of 20 SSRs were specifically detected that were not associated under normal sown conditions. This meant that these specific genomic regions and QTLs were associated under terminal heat conditions.

PROJECTS

1. **Wheat Breeder** under ICAR-AICRP on Wheat & Barley funded by ICAR & State Govt. (75:25)
2. **PI in PM-RKVY Project** on "Maintenance Breeding for Enhancing Seed Quality of Wheat and Barley" (2025). The project provides financial support of **₹ 64.57 lakh** for the development of infrastructure and procurement of machinery.

3. **Co-PI in PM-RKVY Project on "**Strengthening and Mechanization of University Farms to Enhance Quality Seed Production" (2025). That project provides financial support of **₹ 422.20 Lakh** to Ten constitutive colleges of our university for development of infrastructure and procurement of machinery.
4. **Co-PI in State Govt. Project on** "Establishment of Centre of Excellence for Tissue culture for important fruits and flowers of Rajasthan" (2024). That project provides financial support of **₹ 2940 Lakh** to development of state of art facilities for plant tissue culture at RARI, Durgapura.

TECHNICAL EXPERIENCE

MOLECULAR AND STATISTICAL COMPETENCIES

- Wet-lab experiments:
  - ✓ DNA isolation and quantification
  - ✓ Polymerase Chain Reaction
  - ✓ Gel Electrophoresis
- Proficient in using internet resources
- Software Package:
  - ✓ MS office - Excel, Word, PowerPoint
  - ✓ Biometrical- IndoStat, OPstat
  - ✓ Molecular – TASSEL, STRUCTURE, POWERMARKER

PUBLICATIONS

RESEARCH ARTICLES

Choudhary, R. R., Avtar, R., Kumar, P., Singh, M., Bishnoi, M., Kumar, N., & Punia, R. (2024). Dissection of Physiological Traits for Terminal Heat Stress Tolerance in Indian Mustard (*Brassica juncea* L.) Using Microsatellite Markers. *Plant Molecular Biology Reporter*, 1-22. (**NAAS rating – 8.10**)

Singh, M., Avtar, R., Lakra, N. Kumar, N., Bishnoi, M., Punia, R., **Choudhary, R. R.,** Kumari, N., Naresh and Dhillon, A. (2024). Comparative proteomic analysis provides insight into the key proteins inviolved in novel stem-physical-strength-mediated resistance (SPSMR) mechanism against *Sclerotinia sclerotiorum* in Brassicaceae. *Eur J Plant Pathol*, 1-23 (**NAAS rating – 7.80**)

Kumar, P., Nimbal, S., Sangwan, R. S., Budhlakoti, N., Singh, V., Mishra, D. C. and **Choudhary, R. R.** (2021). Identification of novel marker–trait associations for lint yield contributing traits in upland cotton (*Gossypium hirsutum* L.) using SSRs. *Frontiers in plant science*, 855. **(NAAS rating - 11.75)**

Singh, M., Avtar, R., Pal, A., Punia, R., Singh, V. K., Bishnoi, M., Singh, A., **Choudhary, R.R.** and Mandhania, S. (2020). Genotype-specific antioxidant responses and assessment of resistance against *Sclerotinia sclerotiorum* causing Sclerotinia rot in Indian mustard. *Pathogens*, 9(11), 892. **(NAAS rating - 9.49)**

Singh, M., Avtar, R., Lakra, N., Hooda, E., Singh, V. K., Bishnoi, M., Kumari, N., Punia, R., Kumar N. and **Choudhary, R. R.** (2021). Genetic and Proteomic Basis of Sclerotinia Stem Rot

Resistance in Indian Mustard [*Brassica juncea* (L.) Czern & Coss.]. *Genes*, 12(11), 1784. **(NAAS rating - 10.10)**

Singh, M., Avtar, R., Lakra, N., Pal, A., Singh, V. K., Punia, R. and **Choudhary, R. R.** (2022). Early oxidative burst and anthocyanin-mediated antioxidant defense mechanism impart resistance against Sclerotinia sclerotiorum in Indian mustard. *Physiological and Molecular Plant Pathology*, 101847. **(NAAS rating - 8.75)**

Singh, M., Avtar, R., Kumar, N., Punia, R., Pal, A., Lakra, N., ... **Choudhary, R. R.** & Singh, V. K. (2022). Genetic Analysis for Resistance to Sclerotinia Stem Rot, Yield and Its Component Traits in Indian Mustard [*Brassica juncea* (L.) Czern & Coss.]. *Plants*, 11(5), 671. **(NAAS rating - 9.94)**

Singh, M., **Choudhary, R. R.,** Avtar, R., Punia, R., Kumar P., Kumari N. and Khedwal, R.S. (2022). Heterosis for yield and its component traits in Indian mustard [*Brassica juncea* (L.) Czern & Coss.]. *The Pharma Innovation Journal* 11(1): 1842-1851. **(NAAS rating - 5.23)**

Samita, Kumar, M., Singh, V., Yadav, S., Yadav, S., Kavita, Kumar, D. and **Choudhary, R. R.** (2022). Assesment of genetic variability in bread wheat (*Triticum aestivum*) under heat stress. *Indian Journal of Agricultural Sciences*, 92 (4): 511-515. **(NAAS rating - 6.37)**

Choudhary, R. R., Avtar, R., Kumar, P., Singh M. and Bishnoi, M. (2022). Molecular and morphological diversity of the *mori* CMS lines and restores in Indian mustard (*Brassica juncea* L.). *Journal of Oilseed Brassica*, 13(2), 1-6. **(NAAS rating - 4.77)**

Choudhary, R. R., Avtar, R. S. R. and Kumar, D. (2020). Heterosis studies based upon *Mori* CMS system in *Brassica juncea* L. *Journal of Oilseed Brassica*, 11(2), 116-120. **(NAAS rating - 4.77)**

Choudhary, R. R., Avtar, R., Sheoran, R. K., Samita and Kumar, D. (2020). Combining Ability Studies Based on Mori CMS System in Indian Mustard [*Brassica juncea* (L.) Czern. & Coss.]. *Current Journal of Applied Science and Technology*, 39(20), 58-66. **(NAAS rating - 4.71)**

Choudhary, R. R., Avtar, R., Singh M., Samita and Amit (2021). Genetic Variability Studies for Yield and its Components in Indian Mustard (*Brassica juncea* L.) *Frontiers in Crop Improvement*, 9 (7): 2983-2986. **(NAAS rating - 4.67)**

Choudhary, R. R., Avtar, R., Singh M., Chaurasia H., Kumari M. and Poonia M. (2022). Trait Association Analysis for Yield and its Components in Indian Mustard (*Brassica juncea* L.). *Biological Forum – An International Journal*, 14(1): 538-542. **(NAAS rating - 5.11)**

EDITORSHIP - ANNUAL REPORT/INSTITUTE PUBLICATIONS

1. **Booklet on** Seed Production at SKNAU: Assessing the Current Status and Outlining Future Directions
2. **Booklet on** The Scenario of Pulses in Rajasthan: Scope and Opportunities
3. **Booklet on** The Sacred Status and Cultural Impact of Barley in Hindu Heritage
4. **Booklet on** Pulses: Nutritional Value, Cultivation Practices, and Global Impact
5. **Proceedings of** 16th National Symposium of IAUA on Protected Cultivation of Horticultural Crops: Challenges and Potential Solutions

ACADEMIC CONFERENCE PRESENTATIONS

Raju Ram Choudhary *et al.* (2024). Population structure and genetic diversity studies for terminal heat stress tolerance in Indian mustard [*Brassica juncea* (L.) Czern. & Coss.]. Best PhD Thesis Award presented in '5th National Brassica Conference' jointly organized by RARI, Durgapura and SRMR, Bharatpur.

Raju Ram Choudhary *et al.* (2022). Genetics of seed yield and its component traits in Indian mustard [*Brassica juncea* (L.) Czern & Coss.]. Poster presented in 'XV Agricultural Science Congress & ASC Expo' jointly organized by National Academy of Agricultural Sciences and Banaras Hindu University at Institute of Agricultural Sciences, Banaras Hindu University, Varanasi.

Raju Ram Choudhary *et al.* (2022). Genetic parameters and Correlation Studies in Indian Mustard (*Brassica juncea* L.) Poster presented in International Conference On 'Precision Agriculture' VAKSANA-2022. Organized by Shri Vaishnav Vidyapeeth Vishwavidyalaya Shri Vaishnav Institute of Agriculture, Indore (M.P.).

Raju Ram Choudhary *et al.* (2022). Genetic Variability Studies for Yield and its Components in Indian Mustard (*Brassica juncea* L.), Poster presented in 5th International Conference on Advances in Smart Agriculture and Biodiversity Conservation for Sustainable Development (SABCD-2022) organized by Jaipur National University, Jaipur.

Raju Ram Choudhary *et al.* (2022). Trait association analysis for yield and its components in Indian mustard (*Brassica juncea* L.). Participated in 1st International Conference (Virtual Mode) On Recent Advances for Managing Sustainable Soil Health and Crop Production organized by Gramin Kisan Vikas (GKV) Society Agra, India.

Raju Ram Choudhary *et al.* (2020). Combining Ability Studies Based on *Mori* CMS System in Indian Mustard [*Brassica Juncea* (L.) Czern & Coss]. Poster presented in 3rd Plant Science Researchers Meet – 2020 "National Conference on Natural and Agricultural Sciences Issues Challenges and opportunities" Organized by Association of Plant Science Researchers (APSR) Plantica Foundation Dehradun, Uttarakhand, India.

Raju Ram Choudhary *et al.* (2019). Heterosis studies based upon Mori CMS system in *Brassica juncea* L. Poster presented in Golden Jubilee International Conference on New Millennia Agriculture-Novel Trends and Future Scenario organized by Chaudhary Charan Singh, Haryana Agricultural University, Hisar.

Raju Ram Choudhary *et al.* (2018). Tackling Climate Change through Drought Tolerance in Pearl Millet. Poster presented in International Conference on Sustainable Agriculture, Energy, Environment and Technology (Icsaeet-2018) organized by Maharshi Dayanand University, Rohtak.

Raju Ram Choudhary *et al.* (2018). Molecular Marker Aided Plant Breeding. Poster presented in National Conference on Current Trends in Plant Science and Molecular Biology for Food Security and Climate Resilient Agriculture jointly organized by Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya Gwalior, Madhya Pradesh and National Environmental Science Academy (NESA), New Delhi.

RELEVANT COURSEWORK

Principles of Genetics | Principles of Plant Breeding | Principles of Quantitative Genetics | Principles of Cytogenetics | Breeding for Biotic and Abiotic Stress Resistance | Biotechnology for Crop Improvement | Principles of Biotechnology | Plant Tissue Culture and Genetic Transformation | Molecular Breeding | Experimental Design | Statistical Methods for Applied Sciences | Genomics in Plant Breeding| Seed Pathology | Heterosis Breeding in Crop Plants | Breeding for Quality Traits | Breeding Designer Crops | Advances in Breeding of Major Field Crops | Techniques in Molecular Biology - I | Gene Regulation and Expression | Floral Biology, Seed Development and Maturation | Molecular Cell Biology | Introduction to Bioinformatics |

EXTRA CORRICULAR ACTIVITIES AND OTHER ACHIVEMENTS

- Qualified twice ASRB-National Eligibility Test (NET) conducted by ASRB on behalf of I.C.A.R in the Discipline of Genetics & Plant Breeding for eligibility of Lectureship/ Assistant Professorship.
- Qualified Graduate Aptitude Test in Engineering (GATE) in 2021
- Attended two weeks "**International workshop cum hands on training on Genome Editing Approaches for Crop Improvement"**
- Attended ten days "Training on Statistical Data Analysis for Research Scholars"
- Attended a five days' Workshop on "Techniques for Evaluation of Wheat Quality" Organized at ICAR-IIWBR Karnal.
- Participated in 21 days 6th Orientation Programme on "Agriculture Education, Research and Extension Management" organized by DHRM, SKNAU, Jobner.

- **REFERENCES**

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Place: Jaipur **(Raju Ram Choudhary)**

Dated: 09.01.2026